CHAPTER 1
INTRODUCTION

1.1 Statement of Research Problem

The start of the 21st century marked the period when the opinions of all the stakeholders in the fishing industry globally converged on the perception that marine fishery resources are in a deplorable state. Since the United Nations Food and Agricultural Organisation (FAO) commenced monitoring the global state of marine fish stocks in 1974 the proportion of underexploited and moderately exploited stocks has fallen from 40 percent (%) in 1974 to 23% in 2005. Similarly, overexploited and depleted stocks increased from 10% in 1974 to around 25% in the early 1990s, where it has stabilised until the present date. The proportion of fully exploited stocks declined from slightly over 50% in 1974 to around 45% in the early 1990s, but later increased to 52% in 2005.1 At the national level, the state of marine fishery resources reflects the global trend. For instance, between 1992 and 2007 the landing of inshore fisheries catch in Nigeria steadily declined from 25,592 tonnes to 18,040 tonnes, while the landing of offshore fisheries catch in 2007 was only 2,158 tonnes,2 although the latter is generally claimed to be underexploited.3 The total commercial shrimp catch declined to 5,995 tonnes in 2007 against 15,249 tonnes in 1999.4

The deplorable state of marine fishery resources threatens food supply, food security and income generation for more than 2.6 billion people, mostly from developing countries, including Nigeria.5

Until recently, the consensus was that the lamentable state of marine fishery resources was primarily caused by overfishing with pollution and habitat destruction also contributing significantly to the problem.6 These problems persist because of non-compliance by states and individuals with the relevant international and domestic laws. The 2007

2 Federal Department of Fisheries (FDF), (2008) Fish Statistic File, Victoria Island, Lagos: FDF.
4 Federal Department of Fisheries (FDF), (2008) Fish Statistic File, Victoria Island, Lagos: FDF.
5 SOFIA 2006, p. 3.
Intergovernmental Panel on Climate Change (IPCC)\textsuperscript{7} report reveals that from 1961 to 2003 the average temperature of the oceans has increased globally by 0.037°C to depths of 3000 m, and that the oceans have absorbed more than 80\% of the heat added to the climate system.\textsuperscript{8} The increasing ocean temperature causes the ocean water to expand and it also accelerates the melting of Antarctic and Arctic icebergs and ice shelves. These effects have resulted in sea level rises and ferocious storm surges\textsuperscript{9} such as the one in Funafuti photographed by Gore (Figure. 1.1).\textsuperscript{10}

Figure 1.1 Photograph of Ocean Surge at Funafuti

Source: Gore, A., \textit{op. cit}\textsuperscript{11}


\textsuperscript{11} This text was analysed using the intertextuality and semiotic analyses. For detailed discussion on the methods of analysis used in this thesis see pp. 27-31 of Chapter 1.
The issues embedded in the above photograph include the intrusion of high salinity ocean water into estuaries (the spawning, nursery and feeding grounds for certain marine fish), and the destruction of properties and infrastructure of coastal dwellers by storm surges. These have caused coastal dwellers to put more pressure on already overexploited marine fish stocks.

The chances of the observed heat in the ocean being produced by natural internal forces alone are less than 5%. Scientists have established that anthropogenic emissions of greenhouse gases (GHGs), notably carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃) and chlorofluorocarbons (CFCs) are the cause of current global warming. By affecting the physiology and ecosystems of marine fish stocks, as well as exacerbating their overexploitation, anthropogenic-induced climate change has introduced a new dimension into the marine fish crisis.

1.2 Thesis Scope and Research Questions

The two salient issues that dominate the discourse on the marine fish crisis at national and international levels are (i) identifying the cause(s) of the crisis, and (ii) proffering solution(s) to the crisis. This thesis is based upon an exposition of two interrelated fisheries problems, which have serious national and global implications, and failure of the proffered solutions in the existing literature on fisheries to adequately address the problems. Firstly, the effectiveness of the United Nations (UN) and its FAO’s instruments on fisheries depends on compliance by states. According to Stokke and Vidas, although subregional and regional fisheries management organisations (RFMOs) can adopt...
conservation and management measures within their areas of operation, in practice the enforcement of such measures rests with states. Rayfuse and Wilder traced the basis for this to the lack of enforcement powers in RFMOs’ mandates. This means that the effectiveness of IFL remains largely the responsibility of coastal states, fishing states, flag states and port states. Unfortunately, some states are yet to ratify or accept all the UN and the FAO instruments on fisheries, while the majority of the state parties or member states to such instruments have still not complied with them.

Secondly, even if all the states decide to comply with IFL the consequences of increasing global warming on marine fishery resources will render ineffective the predominantly harvest-based measures adopted in existing international fisheries instruments. The truth is, whether marine fish stocks respond positively or negatively to climate change, the management and legal implications of the impact of climate change on marine fisheries are significant when viewed from the perspectives of fish growth, survival rate, recruitment, abundance, distribution, migration, predator-prey relationships and the effectiveness of domestic laws as well as cooperative arrangements on marine fisheries management. The implication of these considerations for marine fisheries management is that the sustainable development of marine fish stocks does not depend only on compliance by states with IFL, but also on external factors such as the integration of climate change into marine fisheries management and compliance by states with the climate change regime.

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18 Oosterveer, P., op. cit., p. 798. In particular, Nigeria has not ratified the FSA. It has also not accepted the Compliance Agreement and has not developed the National Plan of Actions (NPOA) recommended under the Code.
20 In this thesis, the UNFCCC, the Kyoto Protocol, the decisions of Conference of the Parties to the UNFCCC and the decisions of the Meeting of the Parties to the Kyoto Protocol are jointly referred to as “climate change regime”. It is necessary to mention that though this study focuses on the effect of climate change on fisheries, the researcher is mindful of the fact that other external factors, for example, the World Trade Organisation (WTO) and trade on endangered species, if not properly addressed are also capable of hindering states from achieving long-term sustainability of marine fishery resources.
Regrettably, none of the core international fisheries instruments has specifically integrated the impact of climate change into marine fisheries management, or directed their state parties or member states to comply with the UNFCCC and the Kyoto Protocol. It is axiomatic that non-legal commentaries on how to solve the marine fish crisis at the national and international levels have proffered a plethora of solutions, ranging from Diouf’s\textsuperscript{21} support for the development of aquaculture to the call by bioeconomists\textsuperscript{22} for the use of side payments for the purpose of ensuring flexibility and resilience of cooperative arrangements, when fish stocks are affected by stochastic events such as natural variations in climate.

Meanwhile, the majority of legal literature on the parlous state of marine fishery resources focuses predominantly on how to address the problems of overfishing, pollution and habitat degradation. The few legal scholars\textsuperscript{23} who have engaged in the climate change discourse have not called for the integration of climate change into IFL. Generally, the existing legal literature on why states comply with IFL or why fishermen, in the case of national regulatory measures, comply with fisheries law tends to focus on fisheries alone. Such works ignore the holistic approach to compliance, or the fact that the interconnection between environmental issues and their regimes’ compliance mechanisms, is capable of shaping state compliance with environmental regimes.\textsuperscript{24} Putting it more succinctly, while the UNFCCC and the Kyoto Protocol are not capable of inducing significant participation and compliance, establishing the interconnection between the compliance mechanisms of


\textsuperscript{24} Within the context of this study compliance mechanisms include the behavioural prescription and any institution or set of institutions (formal or informal) established by a treaty or any other international instrument for the purpose of encouraging compliance with one or more behavioural prescriptions of an international agreement. Behavioural prescription is any well-defined standard, rule or principle setting forth actions (including prohibitions) that state parties to any international agreement are expected to perform under appropriate circumstance. Young, O. R., (1979) \textit{Compliance and Public Authority: A Theory with International Applications}, Baltimore: The Johns Hopkins University Press, at pp. 5 and 2. See generally Breitmeier, H., Young, O. R., and Zürn, M. (2006) \textit{Analyzing International Environmental Regimes: From Case Study to Database}, Cambridge: The MIT Press, pp. 148-187 particularly at p. 159, and Ward, H. (2006) “International Linkages and Environmental Sustainability: The Effectiveness of the Regime Network”, \textit{Journal of Peace Research}, Vol. 43, No. 2, pp. 149-166 at pp. 150-151.
the regimes, regulating fisheries and climate change could be an additional motivation for coastal and fishing states to honour their obligations under the UNFCCC and the Kyoto Protocol.

In Nigeria, the Sea Fisheries Act Cap S4 Laws of Federation of Nigeria (LFN) 2004 (SFA) and its supplementary regulations\textsuperscript{25} prescribe only harvest-based measures without integrating climate change into marine fisheries management. With the exception of Oludayo\textsuperscript{26}, who noted that climate change will lead to pole-ward movement of freshwater species and changes in sea-level will have negative impacts on fisheries and aquaculture,\textsuperscript{27} legal literature on marine fisheries\textsuperscript{28} does not address the emerging climate change issue. The scant scientific literature by Ibe,\textsuperscript{29} Teme\textsuperscript{30} and \textit{Nigeria’s First National Communication under the United Nations Framework Convention on Climate Change},\textsuperscript{31} examine the effects of climate change on marine fishery resources. Unfortunately, they over-relied on the IPCC’s report without explaining how individual species will be affected by key climate change parameters, especially the increasing Atlantic Ocean temperature.\textsuperscript{32} \textit{Nigeria’s National Communication} suggests implementation of adaptation measures as the most appropriate way of addressing the impact of climate change on fisheries. However, it fails to examine the likelihood of such measures being effective in the face of the stratifying impacts of climate change and their workability under the existing fisheries laws in Nigeria.

\textsuperscript{25} At this point it is necessary to mention only the core legislation regulating marine fishery resources in Nigeria. Other laws relevant to the sustainable development of marine fishery resources are examined in Chapter 7.
\textsuperscript{27} \textit{Ibid}, pp. 409-410.
\textsuperscript{29} Ibe, A. C., (1990) “Global Climate Change and the Vulnerability of the Nigerian Coastal Zone to Accelerated Sea Level Rise: Impacts and Response Measures”, \textit{Technical Paper No. 52, Nigerian Institute for Oceanography and Marine Research}, Victoria Island, Nigeria.
\textsuperscript{32} As a matter of fact, \textit{Nigeria’s National Communication} concedes that the specifics of the impacts of climate change on the ecosystems are yet to be properly analysed. See \textit{Nigeria’s National Communication}, p. 72.
Generally, there is a dearth of literature on the implementation and compliance by Nigeria with IFL, and on whether or not Nigeria’s interest in marine fisheries has influenced its decision to comply with the climate change regime. The scanty legal literature on conservation and management of marine fishery resources neither addresses the subject in detail nor ascertains the extent or the reasons why Nigeria complies with international fisheries law. At the time of writing, none of the existing legal literature on marine fisheries in Nigeria takes a critical look at the exacerbating effect of climate change on already overexploited marine fishery resources and whether existing governance mechanisms are capable of addressing the problem. In addition, none of the literature on marine fisheries in Nigeria explores the views and perceptions of the relevant stakeholders on how to address the exacerbating effects of climate change on already overexploited marine fishery resources. Meanwhile, the IPCC is very clear on the fact that

A comprehensive understanding of the implications of climate change requires an in-depth exploration of the perceptions and reactions of the affected stakeholders group and the lay public.\(^{33}\)

In terms of methodology, there is virtually no literature on marine fishery resources in Nigeria that adopts a historical analogy method to address the crisis in the sector. This thesis attempts to address these issues.

Based on the foregoing interrelated problems and the gaps identified in the existing literature on how to solve the crisis in marine fisheries globally and in Nigeria, this thesis argues that efforts made by states to address the deplorable state of marine fishery resources from only the perspective of “traditionally” known threats, especially overfishing, will not succeed in achieving long-term sustainability of marine fishery resources. In order for states to achieve long-term sustainability of marine fishery resources, they have to adopt a holistic and proactive approach in managing fish stocks. This approach involves integrating climate change into the conservation and management measures adopted at national and international levels, as well as state compliance with all international agreements on marine fish stocks and climate change.\(^{34}\) The most effective

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34 Okon, E. (2005) “Integrating the Impact of Climate Change into Fisheries Management under International Fisheries Law”, Abstract of Poster Presented, In: Winfield, I. J., (ed.) *Fisheries on the Edge Conference Proceedings*, Institute of Fisheries Management Annual Conference – Salford 2005, p. 234. This study is mindful of the fact that non-compliance by coastal states and distant water fishing nations (DWFNs) with other international agreements regulating issue-areas that are also interrelated with fisheries may hinder the
way to integrate climate change into marine fisheries management is through the application of the ecosystem and precautionary approaches. Unless a holistic and proactive approach is taken, the ability of the international community or of any one state to address the deplorable state of marine fishery resources will continue to remain illusory.\textsuperscript{35} In view of the above, the objective of this thesis is to determine the best way to achieve a sustainable development of marine fishery resources.

In order to investigate more fully the need for states to integrate climate change impacts into marine fisheries management and state compliance with both IFL and climate change regimes, this thesis adopts a case study design\textsuperscript{36} with Nigeria’s marine trawler fisheries as the primary unit of analysis.\textsuperscript{37} Nigeria is a federal constitutional republic comprising 36 states\textsuperscript{38} and a Federal Capital Territory, Abuja. (Figure 1.2)

Figure 1.2 Administrative Map of Nigeria

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{administrative_map_of_nigeria.png}
\caption{Administrative Map of Nigeria}
\end{figure}

Source: National Bureau of Statistics, Abuja

effectiveness of IFL. One of such international agreements is the World Trade Organisation (WTO) Agreement. However, this study focuses only on the interrelationship between climate change and fisheries. \textsuperscript{35}Ibid.


\textsuperscript{37}For detailed discussion on unit of analysis see Yin, R. K., (2003) op. cit., pp. 22-26.

\textsuperscript{38}Of the 36 states 8 (Akwa Ibom, Bayelsa, Cross River, Delta, Lagos, Ogun, Ondo and Rivers) are located in the coastal zone.
The country has a population of 147.7 million people occupying a land surface area of 923,768 km$^2$, out of which inland waters are estimated to occupy 13,000 km$^2$. It has a coastline of approximately 853 km which lies between longitude 2° 45’ and 8° 35’E, and latitude 4° 10’ and 6° 20’N. The Nigerian coastline is low lying, with heights of not more than 3.0 m above sea level and is indented with lagoon systems, mangrove swamps and a delta (Niger-Delta) which opens into the Atlantic Ocean through a host of rivers. Nigeria has a maritime zone consisting of a territorial sea, contiguous zone and an exclusive economic zone (EEZ), estimated at 210,900 km$^2$. Fisheries in Nigeria are classified into two main types – captured and aquaculture. The former is further divided into freshwater (coastal/brackish, rivers and lakes) and marine (offshore and inshore) fisheries. The marine fishing industry in Nigeria comprises the industrial trawler fisheries and artisanal fisheries. The focus of this thesis is on the industrial trawler fisheries.

The reasons for choosing Nigeria’s marine trawler fisheries as the case study is because the level of fish depletion and the intensity of trawler activities in this sector poses the greatest challenge to the sustainable development of fishery resources in Nigeria. Secondly, there is serious concern about illegal activities in the marine fishery. Thirdly, there is an increased pressure on this sector to meet the high demand for fish in Nigeria. Fourthly, notwithstanding the fact that industrial trawler fisheries contribute only 3.7% of the domestic markets for fish, it generates foreign exchange (estimated US$ 20 million per annum) through shrimp exports to Europe and US. Fifthly, Nigeria’s marine environment is embedded in the Gulf of Guinea, which is part of Atlantic Ocean (Figure 1.3)

42 Nwilo, P. C. and Badejo, O. T., op. cit., p. 120 and Amire, A.V., op. cit., p 143.
43 Ibid.
44 For instance, for the past thirteen years, the number of trawlers fishing in Nigeria’s inshore waters has been more than the recommended number of vessels. According to Ezenwa and Edonwu 150 vessels are recommended. Ezenwa, B. I. and Ebonwu, B., (2002) “Propagation and Culture of Marine Shrimp, Penaeus notialis and New Entrant in Nigeria Coastal Waters, Penaeus monodon”, 2002 Annual Report, Nigerian Institute for Oceanography and Marine Research, Lagos, pp. 22-23 at p. 22. On the other hand, Amire is of the view that a realistic capacity required to sustainably harvest inshore finfish is 65 vessels, while between 54 and 70 vessels are required for shellfish. Amire, A. V., op. cit., p. 152 – 153. For the number of registered and actually operated vessels see Table 2.3 on p. 47, infra.
Climate trends in the Gulf of Guinea have been consistent with global changes.\textsuperscript{47} As with the oceans generally, the average temperature in the Gulf of Guinea has increased. Observations by Koranteng and McGlade indicate that sea surface temperatures (SST) in the areas off Sierra Leone-Liberia, Nigeria-Cameroon and Ivory Coast-Ghana from 1982-1992 were high.\textsuperscript{48} This is likely to have serious conservation and management implications for Nigeria’s valuable marine commercial stocks, especially \textit{Sardinella aurita} and highly migratory tuna species. Already, investigation reveals that the increasing SST in the western Gulf of Guinea has affected the distribution and abundance of \textit{Sardinella aurita}.\textsuperscript{49} Apart from problems of availability and catchability of fish, predator-prey relationships between and among fish species, on the one hand, and between fish and non-fish species on the other, are also likely to be affected. Importantly too, shifts in the distribution and migration pattern of commercial fish species, e.g. tuna, may trigger fisheries conflicts on the one hand between Nigeria and other Gulf of Guinea states and on the other between Nigeria and distant water fishing nations (DWFNs). Lessons from other jurisdictions on the consequences of climate change on shared fish stocks (e.g. salmon wars between the United States and Canada) lead one to believe that the Gulf of Guinea states are sitting on a potentially explosive situation. As far back as 1979, Munro had anticipated such conflict with respect to transboundary fishery resources off West Africa although he did not


\textsuperscript{49} \textit{Ibid}, p. 196. \textit{Sardinella aurita} is common in the Gulf of Guinea and is one of the most valuable commercial specie in Nigeria.
contemplate that climate change could trigger the conflict.\textsuperscript{50} Choosing Nigeria’s marine trawler fisheries sector as a case study enables this study to present a classic example of how the fisheries law of one of the states bordering the Gulf of Guinea has addressed the problem.

Any effort to address global environmental problems, such as the marine fish crisis, involves the question of leadership at the subregional, regional and global levels. Nigeria plays a leading role in the African Union, the New Partnership for Africa’s Development and the Economic Community of West African states.\textsuperscript{51} How and why Nigeria complies with international agreements on marine fishery resources and climate change is likely to serve as a model to other African countries, particularly those bounded by the Gulf of Guinea. Nigeria has dual status as a coastal state and the second highest gas flaring country in the world.\textsuperscript{52} The focus on the marine trawler fisheries in Nigeria enables this study to examine whether or not Nigeria’s interest in marine fisheries has any influence on its compliance with the UNFCCC. Lastly, evaluation of the extent to which Nigeria has complied with IFL can technically be done \textit{vis à vis} Nigeria’s EEZ and the high seas, where IFL prescribes certain conservation and management measures.

As far as the scope and argument of this study are concerned, five issues need to be emphasised from the outset. Firstly, this study addresses the foremost problems of overfishing and climate change. This does not mean that other “traditional” problems, especially marine pollution and habitat alteration/destruction, are less important or should be treated in isolation.\textsuperscript{53} Ordinarily, any attempt to apply a holistic and proactive approach

\begin{footnotesize}
\textsuperscript{53} For a detailed discussion on such factors see pp. 54-56 of Chapter 2.
\end{footnotesize}
in fisheries management ought to address all the problems. Incidentally, in Nigeria, the problems of marine pollution and habitat destruction have been the subject of intensive research for the past three decades by legal scholars, social scientists and scientists.\(^5^4\) There is a plethora of statutes\(^5^5\) and institutional frameworks\(^5^6\) to address the problems. Once the problem of how to deal with the different tiers of government and their agents/business partners, which constitute the main culprits, is addressed, secondary problems like corruption, lack of political will on the part of government to enforce the relevant laws, lack of required manpower and overlapping mandates and jurisdiction between institutions,\(^5^7\) coherence in policy in the overall governance structure,\(^5^8\) etc., will be relatively easier to deal with.

The above scenario is not the case with the problem of climate change, which has exacerbated the already deplorable state of marine fishery resources caused by overfishing. The novelty and uncertainty of the problems associated with the interrelationship between marine fishery resources and climate change justify urgent independent research on the subject. Furthermore, the SFA did not contemplate the nature and magnitude of the current marine fish crisis or the emergence of new environmental principles and concepts such as sustainable development, precautionary approach and ecosystem approach, which have completely revolutionised contemporary marine fisheries management.

Secondly, the discussion in Chapter 2 on the preliminary issues of the marine fish crisis covers global and Nigerian perspectives as well as all sectors of fisheries. The purpose of


such a wide coverage is to underscore the global nature of the marine fish crisis, and the capacity of climate change to hinder sustainable development in all fishery sectors: marine, inland, and aquaculture. It also enables this study to lay the foundation for the argument that in the light of current global warming neither investment in inland fisheries nor aquaculture is a perfect solution for the marine fish crisis.

Thirdly, the integration of climate change into marine fisheries management through the application of the ecosystem and precautionary approaches requires policy-makers and fisheries managers to adopt conservation and management measures that, in addition to addressing the perennial problem of overfishing, contain diverse adaptation and mitigation measures. The IPCC 2007 defines mitigation as an anthropogenic intervention to reduce the sources or enhance the sinks of GHGs. The Report went on to define adaptation as adjustment in natural or human systems in response to actual or expected climate stimuli or their effects, which moderates harm or exploits beneficial opportunities. The interrelationship between adaptation and mitigation requires policy-makers and fishery managers to take into account their trade-offs and synergies. For instance, reducing fish mortality of fully or over-exploited stocks is a principal adaptation measure that will reduce the effects of climate change on the stocks. Interestingly too, a larger biomass of stock means an increase in fish droppings, which inevitably enhances the capacity of oceans to absorb CO$_2$. Unfortunately, the residual inertia in climate change system are such that even if there is a total cessation of emissions of GHGs, the impact of climate change on fish will continue for the next 50 years or so. Since major changes in fish communities are unavoidable in the next few decades, policy-makers and fishery managers will have to focus more on adaptation measures. They also have to understand that without mitigation climate change will get to a level at which adaptation will become impossible for some fish stocks.

60 Ibid.
61 See generally Klein, R.J.T., et al (2007) op. cit., pp. 754-760 where the IPCC distinguishes between four types of inter-relationship between adaptation and mitigation thus: (i) adaptation actions that have consequences for mitigation; (ii) mitigation actions that have consequences for adaptation; (iii) decisions that include trade-offs or synergies between adaptation and mitigation; and (iv) processes that have consequences for both adaptation and mitigation.
64 Graham, C. T and Harrod, C., op. cit., pp. 1143 and 1186.
Fourthly, there is a need to shed more light on transnational environmental problems like marine fish crises and climate change having domestic roots, thus requiring concerted actions by states. Slaughter and Burke-White have carefully distinguished between the classical model of international law which was designed to address traditional international law problems such as state to state cooperation and the treatment of one state’s nationals by another state on the one hand, and contemporary international law problems, which are shaped by the process of globalisation and the emergence of new transnational threats on the other hand.\(^{65}\)

In order to effectively address contemporary international law problems such as the deplorable state of marine fisheries and climate change at their sources, international law, particularly international environmental law, has shifted from independent regulation above the national state to influencing domestic actors, who are the primary causes of the problems, and their states’ government policies and institutions, the majority of which lack the political will and capacity to address the problems.\(^{66}\) The focus of this thesis on states should not be taken as an implied or expressed rejection of the need for international cooperative actions by states, which is \textit{sine qua non} for solving global problems. Recently, Patricia Espinosa, Minister of Foreign Affairs of Mexico and Incoming President of 16\(^{th}\) Conference of the Parties scheduled for Cancun, November 29-December 10, 2010 has underscored this point thus:

\begin{quote}
I believe that we can and must solve global problems with multilateral actions. I am a strong supporter of the United Nations system of a way (sic [translated version]) of approaching international affairs in which all countries are active participants ... In our interconnected world everyone’s fates is down together (sic [translated version]).\(^{67}\)
\end{quote}

While the incontrovertible fact is that global environmental problems can only be solved using global solutions, the importance, when seeking solution, of targeting the sources of the problems, which are located in sovereign states, in accordance with international legal rules cannot be ignored.


\(^{66}\) Ibid., p. 331.

\(^{67}\) Patricia Espinosa, Minister of Foreign Affairs of Mexico and Incoming President of the 16\(^{th}\) Conference of the Parties. 0.36-1.06 -- 5.12 minutes. Video Message Available at \url{www.youtube.com/watch?v=a8YL3hvH71c} (Accessed October 09, 2010).
Lastly, it is obvious that Nigeria’s overall contribution to global warming is minimal and therefore reducing its GHG’s emissions will have little or no effect on its marine fisheries, whereas such reduction or lack of it by countries such as China and the United States will. The choice of Nigeria is predicated on the fact that Nigeria’s emissions of GHGs is expected to increase by 2030. Importantly too, since the negotiation started on the agreement that will replace or extend Kyoto Protocol after 2012, the two issues that have been emphasised are active participation by all countries and pegging of global and national emissions of GHGs. What this implies is that sooner or later Nigeria will be expected to limit its emissions of GHGs. The argument that Nigeria should integrate climate change into its marine fisheries management as well as comply with the climate change regimes may be provocative. However, it has the benefit of stimulating debate and shaking policy-makers, fisheries managers and legal scholars from their dogmatic and traditional models and strategies of fisheries management and regulation.

Whatever methodology a researcher adopts, the importance of stating the research question(s) from the outset is evident in the existing literature. The academic consensus is that the type of research question posed constitutes one of the major determinants of the appropriate methodological tool for answering the question. Besides, research questions act as the best guide to determine the aim of a research. In order to achieve the objective of this thesis, the following research questions, which also serve as the aims of the thesis, were formulated.

(i) What are the effects of overfishing and climate change on the sustainable development of marine fishery resources globally and in Nigeria?

(ii) How well do international and Nigerian fisheries laws address the problems of overfishing and climate change impacts on marine fishery resources?

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68 Nigeria’s National Communication, pp. 5-6
69 Video Message by Patricia Espinosa, Minister of Foreign Affairs of Mexico and Incoming President of the 16th Conference of the Parties, 0.36-1.06 - 15.12 minutes Available at www.youtube.com/watch?v=a8YL3hvH71c (Accessed October 09, 2010) and Para 2 of the Copenhagen Accord.
(iii) How best can Nigeria address a novel problem like the impact of climate change on already overexploited marine fishery resources?

(iv) Why does Nigeria comply with international fisheries and climate change agreements?

(v) What policy, legislative and institutional reforms should be made in order to ensure the sustainable development of marine fishery resources?

1.3 Research Methodology

1.3.1 Strategies

According to Bradney, research questions such as (ii) above, which can be legitimately answered by reference to statutes and judgements as well as academic commentaries on these sources, are within the domain of doctrinal or the black-letter method of research. On the other hand, with regard to research questions (i), (iii), (iv) and (v) above, for which answers lie outside the textual content of a statute or a judgment, the answers to them can be found using a sociological method of research. What this implies is that any attempt to address these research questions requires the employment of a socio-legal approach. This entails utilisation of both the internal evidence offered by statutes, case law and legal commentaries, as well as scientific data and methodologies from the social sciences.

Apart from the dogmatic methodology, this thesis also adopts a qualitative rather than a quantitative research methodology. Although the latter allows for greater objectivity and generalisation in the statistical sense of findings beyond the phenomenon under study, it does not allow for in-depth and detailed understanding, or elucidation of the participants, as well as their perceptions and beliefs. The decision to use a qualitative methodology

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74 Bradney, A., op. cit., pp. 76 and 79. The term ‘sociology’ is used elusively to embrace a wide range of social sciences and humanities disciplines.

75 Bradney, A., op. cit., see particularly pp. 71 and 73.

76 Qualitative research methodology emphasises words instead of a collection of numerical data as preferred in quantitative research. Unlike mathematical and statistical models that are incomprehensible to non-experts, verbal expression has greater open-endedness, more capacity for connecting various realms of argument and experience, and a greater capacity for reaching different intellectual audiences. Neuman, W. L. (2006) Social Research Methods: Qualitative and Quantitative Approaches, 6th ed., Boston: Pearson Education Inc., p. 459. Bryman has identified three other differences between the two approaches i.e. the role of theory to research and epistemological and ontological assumptions. Bryman, A., op. cit., pp. 22, 140 and 366.

77 Bryman, A. op. cit., p. 156.

stems from the need to integrate the views and perceptions of the relevant stakeholders on how to address the impact of climate change on already over-exploited marine fishery resources in Nigeria. This decision is anchored in the constructionist ontology, which recognises the active role of individuals in the construction of social reality. Secondly, the dearth of literature on interrelationship between climate change and Nigerian marine fish stocks requires an exploratory stance, which can best be achieved using qualitative research methodology.

The decision to use a case study design in this research is further based on Yin and Rowley, who suggested that case studies, histories, and experimental design should be used when:

A “how” or “why” question (as in questions (ii) (iii) and (iv) above) is being asked about a contemporary set of events, over which the investigator has little or no control.

The “how” and “why” questions deal with operational links, which need to be traced over time, rather than mere frequencies or incidences that are likely to favour survey or archival design. Yin also pointed out that with regard to “what” questions that are exploratory in nature (as in questions (i) and (v) above), any of the designs, including a case study, could be used. The case study is commonly used as a research design in most of the literature on how to achieve sustainability of fishery resources, particularly those that focus on compliance or effectiveness of fisheries law at national or international levels.

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80 Ibid p. 20. Primarily, a constructionist ontological view of the nature of social entities is that they should be considered social constructions built up from the perceptions and actions of social actors. Under the constructionist perspective, social entities have a reality that persists and antedates the participation of particular people. On the other hand, objectionism is an ontological position that suggests that social phenomena or entities and their meanings have an existence that is independent and external of social actors. A social entity like an organisation is a social order in the sense that it exerts pressure on individuals to conform to the requirements of the organisation. See generally Bryman, A., op. cit., pp. 18-21.
81 Ibid, p. 26 and Fade, S. A., op. cit., p. 139 where the authors state “where little is known about a subject or where the researcher wants to understand the nature or meaning of human experiences, a qualitative approach offers the opportunity to gain deeper insights”.
83 Rowley, J., op. cit., p. 17.
84 Ibid, p. 17 and Yin, R. K. (2003) op. cit., p. 9. Note that the words in italics are mine. Note also that ways of doing qualitative research have been given different nomenclature by different scholars. Creswell calls it approach. See Creswell, J. W., op. cit. See generally the introductory chapter and chapter 4. Yin and Bryman refer to it as strategy and design respectively. In order to ensure consistency, this study uses the word “design” to refer to ways of doing qualitative research. For Yin, R. K., op. cit see generally the introduction of the textbook and for Bryman, A., op. cit., see generally pp. 35-61.
Although case studies by their nature cannot be representative, they can be indispensable for examining the fine detail of social phenomena, or for retaining the holistic and meaningful characteristics of real-life events, such as the complex and multidimensional nature of the parlous state of marine fishery resources in Nigeria, the exacerbating effect of climate change on the stocks and how well Nigeria addresses the problems. Lastly, the fact that the management of fisheries poses common fundamental problems in all jurisdictions justifies using Nigeria’s marine fisheries sector as a critical test for the claim that non-compliance with IFL by states and the exacerbating effects of climate change on already overexploited marine fishery resources are capable of hindering the sustainable development of the resources.

Unfortunately, concerning questions (iii), the existing literature on how to solve the marine fish crisis in Nigeria ignores the fact that lessons learned from past experiences can aid states at all levels of economic development in their attempt to solve a novel problem such as climate change impacts on already overexploited marine fishery resources. This methodological design, which is known as historical analogy or forecasting by analogy, is integral to physical science. It has been employed as a powerful determinant in political and judicial decision-making because it enables states to identify their

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94 For example, because current atmospheric generation circulation models (GCMs) cannot produce perfect possible consequences of future regional climate change, atmospheric scientists and climatologists sometimes resort to the use of analogies in attempts to understand what future climates might be like, and to provide a glimpse of some aspects of societal responses to climate change. See Glantz, M. H. (1991) op. cit., p. 10.

strengths and weaknesses, their opportunities and threats in coping with novel problems. This must have informed Weiss’ contention that states and organisations, just like individuals, naturally adjust their approaches and procedure to emulate successes and avoid past mistakes.  

Since historical analogy performs many functions, making its purpose explicit helps in its evaluation. The novelty involved in the science relating to the impact of climate change on Nigeria’s marine fishery resources and aquatic ecosystems, combined with a lack of knowledge of some of the key stakeholders on the subject, are the major reasons for drawing analogies from the Norwegian Spring-Spawning herring (NSS herring) and the Fraser River sockeye salmon (Fraser sockeye) cases. This study also uses historical analogy as a heuristic device for the purpose of enabling policy-makers and fisheries managers in Nigeria to understand how, in the past, states exploiting the NSS herring and the Fraser sockeye responded to the impact of climate variation on the stocks, since the current changing climate requires similar but urgent responses. Generally, past experience gained in international management of living resources could indeed be relevant for, and transferable to, other global governance issues. The fact that histories (in this case historical analogy) and case studies rely on the same techniques, and can overlap, justifies the use of both methodologies in this study.

Two problems are associated with the use of analogies. According to Glantz, the appropriateness of a specific analogy in a specific situation is difficult to assess. It must be understood that this unique historical research method consists of a base and a target.

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Although Judge Weeramantry did not expressly inform his readership that he was referring to analogy or historical analogy, he was very explicit about the fact that wisdom drawn from experience of the past, which is embedded in a variety of cultures can enrich the Court’s insight into the matter (sustainable development) arising for the first time in its jurisprudence. See Separate Opinion by Vice President Weeramantry, Gabčíkovo-Nagymaros Projects (Hungary/Slovakia), Judgment, I.C.J. Reports, 1997, p. 7 at 85-119 particularly pp. 96-97.


Nigeria’s First National Communication, p. 11.


Zashin, E. and Chapman, P. C., op. cit., pp. 312-313. The base and target elements distinguish a case study from a historical analogy. Note that Bryman’s explanation of “extreme or unique case” and how and why it was used in Mead, M. (1928) Coming of Age in Samoa, New York: Morrow, reflects a perfect idea of
Assessing the “appropriateness” of a specific analogy in any specific situation must be from this perspective. The suitability of any particular analogy depends on the resemblance between the base and the target. Functional resemblances are more likely to be fundamental than qualitative. Putting it more succinctly, Jamieson said, “good analogical reasoning does not concern the number of similarities two objects share, but rather the significance of the similarities.” In short, a user of the historical analogy method is required to show that the resemblances noted between the base and the target are relevant to the point to be established, whereas the differences are irrelevant.

All fish are ectothermic, hence susceptible to increasing sea temperatures. The appropriateness of the NSS herring and Frazer sockeye analogies stems from the fact that the crises in these fisheries were exacerbated by increasing temperatures in the North Atlantic Ocean and the Pacific Ocean respectively. The highly migratory nature of the stocks and their responses to an increase in the temperature of their habitats are features common to Nigeria’s tuna and other marine fish species. This means that eventually the impact of climate change on Nigeria’s tuna and other marine fish species may render ineffective conservation and management measures adopted, as well as ignite serious fisheries conflicts in the Gulf of Guinea region and beyond.

The second problem with using historical analogy is based on the argument that no two historical events are identical, and that the future is more than a linear extension of the past. Therefore, the instructiveness of historical events tends to diminish the greater the distance in time and space from the day and place they occurred. In Crowley’s opinion, there may be no warm time period that is a satisfactory past analogy for future climate; hence past climate can provide little reliable guidance and insight for policy-makers seeking to develop policies related to climate change. Even though the NSS herring and the Fraser sockeye analogies are not fully comparable with the Nigerian marine fishery resources, Crowley’s proposition does not hold in the present study. The same forcing function (increase in sea temperature) that led to crises in the management of the NSS

herring and the Fraser sockeye is also threatening marine fishery resources in Nigeria. Incidentally, the primary consequences of an increase in ocean temperature on marine fish stocks remain the same. However, since the impact of climate change on marine fishery resources and the aquatic ecosystems may be more intensified and unpredictable than impacts from natural variations in climate, lessons learned from the NSS herring and the Fraser sockeye analogies must be placed in the context of greater uncertainty, which includes taking into account the peculiarity of Nigeria’s marine fisheries sector.

1.3.2 Data Collection

According to Max Weber, in his work on the sociology of law (Rechtssoziologie), the decision to step outside the dogmatic jurisprudence of understanding what the law says and ask what the law ought to be, or interrogate law from an explanatory standpoint, requires evidence outside the traditional sources of law. On that basis, this study adopts multiple sources of data collection, namely documents and interview data. This approach allows for the triangulation of the data collected on the same research question(s), with the aim of ensuring greater confidence in the findings of this study.

1.3.2.1 Documents

As far as this study is concerned documents constitute the primary source of data. Bryman and Scott categorise documents into official and private. They further classify the former category into official documents deriving from the state and official documents deriving from private sources. On the other hand, legal scholars prefer categorisation of documents as either conventional legal documents or non-conventional legal documents. Interestingly, documents as a source of data are common to all the methodologies used in this study. The choice of using each document was based on the authenticity, credibility,

109 The only difference between the two situations is that in NSS herring and Fraser sockeye case studies the increase in sea temperature was caused predominantly by climate variability although later intensified by anthropogenic induced climate change. With regard to Nigeria, climate change is the main threat to marine fishery resources, although periodic climate variability does occur.

110 Examples of the consequences are changes in abundance, distribution, migration patterns and the predator-prey relationships among fish and between fish and non-fish species, which in turn determine the catchability and availability of fish stocks.


113 Bodansky further elucidates this as asking causal questions about why legal rules emerge and what effects, if any, they have on behaviour. Bodansky, D., op. cit., p. 285.

114 The moralists rely on extra-legal standards while the sociologists focus on evaluative standards, normative commitments and changes in the behaviour of individuals. Kronman, A. T., op. cit., pp. 8-14.


representativeness and meaning of the document.\textsuperscript{117} The combined application of these four interdependent criteria provides the standard for assessing the quality of the documents.\textsuperscript{118} The basis of relying on documents not specifically prepared for the purpose of this research is that their non-reactive nature supports the validity of the data contained in them.\textsuperscript{119} The following documents provided the necessary data for this study

A - Personal documents
i. Speeches
ii. Visual object: photographs

B - Official documents in the private sphere:
i Mass Media
   Newspapers
   Magazines
   BBC News 24

ii Legal and non-legal commentaries
   Textbooks
   Legal periodicals
   Fictional literature

Most of the textbooks were in hard copy form while legal periodicals were either accessed electronically or read from hard copy.

iii Annual Reports
iv Conference Reports
vi Minutes of meetings of industrial fisheries stakeholders (MIFS)

\textsuperscript{117} Scott, J., \textit{op. cit.}, p. 6 and Bryman, A., \textit{op. cit.}, p. 516. According to Scott, authenticity of the document implies whether the evidence or data contained there is genuine and of unquestionable origin (i.e. is the purported author the real author Bryman, A. \textit{op. cit.}, p. 517). Credibility of a document has to do with whether the data contained therein is undistorted and sincere as well as free from error and evasion. Representativeness of a document centres on whether the data is typical of its kind and, if not, the extent to which its untypicality is known. The meaning of the document refers to clarity and comprehensiveness of the data. Scott, J., \textit{op. cit.}, pp. 6-8, 19-35 and Bryman, A., \textit{op. cit.}, p. 516. Apart from comparability and methodological questions other drawbacks of documents identified by Sarantakos are inherent in one or more of Scott’s criteria for identification of quality documents. See Sarantakos, S. (2005) \textit{Social Research}, (3\textsuperscript{rd} ed) Basingstoke: Palgrave Macmillan, pp. 298-299.

\textsuperscript{118} Scott, J., \textit{op. cit.}, p. 35.

\textsuperscript{119} Bryman, A., \textit{op. cit.}, p. 515. In non-reactive research, the researcher strives to remain unnoticed as a researcher in order to minimise his or her influence on the ‘natural’ course of events. Scott, J., \textit{op. cit.}, p. 3 In the case of documents, the evidence has already become ‘fixed’ in some material form which the researcher has to ‘read’. \textit{Ibid}, p. 4. On the other hand, Yin argues that the strength of using documents as sources data include their stability, exactness, broad coverage and unobtrusiveness. Yin, R. K., (2003) \textit{op. cit.}, p. 86.
C - Official documents deriving from the States/ Intergovernmental Organisations

a. Constitutions
b. Act of the National Assembly of Nigeria
c. Budgets of the Federal Government of Nigeria
d. Treaties and Non-binding instruments
e. Nigeria’s National Communications Under the UNFCCC
f. Fisheries Statistics File in the FDF

D - Virtual documents Internet (World Wide Web (www))

The official government publications on marine fisheries are not readily available in the public domain. However, the researcher was able to access the FDF files on fisheries statistics, copies of the MIFS and other relevant information by searching the archives of the FDF.\textsuperscript{120}

One important advantage of using documents as a source of data in this study is the opportunity of utilising first-hand primary data, as well as the analysis of such data by previous researchers, public institutions and government authorities.\textsuperscript{121} Data such as the world fish production and the atmospheric and ocean temperature collected by the FAO and the IPCC respectively cover extensive areas (hence are relatively representative), and also lend themselves to comparisons and are longitudinal.\textsuperscript{122} Relying on documentary data therefore allows the production of high quality findings, and has made it possible for this study to address questions relating to trends and developments in national and global fisheries.\textsuperscript{123} The retrospective nature of documentary data enables the study of past events,\textsuperscript{124} such as the NSS herring and Fraser sockeye cases from which this study draws its historical analogy. Sarantakos has identified other strengths of documentary data, which supports the decision to use documents as a source of data in this study.\textsuperscript{125}

\textsuperscript{120} The usefulness of archival records varies from being so important that they could be object of extensive and quantitative analysis or they may be of only passing relevance as in this study. Yin, K.Y., op. cit., pp. 101, 102 and 106. The passive nature of archival records in this study is the reason that it is given specific and detailed examination.
\textsuperscript{121} For example, see the FAO’s primary data and its analysis on global fish stock production.
\textsuperscript{122} Sarantakos, S. (2005) op. cit., p. 296.
\textsuperscript{123} Ibid, pp. 296 and 298.
\textsuperscript{124} Ibid, p. 298.
\textsuperscript{125} Other strengths of document data include quick and easy access, spontaneity, convenience, low cost, less time consuming, sole source, high quality of information and possibility of re-testing. See Sarantakos, S. (2005) op. cit., p. 298.
Despite the rich intertextuality of these documents, most of them were written with prospective scrutiny by others in mind and not to simply reflect reality.\textsuperscript{126} For instance, it is an incontrovertible fact that between author, document, and readership there are complex intervening social processes involving the literary/graphics editors, reviewers, copy-editors and compositors, who may substantially alter the content and meaning of the documents.\textsuperscript{127} Atkinson and Coffery contend that documents cannot be treated – however official’ – as firm evidence of what they report.\textsuperscript{128} They supported their position by arguing that minutes of meetings record what was decided, but not everything that was said and done in the meeting.\textsuperscript{129} Since documents may not provide accurate or full accounts of the past, or may have been distorted on political, economic or ideological grounds, there is a need to triangulate documentary data with other sources of data.\textsuperscript{130} However, it is important to note that to complement documentary evidence is not a rule without exception. Indeed, scholars such as Atkinson and Coffey,\textsuperscript{131} as well as Prior,\textsuperscript{132} convincingly argue that documents enter the fields of action as agents in their own right and should not be considered as mere props to human action. Accordingly, Atkinson and Coffey unequivocally concluded that documentary work might be the main undertaking of qualitative research.\textsuperscript{133}

### 1.3.2.2 Semi-Structured Interviews

In order to triangulate the documentary data on the most significant aspects of this study, primary data was generated using semi-structured interviews. The other advantages supporting the decision to use semi-structured interviews include flexibility, high response rate and allowing for face to face interaction between the researcher and the interviewees, which in turn allows observation of non-verbal behaviour, opportunity to correct misunderstandings by the interviewees, control of flow of questions and discursion. These factors combine to ensure completion of interviews and that major issues of investigation

\begin{itemize}
\item \textsuperscript{126} Bryman, A., \textit{op. cit.}, p. 527.
\item \textsuperscript{127} Scott, J., \textit{op. cit.}, p. 34. Similarly, the internet allows access to a wealth of valuable data. However, some of the data may be inaccurate, out of date, controversial, offensive and/ or illegal.
\item \textsuperscript{129} Ibid, p. 68.
\item \textsuperscript{131} Atkinson, P. and Coffey, A., \textit{op. cit.}, pp. 58 and 59.
\item \textsuperscript{132} Prior, L., \textit{op. cit.}, pp. 3 and 26. Despite taking this position, Prior concedes documents alone cannot reveal how things are resolved. Prior, L., \textit{op. cit.}, p. 121.
\item \textsuperscript{133} Atkinson, P. and Coffey, A., \textit{op. cit.}, p. 58.
\end{itemize}
are addressed. Setting these considerations apart, understanding the unique circumstances of the crisis in Nigeria’s marine fisheries sector and the practicability of the lessons drawn from the NSS herring and Fraser sockeye case studies, requires an in-depth exploration of the views and perceptions held by the relevant stakeholders using semi-structured interviews. In that sense, semi-structured interviews mitigate Grafton and Kompas’ criticism that a synthesis of existing case studies may guide policy-makers and fisheries managers but are no substitute for first-hand knowledge and input from stakeholders in the decision-making process.

While it is necessary that socio-legal research of this kind should give enough methodological and data detail so that other researchers could repeat the study in the same way and draw essentially the same conclusion(s), it does not necessarily have to present all guidelines for demonstrating quality in order to be accepted. However, a critical review of the works of Fade and Mays and Pope reveals the basic quality measures that should be highlighted and discussed, which will assist readers to make a fully informed decision about the research findings.

1.3.3 Sampling

According to Patton, although there are no rules for sample size in qualitative inquiry, in practice, sample size depends on: 

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134 Sarantakos, S. (2005) *op. cit.*, pp. 285-286. However, this does not mean that the semi-structured interview has no demerit. It is more costly, biased (personal flexivity), inconvenient, offers less anonymity and is less suitable when sensitive issues are discussed. *Ibid*, p. 286.

135 Other qualitative approaches for generating data such as ethnographic and focus group were difficult to adopt. With regard to an ethnographic approach, it could have taken the researcher a very long period to be immersed in the day-to-day lives and business of each of the stakeholders. Creswell, J. W. (2007) *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*, 2nd ed., Thousand Oaks, SAGE Publications, p. 68. Importantly too, this approach was impracticable in fishing companies as the researcher could not afford the cost of taking out an insurance policy to cover himself while on the premises or boarding vessels of the various fishing companies. With regard to focus group, it was impractical to group the stakeholders together because of the fierce competition between the fishing companies. Grouping of the regulators and the fishers together would have led to distortion of data, especially by the fishers.


140 The quality measures include triangulation, respondent validation or member checking, reflexivity, attention to negative cases, fair dealing and relevance.

... what you want to know, the purpose of the inquiry, what is at stake, what will be useful, what will have credibility and what can be done with the available time and resources.  

In the context of this study, sampling involved recruiting a specific group of people who possess characteristics relevant to the research questions. These are people who, by virtue of their roles, are capable of contributing to the deplorable state of marine fisheries or sustainable development of the stocks. In addition to purposive sampling, the sample size used for semi-structured interviews was based on convenience and representation of all groups of stakeholders. All participants had more than 10 years’ experience in the industry. The researcher ensured there was a balance between the sampling technique and the research aims, available resources and other considerations. Apart from the willingness of participants to be involved in the study, the state of insecurity in the Niger Delta coupled with the fact that more than 97% of active industrial trawlers have their operational base in Lagos, informed the decision to limit interviews of industrial trawler companies to those based in Lagos.

The need to represent a comprehensive and objective reality of how best to apply the lessons from the NSS herring and Fraser sockeye cases, and other measures that can enhance sustainable development of marine fishery resources in Nigeria, demands sourcing of data from other key stakeholders in the industry. On that basis, interviewees were also drawn from other key stakeholders in the industry, including the FDF Abuja and Lagos, Nigerian Institute of Oceanography and Marine Research (NIOMR), Nigerian Trawlers Owners Association (NITOA), Fish Sellers Association, Marine Unit of the Nigerian Institute of Oceanography and Marine Research (NIOMR), Nigerian Trawlers Owners Association (NITOA), Fish Sellers Association, Marine Unit of the Nigerian Institute of Oceanography and Marine Research (NIOMR), Nigerian Trawlers Owners Association (NITOA), Fish Sellers Association, Marine Unit of the Nigerian Institute of Oceanography and Marine Research (NIOMR), Nigerian Trawlers Owners Association (NITOA). The researcher ensured there was a balance between the sampling technique and the research aims, available resources and other considerations.

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142 Ibid.
143 Bryman, A., op. cit., p. 458. This type of sampling is either called purposive, purposeful or judgment sampling and its focus is to select information-rich cases whose study will illuminate the questions under study. Patton, M. Q., op. cit., p. 230. Patton goes on to examine several different strategies for purposefully selecting information-rich cases (pp. 230-242). This study employed the intensive sampling, which consists of information-rich cases that manifest the phenomenon of interest. Ibid, p. 234.
Police Force, academia, professionals and Non-governmental organisations (NGO). Put simply, the decision to incorporate the views and perception of all the key stakeholders on the major themes of this study is to avoid a situation where the viewpoint of one group is presented as if it represents the sole truth.

1.3.4 Conducting the Interviews

In total, the researcher conducted 18 face-to-face interviews with the majority lasting about 45 minutes. A small number of the participants gave the researcher written responses to the open-ended interview questions because they were unavailable for interview. Unfortunately, the written responses denied the researcher the opportunity to ask the participants follow-on questions from their answers to the prepared semi-structured questions.

1.3.5 Data Analysis

While there are established ways of interpreting and analysing statutes and international agreements, legal scholars who generate data using non-conventional legal sources have no alternative than to apply the different methods of data analysis developed by social scientists. As a matter of fact, despite the diversity of approach regarding documentary analysis, content analysis is the most prevalent approach used in analysing the content of

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148 All efforts made to interview the Flag Officer, Western Naval Command or any of the officers under his command proved abortive. However, by taking into consideration the views expressed by the representatives of the Nigerian Navy during the meetings of industrial fisheries stakeholders, this study ensures that the views and perception of such a key stakeholder, although expressed in documents, are not totally ignored. Note also that the need to incorporate the views and perception of academics is based on the fact that existing literature is either out-dated or does not adequately address the problem of climate change on marine fishery resources.


150 Three interviews were quite brief (lasting between 15 and 20 minutes). This was not unusual because of the highly technical nature of the subject, which made it impossible for all participants to attempt to answer all the questions. See generally Appendices II, III, and IV.


152 See Articles 31-33 of the Vienna Convention on the Law of Treaties 1969 which stipulate the rules on interpretation of international agreements.

153 Among the common ways of analysis of data developed by social scientists are discourse analysis, critical discourse analysis, narrative analysis, semiotic analysis, conversational analysis, institutional analysis and content analysis. Regrettably, no single social science research textbooks have examined all the strands of analysis. For instance, Prior prefers discourse analysis and quantitative content analysis on pp. 20-26 of his text, but in Chapter 6 titled “Content, Meaning and Reference” the author employs interpretivism particularly hermeneutics and intertextuality, which is one of the tools of discourse analysis. See generally Prior, L., op. cit., pp. 107-124. On the other hand, Atkinson and Coffey employed semiotic analysis, which allowed them to take into account the form of textual materials, the distinctive uses of language they may display, the relationship between the texts and the conventions of genre. Atkinson, P. and Coffey, A., op. cit., p. 59.

texts, pictures, films, interview transcripts and other forms of verbal, visual or written communications.\textsuperscript{155} The unobtrusiveness and flexibility of content analysis method makes it an appropriate method that can be applied in a variety of contexts and materials.\textsuperscript{156} Content analysis can either be classified as quantitative or qualitative.\textsuperscript{157} The latter was the primary analytical tool used in this study.

In terms of epistemological considerations, quantitative content analysis is an analysis strand associated with the positivists who utilise a natural science method to study social reality.\textsuperscript{158} On the other hand, proponents of interpretivism, who adopt qualitative content analysis, share the view that social phenomena, which consist of people and their institutions, are different from those of natural science.\textsuperscript{159} In their view, the subject matter of social science is not objective, external and preordained but socially constructed by individuals.\textsuperscript{160} Interpretivism requires social researchers to focus their attention on understanding and interpreting human behaviour and actions.\textsuperscript{161} Interpretivists recognise that a person’s thoughts are not transparently available from, for example, interview transcripts. In order to address this problem, interpretivists must engage in the analytical process so as to be able to say something about that thinking.\textsuperscript{162} Put simply, interpretivists are concerned with understanding what the particular respondent thinks or believes about the topic under discussion. The fact that quantitative content analysis is concerned with manifest content or surface meaning rather than deeper layers of meanings embedded in
documents informed the decision to employ qualitative content analysis in analysing the documents used in this study.

Hsieh and Shannon’s definition of qualitative content analysis emphasises a “systematic classification process of coding and identifying themes and patterns.” In the same vein, the phrase “searching-out of underlying themes in the documents” underpins Bryman’s definition of qualitative content analysis. From the foregoing, qualitative content analysis of documents basically involves searching for themes or patterns in the data, which could be objects, subjects, legislation, measures, concepts, decisions, strategies, phases, and identifying reasons for the occurrence of events such as the factors that caused the marine fisheries crisis, as well as appropriate ways of addressing the crisis. All these are expressed in the documents relied upon in this study in the form of text. According to Fairclough, the analysis of text is form-and-meaning analysis. Unfortunately, the deep-rooted meaning of some texts e.g. the photograph of sea level rise in Funafuti may not be easily discernible. Besides, some texts may have more than one meaning. Indeed, the heterogeneity of texts and the fact that even the most original texts such as photographs, interview transcripts and notes taken during interviews are intertextually connected with external texts, shows how potentially inaccurate it may have been for the researcher to limit the analysis of documents used in this study within their bounds.

From the above, it is practically difficult to understand the meaning of certain documentary data using only qualitative content analysis. Despite it being the primary analysis tool of this study, the researcher also obtained meaning from the texts through interpretation of signs that are manifested in the form of images, objects and words. By applying semiotic analysis, the researcher attempted to uncover the hidden meaning that resides in most of

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164 Bryman, A., op. cit., p. 529.
the texts. The idea of assuming that all texts tell stories is another secondary analytical strategy adopted by the researcher. For a socio-legal scholar, employing the narrative analysis made it easier to identify not only the various themes, which were seen as different stories, but also to distinguish between legal and non-legal narratives. The researcher employed discourse analysis in the sense put forward by Worrall. The process of analysing each document embraced all aspects of communication: not only its content, but its author, its authority, its audience, its object and its objective. Taking into account both content and context of the themes enhanced the researcher’s understanding of the embedded meanings in them.

The fact remains in any organised fisheries industry, whether one is examining the effectiveness of the law-making process or the prosecution and sanctioning of individuals found violating fishery law, the process essentially involves institutional analysis. According to Nielsen and Vedsmand, institutional analysis is the examination of how institutional arrangements affect fishermen’s pattern of activities and their incentives to coordinate their own resource use strategies. An understanding of whether the assigned roles of institutions established for the conservation and management of marine fisheries resources at the international level and in Nigeria were successfully performed or not, as well as the factors responsible for either of the trends, helped to explain the compliance behaviour of states and individuals. Lastly, tabular and bar chart numerical summaries provide standardised and shorthand ways of analysing the state of fishery resources, the trend in the temperature of the Atlantic Ocean at Victoria Island, and the impact of climate change on fish.

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170 Semiotics refers to the ‘science of signs’. The main term employed in semiotic analytical processes are (i) signifier – the form which the sign takes that points to an underlying meaning, and (ii) signified – the concept it represent or the meaning which the signifier points. Chandler, D. Semiotics for Beginners, Available at http://www.aber.ac.uk/media/Documents/S4B/ (accessed last December 2, 2008) and Bryman, A., op. cit., p. 531.

171 For a detailed discussion on narrative analysis see Neuman, W. L., op. cit., pp. 475-477.

172 Worrall, A. (1990) Offending Women: Female Lawbreakers and the Criminal Justice System, London: Routledge, p. 8. As a matter fact, the term discourse analysis was first associated with Michel Foucault. Foucault’s major concern was not just the surface feature of text and discourses (shared by all discourse analysts) but the underlying rules and principles that bind them and their author together in a unifying matrix (where there is divergence with other strands of discourse analysis). Prior, L., op. cit., pp. 25-26 also citing Foucault, M. (1972) The Archaeology of Knowledge, Tr. Smith Sheridan, A. M., London: Tavistock Publications Limited. See generally chapter 1 where Foucault examines ‘the unities of discourse’.


175 Ibid, p. 22.

Finally, there are computer software packages such as NVivo, HyperRESEARCH and Atlas.ti for qualitative data analysis of interview data. Unfortunately, no matter how sophisticated the software is it can only assist and act as a reliable tool for the researcher. Software cannot do any analysis, especially when text and discourse are rooted with deep meanings.\textsuperscript{177} Analysis of the data by hand gives the researcher a deeper understanding of embedded meaning.\textsuperscript{178}

1.3.6 Value/Ethical Principles

In this study, value was manifested at two levels: (i) when one is evaluating whether or not the personal beliefs, feelings or bias of the researcher has been brought into this research, and (ii) when one is ascertaining whether or not the researcher has maintained ethical principles in the course of conducting this research.\textsuperscript{179}

1.3.6.1 Value

According to Bryman, the continuum of the controversy on value ranges from Durkheim’s call for all preconceptions to be eradicated\textsuperscript{180} to Bryman’s own position, which allows researchers to be self-reflective and so exhibit reflexivity or acknowledge the influence of their personal values and bias,\textsuperscript{181} and finally to hard-line feminists like Mies who supports consciously value-laden or conscious partiality research.\textsuperscript{182} This study adopted Bryman’s position.

It is difficult to argue that the choice of a historical analogy method is not influenced by the researcher’s bias of how best to address the impact of climate change on already over-exploited marine fishery resources in Nigeria. However, this can be justified. The novel nature of the impact of climate change on marine fisheries is not contestable in any way. Neither is the contention that a novel problem can be addressed by drawing analogy from how similar past problems were solved. While the decision to draw analogy from the NSS herring and Fraser sockeye case studies was based upon their appropriateness, the instructive lesson from Becker’s article entitled “Culture: A Sociological View”\textsuperscript{183} is that like culture people create rule continuously. Since no two situations are alike, the rule

\textsuperscript{177} See generally Yin, R. K. (2009), \textit{op. cit.}, pp. 128-129.
\textsuperscript{178} Fade, S. A., \textit{op. cit.}, p. 142.
\textsuperscript{179} Bryman, A. \textit{op. cit.}, p. 113.
\textsuperscript{181} Bryman, A. \textit{op. cit.}, p. 25.
solutions available to them are only approximately. No set of rule understanding, then, provides a perfectly applicable solution to any problem people have to solve in the course of their day, and they therefore must remake those solutions, adapt their understandings to the new situation in the light of what is different about it.\textsuperscript{184} The implication of the above quotation is that the decision to apply lessons from NSS herring and Fraser sockeye cases in addressing the effect of climate change on Nigeria’s already overexploited marine fishery resources will require adaptation in light of Nigeria’s peculiar circumstances. For instance, the difference between the states exploiting the NSS herring and Fraser sockeye (developed states and possessing enormous technological capabilities) and Nigeria (developing state and with limited technological capabilities) must be acknowledged and taken into account. This further informed the decision to generate primary data from semi-structured interviews of the relevant stakeholders in the marine fisheries sector of Nigeria.

1.3.6.2 Ethical Principles

Generating semi-structured interview data means that there is human participation in this study. The Ethics Committee on Research Procedures sets the guidelines regulating the conduct of all research involving human participants or tissue at Aberystwyth University.\textsuperscript{185} The Code of Practice for Research Postgraduates succinctly states that:

\begin{quote}
The university is committed to ensuring that all research activities adhere to published guidelines on good practice and employ appropriate and ethically sound methodologies.\textsuperscript{186}
\end{quote}

Under the Ethics Committee on Research Procedures’ terms of reference (1) it can consider the ethics of the procedure of research involving human participants include the purpose of the research; the scientific design of the research; the procedures for

\textsuperscript{184} Ibid, p. 521.

\textsuperscript{185} Research students who have funding from the Economic and Social Research Council (ESRC) or other professional associations are normally expected to comply with the ethical guidelines or code of research set by such associations. Examples of such associations are the British Education Research Association (BERA), the Socio-Legal Studies Association (SLSA) and Social Research Association (SRA).

\textsuperscript{186} Aberystwyth University, (2007) \textit{Code of Practice for Research Postgraduates}, Aberystwyth: Aberystwyth University, Para 16, p. 17. Available also at \url{http://www.aber.ac.uk/postgrads/en/Code%20Res%20E.pdf} (accessed last February 28, 2009). Although the methodology used in research involving human participation must be agreed by the ECRP, this was not an onerous process as departments were directed to develop templates under which approval was given. Unfortunately, the Department of Law did not develop such a template. Note that under the September 2008 Code of Practice for Research Postgraduates, the ECRP acknowledges the fact that the Research Council and other funding bodies now require projects to be subject to appropriate review. The same requirement applies to all research, however funded. Para 16, p. 17 Available at \url{http://www.aber.ac.uk/postgrads/en/coderes08e.pdf} (access January 1, 2009).
recruitment of participants; the care and protection of participants; the procedures for confidentiality; the procedures for obtaining informed consent and for providing participants with information about the research; the availability of suitable resources; and the personnel involved. The three issues emphasised in the foregoing terms of reference are care and protection of participants, which centres on anonymity of the participants, confidentiality and obtaining informed consent.

This researcher has depended for ethical guidance on the Code of Practice for Research Postgraduates and the Ethics Committee on Research Procedures. However, the United Kingdom’s Economic and Social Research Council has introduced important developments in its Research Ethics Framework, which merit consideration. The first of the six principles states that research should be designed, reviewed and undertaken to ensure integrity and the highest quality.187 While the term “highest quality” is not defined in the Research Ethics Framework of the Economic and Social Research Council, the Economic and Social Research Council is very explicit that research should “aim to contribute to a body of knowledge or theory”.188 Aberystwyth University’s Code of Practice for Research Postgraduates does not explicitly integrate the issue of research quality under its Ethics Committee on Research Procedures’ Terms of Reference. However, one of the conditions for awarding its PhD degree is that “PhD students are expected to make a substantial, original contribution to knowledge in the area, normally leading to publication”.189

1.4 Significance of the Thesis

i. By recommending that globally and in Nigeria, the problems of overfishing and the impact of climate change on marine fishery resources should be addressed simultaneously, this thesis proffers one of the best solutions that will enable policy-makers and fisheries managers to achieve the sustainable development of marine fishery resources and also alleviate the current world food crisis.


188 Ibid. See definition of key terms on p. 7.

ii. Achieving a long-term sustainability of Nigeria’s marine fishery resources will contribute to the diversification of the economy of Nigeria from oil and gas, which is the mainstay of the country’s economy. This will directly reduce the vulnerability of Nigeria’s economy due to the effect of complying with the UNFCCC on government revenue from oil and gas.

iii. The recommendation that Nigeria should integrate climate change into its fisheries law and cooperative arrangements on fisheries between Nigeria and other states bordering the Gulf of Guinea will help to avoid international fisheries conflicts, which could threaten the fragile peace and security of the region.

iv. Creating more awareness on the impact of climate change on marine fisheries will encourage Nigeria to comply with the UNFCCC and adopt precautionary and ecosystem approaches to address the impact of climate change on marine fishery resources.

v. By eliciting the views and perceptions of the stakeholders in the marine fisheries sector of Nigeria on the deplorable state of marine fishery resources and how best to address the problem, this study highlights how mutual understanding of compliance issues can contribute to designing effective compliance strategies and invariably improve optimal level of compliance by all the stakeholders in the sector.

vi. The findings of this thesis that the current predominately consultative participation of selective key stakeholders in the marine fisheries sector does not guarantee full legitimacy to Nigeria fisheries law will encourage the FDF to broaden and ensure active participation of all the key stakeholders in marine fisheries management. This will improve the level of compliance by all the stakeholders and also addresses the problem of lack of transparency and public accessibility to crucial information available only to key stakeholders who may not readily share it with the public.

vii. The recommendation that the FDF should collaborate with the relevant security agencies to carry out regular air and coastal surveillance will provide solutions to the most critical and sensitive issue “sea market for
“yamayama” which has threatened the sustainability of marine fishery resources and has destroyed the very fabric of the sector by introducing new and dangerous activities e.g. pirate attacks on fishing vessels.

viii. The interdisciplinary nature of this research makes it an indispensable reference material for policy-makers, fisheries managers, and academics. It is hoped that some of the thought provoking issues raised by the researcher but not exhaustively addressed because of the scope of the thesis will serve as the basis for future research.

1.5 Structure of the thesis:
This study is divided into four main parts in order to maintain methodological congruence. The first part consists of an introductory chapter (Chapter 1) and Chapter 2. Chapter 2 examines preliminary issues, notably the deplorable state of marine fishery resources globally and in Nigeria specifically, factors responsible for it, principles regulating exploitation of fisheries and a critique of the proffered solutions to the fisheries crisis.

The second part, Chapter 3 and 4, examines the binding and non-binding international fisheries instruments. The crux of the argument in both chapters is that the harvest-based measures adopted in the relevant international fisheries instruments have started to yield some level of success that is destined to be short-lived because of the impact of climate change on marine fishery resources. The third part consists of Chapters 5 and 6. Chapter 5 reflects the retrospective focus of this research by drawing an analogy from the NSS herring and the Fraser sockeye cases. A number of management and legal lessons which could influence policy-makers and fisheries managers in Nigeria, including the consequences of non-compliance with climate change regime by states exploiting the said stocks, are identified. The consequence of non-compliance by states exploiting the NSS herring and the Fraser sockeye with climate change regime provoked the explanatory discourse in Chapter 6 on theories of state compliance and factors that promote effectiveness of international law. Based on available scientific evidence and state practice, Chapter 6 argues that a holistic approach to compliance with international agreements on fisheries and climate change will enhance the effectiveness of IFL.

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The fourth part consists of Chapters 7 and 8. Chapter 7 commences with a brief examination of the characteristics of Nigeria’s marine fishery resources. Section two critically examines the measures adopted for the conservation and management of marine fishery resources in the SFA, its supplementary regulations and other relevant Nigerian statutes. In addition, this section also intends to ascertain whether or not the aforementioned statutes have integrated the impact of climate change into marine fisheries management. Section three examines the extent to which Nigeria has complied with IFL, why industrial fishermen comply with Nigerian fisheries law and if Nigeria’s interests in marine fisheries influence its decision to comply with the climate change regime. Section four presents and discusses the views and perceptions of the stakeholders in the marine fishery sector on the major issues investigated. The major views and perceptions of the stakeholders as well as indicators that Nigerian fisheries law is not effective are also identified. The thesis concludes in Chapter 8 by ascertaining, among other things, whether or not the primary objective of the research was achieved, and also makes recommendations with the intention of ensuring the sustainable development of marine fishery resources in Nigeria.

1.6 Conclusion

It is not an exaggeration to conclude that at present overfishing is the primary factor responsible for the deplorable state of marine fishery resources globally and in Nigeria. Meanwhile, besides the claim by the IPCC that climate change is unequivocal, the increasing rate at which GHGs, particularly CO₂, are emitted into the atmosphere means that in the near future climate change could have far-reaching and irreversible consequences on marine fishery resources. The point that is lacking in existing fisheries literature in Nigeria, and which is given far less attention by industrial fishermen and policy-makers in Nigeria, is that climate change has exacerbated the poor state of already overexploited marine fishery resources. Having taken into account past lessons from the NSS herring and the Fraser sockeye cases studies, as well as the views and perceptions of stakeholders in the marine fisheries sector of Nigeria, this thesis concludes by recommending, among other measures, that Nigeria should also enforce conservation and management measures at sea, broaden the participation of stakeholders in marine fisheries management and reduce its emissions of greenhouse gases.
1.7 Definitions of Key Terms

Fish/Fish Stocks/Fisheries/Fishery Resources/Marine Fishery Resources: In this thesis, these terms mean marine finfish and shellfish. Cetaceans are excluded.

Climate Change: In this thesis, climate change is used in the sense referred to in Article 1(2) of the UNFCCC. It is a change of climate that is attributed directly or indirectly to human activities that alters the composition of the atmosphere and that is in addition to natural climate variability observed over a comparable time period.
CHAPTER 2

PRELIMINARY ISSUES ON THE MARINE FISHERIES CRISIS: THE GLOBAL AND NIGERIAN PERSPECTIVES

2.1 Introduction

One of the greatest problems which humanity is facing, not only now, but also for many generations to come, is the parlous state of marine fishery resources. The desire by the international community to address this problem has led to many adjudications and to the adoption of a prodigious number of regional and international instruments on fisheries. At the municipal level almost all coastal states, including Nigeria, and distant water fishing nations (DWFNs), have enacted legislation or entered into international agreements in one form or another, with the aim of addressing the problem. The failure of such laws to tackle effectively the problem has resulted in the proliferation of literature on how to ensure the sustainable development of marine fishery resources at all levels.

This chapter examines some preliminary issues, such as the importance of fish to humankind, the state of marine fishery resources, threats to these resources and the consequences of their lamentable state. Other issues include the principles underpinning exploitation of marine fishery resources and the historical development of international regulation of fisheries resources. Finally, the chapter identifies the weaknesses of the solutions proffered in the existing literature on conservation and management of fishery resources. The gap identified in the said literature has informed the basis of this thesis, and its scope and research methodology, which were outlined Chapter 1.

2.2 Importance of Fish to Humankind

The world’s oceans and seas, which cover 70.8 percent (%) of the earth’s surface, and hold about 97% of all the water on Earth, are endowed with living and non-living resources. The most important use of fish is for human consumption as food. Fish are the world’s largest source of animal protein exceeding beef, sheep, poultry and eggs. The share of fish in total world animal protein grew from 14.9% in 1992 to a peak of 16.0% in 1996, before declining to 15.5% in 2003. According to the FAO, fish provide almost half of the world’s

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1 The relevant instruments and cases are referred to as this study proceeds.
population with at least 20\% of their average per capita animal protein intake.\textsuperscript{5} In Nigeria, fish contribute 28\% of the animal protein intake of the population.\textsuperscript{6} Medically, the consumption of fish or fish oil containing long chain polyunsaturated acids (LC \(\text{n-3 PUFAs}\)) known as ‘omega-3’ has been demonstrated to reduce mortality resulting from cardiovascular related diseases.\textsuperscript{7} 

In 2004, an estimated 41 million people worked in the primary fisheries sector and aquaculture.\textsuperscript{8} Fishing is an important source of livelihood in developing countries, particularly in low-income coastal communities, where job options are limited.\textsuperscript{9} Fisheries contribute to the gross domestic products of many countries including, for example, Namibia 6\% and Iceland 11\%.\textsuperscript{10} International trade in fisheries products continues to increase from US$17 billion in 1985 to over US$55.2 billion in 1996\textsuperscript{11} and to US$71.5 billion in 2004.\textsuperscript{12} Developing countries net export in fisheries products rose from US$4.9 billion in 1984 to US$16.0 billion in 1994 and to US$20.4 in 2004.\textsuperscript{13} Fish products are now one of the most valuable commodity exports for some coastal developing countries.
surpassing coffee, bananas, tea and rice. Meanwhile, developed countries dominate the import market, with the European Union (EU), Japan and the United States (US) accounting for 80% of world imports by value in 1994. These apart, fish also have socio-cultural and recreational importance.

In Nigeria, the industrial fishing sector has a workforce of 80,000. Nigeria exported about 7,000 tonnes of shrimps worth US$53 million in 2004, and the emerging live-fish export trade was valued at US$300,000. This effectively makes fisheries the second highest foreign exchange earner for Nigeria after petroleum. The contribution of fish to Nigeria’s gross domestic products from 2003 to 2007 was 1.37, 1.37, 1.36, 1.37 and 1.37% respectively.

2.3 State of the Marine Fishery Resources
tonnes in 2000. From 2002 to 2005, the world total marine fish catch dropped to an annual average of 84.04 million tonnes.\textsuperscript{22} Except for 1998, the average world total marine fish catch has remained about the same over the past 10 years.\textsuperscript{23}

Table 2.1: World Marine Fisheries Production 1990-2005

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<tbody>
<tr>
<td>Captured Marine</td>
<td>79.29</td>
<td>79.95</td>
<td>84.7</td>
<td>86.1</td>
<td>79.3</td>
<td>86.8</td>
<td>84.5</td>
<td>85.8</td>
<td>84.2</td>
</tr>
<tr>
<td>Population (bs)</td>
<td>*5.2</td>
<td>*5.4</td>
<td>5.6</td>
<td>5.7</td>
<td>5.9</td>
<td>6.1</td>
<td>6.2</td>
<td>6.4</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Source of Data Collation: FAO State of World Fisheries and Aquaculture 1990-2006 and for (\*) Population Division, United Nations\textsuperscript{24}

A few commentators led by Pauly argue that the FAO figure is misleading due to massive over-reporting by China, in which case the true state of fish stocks is one of steady decline since the late 1980s.\textsuperscript{25}

As a matter of fact, with the exception of China, the state of fishery resources at the national level reflects the global trend. In Nigeria, the analysis of fish production from 1992-2007 (Table 2.2) shows that the inshore (0-50 m) waters fish catch declined from 25,592 tonnes in 1992 to a historic low level of 13,877 tonnes in 2000.

Table 2.2: Marine Fish Production in Nigeria (1992-2007)

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<tbody>
<tr>
<td>Fish (Inshore)</td>
<td>25,592</td>
<td>21,886</td>
<td>15,425</td>
<td>17,947</td>
<td>13,877</td>
<td>16,064</td>
<td>16,063</td>
<td>19,129</td>
<td>18,040</td>
</tr>
<tr>
<td>Shrimp</td>
<td>9,373</td>
<td>7,884</td>
<td>9,551</td>
<td>10,716</td>
<td>8,056</td>
<td>12,797</td>
<td>12,469</td>
<td>13,827</td>
<td>5,995</td>
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<tr>
<td>EEZ</td>
<td>4,400</td>
<td>718</td>
<td>2,268</td>
<td>1,291</td>
<td>1,375</td>
<td>1,230</td>
<td>1,889</td>
<td>882</td>
<td>2,158</td>
</tr>
<tr>
<td>Ind. Total</td>
<td>39,365</td>
<td>30,488</td>
<td>27,244</td>
<td>29,955</td>
<td>23,308</td>
<td>30,091</td>
<td>30,421</td>
<td>33,838</td>
<td>26,193</td>
</tr>
</tbody>
</table>

Source of Data Collation: Federal Department of Fisheries, VI, Lagos


\textsuperscript{22} The most recent FAO data on the world capture production indicates that total capture production in marine fishing areas declined to 81.9 million tonnes in 2006. FAO (2006) Yearbook of Fishery Statistics Summary Tables, Rome: FAO. Available at \url{ftp://ftp.fao.org/fi/stat/summary/a1a.pdf} (accessed last June 6, 2008) See particularly the section on Fish, Crustaceans, Molluscs, etc: World Capture Production. This figure is what is reproduced by FAO in The State of World Fisheries and Aquaculture 2008, Rome: Italy, p. 3.


Despite signs of recovery from 2002 to 2006 inshore finfish landing declined in 2007 to 18,040 tonnes; a figure still above Tabor’s estimated potential yield of 16,620 tonnes. The average inshore shrimp landing from 1992-2006, which was 10,584 tonnes, declined to 5,995 tonnes in 2007. During the period of analysis, the shrimp catch was in excess of the estimated maximum sustainable yield (MSY) of between 3,250 and 4,016 tonnes. Further analysis of the data shows that the annual fish catch from offshore (50 m and above) waters, which stood at 4,924 tonnes in 2003, crashed to 882 tonnes in 2006. The sharp increase in offshore fish landing in 2007 to 2,158 tonnes may have been caused by the Federal Government’s decision to redistribute fishing capacity and effort. Offshore landings are unstable but generally contracting. Even though offshore landings for the period under review are below the estimated potential yield of 6,370 and 9,560 tonnes for demersal and pelagic species respectively, illegal fishing by foreign vessels in the Nigerian exclusive economic zone (EEZ) may have drastically reduced the biomass of the stocks.

While the above data analysis may not present a very clear picture of the state of marine fishery resources in Nigeria, it is an incontrovertible fact that for some years now the average size of finfish and shrimps landed by industrial trawlers consists of small and medium-sized specimens. Although the total registered and actually operated number of

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vessels has diminished from 291 in 1992 to 191 in 2007, and the number of days spent at sea has doubled, production has not increased to the 1992 level.\textsuperscript{32} Importantly too, the mean composition of croakers in 2004 was 6.2\% against 16.8\% in 1980, which indicates that the main commercial stock has been depleted.\textsuperscript{33} Finally, the 2007 IUCN Red List of Threatened Species lists twenty-one Nigerian fish species as critically endangered, endangered, or vulnerable.\textsuperscript{34}

\section*{2.4 Threats to Marine Fishery Resources}

Marine fishery resources are under threat from natural and human factors.

Before the industrial revolution variation in climate occurred naturally. Increase in sea temperature as a result of natural atmospheric circulations, such as the El Niño – Southern Oscillation (ENSO),\textsuperscript{35} the North Atlantic Oscillation (NAO)\textsuperscript{36} and the Pacific Decadal Oscillation (PDO)\textsuperscript{37} had short and long-term impacts on a variety of fish populations. Noticeable events reported include (a) widespread death of Californian sea lion pups, (b) catches of warm-water marlin in the usually frigid water off Washington State and (c) poor salmon returns in Bristol Bay, Alaska.\textsuperscript{38} Other natural factors such as salinity, wind speed and direction, ocean currents, nutrient availability, carbon dioxide concentration in the

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\textsuperscript{33} Deputy Director of Fisheries (Monitoring, Control and Surveillance), \textit{The Minutes of the Industrial Fisheries Stakeholders Meeting Involving FDF, NITOA, Nigerian Navy and the Marine Policy Held on the 23\textsuperscript{rd} of November, 2004 at FDF Conference Room, Lagos, p. 6.}

\textsuperscript{34} IUCN (2007) \textit{IUCN Red List of Threatened Species in Each Major Group of Organisms in Each Country (Critically Endangered, Endangered or Vulnerable Categories only) Bonn: Germany. See Table 5. Available at http://www.iucnredlist.org/info/tables/table5 (accessed March 12, 2008).}


\textsuperscript{36} The NAO is an index relating to Atlantic weather and, because weather affects the Atlantic oceanographic conditions, it directly affects the fishery resources. For example, it has been observed that the warm temperature in the Norwegian seas (associated positive NAO) increases the likelihood of good recruitment years for Norwegian spring-spawning herring. Krvonin, A. S. and Rodionov, S. N. (1992) “Atlanto-Scandian Herring: A Case Study”, In: Glantz, M. H. (ed.) \textit{Climate Variability, Climate Change and Fisheries}, Cambridge: Cambridge Uni. Press, pp. 231-260 at p. 243. In addition, the stock has displayed major long-term shifts in migratory behaviour that appear to be linked to changes in stock size and environmental factors. Sissener, E. H., and Bjørndal, T. (2005) “Climate Change and the Migratory Pattern for Norwegian Spring-Spawning Herring – Implications for Management,” \textit{Marine Policy}, Vol. 29, Issue 5, pp. 299-309.

\textsuperscript{37} When the PDO is in its coastal warm phase, sea surface temperatures along the west coast of North America are usually warm, westerly wind stress is stronger than normal, and there is a large area of unusually cool sea surface temperatures in the western and central North Pacific. In the coastal cool phase, the signs of these anomalies are reversed. Mantua N. J., et al., (1997) “A Pacific Interdecadal Climate Oscillation with Impacts on Salmon Production” \textit{Bulletin of the American Meteorological Society} 78(6), pp. 1069-79. Available also at \textit{http://www.iphe.washington.edu/staff/hare/html/papers/pdo/PDO.pdf} (accessed January 12, 2007).

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ocean, strength of upwelling, rain and snow, as well as the interaction among these factors, have tremendous effects on fishery resources. Lastly, consumption of small fish by large predator fish, mammals and seabirds constitutes a serious threat to certain fish species.

In Nigeria, the existence in the centre and south of the Gulf of Guinea of a permanent thermocline, which prevents the enrichment of the surface water with nutrients of deep-sea origin (upwelling), reduces the availability of food for pelagic fish species. Also, excessive pressure is put on inshore fishes because of Nigeria’s relatively narrow continental shelf, which extends for about 15 km in the western area and ranges from 60-80 km in the eastern area. This limits the trawlable area to 3,200 nm² (27.90%) out of the 11,470 nm², which Nigeria is blessed with. Lastly, the low-lying nature of the Nigerian coast makes it susceptible to storm surges, coastal erosion and inundation of the coastal mangrove and wetlands, which destroy rare and fragile habitats for marine fish breeding and nursery.

The human factors that constitute threats to fishery resources are categorised under three broad headings, i.e. overfishing, environmental activities and climate change. The magnitude of the climate change problem makes it imperative to examine it separately from the general meaning of environment.

2.4.1 Problems of Overfishing

Globally, and in Nigeria, overfishing is the primary human activity constituting a threat to fishery resources. Overfishing occurs when so many fish are taken from a population such

that the stock’s capacity to produce MSY on a continuous basis is diminished.  

44 MSY is that level of abundance of population of a living resource that will assure maintenance or restoration of living resources.  

45 Overfishing is caused by several interrelated factors.

2.4.1.1 Increase in Population

The increase in the world population from about 5.2 billion in 1990 to 6.6 billion people in 2007 puts more pressure on all natural resources, including fish. The world demand for fish is estimated to reach 186 million tonnes in 2030 or almost 90 million tonnes more than the 1999 demand; while the total world fish supply is more likely to be in the range of about 150 – 160 million tonnes.  

47 The FAO predicts that by 2030 an additional 37 million tonnes of fish per year will be needed to maintain current levels of fish consumption for an expanding world population.  

48 This gap continues to grow on a daily basis as the world population increases. Part of the efforts to address this problem is putting excessive pressure on marine captured fish.

2.4.1.2 Poverty and Coastal Settlement

Poverty and coastal settlement are inextricably linked to the world population problem. First, according to the World Bank, 2.1 billion people live on less than $2 a day, and 880 million on less than $1 a day. Most of them depend on agriculture, which includes fishing, for their livelihoods.  

49 Second, the observable trend is that more people are moving to the coast, and by 2025 it is expected that 75% of the world’s population will live in coastal

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areas.\textsuperscript{51} The implication of coastward shifts in populations is that more low-income earners are directly or indirectly moving into the fishing industry, thus increasing the pressure on fishery resources.

\subsection*{2.4.1.3 Improved Technology}
Technology has revolutionised fishing operations to such an extent that the actual fishing capacity is estimated to have increased four-fold since 1965.\textsuperscript{52} Many fishing vessels are factory trawlers with sophisticated methods of catching fish, and able to carry on board thousands of tonnes of fish. These trawlers now use radar to navigate in dense fog, sonar to detect schools of fish in deep ocean waters and electronic navigation and image aids such as Global Positioning System, which helps vessels to return to site where fish gather and breed. They also use satellite weather maps to track water temperature fronts that indicate the likely location of fish, and tracker planes to spot fish.\textsuperscript{53} The paradox of technology is that for developing coastal states like Nigeria that do not have it, their ability to conduct fisheries research as well as comply with international conservation and management measures is severely hindered. This has led to overfishing of many fish stocks in developing coastal states’ waters.

\subsection*{2.4.1.4 Non-environmentally Safe Fishing Methods}
After drift nets were banned by the United Nations in 1992, commercial fishermen introduced longline nets and deep-sea bottom trawling.\textsuperscript{54} Longline net fishing and deep-sea bottom trawling for shrimps constitute major unselective and non-environmentally safe ways of fishing, and are causing serious concern. While longline nets increase the

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incidental catching of seabird, deep-sea bottom trawling uproots and pulverises the marine ecosystem, and all the unique life within it, thereby making it difficult for fishers to avoid non-target fish and other non-fish species. This has led to an enormous volume of other species being caught incidentally as bycatch. Davies et al and Bache rightly argued that bycatch is one of the highest causes of human-induced marine resource mortality. Comparing the effect of fishing method in the North Sea with habitat destruction and pollution, Clover is of the view that pollution effects are local, whereas fisheries cover the whole of the North Sea... impact of fisheries on bottom dwelling animals is a thousand times higher than that of sand and gravel extraction in the Dutch part of the North Seas ... the damage by fishing is 100,000 times higher than that of oil or gas exploration.

2.4.1.5 Ghost Fishing

Lost nets and those intentionally abandoned in the sea by fishermen continue to catch fish and non-fish species. Although ghost fishing is under 1% of landed catches, according to a recent FAO and United Nations Environmental Programme’s report, the problem is likely to escalate due to the increased scale of fishing operations, introduction of highly durable fishing gear made of long-lasting synthetic materials and lack of serious concern shown by the international community to address the problem.

55 Mullen, T. op. cit., p. 136.
58 Clover, C. op. cit., pp. 58 and 59. Clover based his view on earlier research findings by Han Lindeboom. The most recent work by Lindeboom on the subject is Lindeboom, H. J. (2005) “Comparison of effects of Fishing with effects of Natural events and Non-fishing Anthropogenic impacts on Benthic Habitats” In: Barnes, P. W. and Thomas, J. P., (eds.) *Benthic Habitats and the Effects of Fishing*. American Fishing Society Symposium 41, Bethesda, Maryland, pp. 609-618. Note that although Lindeboom study focused on benthos, the effect on fishery resources in general will not be very different. Personal Communication with Han Lindeboom.
2.4.1.6 Over-capitalisation/Subsidies

Over-capitalisation of the fishing industry is another factor causing overfishing. The total world fleet engaged in fishing rose in 1998 to about 1.3 million decked vessels and about 2.8 million undecked vessels.\(^{62}\) According to Eichenberg and Shapson, the global fishing fleet doubled in both number and tonnage and is currently about 250% greater than needed to catch what can be sustainably harvested.\(^{63}\) Hunter et al. described the situation as one in which “too many boats are pursuing too few fish.”\(^{64}\) Over-capitalisation of the fishing industry is closely linked to governments subsidising the industry.\(^{65}\) According to Sumaila et al, in 2007 worldwide subsidies to the fishing industry were estimated at US$30-34 billion annually.\(^{66}\) Fisheries subsidies lead to greater fishing capacity and create economic incentives for overfishing, by making the fishing business far more profitable, even when fish stocks are in decline.\(^{67}\) Subsidies promote other destructive fishing practices like deep-seas bottom trawling and illegal, unreported and unregulated (IUU) fishing.\(^{68}\)

2.4.1.7 Poor Management Strategies

Agardy considers failure to empower local people and the breakdown of traditional structures and regulations systems as drivers of overfishing.\(^{69}\) Unfortunately, most literature on fisheries management neglects the effect of Western civilisation on the traditional structures and their regulatory mechanisms, which for centuries successfully prescribed fishing standards for fishermen. The failure of management systems, which is often directed at obtaining the MSY and not towards ecological stability, has been


\(^{63}\) Eichenberg, T. and Shapson, M., *op. cit.*, pp. 596 and 597.


identified as the cause of the collapse of several fisheries. Despite the fact that the ecosystem approach is becoming a common tool in fisheries management, most countries still rely on the traditional single species management system. Such a system is incapable of taking into account spatial and temporal scales of variability in the marine environment, and does not pay attention to the dynamics or behaviour of the fishermen as an integral part of the system.

2.4.1.8 Problem Associated with the Creation of EEZ

The creation of the EEZ also set into motion its own dynamic system leading to compliance and enforcement problems. The majority of coastal states, especially developing states, cannot afford the sophisticated patrol vessels or satellite vessel monitoring systems (VMS) required for monitoring and surveillance of the vast and turbulent waters of the EEZ with less risk. The inability of coastal states to effectively monitor and enforce conservation measures in their EEZ encourages IUU fishing in the area by foreign fishing vessels, thus exacerbating the depletion and collapse of marine fish stocks.

2.4.1.9 Globalisation and Non-compliance

Another factor exacerbating overfishing is globalisation. Couper and Smith argue that globalisation encourages redeployment of excess capacity from the European Union to African, South American, and Indian Ocean waters. In most cases, the transfer takes the form of foreign direct investment, but such investment contributes to overfishing when translated into fishing vessels. Such vessels have no stake in the sustainability of the local fisheries and they are mostly registered in flag of convenience states in order to enable them to perpetuate IUU fishing. The main problem is failure of flag of convenience states to monitor and control what is significantly more than 51% of the total world’s gross

tonnage registered by them. A good number of flag of convenience vessels are constantly reflagging to avoid compliance with international conservation and management measures.\textsuperscript{76} According to Behnam, the implication of this is that half of the world fleet is \textit{de facto} an international anomaly, “stateless” and not subject to the jurisdiction of the state whose flag they fly.\textsuperscript{77} These vessels perpetrate their activities more in the extensive fishing grounds of developing states that lack the financial and naval capability to monitor their waters.\textsuperscript{78} From whatever perspective the marine fish crisis is examined, the truth, as expressed in some literature,\textsuperscript{79} is that non-compliance by fishing vessels with conservation and management measures contributes immensely to it.

\textbf{2.4.1.10 Inadequate Data and Other Factors}

The foregoing problems are further compounded by the lack of relevant data and information on fishing vessels, catch landings and fish stocks biomass, especially in developing countries. The total allowable catch (TAC), which has become the cornerstone of all conservation and management measures,\textsuperscript{80} is not of much assistance because it is either based on erroneous scientific evidence, or on distorted data provided by fishers, which does not reflect unreported discard and IUU fishing.\textsuperscript{81} What is more, politicians at times ignore recommendations of scientists on what should be the sustainable TAC. Other factors rarely mentioned in most literature are the fiscal and economic policies of governments, for example, high interest rates that fishers are paying on loan facilities,\textsuperscript{82} using 40 per cent out of 100 million tonnes of marine fish caught annually as feed for


\textsuperscript{80} As far back as 1996, TAC was use by 18 Regional Fisheries Management Organisations (RFMOs) and 100 different nations and by 2007 it was the core management tool for exploitation of more than 175 different types of fish stocks. Sovacool, B. K. (2009) “A game of Cat and Fish: How to Restore the balance in Sustainable Fisheries Management”, \textit{Ocean Development & International Law}, Vol. 40, Issue 1, pp. 97-125 at p. 107 and footnote 60 and 61.


With the exception of subsidies, most of the foregoing factors directly or indirectly contribute to overexploitation of marine fishery resources in Nigeria. For instance, the Nigerian population has increased from 90.6 million in 1990 to 147.7 million in 2007.\footnote{World Bank (2007) World Development Indicators: Population Dynamics, Washington D. C : World Bank, p. 42. Available at \url{http://siteresources.worldbank.org/DATASTATISTICS/Resources/table2_1.pdf} (Accessed last April 12 2009) and World Bank (2010) \textit{World Development Indicators & Global Development Finance 2010}. \textit{See the section on Population total}. Available at \url{http://search.worldbank.org/data?qterm=population&language=EN&format=html} (accessed 3 September 2010).} With an estimated fish demand of 1.76 million tonnes and local fish supply of only 615,507 tonnes, the difference can only be met by increasing the pressure on fishery resources. Due to a concentration of development along the coastal zone, 25\% of the country’s population is located in the eight coastal states, leaving the remaining twenty-three states including Abuja, the Federal Capital Territory, to share the remaining 75\%.\footnote{Nigeria Meteorological Agency (NIMET) (2006) \textit{Year 2006 Rainfall Prediction and Socio-Economic Implications for All States in Nigeria}, Oshodi, Lagos: NIMET, p. 41.} With more than one third of the Nigerian population living in abject poverty\footnote{About 54\% of her population lives on less than 1 dollar per day. World Bank (2008) \textit{Nigeria – Country Brief} Available at \url{http://go.worldbank.org/FI0T240K0} (Accessed June 4, 2008).} the concentration of people along the coastal zone means that more low-income earners are moving into the fishing industry, thus putting pressure on fishery resources. It also means more development along the coastal zones, in order to provide basic infrastructures for the
teeming population. From 1995 to 2007 the total number of registered vessels that actually operated was far above the recommended maximum fleet of 150 vessels.\(^8^9\) (Table 2.3).

Table 2.3 – Registered & Actually Operated (R & AO) Vessels 1995-2007

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Fishing (R &amp; AO)</th>
<th>Shrimping (R &amp; AO)</th>
<th>EEZ (R &amp; AO)</th>
<th>Total (R &amp; AO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>72</td>
<td>235</td>
<td>8</td>
<td>315</td>
</tr>
<tr>
<td>1996</td>
<td>57</td>
<td>196</td>
<td>1</td>
<td>254</td>
</tr>
<tr>
<td>1997</td>
<td>49</td>
<td>197</td>
<td>3</td>
<td>249</td>
</tr>
<tr>
<td>1998</td>
<td>36</td>
<td>162</td>
<td>1</td>
<td>199</td>
</tr>
<tr>
<td>1999</td>
<td>23</td>
<td>187</td>
<td>1</td>
<td>211</td>
</tr>
<tr>
<td>2000</td>
<td>34</td>
<td>173</td>
<td>1</td>
<td>208</td>
</tr>
<tr>
<td>2001</td>
<td>33</td>
<td>184</td>
<td>3</td>
<td>220</td>
</tr>
<tr>
<td>2002</td>
<td>30</td>
<td>212</td>
<td>1</td>
<td>243</td>
</tr>
<tr>
<td>2003</td>
<td>48</td>
<td>204</td>
<td>8</td>
<td>260</td>
</tr>
<tr>
<td>2004</td>
<td>37</td>
<td>182</td>
<td>2</td>
<td>221</td>
</tr>
<tr>
<td>2005</td>
<td>35</td>
<td>203</td>
<td>1</td>
<td>239</td>
</tr>
<tr>
<td>2006</td>
<td>32</td>
<td>176</td>
<td>2</td>
<td>210</td>
</tr>
<tr>
<td>2007</td>
<td>28</td>
<td>161</td>
<td>2</td>
<td>191</td>
</tr>
</tbody>
</table>

Source of Data Collation: Federal Department Fisheries (FDF), Lagos

A further analysis of Table 2.3 indicates that between 1995 and 2007 there was not a single year in which the percentage of fishing vessels compared with shrimping vessels reached 24%. (see Table 2.4)

Table 2.4: Percentage of Registered Fishing and Shrimp Vessels

<table>
<thead>
<tr>
<th>Year</th>
<th>% Fishing Vessels</th>
<th>% Shrimp Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>23.45</td>
<td>76.55</td>
</tr>
<tr>
<td>1996</td>
<td>22.52</td>
<td>77.48</td>
</tr>
<tr>
<td>1997</td>
<td>19.19</td>
<td>80.81</td>
</tr>
<tr>
<td>1998</td>
<td>18.18</td>
<td>81.82</td>
</tr>
<tr>
<td>1999</td>
<td>10.95</td>
<td>89.05</td>
</tr>
<tr>
<td>2000</td>
<td>16.42</td>
<td>83.42</td>
</tr>
<tr>
<td>2001</td>
<td>15.20</td>
<td>84.80</td>
</tr>
<tr>
<td>2002</td>
<td>12.39</td>
<td>87.61</td>
</tr>
<tr>
<td>2003</td>
<td>19.04</td>
<td>80.96</td>
</tr>
<tr>
<td>2004</td>
<td>16.89</td>
<td>83.11</td>
</tr>
<tr>
<td>2005</td>
<td>14.70</td>
<td>85.30</td>
</tr>
<tr>
<td>2006</td>
<td>15.38</td>
<td>84.62</td>
</tr>
<tr>
<td>2007</td>
<td>14.81</td>
<td>85.19</td>
</tr>
</tbody>
</table>

This situation is primarily caused by the Federal Government’s decision in 1986 to implement the World Bank/International Monetary Fund recommended structural adjustment programme, which led to massive devaluation of the Naira. Furthermore, scarcity and escalation in the costs of petroleum products, together with inequities between the Federal Government policies of banning the export of all finfish caught in Nigerian waters and export incentives for the non-oil sector, which include shrimps, caused industrial fishermen to shift their focus to shellfish (shrimp), in order to earn foreign exchange. In that way they were sure of profitability and the survival of their business. Unfortunately, shrimp fishing leads to a higher rate of juvenile fish mortality because of the smaller cod-end mesh size used for shrimping. According to Ambrose et al., the percentage by weight compositions of commercial by-catch fish species in artisanal and nearshore shrimp beam trawl fisheries off Lagos was 58.14%. While bycatch of 11-30 cm are marketable and consumed, those with length range of 4-10 cm, which constituted 75% and were previously discarded, resulted in high biodiversity loss. The emergence of sea market for juvenile fish of less than the 14 cm is another important factor that contributes to overexploitation of marine fish stocks.

The restriction of fishing activities to the western inshore waters, because of attacks on fishing trawlers in the Niger Delta area by pirates, has resulted in more fishing pressure on marine fish stocks in the western inshore waters. From 2003 to 2008 the number of reported pirate incidents on fishing vessels was 4, 11, 34, 57, 55 and 72 respectively. Other factors contributing to overfishing of marine fishes in Nigeria include lack of funds and insufficient manpower by the FDF, scarcity of reliable production data, non-

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90 Devaluation of the Nigerian Naira (then at about NGN1 to US$1) meant that sales of fish catch locally could not be profitable because of the heavy foreign exchange dependent operational cost of fishers. Gillett, R., op. cit., p. 247 and Ogbonna, J. C., op. cit., p. 197.
91 Ibid.
93 The Standard Sorting System for Fishes Caught in Nigeria’s Marine Waters Policy which took effect from May 1, 2006 approved 14 cm as the minimum size for grading of fishes in Nigeria. See Re: Standard Sorting System for Fishes Caught in Nigeria’s Marine Waters, FDM/C/L/24/S.4/I/193 of February 27, 2006 signed by A.V. Amire for Hon. Minister and addressed to The President, NITOA, Kirikiri Lighter Terminal 1, Lagos.
95 Federal Department of Fisheries (FDF), (2009) Fish Statistic File, Victoria Island, Lagos: FDF.
availability of patrol vessels and weakness in prosecuting violations of fisheries laws. These factors make it impossible for the FDF to enforce conservation measures or check IUU fishing activities, especially by foreign fishing vessels, in Nigeria’s maritime zones. Also, the unregulated nature of artisanal fishing makes it difficult to stop those using undesirable fishing methods.

2.4.2 Environmental Activities

2.4.2.1 Pollution of Aquatic Environment

Pollution of the aquatic environments constitutes another major threat to marine fish populations all over the world. Marine accidents, such as the one involving Prestige off the Galician coast in 2002, have disastrous consequences on fish stocks. Dumping of toxic waste in the sea and emptying of ballast water from ships into the sea are other human activities polluting the aquatic environment. The problem of invasion of exotic fish species is linked to ballast water from ships.

In Nigeria, the sources of pollution of the aquatic environment are industrial waste, raw/untreated domestic sewage, run-off of fertilisers and pesticides, sand mining, construction of canals and oil spills. Excluding unreported cases, more than 1.07 million barrels of oil were spilled in Nigeria between 1960 and 1997. The millions of tonnes of polythene bags and other types of non-biodegradable debris that have been washed by rain water into the aquatic environment constitute new threats to marine fisheries.

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96 Gillett, R., op. cit., pp. 49, 255 and 256 and Edet, E. E., and Williams, A. B., op. cit., p. 18. It was only in 2007 that the Federal Government made budgetary allocation for the purchase of a patrol boat for fisheries monitoring, control and surveillance. See Budget Classification No. 02500030170000 in the 2007 Budget where N25, 000, 000 was allocated for that purpose. However, as at June 2009, the FDF was not given the money or presented with a patrol boat.

97 Gillett, R., op. cit., p. 255.


2.4.2.2 Habitat Destruction

Habitat loss and environmental degradation of coastal zones, wetlands, deltas, and mangrove areas due to developmental activities and growth in aquaculture constitute the main reasons for the collapse of marine fish species that spawn in freshwaters. In the case of the Pacific salmon, building of hydropower dams and modification of natural river flows are some of the factors contributing to salmon decline. The fact that 90% of the world’s coasts will become developed by 2050 will definitely exacerbate the already lamentable state of marine fishery resources. Habitat loss also occurs in the high seas through deep-sea fishing activities.

In Nigeria the oil boom of the seventies, which fuelled rural-urban drift and increasing population growth, has led to intense urbanisation especially along the coastal areas. The establishment of new coastal settlements such as Victoria Garden City in Lagos, and Eagle Island in Port Harcourt, led to the reclaiming of lagoons and filling of mangrove swamps and estuaries for building of social infrastructures and industrial estates. Recently, there has been increasing destruction of mangrove swamps for aquaculture purposes. All these expose the coast to storm surges, and coastal erosion, and make it easy for , which lacks the necessary prop root system to invade the mangrove area. The consequences of these are: (i) the size of the Niger Delta wetland, which is the largest in Africa and the third largest in the world, has been seriously reduced, and (ii) critical and fragile habitats for fish spawning, breeding and nursery are destroyed. Bottom trawling by

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102 In Dead Water, p. 12.


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shrimp vessels destroys epibenthic and infauna on which most demersal fish species depend for their food.\textsuperscript{107}

\subsection*{2.4.2.3 Climate Change}

The most basic way that climate change affects fish is through increase in global temperature. The 2007 Report of the Intergovernmental Panel on Climate Change (IPCC) reveals that global average surface temperatures over the last 100 years have increased by 0.74°C ± 0.18°C, while the rate of warming over the last 50 years is almost double that of the last 100 years (0.13°C ± 0.03°C vs. 0.07°C ± 0.02°C per decade).\textsuperscript{108} Global warming is responsible for the unprecedented warming of the oceans,\textsuperscript{109} although the temperature of the Northeast Atlantic Ocean may fall instead of rise due to the weakening of the Gulf Stream and the thermohaline circulation.\textsuperscript{110} However, there is need to point out from the outset that ignoring other climatic parameters makes the real past and future effects of climate change on fish stocks highly tentative and uncertain.\textsuperscript{111}

Ocean warming globally affects marine fishery resources in many ways. In the first place, although El Niño events are naturally induced and inevitable, simulations of the El Niño cycle indicate they are becoming stronger and with wider swings as the global climate warms.\textsuperscript{112} Similarly, the observed upward trend in the NAO index is said to be caused partly by an increase in GHGs.\textsuperscript{113} Increased sea temperature is one of the major causes of destruction of coral reef ecosystems.\textsuperscript{114} Coral reefs are highly sensitive and can only

\textsuperscript{107} Gillett, R., \textit{op. cit.}, p. 253 and Edet, E. E. and Williams, A. E., \textit{op. cit.}, p. 16.
survive between 18˚C and 30˚C. Most coral bleaching, including that of Lettuce coral in Polynesia shown in figure 2.1, is caused by a 1˚C increase in temperature above the seasonal maximum water temperature.\textsuperscript{115}

Figure 2.1: Lettuce coral Phoenix Islands, Polynesia 2004

Coral reefs serve as habitat to at least 25% of all marine species and thirty-two of the 33 animal phyla.\textsuperscript{117} Presently, 30% of coral reefs have been damaged because of increasing sea temperatures.\textsuperscript{118}

Another impact of climate change that threatens fishes is sea level rise. From 1961-2003, the global sea level rose at an average rate of 1.8 (1.3-2.3) mm per year.\textsuperscript{119} Already, the


IPCC predicts that partial deglaciation of the Greenland ice sheet and the West Antarctic ice sheet (Figure 2.2) because of global average temperature increase of 1-4°C, will cause a sea-level rise of 4-6m or more.\textsuperscript{120}

Figure 2.2 Melting Greenland Glaciers

This has resulted in ocean surges into lowland coastal areas and the destruction of critical aquatic habitat.\textsuperscript{122} Unfortunately, the large capacity of the ocean to absorb heat (1000 times more than the atmosphere\textsuperscript{123}) means that there will be a considerable delay before the full effect of warming is felt throughout the depth of the ocean. Hence, the global average sea level will continue to rise for centuries at a gradually decreasing rate after atmospheric greenhouse gas concentrations have stabilised.\textsuperscript{124}


\textsuperscript{121}Lovelock, J., op. cit., p. 83. This same picture is available in Gore, A. (2006) op. cit., 193.


Fish species are ectothermic (cold blooded); thus, sea temperature affects all facets of their lives including, spawning, growth, distribution, migration patterns and incidence of disease. Since Pierce provided the first empirical evidence on the correlation between fish stocks level and temperature, subsequent studies have continued to reveal the negative and positive impacts of increases in sea temperature on fish stocks. Until recently, one could assume that because global warming mostly affects the surface layer of the sea, demersal fish stocks were less affected by climate change than pelagic fish. That proposition is no longer tenable considering the rate and depth at which the oceans have absorbed heat from the atmosphere.

In the northeast Atlantic increases in the sea surface temperature (SST) affects the dynamic equilibrium of pelagic ecosystems from phytoplankton to salmon fish. Concerning predator/prey relationship, the recruitment of herring is enhanced by increased inflow of warm Atlantic water, which carries zooplankton that serves as food for the larval and fry stages of this specie. However, an increase in young herring population, which preys on capelin larva might lead to a decline in the capelin population. This may have a negative effect on other fish (e.g. cod), birds and marine mammals (e.g. harp seals and minke


whales) that prey on capelin. Fisheries biologists have also discovered that SST influences the migratory pattern of some fish, and causes mortality and shift to deeper water of species such as Spisula solidissima. Changes in the migration patterns of fish and other aquatic organisms and pathogens as a result of increases in ocean temperature constitute a new origin of exotic invasive species (traditional origins of these species were ballast water from maritime transportation and aquaculture), which represent the second main cause of loss in world’s biodiversity. This will undermine the use of the 2004 International Convention for the Control and Management of Ships’ Ballast Water and Sediments, as well as authorisation of routine or non-routine movement strategies to curb transfer of alien species.

Globally, with regard to inland fisheries, 60 years of data collection reveal that climate change has led to significant warming of the surface water and long-term changes in nutrient cycling and the basal food web in the world’s largest and most ancient lake. Recent studies have also noted the direct and indirect impacts of climate change on aquaculture. In summary, climate change affects all types of fisheries. While some species are negatively affected by climate change others are positively affected.

135 Ibid., p. 11. 
However, the truth is that as climate change becomes more severe its harmful impacts on fish species are likely to outweigh the benefits in all regions.\textsuperscript{139}

Unfortunately, in Nigeria, there is no specific research on how climate change affects the physiology of any individual marine fish species or how such species respond to climate change. The few existing scientific literature resources rely heavily on the IPCC reports in their analyses of climate change impacts on marine fisheries.\textsuperscript{140} For instance, Ajayi had earlier presumed that the synergistic effect of climate change such as sea level rise, ocean storm surge leading to coastal inundation, changes in precipitation resulting in more coastal rainfall, drier rainy season in the Sahel, more enduring low salinities and low level of fish solar drying would affect aquatic ecosystems and marine fish species.\textsuperscript{141} However, one fact is certain; the Nigerian marine environment is getting warmer. The surface temperature of the Atlantic Ocean at Victoria Island, Lagos, between 1990 and 2007 recorded the lowest annual temperature of 26.65°C in 2000 and the highest annual temperature of 29.6°C in 1995 (Figure 2.3).

Figure 2.3 Average Annual Temperature of Atlantic Ocean at Victoria Island, Lagos

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Average_Annual_Temp_ATL_VI_Lagos.png}
\caption{Average Annual Temp: Atlantic Ocean - VI Lagos}
\end{figure}

Source of data collation: Nigerian Metrological Agency, Lagos.\textsuperscript{142}

\begin{flushright}
\textsuperscript{141} Ajayi, T. O., op. cit., pp 100-106.
\end{flushright}
This temperature range is above the thermal limits of some commercially important inshore and offshore species (Tables 2.5).

### Table 2.5 Temperature Preference of some Marine Fish Species

<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
<th>Common Names</th>
<th>Temperature Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sciaenidae</td>
<td><em>Pseudotolithus senegalensis</em></td>
<td>Croaker</td>
<td>Spawn from November to March in waters of 22 to 25°C</td>
</tr>
<tr>
<td>Clupeidae</td>
<td><em>Sardinella maderensis</em></td>
<td>Sardine</td>
<td>Prefers water temperature of 24°C</td>
</tr>
<tr>
<td></td>
<td><em>Sardinellaimbriata</em></td>
<td>Bonga Shad</td>
<td>Distribution corresponds to extreme northerly and southerly limits of the 25°C isotherms throughout the year</td>
</tr>
<tr>
<td>Shrimps</td>
<td>Penaeus notialis</td>
<td></td>
<td>Prefers 25°C</td>
</tr>
</tbody>
</table>

Source: Whitehead, P.J.P\(^{143}\)

For example, the biomass of *Pseudotolithus senegalensis*, which is among the most commercially important demersal fish in Nigeria, may have been negatively affected because the lowest Atlantic Ocean temperature of about 28°C (at the Victoria Island of Lagos) during its spawning months of November to March being above its preferred temperature of 22 to 25°C. (Figure 2.4)

Figure 2.4 Average Monthly Temperatures at Atlantic Ocean – Victoria Island, Lagos

![Average Monthly Temp: Atlantic Ocean - VI Lagos (1990-2007)](source)

Source of Data Collation: Nigerian Metrological Agency, Lagos\(^{144}\)

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\(^{144}\) Supra, footnote 142.
Indeed, such a warm habitat might have affected the species’ egg development, recruitment, distribution, migration, abundance and predator/prey relationship.

In Nigeria, accurate data is not available to determine the state of fish in the numerous rivers and small lakes. However, because of climate change rainfall prediction in 2007 showed generally either shorter length or below normal annual total rainfall in most states of Nigeria. Similar to the experience in South Asia and other African countries, lower dry season water levels in most Nigerian rivers and lakes may have contributed to decline in fish yields.

At this point, it is necessary to emphasise that some of the changes in the aquatic ecosystems and marine fishery resources in Nigeria may have been induced by natural factors. However, Okude and Ademiluyi have identified climate change as one of the anthropogenic factors that have exacerbated coastal erosion in Nigeria. From their observations the rise in Atlantic Ocean levels have contributed to the frequent surge of high salinity ocean water events into the mangrove swamp and wetland ecosystems, which serve as spawning, breeding and nursery grounds for many marine fish species. While it is not contestable that there exist a permanent thermocline in the centre and south of the Gulf of Guinea, the stability of warm surface layer in the region due to increasing ocean temperature means that the chances of any turnover or mixing of the “desert” surface layer with the deep ocean water that is rich in nutrients (upwelling) has become slimmer. Lastly, even though few Nigerian marine fish species may have responded positively to increasing sea temperature the extinction of even one fish species as a result of climate change can have significant implications for the marine ecosystem as a whole.

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146 Nigerian Meteorological Agency (NIMET) (2007) Year 2007 Rainfall Prediction and Socio-Economic Implications for all States in Nigeria. Oshodi, Lagos: NIMET, see pp. 6-10 on summary of the prediction and p. 44 where the deviation is explicitly stated as delay of 30 days for onset of rainy season and 5 days for cessation of rainy season.
147 FAO, New Directions in Fisheries, supra, p. 5.
148 Search and analysis of the Fish Production File in the Federal Department of Fisheries, Lagos revealed that total fish landing of artisanal fishermen from rivers, lake, coastal and brackish water declined from 518,537 tonnes to 504,227 tonnes.
152 For example, Sardinella aurita prefers water with a minimum temperature below 24°C. Whitehead, P. J. op. cit. The Norwegian Spring Spawning Herring responds positively to increases in sea temperature, but recent research reveals that NSS herring was more observed in Norwegian Sea area with intermediate...
change can cause unimaginable consequences, especially in the area of prey-predator relationship.

2.5 Controversy in the Scientific Claims

Controversy exists when it comes to determining whether the collapse or depletion of certain fish stocks is actually caused by overfishing, climate change or other factors. For instance, seventeen years after the collapse of Newfoundland cod the stock has not recovered, despite the imposition of a moratorium on fishing. Most commentators identify overfishing as the only factor responsible for the stock’s collapse, but evidence has emerged proving that severe climate conditions, in particular cold temperatures, also played an important role in its decline.

The controversy over superimposing the effects of overfishing and climate change on fish stocks has been resolved using historical catch records (historical methodology), and palaeolimnological data. The analysis of Lajus et al. of historical catch data and climate variations in the 17th and 18th centuries reveals a strong correlation between SST in the White and Barents Seas and fish species such as salmon, cod and halibut. Studies conducted by Klyashtorin and Sharp based on long-term observations (110-150 years) of outbursts of certain species, and global and regional atmospheric indices, established a correlation between natural long-term climate variability and long-term fluctuations in the abundance of commercial species such as herrings, salmon, sardine, pollock and jack mackerel. The FAO also confirmed that spectral analysis of the time series of atmospheric global temperature both measured and reconstructed from the sixteenth century shows a temperature 6°C, compared to the warmest water masses (up to 8°C) and colder water masses (<4°C). Olsen, E. M., et al., (2007) “Spatially Structured Interactions Between a Migratory Pelagic Predator, the Norwegian Spring-Spawning Herring Clupea harengus L., and its Zooplankton Prey”, Journal of Fish Biology, Vol. 70, No. 3, pp. 799-815 at p. 812.


common periodicity in climate variations and stocks fluctuations. Lastly, in Lake Tanganyika, carbon isotope records in sediment cores showing negative values beginning in the mid-1900s has been identified as being responsible for the 20% reduction in primary productivity (phytoplankton productivity), implying a roughly 30% decrease in fish yield.

From the foregoing, one can safely conclude that the causes of the deplorable state of marine fisheries globally and in Nigeria are manifold and complex, although currently the primary human-induced threat is overfishing.

The fact that carbon dioxide levels in the atmosphere has increased up to 385 parts per million -100 in 2008 from an average of 280 ppm in the pre-industrial age (the highest for at least the last 650,000 years), suggests that IPCC general circulation models’ prediction of about 2.4 – 6.4˚C (the best estimate for the high scenario) rise in global temperature by the year 2099 may come to pass, unless emission of GHGs is reduced drastically. The truth, as pointed out by the IPCC, is that even if emission of GHGs and aerosols stabilises at the 2000 emission levels a further warming trend would occur in the next two decades of about 0.2˚C per decade. Unfortunately, the issue of global warming is like a mortgage rate. Over time, a slight increase in global temperature has amplified effects on marine fish stocks. It is almost certain that in the next few years the negative

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159 This is the underlying message in Lindeboom’s work although he focused on comparing the effects of fishing with effects of natural events and non-fishing anthropogenic impacts on benthos. Lindeboom, H. J., op. cit.
164 IPCC (2007) op. cit., p. 12.
impacts of climate change on fishery resources will surpass the level at which they would have collapsed or depleted due to overfishing or other causes.\textsuperscript{166}

2. 6 Consequences of the Deplorable State of Marine Fishery Resources

The deplorable state of marine fish stocks has serious environmental and socio-economic consequences. On the environmental side, the tendency to fish down on the food chain and target smaller and younger fish may affect predator-prey relationship, genetic diversity of fish stocks and the future regenerative capacity of the fishery.\textsuperscript{167} This is exactly the situation in Nigeria where less than one fifth of the trawlers registered between 1997 and 2007 were involved in harvesting finfish.\textsuperscript{168} Some of the socio-economic consequences of the present state of marine fisheries include a decline in employment and income in the sector. For instance, the July 1992 moratorium on cod fishing put 40,000 fishermen out of work in Newfoundland.\textsuperscript{169} While the immediate reaction seems to be sector focused, national economies depending largely on revenue from fishing and allied industries may break down.

Globally, the FAO has confirmed that the share of fish protein, in total world animal protein, declined from 16.0\% in 1996 to about 15.5 in 2003, while fish consumption by weight in low-income food-deficit countries was 14.1 per capita in 2003.\textsuperscript{170} The crisis in marine fisheries has already led to escalating prices of fish and fishery products. The FAO predicts that prices of all types of fish will increase in real terms by 3.0 and 3.2\% by the years 2010 and 2015, respectively.\textsuperscript{171} The consequences of the escalating prices of fish on poor developing countries, including Nigeria, which may not have immediate substitutes for fish protein, are likely to include hunger, malnourishment, disease and death.\textsuperscript{172} With

\begin{itemize}
\item \textsuperscript{168} See Table 2.4, supra, p. 52.
\item \textsuperscript{170} SOFIA 2006, p. 3.
\end{itemize}
the world population projected to increase from 6.437.7 billion in 2005 to 7.165.8 billion in 2015, and world food prices increasing geometrically, nothing short of a global food catastrophe is expected. Unless the deplorable state of marine fishery resources is urgently addressed the source of about 15% of world supply of animal protein will continue to be at risk.

Food fish insecurity will further threaten global and national peace and security. There have been a number of incidents that provide evidence of international tensions and use of force by states as a result of fishing conflicts. Examples of such incidents are the Cod wars between Iceland and Britain, the Turbor war involving the arrest of a Spanish vessel, the Estai, on the high sea by the Canadian government, and the Salmon war between the United States (U.S.) and Canada. Lastly, changes in the coastal states’ baseline, because of rises in sea levels, will lead to the creation of new maritime boundaries, thereby pushing high seas fishing fleets into existing EEZ. Such a situation is likely to result in fishing conflicts between Nigeria and DWFNs, especially when the poor state of marine fish stocks is taken into account.

Regrettably, much of the climate change burden will be on poor developing states, including Nigeria, because of their high vulnerability to climate change. The manifestation of this claim seems certain if it is accurately reflected by the FAO’s table of climate variability, their impacts and outcomes for fisheries. For example, two-thirds of the world’s coral reefs occur in the territorial waters of developing states, and 30 million small-scale fishers in the developing states depend directly on coral reef fisheries for their 173 World Bank (2007) World Development Indicators: Population Dynamics, Washington D. C : World Bank, p. 42. Available at http://siteresources.worldbank.org/DATASTATISTICS/Resources/table2_1.pdf (Accessed last April 12 2009).
177 The arrest of Estai by Canada led to the Fisheries Jurisdiction Case (Spain v. Canada) (December 4, 1998). The judgment of ICJ on its jurisdiction over the case is available at http://www.oceanlaw.net/cases/fishj3j.htm last visited May 6, 2005.
178 Ibid.
179 FAO, New Directions in Fisheries, supra, n. 5.
livelihoods. The survival of these people is seriously threatened if 60% of the coral reefs disappear by 2030, as predicted. Unfortunately, most developing countries, including Nigeria, have little or no surplus biomass to buffer climate-induced fluctuation in stock abundance relative to current demand.

2.7 Principles Underpinning Exploitation of Marine Fisheries Resources

Three fundamental principles inform the way in which marine fisheries are managed globally. The first two – freedom of the high seas and sovereignty of coastal state over territorial sea were developed in the 17th century. The third is cooperation of states, which underpins Hardin’s *Tragedy of the Commons*.

2.7.1 State Sovereignty over Territorial Sea

The historical development of the territorial sea is traceable to the ancient Roman Empire. According to Grotius, “all the expanse of sea which is visible from the shore” was part of the Roman Empire. The system of independent sovereign states that emerged after the fall of the Roman Empire accepted the right of coastal states to regulate, in their own interests, activities in the seas adjoining their coasts. Grotius defines sovereignty as “a particular kind of proprietorship, such in fact that it absolutely excludes like possession by anyone else.” The 1949 Draft Declaration on the Rights and Duties of States defines sovereignty as the capacity of a state to provide for its own well-being and development, free from the domination of other states, provided it does not impair or violate their

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182 Watson, R. T. *et al.*, *op. cit*.
183 Put simply, a legal principle is the most general and fundamental precept which has persuasive power and is used by legal institutions and individuals as a legal basis for judgments and actions. See Gillroy, J. M., (2006) “Adjudication Norms, Dispute Settlement Regime and International Tribunals: the Status of Environmental Sustainability in International Jurisprudence”, *Stanford Journal of International Law*, Vol. 42, Issue 1, pp. 1-52 at p. 5. Dzidzornu puts it more succinctly: “principles encompass interests and goals, and thus indicate directions for individual and collective conduct consistent with realising the interests and goal in issue ... In other words, principles are fundamental or comprehensive truths that furnish the basis or origin for specific prescription consistent with the truths that they embody” Dzidzornu, D. M. (1998) “Four Principles in Marine Environment Protection: A Comparative Analysis”, *Ocean Development & International Law*, Vol. 2, Issue 2, pp. 91-123 at p. 93.
legitimate rights.\textsuperscript{188} Okorodudu-Fubara puts it more succinctly as “the state as a repository of the ultimate supreme power.”\textsuperscript{189} As a rule of customary international law, all states have the right to permanent sovereignty over their natural resources.\textsuperscript{190} The sovereignty of a coastal state extends, beyond its land territory and internal waters and, in the case of an archipelagic state, its archipelagic waters, to its territorial sea.\textsuperscript{191} On these bases, a coastal state has exclusive jurisdiction to regulate fishing activities in its internal and territorial sea.\textsuperscript{192}

\subsection*{2.7.2 Freedom of the High Seas}

The principle of freedom of the high seas is traceable to Hugo Grotius who, in his work, \textit{Mare Liberum},\textsuperscript{193} supported the idea of the sea being common and free to all states. Grotius distinguishes between things such as air and sea which are regarded as \textit{res nullius} (property of no one) but have been given by nature for the common use of all mankind, and things such as fish, birds and wild animals which, though also \textit{res nullius}, nature has not marked for common use.\textsuperscript{194} He argues

\begin{itemize}
\item \textsuperscript{189} Okorodudu-Fubara, M. T. (1999) \textit{Dynamics of a New World Environmental Legal Order}, An Inaugural Lecture Series 133 Delivered at Oduduwa Hall, Obafemi Awolowo University, Ile-Ife, Nigeria, p. 18.
\item \textsuperscript{191} Article 2, Convention. However, a state can only establish the breadth of its territorial sea up to 12 nautical miles measured form the baseline (Article 3). See Article 3-7 of the Convention on how baselines are measured.
\item \textsuperscript{192} Mullen, T., \textit{op. cit.}, p. 135. See also paras 2, 4 and 5 of the Award of North Atlantic Coast Fisheries Arbitral Tribunal of September 7, 1910 in \textit{North Atlantic Coast Fisheries Case (Great Britain/United States of America)} Reported in Robb C. A. R. (1999) \textit{International Environmental Law Reports}, Vol. 1, Cambridge: Cambridge University Press, pp. 89-140 at pp. 92, 93-94 and 114.
\item \textsuperscript{193} Grotius, H., \textit{op. cit.} For a detail discussion on the claims and oppositions of the exclusive jurisdiction over the high seas, see Brownlie, I. (2003) \textit{Principles of Public International Law} (6\textsuperscript{th} ed.) Oxford: Oxford University Press, pp. 224 - 225.
\item \textsuperscript{194} Grotius, H., \textit{op. cit.}, pp. 24-25.
\end{itemize}
Things under the latter category are subject to private ownership. For if any one
seizes them and maintains uninterrupted and perpetual possession of them they can
become object of private ownership. 195

The freedom of fishing on the high seas (which creates property right) is inherent but
distinct from the general concept of freedom of the seas (which does not permit property
right).

John Selden who, in 1635, published his own work Mare Clausum seriously challenged
Grotious’ Mare Liberum. He advocated states’ exercise of authority or sovereignty over
the sea. Grotius won the doctrinal battle on the status of the high sea. Consequently,
freedom of fishing on the high seas became a rule of customary international law. This
implies that no state could restrict or limit nationals of other states from fishing on the high
seas. Unfortunately, most literature ignores the fact that despite advocating freedom of
fishing on the high seas, Grotius conceded the possibility of prohibiting fishing “for in any
way it can be maintained that fish are exhaustible.”196

2.7.3 Tragedy of the Commons

During the post World War II period, the exercise of the freedom of fishing on the high
seas witnessed a radical change because of the growing world population, the emergence
of new independent states 197 and the development of technology, which revolutionised
commercial fishing operations. By this time it was apparent that fishery resources were
exhaustible and that commercial high seas stocks could collapse because of the laissez-
faire system used in their exploitation. The threat of overfishing led many scholars to
question the basis of Grotius’ freedom of fishing on the high seas.

Hardin’s Tragedy of the Commons reveals the negative effect of population on an
unregulated exploitation of finite common resources such as high seas fisheries. Drawing

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195 Grotius, H., op. cit., pp. 22 and 25. The legal basis for Grotius’ freedom of fishing on the high seas also
serves as the basis for the rule of capture which holds that seizure of resources entitles the captor to dominion
196 Grotius, H. op. cit., 34. Very few literatures have pointed out this misunderstanding. See Francisco O. V.
University Press, p. 649.
197 The newly independent states argued that they had never played any part in framing or shaping the
existing customary legal standards on the law of the sea. They also argued that the existing standards
reflected not their economic interests but primarily those of the older states; the larger maritime powers and
(ed.) Proceedings of the Fourth, Fifth and Sixth Annual Conference of the Nigerian Society of International
Law, Benin City, Ethiope Publishers Corporation, pp. 279-303 at 279.
on the analogy of a pasture open to all, Hardin argues that the conclusion reached by each and every rational herdsman is to add another animal to his herd. But

Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit – in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.

The consequence of the absence of a defined regulation in a finite world is that the per capita share of the world’s goods must steadily decrease. The resulting tragedy is essentially from the inability of resource harvesters, operating individually to monitor and limit one another’s harvesting efforts. The tragedy of unregulated exploitation of high seas fish stocks is evidence in the collapse of major commercial stocks including Cod, Bluefin Tuna, Pollock, Patagonian Toothfish and Atlantic salmon, amongst others.

Hardin was not the first to conceive the idea of the Tragedy of the Commons. Long ago, Aristotle observed,

What is common to the greatest number has the least care bestowed upon it. Everyone thinks chiefly of his own, hardly at all of the common interest; … everybody is more inclined to neglect the duty which he expects another to fulfil.

In 1954, Gordon examined the effect of unregulated and competitive exploitation of fishery resources. Drawing his lesson from the medieval manorial economy, Gordon opined that:

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198 Hardin’s ‘commons’ and ‘grass’ metaphors fit the high seas where freedom of fishing prevails. As far as Rose is concerned, “[a] fishing area might be thought of as a ‘congestible’ resource, that is, one that can bear some joint usage, but that ‘congests’ when uses increase too much.” Rose argues that up to a point, a number of people can fish and no one really notices, because everyone can take all that he wants and the fish can still regenerate at a level that seems acceptable. But beyond some point of congestion, additional fishing hurts all the resources users - - a little at first, and then with increasing detrimental consequences. Rose, C. M., (1991) “Rethinking Environmental Controls: Management Strategies for Common Resources”, Duke Law Journal, Vol. 1991, Issue 1, pp. 1-38 at pp. 5-6.
199 Goldstein, G., op. cit., p. 1244.
200 Ibid. p. 1243.
202 Ostrom, E. (1990) Governing the Commons: The Evolution of Institutions for Collective Action, Cambridge: Cambridge University Press, pp. 2 - 3. The author elaborately discusses other works that are similar or prototype of the tragedy of the commons and provides a comprehensive list of works on such diverse problems which the tragedy of the commons has been used to describe.
There appears, then, to be some truth in the conservation dictum that everybody’s property is nobody’s property. Wealth that is free for all is valued by none because he who is foolhardy enough to wait for its proper time of use will only find that it has been taken by another … The fish in the sea are valueless to the fisherman, because there is no assurance that they will be there for him tomorrow if they are left behind today.\textsuperscript{205}

According to Hardin, private property, education, self-motivated restraint and coercive laws or tax devices could avert the tragedy. Unfortunately, the oceans cannot be fenced and self-motivated restraint is highly unlikely, where there is no consensus on how to exploit the resources of the oceans. The best solution to the tragedy is mutual coercion, mutually agreed upon.\textsuperscript{206} Mutual coercion that is mutually agreed upon implies regulating the exploitation of resources of the commons based on negotiated agreement by the exploiters. Cooperation on the part of the exploiters serves as the underlying principle for the enforcement of the regulation.

On the contrary, because fish stocks yield no economic rent\textsuperscript{207} Gordon suggested private property or public (government) property that is subject to a unified directing power.\textsuperscript{208} It is possible to apply the concepts of private property and public property to immobile commons like grazing land or non-migratory fish, which Gordon lists as cod, haddock and similar species.\textsuperscript{209} However, the workability of these concepts creates an insurmountable problem in the absence of an international agreement, especially when their application relates to catadromous, anadromous, straddling and highly migratory fish stocks (SHMFS). Indeed, while it may be ideal to apply these concepts in the territorial sea and EEZ, landlocked states will experience great injustice if the high seas, which nature has given freely to all humankind, is partitioned among a few privileged states that have the capability of fishing there. In any case, the fact that some fish stocks located within national jurisdiction were not in a healthy state before Gordon published his work, points to the fact that “tragedy” is also inherent in private or public property rights in fisheries.\textsuperscript{210}

The advantage of solving global environmental problems through coercion based upon international cooperation makes Hardin’s \textit{Tragedy of the Commons} the dominant paradigm.

\textsuperscript{205} \textit{Ibid}, p. 135.
\textsuperscript{206} Hardin, G., \textit{op. cit.}, pp. 1247-1248.
\textsuperscript{207} Gordon, H. S., \textit{op. cit.}, p. 124.
\textsuperscript{208} \textit{Ibid}.
\textsuperscript{209} \textit{Ibid}, 129.
\textsuperscript{210} The failure of individual transferable quotas (ITQ) in some jurisdictions and escalation of the world fisheries crisis after the creation of the EEZ further reduces one’s faith in private or public property. On the failure of “territorial temptation” – the quest for supremacy of territorial sovereignty – in the sea and the need for cooperative efforts to address fisheries crisis see generally Oxman, B. H. (2006) “The Territorial Temptation: A Siren Song at Sea”, \textit{American Journal of International Law}, Vol. 100, No. 4, pp. 830-851.
in the study of exploitation of natural resources, including fish. Unfortunately, some scholars, particularly advocates of self-management and co-management theories, seem to ignore the fact that cooperation underpins mutual coercion as suggested by Hardin.211

2.8 Historical Development of Marine Fisheries Regulation

Despite the first scientific evidence of declining catches per unit of effort for cod, capelin and other fish in the North Sea published in the early 1860s,212 there was no serious effort made at the international level to fashion out a comprehensive international regime on conservation and management of fishery resources. The inability of states to reach a consensus on the seaward limit of the territorial sea led to failure of the initial efforts to adopt international rules on fisheries.213 This state of affairs had two serious consequences. First, it led to constant confrontation between coastal states and DWFNs. Efforts to resolve such conflicts resulted in a number of bilateral or regional fisheries agreements.214 Early bilateral fisheries treaties date back to the 1783 Treaty of Paris between Great Britain and the U.S.215 At the regional level, Great Britain, Germany, Denmark, Holland, Belgium and France signed the North Sea Fisheries Convention in 1882. The main objective of these early treaties was not to establish acceptable harvest levels to avoid overexploitation of marine fishery resources or substantial international rules on conservation and management; but rather, the distribution of authority for exploitation and the granting of fishing rights to friendly states’ nationals were the critical issues.216 For example, although the adoption of the 1882 Convention was in response to the increasing levels of fishing in the North Sea, its focus was on policing and enforcement measures without adopting

211 For example see Hønneland, G. (1999) “A Model of Compliance in Fisheries; Theoretical Foundations and Practical Application”, Ocean and Coastal Management, Vol. 42, Issue 8, pp. 699-716 at p. 702-3 where the author noted the qualitative difference between Hardin’s and Ostrom’s (self-management theory) ways of reasoning. Hønneland correctly noted that there is a social contract in the self-management perspective before the responsibility is handed over to the state. Where he seems to lose grip in his analysis is when he failed to take into account the fact that Hardin’s “coercion” arises after the initial “mutual agreement” by the resource users.


215 Other examples of such treaties are the United States – Great Britain Fisheries Agreement of October 20, 1818 and the France-Great Britain Convention for Defining the Limits of Exclusive Fishing Rights of August 2, 1839.

conservation measures for the threatened stocks. The 1923 Convention between the U.S and Canada for the Protection of the Halibut Fisheries was the first attempt by two states to prescribe specific conservation and management measures to prevent overexploitation of fish.

While early fisheries conflicts did not result in the adoption of measures for the conservation of marine fishery resources, the plundering of sealing grounds set the first steps toward developing conservation and management measures for marine living resources. Apart from the 1876 Agreement between Britain, Germany, Norway, the Netherlands and Sweden, which designated closed seasons for seals in Eastern Greenland and Jan Mayen, the 1893 Bering Sea Fur-Seals Arbitration recommended a nine-point conservation plan to the parties. The arbitration, established by the 1892 Treaty of Washington, arose due to controversy surrounding the US decision to exclude vessels from other states from seal hunting in the Pribilof Islands and the adjacent high seas. The US based its argument on the fact that it had right of protection and property in the fur seals

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217 See also Article 1 of the 1818 Fisheries Agreement between the United States – Great Britain gave inhabitants of the United States rights to take fish of every kind from the Southern Coast of Newfoundland. Similarly Article 3 of the 1783 Treaty of Paris between Great Britain and the US granted the people of the United States the right to take fish of every kind from the Grand bank, other Banks of Newfoundland and Gulf of Saint Lawrence.

218 Daggett, A. P. (1934) “The Regulation of Maritime Fisheries Treaty”, American Journal of International Law, Vol. 28, Issue 4, pp. 693-717 at pp. 703-704. Article 1 of the Halibut Convention prohibits the nationals and inhabitants and the fishing vessels and boats of the United States and of the Dominion of Canada from fishing for halibut (Hippoglossus) both in the territorial waters and in the high seas of the western coast of the United States, including Bering Sea, and of the Dominion of Canada from 16th November to 15th February each year. This Article further states that incidental catch may be retained and use for food for the crew of the vessel by which they are taken. Any unused portion shall be landed and immediately turned over to the appointed officer and department of the state parties. The closed season was subject to modification or suspension after three seasons.

219 Ibid, p. 703. Also, the July 7, 1911 Convention Respecting Measures for the Preservation of Fur Seals in the North Pacific Ocean signed by Great Britain, Japan, Russia, and US prohibited citizens and subjects of the state parties from fishing in the North Pacific Ocean, including the Seas of Bering, Kamchatka, Okhotsk and Japan. The convention provided for enforcement of the prohibition order by all the state parties and vested the jurisdiction to try offences and impose penalties on the states of the culprit. See Article 1. For other measures comparable to contemporary port state and trade restriction measures see Articles 2 and 3 of the convention respectively.


221 The conservation plan expressed by the Arbitration as Articles 1-9 include a prohibited zone; a closed season in a defined area of the high seas, with specific exceptions in favour of indigenous people as long as they hunt for traditional purposes, using traditional methods; a limitation on the type of vessels used, a licensing system to be operated by the governments concerned, use of a special flag while sealing; the keeping of catch records; exchange of data collected; government responsibility for selection of suitable crews; the provisions to continue for five years or until abandoned by agreement. Moreover the tribunal went on to recommend that these regulations be enacted into opposite and uniform national laws in both states and that national measures be adopted to ensure their enforcement. Thus the priority of national measures of enforcement, rather than international means was established. Finally, the tribunal recommended a three-year ban on all sealing, which has become the foundation of the moratorium approach to conservation of marine living resources. See Robb C. A. R., op. cit. particularly pp. 70-72.
frequenting the Pribilof Islands, even when found outside the US three-mile limit. The Arbitration held that the US had no property rights in the seals and had no right to protect them beyond the three-mile limit of her territorial sea. The Tribunal, nevertheless, pointed out the need to conserve seals because of over-exploitation and went ahead to develop the conservation plan, which serves as the genesis of contemporary measures for conservation and management of fishery resources.

Secondly, the absence of a comprehensive international agreement on conservation and management of fishery resources on the high seas sparked off the desire by the coastal states to unilaterally expand their territorial seas in order to protect and preserve fishery resources on the high seas adjacent to their coasts. Such actions were justified because none of the regional fisheries management organisations (RFMOs) enforced conservation and management measures or dealt appropriately with fishing conflicts in their zones. On September 28, 1945, President Harry S. Truman of the US issued two proclamations concerning the continental shelf and fisheries in the high seas contiguous to the US coastal jurisdiction. In the fisheries proclamation, the US asserted its authority to establish fishery conservation zones in those areas of high seas contiguous to its coasts. The rationale for Truman’s proclamation was:

… the inadequacy of present arrangement for the protection and perpetuation of the fishery resources contiguous to its coasts … the progressive development of new methods and techniques contributes to intensified fishing and in some cases seriously threatens fisheries with depletion….

Truman’s proclamation inaugurated a new era of concern for conservation and management of marine fish stocks. It provided the basis for other coastal states to claim large coastal zones in order to protect fishery resources in the high seas adjacent to their coasts, which hitherto had received no protection under the principle of freedom of fishing on the high seas. The widespread reactions to the Truman Declaration not only escalated the race by the coastal states to grasp the sea and its resources, it also escalated confrontation between the coastal states and DWFNs. The paradox of such conflicts was


the strong desire by the international community to fashion an acceptable international regime on conservation and management of marine fishery resources.\textsuperscript{224}

2.8.1 The 1958 and 1960 UN Geneva Conferences on the Law of the Sea (UNCLOS I & II)

The UNCLOS I adopted four conventions on April 27, 1958\textsuperscript{225} including the CFCHS which has not been widely ratified or implemented.\textsuperscript{226} The UNCLOS II failed by one vote to ascertain the breadth of territorial sea and to establish fishing zones in the high seas contiguous to, but beyond, the outer limit of territorial seas.\textsuperscript{227} This aggravated the series of conflicts over offshore jurisdiction claims by coastal states. One such conflict led to the \textit{Fisheries Jurisdiction (United Kingdom v. Iceland), Merits, Judgment,}\textsuperscript{228} where the International Court of Justice (ICJ) held that:

It is one of the advances of maritime international law, resulting from intensification of fishing, that the former laissez-faire treatment of the living resources of the sea in the high seas has been replaced by a recognition of a duty to have due regard to the rights of other states and the need of conservation for the benefit of all.\textsuperscript{229}

2.8.2 The 1982 UN Conference on the Law of the Sea (UNCLOS III) and Beyond

A proposal by Arvid Pardo, the Maltese Ambassador to the UN General Assembly, that the sea-bed and ocean floor beyond national jurisdiction be reserved exclusively for peaceful purposes, and that their resources be declared “the common heritage of mankind” culminated in the adoption of the Convention.\textsuperscript{230} The Convention supersedes all the 1958

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\textsuperscript{224} For instance, it was this desire that led to the London Conference on Overfishing of 1947. See FAO (1996) \textit{World Review of Fisheries and Aquaculture} Rome: FAO, Available at \url{http://www.fao.org/DOCREP/003/W3265E/w3265e02.htm} (accessed December 1, 2007).
\textsuperscript{225} The conventions are: the Convention on Fishing and Conservation of the Living Resources of the High Seas (CFCHS); the Convention on the High Seas (CHS), see Article 2(2), which is relevant to conservation of fisheries resources; the Convention on the Continental Shelf (CCS), see Articles 3 and 5(1), which are relevant to conservation of fishery resources; and the Convention on the Territorial Sea and the Contiguous Zone (CTSCZ).
\textsuperscript{226} At the time of writing, only 38 countries had ratified the CFCHS. In fact, as at 1966 when the CFCHS entered into force, none of the major fishing states ratified it. Kanehara, A., \textit{op. cit.}, p. 7.
\textsuperscript{228} \textit{I.C.J. Reports} 1974, p. 3 and \textit{Fisheries Jurisdiction Case (Federal Republic of Germany v. Iceland) Merits, Judgment, I.C.J. Reports} 1974, p. 175 where the ICJ was asked to determine the legality of Iceland unilateral extension of its exclusive fisheries jurisdiction to 50 miles from the then 12 miles recognised by other states.
\textsuperscript{229} \textit{Ibid}, para 64 at pp. 29 and 30 (\textit{Fisheries Jurisdiction (United Kingdom v. Iceland)}) and para 72 in \textit{Fisheries Jurisdiction Case (Federal Republic of Germany v. Iceland)}.
Geneva conventions and has provisions on conservation and management of fishery resources in the EEZ and on the high seas. The UN General Assembly and the FAO have adopted a number of other instruments in an attempt to address the inherent weaknesses of some of the fisheries provisions in the Convention and the new fishing problems that emerged after the adoption of the Convention. The basic instruments are the 1993 Agreement to Promote Compliance with International Conservation and Management Measure by Fishing Vessels on the High Seas, the 1995 Agreement for the Implementation of the Provisions of the UN Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of SHMFS, and the 1995 Food and Agriculture Organisation Code of Conduct for Responsible Fisheries.

In order to ensure the implementation of the Code the FAO adopted the International Plan of Actions (IPOAs) on: (a) reducing incidental catch of seabirds in longline fisheries, (b) conservation and management of sharks, (c) management of fishing capacity, and (d) IUU fishing, and a number of Technical Guidelines for Responsible Fisheries. Other important instruments adopted by the FAO are the FAO Conference Resolution 6/2003, the 2003 Strategy for Improving Information on Status and Trends of Capture Fisheries, the 2005 Rome Declaration on IUU fishing and the 2005 Model Scheme on Port State Measures to Combat IUU Fishing. The UN General Assembly has also adopted a series of resolutions aimed at addressing the major factors responsible for the parlous state of marine fisheries. There are other international instruments and international conference declarations, decisions and programmes of actions which are relevant to marine fisheries.

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232 The problems include excessive pressure on high seas fisheries as a result of creation of exclusive fishing zone (EEZ): how to resolve conflict where cooperation between coastal states and fishing states for the purpose of conservation and management of straddling and highly migratory fish stocks (SHMFS) (these stocks account for roughly 20% of the total marine catch and include some of the most economically valuable fish populations (von Zharen, W. M. (2000) op. cit., p. 26), setting priorities between international free trade and conservation of fishery resources, introduction of longline and other non-environmentally safe nets, increase in bycatch and discard of fish and non-fish species, over-capitalisation of the fishing industries, illegal, unregulated and unreported fishing (IUU fishing), unavailability of data and information on fishing vessels, catch and fish stocks, non-compliance with and enforcement of conservation measures by states, reflagging of fishing vessels in order to evade international conservation measures, poor flag state control of vessels flying their flags and increase subsidies to fishing industry, etc.

233 Hereinafter referred to as the FSA or the 1995 agreement.

234 Hereinafter referred to as the Compliance Agreement.

235 Hereinafter referred to as the Code. The full text of the FSA, the Compliance Agreement and the Code are available at Internet Guide to International Fisheries Law [http://www.intfish.net/treaties/index.htm](http://www.intfish.net/treaties/index.htm) (accessed last February 27, 2007). Note that the 2009 FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing adopted by the FAO Council on 22 November 2009 is not listed here because it yet to enter into force.

The body of rules on conservation and management of marine fishery resources embodied in all these instruments are technically termed “international fisheries law” (IFL).

The conclusions deducible from the historical development of IFL are first, the historical development of IFL is largely the story of the development of the principle of the freedom of the seas and the vicissitudes through which it has passed over the centuries. Second, the sources of IFL consist of the traditional sources of international law entrenched in Article 38 (1)(a-c) of the Statute of the International Court of Justice. The main sources are conventions, customary international law and general principles of law recognised by civilised nations. Subject to the provision of Article 59 of the Statute of the International Court of Justice, judicial decisions and the teachings of the most highly qualified publicists of the various nations are subsidiary means for the determination of international fisheries law. The basic characteristics of determining customary international law remain state practice and *opinio juris*. Third, there is an increased use of “soft law” or “non-binding norms” in IFL-making process because of their ability to change the behaviour of states and non-state actors towards the long-term conservation and sustainable use of fisheries resources. Fourth, even though states continue to be the principal international actors and creators of IFL, non-state actors are increasingly participating in its law-making process.

In Nigeria, the regulation of exploitation of marine fishery resources dates back to the promulgation of Sea Fisheries Decree No 30 of 1971. The need to promote sustainability of marine fishery resources and also reflect the current developments in international law of the sea, led to the repeal of the Sea Fisheries Act Cap 404 LFN 1990 by the Sea Fisheries Decree No 71 of 1992. Decree No. 71 of 1992 is designated in the 2004 LFN as

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237 The important declarations are the 1984 Strategy and Programme of Action adopted by the FAO World Conference on Fisheries Management and Development, the 1992 Declaration of Cancun by the International Conference on Responsible Fishing, 1998 Jakarta Mandate on Marine and Ecosystem Biological Diversity (Decision IV/5 of the Conference of Parties to the Convention on Biological Diversity, the 1999 Rome Declaration on the Implementation of the Code of Conduct for Responsible Fisheries and the 2001 Reykjavik Declaration on Responsible Fisheries and the Marine Ecosystem.


242 This decree was later designated as the Sea Fisheries Act Cap 404 Laws of the Federation of Nigeria (LFN) 1990.
the Sea Fisheries Act Cap S4, without any change in its substance or procedural requirement. So far, by virtue of section 14(1)(a) and (b) of the SFA, the Minister of Agriculture and Water Resources (the Minister) has made a number of regulations aimed at furthering the interests of the sea fishing industry in Nigeria and to give effect to the provisions of the SFA. Besides the SFA and its supplementary Regulations, there are other Nigeria laws that are relevant in marine fisheries management even though they do not specifically prescribe conservation and management measures. Nigeria is not a party to the 1993 Compliance Agreement and the FSA. Nigeria has accepted the Code, but has not developed any of the National Plans of Action (NPOAs) as recommended under the various IPOAs. Nigeria is a party to a number of RFMOs, including the Convention for the Establishment of the Fisheries Committee for the West Central Gulf of Guinea.

Lastly, as will be seen in the next two chapters, the objective of conservation and management of fishery resources under IFL has metamorphosed from:

a) optimum sustainable yield in order to secure maximum supply of food to
b) optimum utilisation of fish subject to each species maximum sustainable yield (MSY) level and finally to
c) the aim of achieving a long-term conservation and sustainable use of fishery resources.

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243 Hereinafter referred to as SFA.
244 The regulations are: the Sea Fisheries (Licensing) Regulation, 1992 (Licensing Regulation); the Sea Fisheries (Fishing) Regulation, 1992 (Fishing Regulation); the Sea Fisheries (Fish Inspection and Quality Assurance) Regulation, 1995 (Quality Assurance Regulation); and the Use of Turtle Excluder Devices (TEDs) and other By-Catch Reduction Devices (BRDs) on Shrimp Trawl Nets Regulations, 2006 (TED/BRD Regulation).
245 For example the Exclusive Economic Zone (EEZ) Act Cap E17 LFN (EEZ Act) gives effect to the concept of the EEZ by delimiting the EEZ of Nigeria to 200 nautical miles, and also vesting the sovereign and exclusive right to exploit marine living resources of the EEZ in Nigeria. See Sections 1(1) and 2(1), EEZ Act, the Territorial Waters Act Cap T5 LFN (Territorial Waters Act) limits the territorial sea of Nigeria to 12 nautical miles. See section 1(3)(a) and The Petroleum Act Cap P10 LFN (Petroleum Act ) defines the continental shelf of Nigeria, based on the exploitable test, as entrenched in the 1958 Geneva Convention on the Continental Shelf, See See section 15(1), Petroleum Act.
247 Article 2 CFCHS. The CFCHS does not specifically state its objective. The objective stated here is deduced from the meaning of conservation in Article 2 of the CFCHS.
248 Articles 61(3) and 62(1), Convention. Similarly, the Convention does not state its objective, but a critically analysis of these articles reveals this objective.
249 Articles 2, FSA and Articles 7.1.1 and 7.2.1, Code.
The fact that sustainable development now constitutes the core regulatory objective of IFL justifies the need to understand its nature and legal status.

2.9 Nature of Sustainable Development

The attempt at integrating the environment and development, technically termed as sustainable development, is now universally recognised as the contemporary approach towards solving environmental problems.\(^{250}\) Whilst it is true that the definition of sustainable development is complex and unclear,\(^{251}\) its original conceptualisation is defined in the Brundtland Report as:

...development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The term contains within it two key concepts: the concepts of “needs,” in particular the essential needs of the world’s poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organisation on the environment’s ability to meet present and future needs.\(^{252}\)

Put simply, the fundamental elements of sustainable development are (i) equity towards future generations or passing a clean and healthy environment to future generations, (ii) equity within our generation or addressing the global economic inequalities, and (iii) integrating the environment into development processes.\(^{253}\) Even though the concepts of environmental protection and intergenerational equity constitute the substratum of the rights or obligations equation in any legal framework of sustainable development,\(^{254}\) poverty alleviation is also important especially when setting obligations for developing states.\(^{255}\) The concept of sustainable development is embodied in several international environmental instruments, the most important being the Rio Declaration on Environment


\(^{251}\) In Bratspies opinion, the problem with sustainable development is that the same term means very different things to different thinkers acting in a variety of contexts. Bratspies, R. M. (2007) “Rethinking Decisionmaking in International Environmental Law: A Process-Oriented Inquiry into Sustainable Development”, Yale Journal of International Law, Vol. 32, Issue 2, pp. 363-391 at p. 364.


\(^{255}\) Para 5 of the Johannesburg Declaration on Sustainable Development.
and Development, Agenda 21, the UN Millennium Declaration and the 2002 Johannesburg Declaration.

2.9.1 Sustainable Development as Core Fisheries Conservation Principle

Chapter 17 of Agenda 21 identifies the marine environment as an essential component of the global life supporting system. It urges states to capitalise on the rights and obligations under the Convention as a basis upon which to pursue the protection and sustainable development of the marine and coastal environment. On the other hand, the 2002 World Summit on Sustainable Development Plan of Implementation sets specific targets and a timetable to address the plethora of problems hindering the achievement of long-term sustainability of fishery resources. The most important of such deadlines is the call for action at all levels to maintain or restore stocks to levels that can produce maximum sustainable yield, with the aim of achieving this goal for depleted stocks on an urgent basis and, where possible, not later than 2015.

The FSA specifically states as its cardinal objective the achievement of long-term conservation and sustainable use of SHMFS. The FSA, therefore, marked a turning point in which sustainable development entered IFL, thus responding to the calls that law should be used to keep human activities in harmony with the environment.

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257 See paras. 1, 5 and 8 though other paragraphs are also relevant. Text of the declaration is available at http://www.un.org/millenniumgoals/ (accessed January 23, 2005).


259 See particularly para 17.1 of Chapter 17 which deals with “protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources.” United Nations (1992) Earth Summit: Agenda 21 The United Nations Programme of Action from Rio, New York: UN Dept of Public Information. United Nations, pp. 147-165 at p. 147.


261 Paragraph 30(a). 2002 World Summit on Sustainable Development Plan of Implementation, Ibid.

262 Articles 2 and 5(a), FSA. Note that this objective can only be achieved through the effective implementation of the relevant provisions of the Convention. Article 2.

263 See generally paras 29 – 31 of the 2002 World Summit on Sustainable Development Plan of Implementation. Within these two paragraphs specific targets and timetable have been set for the development and implementation of National Plan of Action on fishing capacity (2005) and on IUU (2004), the application of ecosystem approach (2010) and development of marine protected areas (2012). Available at http://www.isd.ca/2002/wssd/PlanFinal.pdf (accessed last on June 20, 2005).
sustainable development as one of the principles for ensuring responsible fisheries. What is more, the Code identifies the achievement of long-term sustainability of fishery resources as the overriding objective of conservation and management of fishery resources.

Unfortunately, apart from the Code, which contains indirect provisions on climate change, none of the core international fisheries instruments specifically take into account the inextricable relationship between climate change and sustainable development. Meanwhile, the 2007 IPCC Report states that sustainable development and states’ adaptive capacity to cope with climate change have common determinants. Unless measures are taken to ensure that they reinforce each other, climate change has the potential, especially in the long term, to substantially affect the progress of states, particularly the most vulnerable developing countries in achieving sustainability.

2.9.2 Legal Status of Sustainable Development

The application of sustainable development by the courts and the states is a matter of legal reasoning. Legal reasoning is a hierarchical form of reasoning, establishing relationships of inferiority and superiority between units and levels of legal discourse. The status of a moral or legal concept is a measure of its true salience within legal debate and its power to affect legal decision-making. Therefore, the normative value of sustainable development bestows on it its legal weight, which in turn influences its application in diplomatic and legislative discourses and by courts in dispute settlement. Determining the legal status of sustainable development implies identifying its position within the hierarchy of norms of international and municipal environmental law.

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265 Articles 2(a), 6.2, and 7.1.1, Code. The Code was adopted by consensus during the twenty-eighth session of the FAO Conference on 31 October 1995.

266 Articles 7.2.1, Code.


270 Koskenniemi, M., op. cit., p. 568 According to Gillroy, normative standard is the “value” that defines the logical parameters of the positive law so that specific legal rules can be created to fulfill the moral ends of those principles.” Gillroy, J. M., op. cit., p. 5. Contrary to Marong’s opinion that the usefulness of sustainable development does not depend upon its status as a customary international law (Alhaji Marong, B. M. (2003) “From Rio to Johannesburg: Reflections on the Role of International Legal Norms in Sustainable Development”, Georgetown International Environmental Law Review, Vol. 16, Issue 1, pp. 21-76 at pp. 56 and 60-61), this study considers the legal status of sustainable development as an important factor that influences its application by a state, its institutions and non-state actors including international organisations and NGOs.
At the international level, the first opportunity for judicial application of sustainable development occurred in *Gabčíkovo-Nagymaros Projects (Hungary/Slovakia), Judgment.* Among the issues for determination by the Court was the sustainability and environmental damage that the project would, or likely to cause. Referring to its earlier decision in *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion,* the Court reiterated the great importance that it attaches to respect for the environment, not only for states but also for the whole of mankind. The Court further stated that it was mindful of the fact that:

Throughout the ages, mankind has, for economic and other reasons, constantly interfered with nature. In the past this was often done without consideration of the effects on the environment. Owing to new scientific insights and to a growing awareness of the risks for mankind – for present and future generations – of pursuit of such interventions at an unconsidered and unabated pace, new norms and standards have been developed [and], set forth in a great number of instruments during the last two decades. Such new norms have to be taken into consideration, and such new standards given proper weight, not only when States contemplate new activities, but also when continuing with activities begun in the past. This need to reconcile economic development with the protection of the environment is aptly expressed in the concept of sustainable development.

The Court not only referred to sustainable development, but actually recommended that it should form the basis of renegotiating the 1977 Treaty. It did this by asking the parties to look afresh at the effects of the *Gabčíkovo* power plant on the environment. In short, the Court directed the parties to take into account both the objectives of the 1977 Treaty as well as the norms of international environmental law in their negotiations.

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271 I.C.J. Reports 1997, p. 7. This case concerned the use of the Danube River by Hungary and Slovakia for a significant hydroelectric dam project involving two facilities (one up-river and the other down) and the opportunity for the up-river dam to hold the water so that the backup could be used en masse for “peak-power” production by the down-river facility. The project was established in 1977 through a bilateral treaty. In 1989, Hungary suspended the project. In 1992, Hungary tried to pull out of the treaty because Slovakia had decided to proceed with a unilateral “Variant C” of the project, which would produce power by diverting eighty percent of the flow of the Danube away from Hungary. Hungary pleaded that Variant C was a breach of the treaty.


273 Supra n. 270. See particularly para 53 at p. 41. Referring to para 29 of its Advisory Opinion in *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion,* I.C.J. Reports, 1996, p. 226 the Court said “the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The existence of the general obligation of states to ensure that activities within their jurisdiction and control respect the environment of other states or of areas beyond national control is now part of the corpus of international law relating to the environment”; pp. 241-242.

274 Supra n. 270. Para. 140 at p. 78.

275 Ibid.

276 Ibid, para 141 at p. 78. Note that the Court restated its definition of the content of the obligation to negotiate in the *North Sea Continental Shelf, Judgment.* I.C.J. Reports, 1969, p. 3 (see particularly para 87 at pp. 47-48), wherein it referred to the Advisory Opinion of the Permanent Court of International Justice (P.C.I.J.) in *Railway Traffic between Lithuania and Poland, P.C.I.J., Series A/B, No. 42, 1931,* at p. 116. According to P.C.I.J., the obligation was not only to enter into negotiations but also to pursue them as far as
The ICJ was specific in stating that new norms and standards (of which sustainable development is one) are set forth in a great number of instruments during the last two decades. The Court only referred to sustainable development as an “emerging norm” of international environmental law and not “customary norm” of international law or *jus cogens*, otherwise, it would not have asked the parties to take it into consideration. The word “take into consideration” leaves the states involved with some level of discretion, which they would not have if sustainable development was either a “customary norm” or *jus cogens*. Furthermore, the ICJ also contradicts itself by later referring (last sentence in para. 140) to sustainable development as a “concept” thereby diluting the norm status, which it earlier ascribed to sustainable development in the preceding lines of para. 140.

The inconsistency in the ICJ’s judgment must have prompted Justice Weeramantry to commence his Separate Opinion by pointing out that “the court has referred to it as a concept…, I consider it to be more than a concept, but as a principle with normative value.” Weeramantry is very clear concerning the legal status of sustainable development when he repeatedly said that sustainable development is a principle that has become an integral part of modern international law. Despite referring to so many international instruments in which sustainable development was incorporated and its wide acceptance in traditional legal systems and agricultural practices of a number of ancient civilisations, Weeramantry cautiously noted that “the express incorporation of sustainable development into a number of binding and far reaching international agreements gives it binding force in the context of those agreements.” The implication of this is that sustainable development may not be enforceable if incorporated into soft law,

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277 There is an exception to this rule. With regard to customary international law that is not an expression of peremptory norm of international law from which derogation is not permitted, states that persistently objected to it are not bound by it. *Fisheries Case (United Kingdom v. Norway) Judgment*, I.C.J. Reports 1951, p. 116 The ICJ after deciding that the United Kingdom failed to prove sufficient generality in the practice of adopting a ten-mile limit upon lines drawn across the mouth of bays where such lines served as the baselines from which the territorial sea is measured went further to say “In any event the ten-mile rule would appear to be inapplicable as against Norway inasmuch as she has always opposed any attempt to apply it to the Norwegian coast”, *Ibid*, p. 131.


279 *Ibid*, p. 89. See also pp. 88, 90, 92, 94, 95 and 96 where Weeramantry acknowledges that sustainable development is a principle. It is true that Vice President Weeramantry also refer to sustainable development as “a concept” in pp 92, 93, 94, 95, 96, 97, 98 etc, but this does contradict his main argument on p. 88 that sustainable development is more than a mere concept.


but that does not mean it has not evolved into a general principle of law or that it cannot create an *erga omnes* obligation in future.

At the municipal level, the Supreme Court of India in *Vellore Citizens Welfare Forum v. Union of India & Others* decided that sustainable development has indeed formed part of the customary international law. The Court held after tracing the development of sustainable development from the Stockholm Declaration in 1972 to the Rio Conference of 1992 that:

> The traditional concept that development and ecology are opposed to each other is no longer accepted. Sustainable development is the answer… We have no hesitation in holding that ‘Sustainable Development’ as a balance concept between ecology and development has been accepted as part of the Customary International Law though its salient features have yet to be finalised by the International Law Jurists.

Paragraph 10 of the judgment reveals that the Court based its decision on state practice as evidenced in the long list of international documents, which incorporate sustainable development. In order for sustainable development to become a rule of customary international law, it must meet the requirements of state practice and *opinio juris* set by the ICJ in *Asylum case (Columbia v. Peru)* and *North Sea Continental cases*.

A number of municipal laws have expressed sustainable development in the form of specific rights, obligations, and responsibilities thereby regulating the conduct of states and their citizens. Example of such legislation are Article 6 of the 2004 French Charter for the Environment, section 24 of the Constitution of South Africa, and a number of

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288 I.C.J. Reports 1969, p. 3, paras 75 and 77 at pp 43 and 44.
290 Article 2 of Constitutional Amendment incorporates the Charter into the French Constitution. Article 6 of the Charter provides that “Public policies must promote a sustainable development. To this purpose, they conciliate protection and valorisation of the environment, economic development and social progress.” See Marrani, D. (2008) “The Second Anniversary of the Constitutionalisation of the French charter for the
United Kingdom statutes, including section 4 (1) of the Environment Act 1995 Chapter 25 and section 79 of the Government of Wales Act 2006 Chapter 32. In Nigeria, section 1(2) of the National Environmental Standards and Regulation Enforcement Agency (Establishment) Act 2007 No. 25 provides that the Agency shall have, among others things, the responsibility for the sustainable development of Nigeria’s natural resources in general. It therefore means that sustainable development can now be the basis of the Agency instituting environmental action against individuals and corporate persons in Nigeria. In the same vein, the Agency can be sued for failing to ensure the sustainable development of natural resources in Nigeria, including fisheries.

Few commentators support the idea that sustainable development has attended the status of international custom. On the contrary, Lowe contends that sustainable development lacks a fundamental norm-creating character to constrain actions; hence it cannot become a primary rule of law. Similarly, lack of precise definition of the concept led Bratspies to note that the “widespread agreement on a principle does not translate into agreement on the principle’s normative content”. It is apparent that Lowe and Bratspies did not take into account the fact that in some jurisdictions sustainable development has already acquired

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291 This section, which is under the bill of rights chapter, provides that everyone has the right (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

292 Under this section, the Agency is given sustainable development as a specific aim. The main problem with this section is the exceptions it has created for which it may not be used to challenge the Agency’s failure to achieve its statutory aim. Ross, A., (2008) “Why Legislate for Sustainable Development? An Examination of Sustainable Development Provision in UK and Scottish Statutes,” Journal of Environmental Law, Vol. 20, No. 1, pp. 35-68 at pp. 46-47. In fact, Ross has examined a number of UK statutes where the strength of sustainable development provision ranges from weak and discretionary provisions (i.e. Natural Heritage (Scotland) Act 1991) to stronger and mandatory provisions (section 39(2) Planning and Compulsory Purchase Act 2004 and section 1(5) Local Government in Scotland Act 2003). Ibid, pp. 46-67.

293 Basically, section 76 provides that Welsh Minister must make the sustainable development scheme setting out how they propose, in the exercise of their functions, to promote sustainable development. The scheme must be reviewed or revised from time to time after consultation with the appropriate persons.


the status of a legal rule. In these countries, few as they may be, sustainable development has attained something more than a mere “concept or moral principle.” Their laws have recognised sustainable development as an enforceable right and duty for both state and non-state actors. The international community would not have established the United Nations Commission on Sustainable Development and, at the beginning of this millennium, directed all states to integrate the principles of sustainable development into their policies and programmes, when the substratum in which the principles evolved has no legal significance.

However, the truth as argued by some commentators is that, while state practice in support of sustainable development is overwhelming, not all the states that are party to international instruments containing sustainability provisions, or have introduced sustainable development into their laws and policies want to be bound by them. In that case, ascribing sustainable development with the status of a legal principle, norm or rule will depend upon whether or not it is incorporated into a binding international instrument, or enforceable national legislation. Its status will also depend upon whether or not it is placed in the preamble or operative part of the agreement or legislation and if it is expressed in general or specific mandatory language.

Within the context of IFL, the normative value of sustainable development depends on whether it is examined under the FSA or the Code. There is no doubt that the preamble and objective provision of the FSA express sustainable development in general terms.

298 The same argument goes for intergenerational equity, which is one of the main elements of sustainable development. Under Article 50 of the Constitution of the Islamic Republic of Iran preservation of the environment for the present and future generations is regarded as a duty. Also, the Supreme Court of Philippines in Oposa v. Secretary of the Department of Environment and Natural Resources of the Philippines 33 I.L.M. 173, 1994 upheld the complaint of the plaintiffs who sued on their own behalf and on behalf of unborn generations.


300 See the UN General Assembly Resolution A/RES/47/192 on Institutional Arrangement to follow up the United Nations Conference on Environment and Development adopted on 22 December 1992. Monitoring and reviewing the progress of implementation of the commitment set forth in Agenda 21 is part of the functions of the UNCSD. See para 3 (a-J), 4(a-c) and 5(a-h) of UNGA Resolution A/RES/47/192.


303 For instance, before the enactment of the NESREA Act 2007, Paragraph 3 of the 1999 Revised National Policy on the Environment, which was the only legal instrument that explicitly embraced sustainable development, provided that the concept “operates as a programme of actions”. The reasons may be due to lack of technology, finance and human resources as well as over-reliance of the economies on natural resources.

304 Article 2, FSA is examined in detail in Chapter 3.
However, a critical analysis of Article 5 of the FSA shows that states are required to adopt specific measures that will ensure the long-term sustainability of SHMFS. Article 5(b-I) specifically itemised the measures in the form of duties, which states must perform in order to ensure the sustainability of SHMFS.

The Code expresses sustainable development in general terms as one of the general principles underpinning responsible fisheries management and as the overriding objective of conservation and management.\(^{305}\) In Article 6.2, the Code is also specific in terms of intergenerational equity obligation on states. Similarly, Articles 7.2.1 and 7.2.2 list the specific measures and duties which states and RFMOs should perform in order to achieve the overriding objectives of the Code. Notwithstanding the soft law nature of the Code, its law-making potential cannot be dismissed.

### 2.10 Critique of Solutions Proffered in Existing Literature

The failure of IFL and domestic laws on fisheries to adequately address the deplorable state of marine fishery resources has provoked different lines of arguments by both legal and non-legal scholars on how best to solve the problem. Such arguments underpin the themes of most literature on the subject. Encouraged probably by instances such as the Northern Chile Scallop *Argopecten purpuratus* collapse due to overfishing and the replacement of the species by aquaculture,\(^{306}\) some scholars believe that development of sustainable aquaculture will take the pressure off captured marine fishery resources and invariably lead to recovery of depleted and collapsed fish stocks. In Diouf\(^ {307}\) and Lomborg’s\(^ {308}\) view, aquaculture will provide the expected increases in fish production and not captured marine fisheries. Quite different from the initial expectation, aquaculture has led to degradation of the aquatic environment and creates demand for bycatch that is used mostly as feed for farmed fish.\(^ {309}\) Apart from the fact that the growth rate of aquaculture

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\(^{305}\) Articles 6.2 and 7.2.1, Code.


\(^{307}\) Diouf, J., op. cit., p. 2.


may have peaked.\textsuperscript{310} Diouf conceded that climate change is one of the major constraints and a real threat to the development of aquaculture.\textsuperscript{311}

On the other hand, there are scholars who believe that the application of better conservation and management measures, as well as compliance by states with IFL, will lead to recovery of depleted and collapsed stocks. A critical appraisal of the literature reveals that the solutions proffered by this group of scholars are directed at addressing the different factors that have contributed to overfishing within national jurisdictions and on the high seas. Since it is not possible to review all the literature, effort has been made to identify the major suggested solutions. To commence with, there are those who believe that the parlous state of marine fishery resources is caused by the absence of an international organisation which has the power to enforce international conservation and management measures. In their view, the solution therefore is to establish an international commission vested with management and enforcement power over fishing activities on the high seas.\textsuperscript{312}

Due to the clandestine nature of IUU fishing and the problems of monitoring the vast span of most EEZ and the high seas, some scholars canvass for the use of market economy mechanisms.\textsuperscript{313} Others advocate strengthening of port states power,\textsuperscript{314} because of failure

\textsuperscript{310} SOFIA 2006, p. 5.
\textsuperscript{311} Diouf, J., op. cit., p. 2.

by flag states to ensure that vessels flying their flags comply with international conservation and management measures. In Kaye’s opinion, adoption of universality of conservation and enforcement measures together with financial inducements, especially to the poor flag of convenience and port states, will extenuate the problem.\(^{315}\) On the problem of non-compliance at national level, Kieves suggests enactment of strong and appropriate national legislation that sets forth civil and criminal sanctions capable of driving compliance.\(^{316}\) Other commentators argue that in addition to coercion, legitimacy of regulations and management procedures should be promoted through participation and discursive measures which involve all the stakeholders in the fishing industry.\(^{317}\)

Solutions proffered to address the inherent weaknesses of MSY and individual species or multi-species approaches to fisheries management include the enforcement of the precautionary principles by courts,\(^{318}\) establishment of marine-protected areas\(^{319}\) and introduction of ecosystem-based fisheries management.\(^{320}\) With regard to the problem of over-capitalisation and excessive subsidies to fishing industries, it has been suggested that reduction of fishing efforts through vessel buybacks and destruction\(^{321}\) as well as removal of subsidies for fisheries\(^{322}\) are the best ways of solving the problems. After a careful analysis of all the international fisheries instruments, Birnie and Boyle suggest the need for greater cooperation especially in the areas of transfer of technology, information, training and financial assistance.\(^{323}\) Although not explicitly mentioned by the authors, cooperation of states in these areas will enable developing states to meet their obligations under IFL.

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\(^{316}\) Kieves, N., op. cit., p. 1879.


\(^{318}\) Telesca, T. A., *op. cit.*, pp. 23, 29, 64 and 72


\(^{322}\) Safina, C., *op. cit.*, p. 34.

\(^{323}\) Birnie, P. W. and Boyle, A. E., *op. cit.*, 684-685.
It is important to mention that in some of the literature, the solution(s) mentioned here may be among other solutions suggested by the authors.\textsuperscript{324} The multi-solution approach adopted in such literature confirms the complexity involved in addressing the parlous state of marine fishery resources and the need to apply a holistic approach in addressing the problem. As a matter of fact, most of the suggested solutions have been incorporated into the various international fisheries instruments. Unfortunately, none of them specifically addressed climate change impacts on already overexploited marine fishery resources.

There is no doubt that the reviewed literature follows the single-regime approach adopted by IFL and national legislation on fisheries. This approach hinders the authors from taking into consideration that, in light of increasing global warming, it will be impossible for states to achieve sustainable development of marine fishery resources by addressing only the traditional problems of fishing, particularly overfishing.

Finally, a number of bioeconomists argue that side payments or negotiation facilitators can ensure the flexibility and resilience of cooperative arrangements when a stochastic event such as a shift in climate regime changes the circumstances of the fishery.\textsuperscript{325} Sound as the bioeconomists’ argument might be, it does not specifically call on states to integrate climate-related measures such as constant monitoring of sea temperature and fish species spawning behaviour into fisheries management. Existing bioeconomist literature tends to focus only on natural variations in climate, thereby ignoring the critical need to address the problem of emissions of excessive GHGs into the atmosphere, which is causing global warming.

Regrettably, whilst scholars in other disciplines have already started to evaluate the need to integrate climate change into marine fisheries management, the majority of international fisheries lawyers are yet to shift from their belief that pollution, habitat destruction and

\textsuperscript{324} For example, see Kieves who in addition to the suggested solution already mentioned (\textit{Supra}, footnote 315) canvasses for the application of an ecosystem approach, a timely fisheries research programme and use of precautionary approach in the absence of scientific data. Kieves, N., \textit{op. cit.} pp. 1909-1910. Pauly and Maclean recommend five measures to restore depleted stocks in the North Atlantic: Reducing fishing effort by a factor of three or four; establishing 20 per cent of the ocean as marine reserves by 2020; increasing market-based measures such as eco-labeling; implementing procedures to expose unsustainable and illegal practices; and altering access and property rights in fisheries to favour small scale, place-based operations. Pauly, D. and Maclean, J., \textit{op. cit.}, pp. 104 – 107.

chronic overfishing are the only causes of the sorry state of marine fishery resources. A typical example is von Zharen, who over-emphasised overfishing as the only cause of the “Salmon Skirmish”. Similarly, Burke noted that “the Convention (the 1930 Fraser River Convention) and the Commission had become of questionable utility to Canada … because they dealt only with sockeye and pink salmon … and because they provided for an equal division of the catch while placing most of the burdens of conservation on Canada”. 327

Meanwhile, respectable scientific evidence has revealed that changes in the migration pattern of salmon as a result of climate regime shifts in the North Pacific Ocean triggered the problem of inequities in the interception of the stocks. 328 It is true that recently Burns and Doelle have examined the impacts of climate change on fishery resources. Burns focuses on explaining how the Convention and FSA can provide a potential international forum in which the threat of climate change might be addressed. 331 Doelle, on the other hand, explores how emissions of GHGs regulated under the climate change regime could constitute a violation under the Convention’s binding dispute settlement process. 332 First, Burns and Doelle ignore the need to integrate the impacts of climate change into existing international fisheries instruments. More importantly, while their works aim at enhancing state compliance with climate change regime through IFL, they neither have sustainability of fisheries in mind nor canvass for the establishment of interconnection between the compliance mechanisms of these related regimes. A few other legal literature sources have mentioned in passing that climate change constitutes a threat to fishery resources and aquatic ecosystems, but none has seriously addressed or proffered a solution to the problem.

332 Doelle, M., op. cit., particularly at pp. 319 and 321-324.
The 2006 FSA Review Conference provided international fisheries lawyers with another opportunity to address the problem of climate change as it affects SHMFS, but they failed to do so. Despite the international community’s recognition of climate change as the greatest threat to the human environment, the Conference did not identify climate change as one of the new challenges to SHMFS management. Even though the conference identified ecosystem as one area of its concerns, discussions and recommendations of the conference on ecosystem were limited to the problems of bycatch and deep-sea fishing. The other areas of concern identified were overfishing and overcapacity, IUU fishing, lack of capacity among developing states and transfer of exotic species through tanker ballast water. According to Freestone, these are the new challenges which must be addressed via a holistic approach.

Another important noticeable trend in the existing literature on the subject is the concentration of attention on the fisheries crisis in the developed countries’ waters and the high seas when, in actual fact, developed states’ fleet capacities are constantly being relocated to the developing states’ waters, especially those in Africa. Despite the present marine fisheries crisis being a global issue, there is a dearth of literature on the extent to which African states, particularly Nigeria, have complied with IFL. Furthermore, there is a lack of geographical spread of the few published scientific works on correlation between climate change and fish in African waters.


335 This was exactly the pattern of discussion during the St John’s Conference on the Governance of High Seas Fisheries and the United Nations Fish (Stock) Agreement: ‘Moving from Words to Action’ 1-5 May 2005, St John’s Newfoundland and Labrador, Canada (St John’s Conference). See generally Gjerde, K. M. (2005) “Editor’s Introduction Moving From Words to Action”, International Journal of Marine and Coastal Law, Vol. 20, Nos. 3-4, pp. 323-344 at pp. 334-335. Similarly, the 2005 Abuja Fish Summit, which dealt extensively with marine and inland fisheries did not identify climate change as a problem hindering the sustainability of marine and inland fisheries in Africa.

336 Balton, D. A. and Koehler, H. R., op. cit., pp. 8-9. Freestone added only the problem of exotic species to the FAS Review Conference area of concerns, which he identified as the new challenges or threats to world oceans. Freestone, D. (2006-2007) op. cit.,

337 Ibid, p. 4


339 The few available scientific works on this area are from Ghana, East Africa and South Africa. See, for instance, McGlade, J. M., et al (2002) The Gulf of Guinea Large Marine Ecosystem: Environmental Forcing
The situation in Nigeria is pathetic. The dominance of oil and gas in the country’s economy\(^{340}\) has resulted in the government paying less appropriate attention to the state of other natural resources, including marine fishery resources. The degradation and destruction of the Niger Delta environment by oil pollution dominates discourses by environmentalists and non-governmental organisations. Qualitative content analysis of Okorodudu-Fubara’s\(^{341}\) brief examination of the SFA reveals a high “pollution” undertone instead of “conservation and management of marine fishery resources”, which is the primary objective of the Act. Furthermore, the learned Professor of Law does not examine the regulations made pursuant to the SFA. Similarly, Ajai’s\(^{342}\) work entitled “Conservation and Management of Marine Environment” does not examine the state of marine fishery resources in Nigeria, the core statute regulating marine fisheries and their effectiveness, let alone climate change impacts on marine fishery resources. Oludayo only went as far as briefly examining the SFA and two impacts of climate change on fisheries and aquaculture.\(^{343}\) He failed to suggest the exact measures that will reverse the sorry state of marine fishery resources in light of the current global warming.\(^{344}\)

A review of the *Annual Reports of the Nigerian Institute of Oceanography and Marine Research* (NIOMR)\(^{345}\) shows that the majority of the Institute’s research and funded projects on marine fisheries resources concentrate on how to address the problem of overfishing. Ebeku convincingly argues that biodiversity of Niger Delta area remains unprotected and, among other measures, urges government to extend the application of the

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\(^{340}\) In Nigeria, oil revenue accounts for 80 per cent of total government revenues, 95 per cent of foreign exchange earnings and 40 per cent of gross domestic product (GDP). Proven oil reserves are estimated at 36 billion barrels while natural gas reserves are over 100 trillion cubic feet. Shamsuddeen (OFR), U. (2007) ‘Nigeria: Scorching Resource Curse’ *Presentation at London School of Economics and Political Science*, October 11, 2007, pp. 1-24 at p. 6.


\(^{343}\) Oludayo, A. G., *op cit.*, pp. 409 and 410.

\(^{344}\) Other important issues he ignored are how far Nigeria has complied with the Convention and other international fisheries instruments (which he briefly examined on pp. 299-305) and the effectiveness of the SFA.

\(^{345}\) While the 1999, 2000 and 2002 volumes were available to the public, the Director General of NIOMR graciously made available to the researcher 2005 and 2006 volumes that were in the press.
relevant biodiversity laws to the Niger Delta.\textsuperscript{346} Unfortunately, Ebeku does not address his mind to the fact that the severity of climate change on the low lying Niger Delta will render biodiversity laws ineffective.\textsuperscript{347} He seems to be unaware of the increasing temperature of the freshwater environment leading to high mortality of fish in other jurisdictions.\textsuperscript{348} As far as climate change is concerned, Adeyemo\textsuperscript{349} only mentions in passing that fish are “also vulnerable to variation in water levels and temperature, particularly during spawning”\textsuperscript{350} without stating clearly the causes of the problems and how they should be addressed.

The scantly scientific work on the impacts of climate change on marine fishery resources in Nigeria have over-relied on the various IPCC Reports for their forecasts and suggested adaptation and mitigation measures.\textsuperscript{351} \textit{Nigeria’s First National Communication under the UNFCC} suggests, among other measures, stocking of marine waters with salt tolerant or harder fish species.\textsuperscript{352} On the other hand, Teme only notes that the challenge is on how local fisherfolk will adjust to changes in the migratory patterns of fish\textsuperscript{353} without suggesting how the impacts of climate change on marine fish should be addressed. Generally, none of these works investigates how individual marine fish species respond to climate change or variations in their ability to respond to it.\textsuperscript{354} They fail to specifically address the question: which of the climate change variables (temperature, ocean current, wind, salinity, etc.) will impact most on marine fish stocks in Nigeria? Regrettably too, none of the works emphasises that efforts to reduce vulnerability will not be sufficient to


\textsuperscript{347} This is because the Niger Delta is particularly vulnerable to sea level rise and the associated risk of flooding, saline intrusion and coastal erosion. FAO (2009) \textit{The State of World Fisheries and Aquaculture 2008}, Rome: FAO, p. 88.


\textsuperscript{350} \textit{Ibid}, p. 305.

\textsuperscript{351} For example, see Ibe, A. C., (1990) “Global Climate Change and the Vulnerability of the Nigerian Coastal Zone to Accelerated Sea Level Rise: Impacts and Response Measures”, \textit{Technical Paper No. 52, Nigerian Institute for Oceanography and Marine Research}, Victoria Island, Nigeria., pp. 7, 13-16 and 17-21.


eliminate all damages associated with climate change. More importantly, they ignore the crucial fact that implementation of adaptation and mitigation measures can only be effective if they are mainstreamed into existing legislative frameworks.

As recently as 2007, research on how to build depleted or collapsed marine fishery resources was focused on curbing overfishing and restoring the ecosystem by protecting aquatic habitats from pollution and destruction. Today, climate change, which constitutes the major driver of uncertainty and complexity in aquatic ecosystems, and which hinders sustainable fisheries management, is changing the focus of scientists’ attention. The most crucial question for policy-makers, fisheries managers and academics is: now that climate change is unequivocal and accelerating, can the international community and, in particular Nigeria, achieve long-term sustainability of marine fishery resources by addressing only the traditionally known fisheries problems, without taking simultaneous and concerted actions to also address the problem of climate change?

With regard to the methodology adopted in existing legal literature on how to address the marine fisheries crisis globally, and in Nigeria in particular, the predominant approach is a combination of the doctrinal method with a case study strategy that is common to social scientists. With the exception of the FAO’s quantitative assessment of the implementation of the Code, empirical research by legal scholars on compliance by Nigeria or the resource’s users is not available in the public domain. Methodologically, there is gap in the existing literature on how Nigeria can address a novel and not well understood problem, such as the stress of climate change on marine fishery resources that

355 Yohe, G. W., et al., op. cit., pp. 813, 821, 827 and 832.
are already subject to a series of natural and anthropogenic threats, particularly overexploitation.\textsuperscript{360}

2.11 Conclusion
For many decades to come marine fisheries discourse will be shaped by the answers which fisheries managers, policy-makers, academics and other stakeholders will give to the following descriptive questions: (i) Where are we? (2) How did we get here? (3) What should we do to get out of here? The answers to these questions will help anyone to appreciate the marine fish crisis (whether viewed from national, regional or global perspectives) in terms of the past, present and future. Globally, and in Nigeria, we have reached the point where nobody can deny that marine fishery resources are in crisis. Today, science and documentary evidence have established that climate change has emerged as a new major threat, which has directly and indirectly exacerbated the deplorable state of marine fishery resources caused primarily by overfishing.

It is true that some of the conservation and management measures adopted, especially by the developed states, to address the problem of overfishing have started to yield at least minimal success. On that basis, the developed states can afford to focus more attention on how to address the impact of climate change on their marine fishery resources; although it is dangerous to relax on the harvest-based conservation and management measures, which they have put in place. On the other hand, for a developing state like Nigeria to achieve the sustainable development of its marine fishery resources, which has become a legal duty after the enactment of the NESREA Act, it has no other option than to simultaneously address the pernicious problem of overfishing and the emerging threat of climate change. Fisheries managers and policy-makers in the marine fisheries sector have to understand that the magnitude and complex nature of climate change impacts on marine fishery resources is too enormous to be subsumed under the vague notion of the environment.

CHAPTER 3

LEGAL FRAMEWORK FOR THE CONSERVATION AND MANAGEMENT OF MARINE FISHERY RESOURCES: ADDRESSING OVERFISHING AND CLIMATE CHANGE PROBLEMS FROM THE HARD LAW PERSPECTIVE

3.1 Introduction

After the adoption of the United Nations (UN) Convention on the Law of the Sea\(^1\) it was assumed that, based on the consensus rule and package deal theory that underpinned the negotiations of the Convention,\(^2\) its fisheries provisions would for a long time provide the necessary solutions to the problem of overexploitation of marine fishery resources. Unfortunately, in the early 1990s, it became apparent that apart from the inherent weaknesses of some of the fisheries provisions in the Convention, new fishing problems had emerged that the conservation and management measures adopted in the Convention could not effectively address. One such problem is the current climate change caused by global warming. In an attempt to address the new fishing problems and further strengthen the fisheries provisions in the Convention, the UN General Assembly and its Food and Agricultural Organisation (FAO) have adopted a number of international fisheries instruments.\(^3\) In order to be consistent with the traditional method of classification of sources of international law into binding and non-binding sources, this chapter aims to establish whether the existing binding international fisheries agreements effectively address the problem of overfishing and climate change. This task can only be accomplished through a critical analysis of the conservation and management measures embodied in the various binding international fisheries agreements.

Unfortunately, unlike the Convention and the 1995 Fish Stocks Agreement (FSA), the 1993 Agreement to Promote Compliance with International Conservation and Management

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\(^1\) Hereinafter referred to as the “Convention”.


\(^3\) See generally p. 77 of Chapter 2 for a list of the instruments.
Measure by Fishing Vessels on the High Seas (Compliance Agreement), by virtue of its scope and objective, does not prescribe conservation measures for marine fishery resources. Also, its vital management provisions on the responsibilities of flag and port states, international cooperation and transparency in fisheries management through the exchange of information have been incorporated into and, in most cases, enhanced in the FSA. This has resulted in the FSA overshadowing the Compliance Agreement. On that basis, this chapter focuses on the Convention and the FSA. The lacuna unavoidably created by not examining the Compliance Agreement separately is covered by the provision of adequate cross-references and explanatory footnotes between the Compliance Agreement and the FSA.

It is also important to mention at the outset that this chapter does not examine the precautionary and ecosystem approaches, which form the substratum of the first segment of the argument put forward in this study. In order to maintain coherency of ideas, they are examined in greater detail in Chapter 5 where the first segment of the argument in this thesis is presented.

This chapter consists of five parts including the introduction. Part two details the conservation and management measures embodied in the Convention and ascertains if climate change has been integrated into the measures. This part also highlights the mechanism for enforcement of the measures and weaknesses in the mechanism. Part three

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4 The objective of the Compliance Agreement is to stop the reflagging of fishing vessels by those who have the intention of evading international conservation measures. It applies to all vessels that are used or intended to be used for fishing only on the high seas. Parties may exempt vessel of less than 24 metres in length flying their flags from the application of the agreement so long as this does not undermine the object of the agreement. Article II(1) Compliance Agreement.

5 In fact, reaching a consensus on the FSA provisions on these issues was greatly facilitated by the successful conclusion of the Compliance Agreement. The port state measure is one example that can be used to illustrate the position taken here. The Compliance Agreement provides for limited port state measures to combat illegal, unreported and unregulated (IUU) fishing whereby a port state has to notify the flag state where it has reasonable grounds for believing that a fishing vessel of that state was involved in an activity that undermined the effectiveness of international conservation and management measures (Article V(2), Compliance Agreement). As will be seen later, the FSA contains more detailed provisions on the measures that may be taken by a port state, including the prohibition of landings and transhipments, (Article 23, FSA). For a detailed discussion on other areas such as the definition of fishing vessels, record of fishing vessels, flag State responsibilities and port State control in which the FSA contains more comprehensive rules than the Compliance Agreement see Edeson, W. (2001) “Towards Long-term Sustainable Use: Some Recent Developments in Legal Regime of Fisheries”, In: Boyle, A. and David, F. (eds.) International Law and Sustainable Development: Past Achievements and Future Challenges, Oxford: Oxford University Press, pp. 165-203 particularly at pp. 173-178.

6 As will be seen in Chapter 4, the Compliance Agreement is not only linked to the FSA. It also forms an integral part of the Food and Agriculture Organisation Code of Conduct for Responsible Fisheries (Code). Due to the non-binding nature of the Code, many states prefer to implement of the Code instead of the Compliance Agreement. In fact, as at September 8, 2009 only 39 countries had deposited their instruments of acceptance of the Compliance Agreement. See FAO Legal Office: Treaties. Available at http://www.fao.org/Legal/treaties/0124-e.htm (accessed October 30, 2009).
explores the same issues as part two, but within the context of the FSA. This part specifically discusses the major strengths and weaknesses of the FSA. Part four examines whether hard sources of IFL have effectively solved the marine fish crisis in the face of current climate change. This chapter concludes by arguing that purposeful interpretation of the vague environmental and associated provisions in the Convention and the FSA will provide the legal basis for states to integrate climate change factors into marine fisheries management.

3.2 The Regulation of Marine Fishery Resources under the Convention

As a result of the territorial sovereignty which a coastal state has in its inland waters and territorial sea, the Convention only prescribes conservation and management measures in the exclusive economic zone (EEZ) and the high seas.

3.2.1 Conservation and Management Measures

3.2.1.1 EEZ

The Convention gives every coastal state the discretion to claim an EEZ seaward of its territorial sea extending up to 200 nautical miles from the baseline, which the breath of the territorial sea is measured. A coastal state has in its EEZ sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living.

Article 61(1) of the Convention mandates coastal states to determine the allowable catch for the fishery resources in their EEZs without explaining how such catches shall be determined. The coastal state, taking into account the best scientific evidence available to it, must take proper conservation and management measures which will ensure that the maintenance of fishery resources in the EEZ is not endangered by over-exploitation. The Convention further imposes a duty on coastal states to maintain or restore fishery resources in the EEZ to levels that can produce maximum sustainable yield (MSY).

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8 Article 56 Convention.

9 Article 61(2) Convention.

10 Article 61(3) Convention. The International Law Association (American Branch) defines MSY as that level of abundance of living resources which will assure maintaining or restoring that living resources. It is one of the primary objectives of conservation measures taken by a state. See Walker, G. K. (2005-2006) “Defining Terms in the 1982 Law of the Sea Convention IV: The Last Round of Definitions Proposed by the International Law Association (America Branch) Law of the Sea Committee”, *California Western International Law Journal*, Vol. 36, Issue 1, pp. 133-183 at p. 178. On the other hand, the European Commission defines MSY as a long-term approach to stock management, which establishes catch rates that
determination of the MSY of any fish species is subject to environmental and economic factors including economic needs of coastal communities and the special requirements of developing states, fishing patterns, interdependence of stocks and generally recommended international minimum standards whether subregional, regional or global.\textsuperscript{11}

Article 61 also mandates that measures adopted by coastal states must ensure that populations of species associated with or dependent upon harvested species are maintained or restored above the level at which their reproduction may become seriously threatened.\textsuperscript{12} The terms ‘associated’ and ‘dependent’ relate to the interdependence of fish and non-fish species, including mammals, particularly within the context of food chains.\textsuperscript{13} Recognising the need for all states to have the relevant information to assist them in determining appropriate conservation measures, Article 61(5) makes it mandatory for all states to contribute and exchange, on a regular basis, available scientific information, catch and fishing effort statistics and other information relevant to conservation of fish stocks in the EEZ through competent international organisations, whether subregional, regional or global.\textsuperscript{14}

Notwithstanding the mandatory language of Article 61, it has been widely criticised from the textual perspective because of its use of vague and ambiguous words and phrases. For example, despite the use of the word “shall” in Article 61(1), the obligation on coastal states to determine allowable catches lacks any limit or standard. The coastal states could rely on such discretionary power to set the total allowable catch (TAC) at any percentage or at domestic harvesting capacity.\textsuperscript{15} Most commentators argue that the use of relative terms, such as ‘available to it’, ‘taking into account’ and ‘proper’ in Article 61(2), allow for unnecessarily wide discretion on the part of coastal states.\textsuperscript{16} The first two of these terms

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\textsuperscript{11} Article 61(3), Convention.
\textsuperscript{12} Article 61(4), Convention.
\textsuperscript{13} Walker, G. K., \textit{op. cit.}, p. 157.
\textsuperscript{14} Article 61(5), Convention.
\textsuperscript{16} According to Burke, the implication of this provision is that even if very little data is available, so long as it can be characterised as the best of what exists, that would appear to suffice. Burke, W. T., \textit{op. cit.}, pp. 56-57. Kaye argues that Article 61(2) creates an advantage for developing countries as more will not be required
suggests mere consideration of available scientific evidence which may be inadequate, or poor, provided it is recognised as the best available. Incidentally, the Convention neither defines the evidence required in any quantitative manner nor what is “the best” scientific evidence? Failure to define what conservation and management measures are ‘proper’ has led most developed coastal states to rely on over-subsidising their fishing industries and relocation of their fleet to the waters of developing states. These measures constitute part of the reasons for the over-capitalisation of the marine fishing industry.

The inherent vagueness in the factors which coastal states must take into account in determining the MSY of any given fish species allows for subjectivism on what should be the MSY of the species and which conservation measure to adopt. For instance, it is not clear whether reference to fishing patterns means the long established local fishers’ ways of fishing, or the industrialised way of fishing. In addition, there is the problem of setting unreliable MSY by developing states due to inadequate information and models to predict correctly the effect of variations in environmental conditions and the inter-relationship among fish species. Kanehara argues that the internationalisation of the MSY standard, which forms part of the content of conservation measures under the Convention, will enable the concept of conservation keep a distance from the particular interest of states. Disappointingly, Kanehara fails to address the inequities involved in setting such a standard for developing states when developed states have refused to transfer the necessary technology that will help these countries to develop their fisheries and marine research. By adopting only a species interdependent approach Article 61(4) jettisons the ecosystem approach, which had gained popularity in natural resources management even before the


18 Ibid.


commencement of UNCLOS III. Furthermore, within the context of interdependency of fish species, the potential relationships of the species are not defined.

In an attempt to avoid the dangerous consequences of coastal states aiming at securing a maximum supply of fish food for their teeming population as the objective of fisheries conservation, Article 62(1) of the Convention provides that without prejudice to Article 61, any coastal state shall promote the objective of optimum utilisation of the living resources in its EEZ. It has been suggested that both biologically and economically, optimum utilisation of fishery resources of the EEZ means a level of utilisation that may be less than full and maximum utilisation. Since the optimum utilisation standard is subject to the rules of Article 61, a combination of the MSY and optimum utilisation requirements should assist coastal states to set their allowable catch at a point that is not so high so as to endanger the future health of fish stocks, or so low as to waste fish food. Economically, the goal is to maximise the net economic rent generated by the fishery. In Article 62(4)(a-k), the Convention lists some of the terms and conditions, which coastal states may impose on foreign vessels authorised to fish in their EEZs. The use of the words “inter alia” in this sub-article means that coastal states are not restricted from imposing other terms and conditions as long as they are consistent with the Convention.

While it appears from the generality of Article 62 that its objective tends to promote allocation rather than conservation of fish stocks in the EEZ, the proviso “without

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A broad analysis of the list shows that: (i) sub-paragraphs (a-d) deal with licensing of vessels, fees and the manner, place and time in which fishing can take place; (ii) sub-paragraphs (e, f and j) deal with measures designed to enhance the research capacity of the coastal state; (iii) sub-paragraph (g) allows for monitoring, surveillance and confirmation of data by coastal states through placing observers or trainees on board of other states’ fishing vessels in the EEZ; and (iv) sub-paragraphs (h and k) directly or indirectly deal with enforcement of whatever mechanisms are put in place by the coastal state.

29 Article 62(4), Convention.
prejudice to Article 61” reemphasises the fact that whatever level of optimum utilisation the coastal states may fix, it should not go beyond the limits prescribed in Article 61.\(^{31}\)

### 3.2.1.2 Right of Other States to Surplus Catch in the EEZ

To avoid under-utilisation of fish stocks in the EEZ by coastal states, the Convention makes it mandatory for them to determine their capacity to harvest the stocks in the EEZ. Where a coastal state lacks the capacity to harvest the entire allowable catch, the Convention mandates it to give states which traditionally fish there, or are land-locked or geographically disadvantaged, access to the surplus of the allowable catch.\(^{32}\) The Convention envisages a situation where the harvesting capacity of a coastal state approaches a point that would enable it to harvest the entire allowable catch in its EEZ. Under such circumstances, arrangement must be made between the coastal state and the developing land-locked and geographically disadvantaged states, which gives such states the right to participate in the coastal state’s harvest.\(^{33}\) Nationals of other states who are given access to fish the surplus allowable catch must comply with the coastal state’s conservation measures.\(^{34}\) Where it is alleged that the coastal state ‘arbitrarily refused to allocate’ the surplus, a state desiring such access can submit the dispute to compulsory conciliation under Annex V, section 2 of the Convention.\(^{35}\) Unfortunately, this provision is self-defeating because the Commission’s report, including its conclusions and recommendations, is not binding upon the parties.\(^{36}\)

The implementation of the surplus allowable catch provisions may be problematic for other reasons. The mere fact that coastal states are allowed to take into account all relevant factors including, \textit{inter alia}, the importance of the fish stocks to their economies and other national interests leaves open the factors which they may consider.\(^{37}\) Since the words “\textit{inter}

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\(^{31}\) For example, the number of foreign vessels licensed by a coastal state into its fishery should not increase the TAC beyond the level of MSY as qualified by relevant economic and environmental factors so as to ensure that the fish stocks are not endangered by over-exploitation Article 61(3). M. Dahmani, M. (1987) \textit{The Fisheries Regime of the Exclusive Economic Zone}, Dordrecht: Martinus Nijhoff, p. 49.

\(^{32}\) Articles 62(2) and (3), 69 and 70, Convention. The coastal state can give other states access to its surplus catch in its EEZ through international agreement or other arrangements and pursuant to the terms and conditions established in its laws and regulations.

\(^{33}\) Article 69(3) and 70(4) Convention. These states must be of the same region or subregion with the coastal state.

\(^{34}\) Article 62(4) Convention.

\(^{35}\) Article 297(3)(b)(III) Convention.

\(^{36}\) Articles 7(2) and 14 of Annex V of the Convention. Article 297(3)(c) of the Convention exempt the coastal states from dispute relating to the exercise of their sovereign rights in the EEZ while Article 297(3)(c ) states that in no case shall the conciliation commission substitute its discretion for that of the coastal state.

\(^{37}\) Some of the factors are (i) provisions of Articles 69 and 70 of the convention, (ii) requirement for the surplus allowable catch by developing states in the region or subregion and (ii) economic interests of states whose national have habitually fished in the zone or have made substantial efforts in research and
“alia” and “other national interests” are very ambiguous, states can capitalise on them to achieve any motive. Churchill and Lowe argue that the discretion of coastal states to determine which state is given access to her surplus allowable catch is particularly broad. By having the latitude to determine the allowable catch, the coastal state can also determine the size of the surplus. A coastal state that is a party to the World Trade Orgainsation (WTO) Agreement may rely upon the principle of freedom of international trade, which underpins trade relationship between state parties to the WTO, to support its decision not to give preferential right of access to its surplus allowable catch to any other state. Moreover, nothing prevents a coastal state from seeking foreign assistance or investment in its EEZ for the purposes of fully developing its capacity to harvest the stocks in its EEZ. In fact, the decision by the coastal states to fully develop their capacity to exploit fish stocks in their EEZs contributes to global overcapitalisation of the marine fishing industry.

3.2.1.3 Specific Stocks - Shared Stocks, Straddling Stocks, Highly Migratory Species, Anadromous Stocks and Catadromous Species

Negotiators of the Convention seem to have been aware that the creation of EEZ was inconsistent with the principles of marine biology and the migratory pattern of many stocks. Apart from bridging the national EEZs and the high seas, measures prescribed for conservation and management of specific stocks take into account the biological characteristics of the stocks and impose additional and stronger cooperative obligations on coastal states as well as other states involved in the exploitation of the stocks. A shared fish stock consists of the same stock or stocks of associated species that occur within the EEZ of two or more coastal states. Straddling stocks such as cod, ilex squid, blue whiting

identification of stocks. Article 62(3), Convention. Kaye qualifies the list of terms and conditions in Article 64(4)(a-k) as “non-exhaustive set of criteria”. Kaye, S., op. cit., p. 106.
41 Article 63(1), Convention.

With regard to shared stocks, the Convention merely requires that the coastal states concerned shall seek to agree, either directly or through appropriate subregional or regional organisations, on measures necessary to co-ordinate and to ensure conservation and development of the stocks. Such measures shall be taken without prejudice to other provisions on conservation of fishery resources in the EEZ.\footnote{44}{Article 63(1) Convention.} Coastal states and states fishing straddling fish stocks in adjacent high seas shall seek, either directly or through appropriate subregional or regional organisations, to agree on measures for the conservation of such stocks in the adjacent high seas.\footnote{45}{Article 63(2) Convention.} Coastal states and other states, whose nationals fish highly migratory stocks, must co-operate directly or through appropriate international organisations with a view to ensuring the conservation of the stocks and promoting their optimum utilisation within and outside the EEZ.\footnote{46}{Article 64(1) Convention.} In regions where no appropriate international organisation exists, the coastal state and other states, whose nationals fish these species in the region, must co-operate for the purposes of establishing an international organisation and participating in its work.\footnote{47}{Ibid.}

Unfortunately, the Convention does not define the word “appropriate”; nor does it state what will happen if the states involved in managing either the shared or straddling stocks are unable to reach an agreement; or with regard to the highly migratory stocks, if co-operation between or among the states concerned fails. The truth, as argued by Vicuña, is that the words “shall seek” imply no obligation on states to enter into such agreements.\footnote{48}{Vicuña, F. O. (1999) \textit{The Changing International Law of High Seas Fisheries}, Cambridge: Cambridge University Press, p. 41. The same argument applies to the words “with a view” in Article 64 of the Convention. See Burns W. C. G (2006-2007) “Potential Causes of Action for Climate Change Under the United Nations Fish Stocks Agreement”, \textit{Sustainable Development Law and Policy}, Vol. 7, Issue 2, pp. 34-38 and 81-82 at p. 36.}
Therefore, the duty to cooperate under the Convention is not followed by the duty to join or bring conservation measures into practice.\(^{49}\) Since coastal states have the sovereign rights to fishery resources in their various EEZs, they may adopt non-cooperative game theory to manage shared stocks in their respective EEZs. In a non-cooperative game, each rational player (in this case coastal states) adopts fishing strategies which it recognises as being undesirable.\(^{50}\) The same theory is likely to be adopted by states when the negotiation of agreement or cooperation on management of straddling and highly migratory stocks fails. In all these cases, it is difficult to achieve a long-term sustainability of the stocks because the states involved may apply different conservation and management measures that are suitable to their own economic policies or interests. Kaye suggests that if the conflict involves high seas fisheries, the affected states could bring an action under the Convention’s dispute settlement mechanism.\(^{51}\) The workability of Kaye’s suggestion is doubtful considering the inherent weakness in the Convention’s dispute settlement mechanism.

Other specific stocks regulated in the Convention are anadromous stocks and catadromous species. The Convention assigns the state in whose rivers anadromous stocks originate the primary interest in, and responsibility for, conservation of the stocks within its national jurisdiction.\(^{52}\) Reflecting the position of the US and Canada during the UNCLOS III,\(^{53}\) the Convention prohibits fishing of anadromous stocks on the high seas except in cases where economic dislocation might result for states whose nationals fish anadromous stocks on the high seas.\(^{54}\) It is mandatory for the state of origin of the stocks to co-operate in minimising


\(^{51}\) Kaye, S. M., \textit{op. cit.}, pp. 119-120.

\(^{52}\) Article 66(1) and (2), Convention.


economic dislocation of other states fishing these stocks.\textsuperscript{55} The Convention does not explain how a fishing state’s economy can be dislocated if its nationals do not fish the stocks. According to deReynier, conservation efforts would result in economic dislocation only for a state with a history of participation in fishing of the stocks prior to any international acceptance of the principles of Article 66.\textsuperscript{56}

Where other states are involved in fishing anadromous stocks on the high seas, the state of origin may after consultations with such states establish the TAC for the stocks.\textsuperscript{57} The words “may” and “consultation” give the coastal states wide discretion on what should be the TAC for the stock. Burke\textsuperscript{58} and Kaye\textsuperscript{59} share the view that since the state of origin determines the TAC “after” consultations and not “in” consultation with other states, it may disregard the interests of other states and proceed to determine the TAC independently. As a check on the state of origin’s power to establish TAC, Article 66(3)(d) provides that enforcement of regulations regarding anadromous fish stocks beyond the EEZ shall be done through negotiated agreement and where appropriate, the state of origin and other states fishing the stocks shall make arrangements to implement Article 66 through regional organisations.\textsuperscript{60} A state of origin that fails to take the interests of other states into consideration while determining the TAC of its anadromous stock may find it difficult to enforce, especially on the high seas.

Other terms and conditions for conservation and management of these stocks, agreed upon by the state of origin and other states, shall give due regard to the conservation requirements and the needs of the state of origin.\textsuperscript{61} The state of origin is expected to give special consideration to other states that participate with it financially in taking measures to renew the stocks.\textsuperscript{62} Where anadromous stocks migrate into sea areas under the national jurisdiction of a coastal state other than the state of origin, such a coastal state has the right to fish the stocks, but shall co-operate with the state of origin on conservation and

\textsuperscript{55} Article 66(3)(b).
\textsuperscript{57} Article 66(2) Convention.
\textsuperscript{59} Kaye, S. M., op. cit., p. 135.
\textsuperscript{60} Article 66(5), Convention.
\textsuperscript{61} Article 66(3)(a), Convention.
\textsuperscript{62} Article 66(3)(c), Convention.
management of the stocks. The coastal state duty to co-operate with the state of origin is likely to be influenced by the belief that it has exclusive right over fish within its maritime jurisdiction. However, because of the customary nature of the anadromous species regime, the coastal state should cooperate with the state of origin to establish a TAC for the stock.

The Convention gives the coastal state, where catadromous species spend most of their lives, the responsibility of managing the stock in accordance with the relevant provisions of the Convention, and prohibits entirely the harvesting of the species on the high seas. The coastal state has an obligation to ensure the ingress and egress of the species. In cases where catadromous species migrate through the EEZ of another state, the management, including the harvesting of the species, shall be regulated by agreement between the coastal state, where the species spend most of their lives, and the other state concerned.

The main problem with the provision of the Convention on catadromous species is its failure to specify which state has the responsibility of ensuring that the species are not fished on the high seas. A strict prohibition such as the prohibition of harvesting of catadromous species on the high seas should have had a sanction attached to it and a procedure for its enforcement.

3.2.1.4 High seas

The Convention does not express in direct terms the geographical limit of the high seas. Article 86 of the Convention provides that the provisions of Part VII, which deals with the high seas, shall apply to all parts of the seas that are not included in the EEZ, in the territorial sea, in the internal waters of state, or in the archipelagic waters of an archipelagic state. The high seas are open to all states to exercise the freedoms of the sea, including fishing. Under the Convention, the right to fish on the high seas is not absolute. It is subject to treaty obligations of all states, the rights and duties as well as the interests of coastal states including those set forth in Articles 63(2), 64 and 67. In addition, the right to fish on the high seas is subject to Section 2 of Part VII of the Convention, which prescribes measures for conservation and management of high seas fish stocks.

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63 Article 66(4) Convention.
64 Article 67(1), Convention. The relevant provisions of the Convention are Articles 61, 62 and 64(1).
65 Article 67(2), Convention.
66 Article 67(3), Convention.
67 Unlike Article 1, 1958 Geneva Convention on the High Seas which states in direct terms that “high seas means all the parts of the sea that are not included in the territorial sea or in the internal water of a state” Oxman, B. H., op. cit., pp. 832 and 836.
68 For a list of all the freedoms see Article 87(1)(a-f), Convention.
69 Article 116, Convention.
In an attempt to address the problem of absence of an international authority to enforce conservation and management measures on the high seas, Article 117 provides that states whose nationals fish on the high seas must take, or co-operate with other states in taking such measures as may be necessary for the conservation of the fish stocks on the high seas. Where the nationals of two or more states fish identical or different species in the same area, their states must enter into negotiation with a view to taking measures for conservation and management of high seas fish stocks and, as appropriate, co-operate to establish RFMOs for that purpose.\textsuperscript{70} By asking states to enter into negotiation, the Convention falls short of directing them to reach an agreement.\textsuperscript{71} The phrase “with a view to taking measures” gives states the discretion whether to implement the measures or not. The obligation to establish new RFMOs is expressed in very weak terms because the phrase “as appropriate” allows for promotion of national interests or pleas of special circumstances by states as justification for non-compliance.\textsuperscript{72} Importantly too, the Convention does not provide states with alternative actions when co-operation fails.

Article 119(1)(a) and (b) lists factors similar to those in Article 61(2-4) that states must consider in determining the allowable catch and establishing other conservation measures for fishery resources on the high seas. The only factors in Article 61(1-4) which are not included in Article 119(1)(a and b) are: (i) the requirement for coastal states to take conservation and management measures that will avoid over-exploitation of fishery resources in EEZ, and (ii) the qualification of MSY by the economic needs of coastal fishing communities. It is difficult to explain the first omission since the rapid development in fishing technology and ship building suggested the possibility of over-exploitation of fish stocks in the high seas in the future. It seems that the negotiators of the Convention underestimated the effect of overfishing on the estimated 10 percent (\%) high seas species

\textsuperscript{70} Article 118, Convention.

\textsuperscript{71} Although not emanating from one of the courts vested with the powers of interpreting and applying the Convention, the obligation to negotiation (which is part of the condition stipulated in section 609 of the US Public Law 101-162) has been interpreted as placing an obligation on a state to make effort to negotiate seriously and in good faith, and not an obligation to actually conclude such an agreement. See para 172 of the WTO Appellate Body decision in the first US-Shrimp case United States – Import Prohibition of Certain Shrimp and Shrimp Products, WTO Doc. WT/DS58/AB/R (Appellate Body Oct. 12, 1998), 38 ILM (1999). See also paras 5.62 - 5.87 (particularly paras 5.64 and 5.67) of WTO Panel findings in the second US-Shrimp case. WT/DS58/RW United States – Import Prohibition of Certain Shrimp and Shrimp Products – Recourse to Article 21.5 – Report of the Panel, 15/06/2001. This decision was confirm by the WTO Appellate Body in WT/DS58/AB-RW United States – Import Prohibition of Certain Shrimp and Shrimp Products – Recourse to Article 21.5 – AB-2001-4-Report of the Appellate Body, 22/10/2001. For a similar position taken by the I.C.J. and the Permanent Court of International Justice (P.C.I.J.) see North Sea Continental Shelf, Judgment, I.C.J. Reports, 1969, p. 3. See particularly para 87 at pp. 47-48 and Railway Traffic between Lithuania and Poland, P.C.I.J., Series A/B, No. 42, 1931, at p. 116 respectively.

\textsuperscript{72} Note, the words “as may be necessary” in Article 117 have a similar effect as this phrase even though the latter carries more force.
and the SHMFS, which account for roughly 20% of the total marine catch and include some of the most economically valuable fish populations.\textsuperscript{73} Except for the jurisdiction differences, Article 119(2) is similar to Article 61(5). Article 119(3) of the Convention provides that conservation measures and their implementation should not discriminate against fishermen of any state.

### 3.2.1.5 The Convention, Climate Change and Marine Fisheries Management

It is true that 28 years ago when the Convention was adopted, climate change had not yet been identified as an environmental problem. Although the first international conference on climate change took place in 1979, it was not until 1988 that the UN General Assembly’s Resolution 43/53 recognised climate change as a common concern of humanity. That year, the United Nations Environmental Programme and the United Nations World Meteorological Organisation established the Intergovernmental Panel on Climate Change (IPCC) to investigate the potential severity and impact of climate change and to suggest possible policy responses.

With this background in mind, the Convention could not be expected to contain direct and specific provisions on climate change. Indeed, immediately after the adoption of the Convention, it could have been an aberration to construe the environmental and related provisions of the Convention in light of climate change. However, circumstances have changed after the adoption of the Convention. The plethora of scientific literature reviewed in Chapter 2 confirms that climate change affects marine fish and modifies the suitability of aquatic habitats for fish and other aquatic taxa.\textsuperscript{74} With this development, the relevant question is: do the conservation and management measures adopted in the Convention adequately allow for the integration of climate change into marine fisheries management? The answer to this epoch-making question depends on how the environmental and related provisions of the Convention are interpreted.

Articles 31-33 of the Vienna Convention on the Law of Treaties 1969 stipulate the general rules on treaty interpretation. Article 31(1) reiterates the customary international law\textsuperscript{75} that

\textsuperscript{73} von Zharen, W. M. (2000) “The Shrinking Sea and Expanding Sovereignty: The Fate of Fisheries”, \textit{Natural Resources & Environment}, Vol. 15, Issue 1, pp. 24-27 and 65-66 at p. 26. According to Sydnes, the provisions regarding fishing on the high seas were not examined very thoroughly during the UNCLOS III due to the then-limited importance of fisheries beyond the 200 mile zones. Sydnes, A. K., \textit{op. cit.}, p. 352.


“treaty shall be interpreted in good faith in accordance with the ordinary meanings to be
given to the terms of the treaty in their context and in the light of its object and purpose”. This
means that the interpretation of a treaty must be based on the ordinary meaning of the
words, the context in which they are used and the object and purpose of the treaty. In
order to determine the object and purpose of the Convention all its relevant provisions
must be taken into account. This approach is consistent with (i) the holistic approach of
solving ocean issues, which is reflected in the preamble to the Convention, and (ii) the
package deal theory used by UNCLOS III to negotiate the Convention. The approach
jettisons the traditional idea of separation of discourses between marine pollution and
conservation and management of fishery resources.

Since climate change was not contemplated within the ordinary meaning of the words
“environmental factors” (as used in Articles 61 and 119), “pollution” (as defined in Part 1
of the Convention) or the “sources” of marine pollution (that are listed in Part XII of the
Convention), there is a need to seek their meanings by reading them in their context, and in
the light of the object and purpose of the Convention as a whole. The use of the words
‘object’ and ‘purpose’ in Article 31(1) of the Vienna Convention seems superfluous as
both mean the same thing: aim or the thing (object/purpose) for which something or
anything is done. As already noted, the objective of the fisheries provisions in the

76 Article 31(2) defines the context for the purpose of the interpretation of a treaty as comprising any
agreement relating to the treaty which was made between all the parties in connection with the conclusion of
the treaty and any instrument which was made by one or more parties in connection with the conclusion of
the treaty and accepted by the other parties as an instrument related to the treaty. Article 31(3)(a-c) provides
further that any subsequent agreement between the parties regarding the interpretation of the treaty or any
subsequent practice in the application of the treaty which establishes the agreement of the parties regarding
its interpretation or any relevant rules of international law applicable in the relations between the parties.
Article 32 allows for the use of supplementary means of interpretation, including the preparatory work of the
treaty and the circumstances of its conclusion, in order to confirm the meaning resulting from the application
of Article 31, especially when the interpretation according to Article 31 leaves the meaning ambiguous or
obscure; or leads to a result which is manifestly absurd or unreasonable. Oil Platforms (Islamic Republic of

77 See Parts I and XII of the Convention, which deal with the introduction, and protection and preservation of
the marine environment and Part V (Articles 61, 62, 63, 64, 66, and 67) and Section 2 of Part VII on
convention and management of fishery resources in the EEZ and the high seas respectively.

78 The third paragraph of the preamble to the Convention states “Conscious that the problems of ocean space
are closely interrelated and need to be considered as a whole”. Boyle, A. (2005) “Further Development of the
Law of the Sea Convention: Mechanisms for Change”, International and Comparative Law Quarter, Vol. 54,
Issue 3, pp. 563-584 at p. 563 and footnote 2 on page 95 of this Chapter.

79 Besides the provisions of the Convention cited in footnote 77 above see also Birnie, P. W. & Boyle, A. E.
where these issue areas are separately examined.

80 See particularly Article 1(4), Convention.


Convention, and indeed IFL, has evolved to long-term conservation and sustainable use of marine fishery resources. Incidentally, the Convention makes no formal provision for the adoption of further protocols and annexes as a means of developing the legal regime to meet new priorities and problems. In order therefore to achieve the Convention’s fisheries objective, in the face of significant change in circumstances, particularly new threats such as climate change, a purposeful interpretation of the Convention and other international fisheries instruments should be adopted.

The purposeful interpretation of the Convention enhances its evolutionary character. This approach of interpretation is rooted in the principle of contemporaneity in the application of environmental norms. While accepting the primary necessity of interpreting an instrument in accordance with the intentions of the parties at the time of its conclusion, the ICJ has also acknowledged that treaties are to be interpreted and applied within the framework of the entire legal system prevailing at the time of the interpretations. In *Kasikili/Sedudu Island (Botswana/Namibia)* the ICJ made it clear that in order to illuminate the meaning of words in a treaty of 1890 relied upon by the parties:

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...there is nothing that prevents the court from taking into account the present-day state of scientific knowledge, as reflected in the documentary material submitted to it by the Parties.  

This line of thinking led the European Court of Human Rights’ to observe that the European Convention on Human Rights is a “living instrument” which must be interpreted “in the light of present-day conditions.”

The Convention is very clear on the sovereign right of states to exploit their natural resources pursuant to their environmental policies, but this right is subject to the duty to protect and preserve the marine environment. The duty to protect and preserve the marine environment requires all states to take necessary measures that will deal with all sources of pollution of the marine environment including “the release of toxic, harmful or noxious substances, especially those that are persistent … from land-based sources, [or] from or through the atmosphere…” The Convention defines pollution as

> The introduction by man, directly or indirectly of substances or energy into the marine environment including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.

A few elements are deducible from this definition. First, pollution can be substance or energy in the marine environment. Second, the substance or energy must be introduced directly or indirectly by man. Third, the substance or energy must have a deleterious effect although the phrase “is likely to result” expands the ambit of the substance or energy to include those deleterious effects which have not yet materialised. Lastly, the marine environment includes estuaries. Other provisions of the Convention elaborate on the meaning of marine environment. For instance, the terms “rare or fragile ecosystems” and “habitat of depleted, threatened or endangered species and other forms of marine life” in Article 194(5) are technical terms, which also refer to coral reefs, mangrove and seamounts. Marine environment also includes coastline and its ecological balance. The

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93 Article 193, Convention.
94 Articles 194(1) and (3), and 212 Convention.
95 Article 1(4) Convention.
96 Firestone and Jarvis are of the view that the phrase is less precautionary that had the permissive ‘may’ been used in its place. Firestone, J. and Jarvis, C. (2007) “Response and Responsibility: Regulating Noise Pollution in the Marine Environment”, Journal of International Wildlife Law & Policy, Vol. 10, Issue 2, pp. 109-152 at p. 125.
97 Articles 145 and 211(1), Convention.
extent to which the Convention stretches the meaning of marine environment suggests that it has adopted an ecosystem-based approach on issues concerning marine pollution.

The Convention prohibits the introduction of substances or energy either directly or indirectly, for example, through the atmosphere, which could harm fishery resources and marine life including rare or fragile ecosystems, such as coral reefs. The word “substance” and “energy” include “excessive carbon dioxide (CO₂)” and “heat” respectively. The emission of excess greenhouse gases (GHGs) into the atmosphere is a source of pollution of the marine environment because the resultant rise in sea temperature, rise in sea level and changes in the ocean pH constitute serious harm to fishery resources and marine life. The obligation on states not to emit GHGs into the atmosphere indirectly requires them to integrate climate change into marine fisheries management.

The Convention includes environmental factors among other factors that states must take into account while determining the MSY of any species in the EEZ and the high seas. Ordinarily, the environment is defined as natural resources both “biotic” (fauna and flora) and “abiotic” (land, air, water) and the interaction between them. Apart from the classical elements of the environment, the term also includes man-made environments such as landscapes, buildings and objects that form part of man’s cultural heritage, and the interaction between man-made environments with natural environment. The cardinal feature of the interaction between the atmosphere and oceans is that the latter acts as a sink by absorbing excess carbon dioxide and heat from the atmosphere. This demands integration of climate change into the measures adopted by states for the conservation and management of marine fishery resources.

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98 Articles 145 and 211(6)(a), Convention. Firestone and Jarvis have also identified these elements in their works. Firestone, J. and Jarvis C., op. cit., p. 131.
101 Articles 61(3) and 119(1)(a), Convention.
3.2.2 Enforcement of Conservation and Management Measures

3.2.2.1 EEZ

Where a coastal state enacts laws and regulations in conformity with the Convention for the exploitation, exploration, conservation and management of fishery resources in its EEZ, Article 73(1) of the Convention allows it to enforce such laws and regulations through boarding, inspection, arrest and judicial proceedings. When a foreign vessel has been arrested for violating the fisheries law of a coastal state, its flag state must be notified immediately and the vessel and crew promptly released upon the posting of a reasonable bond or other security.\(^\text{103}\) The arrest of foreign vessels in the EEZ by coastal states constitutes an exception to the exclusive jurisdiction of a flag state over vessels flying its flag.\(^\text{104}\) In an attempt to ensure that coastal states do not abuse this power, Article 292 of the Convention allows the flag state to file an application with a competent court or tribunal for prompt release of its detained vessel. The implication of such application is that disputes over prompt release are the subject of compulsory procedures entailing binding decisions which coastal states must promptly comply with. The application for prompt release of a detained fishing vessel can only deal with the question of release, without prejudice to the merit of any case, before the appropriate domestic forum against the vessel, its owner or the crew.

The first problem with the enforcement of coastal states’ fishing laws in the EEZ against foreign vessels is the controversy on what constitutes a reasonable bond. The phrase ‘reasonable bond’ is not defined in either Article 73(2) or 292. In answering this question, the International Tribunal on the Law of the Sea (ITLOS) has persistently held that Articles 73 and 292 are designed to balance the interests of the detaining coastal state, which on the one hand seeks to ensure compliance with the laws and regulations adopted by it and, on the other hand, the interests of the flag state which seeks to have its vessel and its crew released promptly.\(^\text{105}\)

\(^{103}\) Article 73(2) and (4), Convention. See also Churchill, R. R. and Lowe, A. V., *op. cit.*, p. 292.

\(^{104}\) Other exceptions to the exclusive jurisdiction of flag states over ships flying their flag include seizure of a pirate ship (Article 105), arrest of ships used for unauthorised broadcasting from the high seas (Article 109), right to visit (Article 110), right of hot pursuit (Article 111) and where a ship is assimilated to a ship without nationality because it sails under the flag of two or more states and uses them according to convenience (Article 92(2)). Under international law a stateless ship is subject to the jurisdiction of no state hence cannot be protected by any state. *See Molvan v. A. G. Palestine* 81 L.I.L. Rep 277 (1948) and Warner-Kramer, D. M. and Canty, K. (2000) “Stateless Fishing Vessels: The Current International Regime and a New Approach”, *Ocean and Coastal Law Journal*, Vol. 5, Issue 2, pp. 227-243 at p. 230.

In the Camouco Case (Panama v. France) the Tribunal indicated the factors which it considers relevant in assessing what reasonable bond or other financial security is as:

The gravity of the alleged offences, the penalties imposed or imposable under laws of the detaining State, the value of the detained vessel and of the cargo seized, and the amount of bond imposed by the detaining State and its form.

The Tribunal later added in the Monte Confurco Case (Seychelles v. France) that “this is by no means a complete list of factors nor does the Tribunal intend to lay down rigid rules as to the exact weight to be attached to each of them.” In the Volga Case (Russian Federation v. Australia), the Tribunal stated that in assessing the reasonableness of the bond or other security, due account must be taken of the terms of the bond or security set by the detaining state, having regard to all circumstances of the particular case. Finally, in the “Juno Trader” Case (Saint Vincent and the Grenadines v. Guinea-Bissau), the Tribunal further declared that:

The assessment of the relevant factors must be an objective one, taking into account all information provided to the Tribunal by the parties.

A critical analysis of the judgments delivered by the Tribunal in other prompt release cases indicates that balancing the interest of the parties based on the factors mentioned earlier is not an easy task. Tanaka accepts that it is difficult, if not impossible, to establish objective criteria for evaluating each and every element to be considered. Usually, there is no explanation of how relevant factors were considered and the manner of calculation in fixing the bond to be posted, which remains a matter of speculation. As the law stands now, there is no conclusive determination of what constitutes a ‘reasonable bond.’ The ITLOS seems to favour some flexibility and caution and accordingly has been reluctant to in its court of the Master and the payment of penalties.” The ITLOS has maintained the objectives of Article 73 and 292 from the Monte Confurco case up to its last prompt release ruling in The Hoshinmaru Case (Japan v. Russian Federation) Prompt Release, Judgment, Case No. 15, 6 August 2007. See para. 82. Available at [http://www.itlos.org/star2_en.html](http://www.itlos.org/star2_en.html) (accessed September 21, 2007).


Ibid, para 67.


Ibid, para 76.


Ibid, para 85.

identify precise guidelines. The best solution to the problem, which Judge Marsit emphasised in the *Volga Case,* is for the Tribunal to pronounce clearly and explicitly at some stage on the meaning and significance of the expression ‘reasonable bond.’

It is very likely that coastal states will prefer to set low financial security for prompt release of vessels in order to avoid a situation where the ITLOS decides that the terms of the bond are unreasonable. Already, the restrictive approach adopted by the ITLOS in determining what constitutes ‘reasonable bond’ favours the flag states. For instance, in the *Volga Case,* the Supreme Court of Western Australia set the sum of AU$3,332,500 as the financial condition for the release of the *Volga.* However, ITLOS reduced the sum to AU$1,920,000 representing the value of the vessel, fuel and lubricants. Although the ITLOS had always emphasised on the flexibility in the list of factors relevant when it comes to balancing the interests of the coastal and flag States, in the *Monte Confurco Case,* despite taking note of the general context of unlawful fishing in the Southern Ocean, it still went ahead to drastically reduced the bond set by France from 56,400,000 FF to 18,000,000 FF. Such a decision supports the conclusion that it struck the balance of interest in favour of the flag state and failed to promote the conservationist objective of the Convention.

The uncertainty as to what constitutes reasonable bond, as well as the idea of posting a reasonable bond diminishes the effectiveness of the power of a coastal state to arrest and detain vessels that violate its fishing law, as it assumes that the monetary value of the vessel equates its replacement value. The mere fact that fines imposed upon the Master of a ship is factored into the bond and the Master can depart with the ship without any assurance of returning to the jurisdiction, does not deter the Master from further illegal fishing. Indeed, the blanket application of the process of prompt release of all vessels which violate the fishing laws of coastal states is devoid of equity. The obligation on coastal states to promptly release vessels arrested by them ought to have been available

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115 *Supra,* n. 110.
117 See paras. 72 and 73 of the judgment.
118 Similarly, in the *Volga case,* supra n. 110 The ITLOS said that it “understands the international concern about illegal unregulated and unreported fishing and appreciates the objective behind the measures taken by States” but still went ahead to reduce the bond set by Australian Supreme Court. See paras. 68, 72 and 74 of the judgment.
only to vessels which at least have been authorised by the coastal state to fish in its EEZ, but violated the terms and conditions of such authorisation. The present list of prompt release cases shows that the process benefits vessels used for illegal, unreported and unregulated (IUU) fishing. For example, it is difficult to explain why vessels such as Salvora and Arvisa 1 that have been arrested a number of times for engaging in IUU fishing are still allowed to fish.123

The second problem lies in the implication of Article 73(3) of the Convention. The said article provides that penalties prescribed against foreign fishermen by a coastal state for the violation of its laws and regulations in the EEZ may not include imprisonment or any other form of corporal punishment except when the states concerned, by agreement, consent to the coastal state prescribing imprisonment or other forms of corporal punishment.124 As of September 2007, the issue of corporal punishment or imprisonment of crew by the coastal states was not raised in any of the prompt release cases. It is likely that in future, the ITLOS will adopt the dissenting opinion of Judge Anderson in the Volga Case.125 Accordingly, where the consent required in Article 73(3) is lacking, the Convention will limit the power of coastal states to prescribe imprisonment or other forms of corporal punishment.126 It will not be unusual if coastal states question the legality of international law to limit their sovereign rights to prescribe corporal punishment, especially against crewmembers that are persistently involved in IUU fishing in their EEZs. Already some state parties to the Convention have included imprisonment among the sanctions against foreigners who violate their fishing laws, even when they have no agreement with the states of such foreigners as required under Article 73(3).127

123 Salvora was arrested in October 1997 by the frigate HMAS Anzac for fishing off Heard Island but released after the owners posted the requested bond by the Australian authority. In March 1999, the Greenpeace observed that Salvora was fishing illegally in French waters to the north of Heard Island. See Kaye, S. M., op. cit., p. 469. In early 2002, Arvisa 1 then flying the Uruguayan flag was arrested for illegally fishing the Patagonian toothfish in the Australian Antarctic EEZ. The vessel was then reflagged to Netherlands Antilles a non-member of CCAMLR and renamed the External. In July, it was arrested by the French for illegal fishing of toothfish in the French EEZ around Kerguelen Islands. The French had previously arrested the same vessel in 1999 when it was named the Camouco. The IUU fishing activities of Arvisa 1 forms part of Australia’s Report of Member’s Activities in the CCAMLR Area (2001-2002), available at http://www.ccamlr.org/pu/F/e_pubs/ma/01-02/Australia-02.pdf (accessed last October 12, 2006).

124 Article 73(3), Convention.

125 Judge Anderson said, “where the convention does limit the right of the coastal states in the matter of enforcement; it does so in express terms: article 73, paragraph 3, prohibits imprisonment and corporal punishment”. See para 7 of Judge Anderson’s dissenting opinion. In his view further limitation upon the right of state parties in what are important matters of domestic criminal procedure are not to be easily implied. See also para 11 of Judge Ad Hoe Shearer’s dissenting opinion for the support of Judge Anderson’s opinion.

126 Ibid.

127 For example see Section 1(1) of the Sea Fisheries Act Cap S4 Laws of the Federation of Nigeria (LFN) 2004 (SFA) and Attorney General of the Federation v. Constantinos Oikonomos & 16 ors, Charge No. FHCL/10c/90 and Attorney General of the Federation v. Panagondis Nifiatis & 17 ors Charge No.
Another enforcement problem is the exemption of a coastal state from compulsory dispute settlement procedures, with regard to any dispute relating to exercise of its sovereign rights on fish stocks in its EEZ.\(^{128}\) This includes the discretionary powers of a coastal state to determine the TAC of its fish stocks, its harvesting capacity, the allocation of surplus to other states and the terms and conditions established in its conservation and management laws and regulations. This exemption also applies to measures adopted by a coastal state for the conservation and management of straddling and highly migratory fish stocks (SHMFS) found in the EEZ. Unfortunately, the conciliation procedure contemplated under Annex V, Section 2 of the Convention fails to limit the sovereign rights of the coastal state in its EEZ by prohibiting a situation where the conciliation commission substitutes its discretion for that of the coastal states.\(^{129}\)

### 3.2.2.2 High Seas

Under the Convention, there are two ways of ensuring state compliance with and enforcement of conservation and management measures on the high seas. First, the combined effect of Articles 92(1), 94(1) and 117 of the Convention is that the exclusive jurisdiction of a flag state over fishing vessels flying its flag on the high seas imposes a duty on the flag state to compel such vessels to comply with international conservation and management measures applicable on the high seas.\(^{130}\) The problem with this method has always been the unwillingness and lack of technology and material capacity by some flag states, especially developing ones, to control and monitor the activities of vessels flying their flags. Naturally, the vastness of the oceans also contributes to the difficulties faced by all flag states in controlling and monitoring fishing vessels flying their flags on a remote part of the high seas.

Secondly, by urging states to take measures necessary for the conservation of fishery resources and to co-operate in establishing subregional or regional fisheries management organisations (RFMO) to this end,\(^{131}\) the Convention invariably gives RFMOs the power to enforce conservation and management measures within their respective jurisdiction. The Convention is silent on how RFMOs are to perform this function. Since almost all existing

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\(^{128}\) Article 297(3)(a), Convention.

\(^{129}\) Article 297(3)(b), Convention.

\(^{130}\) *S. S. Lotus* P.C.I.J., Series A, No. 10 (1927) 25 where it was held that vessels which are on the high seas are subject to no authority except that of the State whose flag they fly.

\(^{131}\) Article 118, Convention.
RFMOs operate as scientific/administrative organisations without any self-executing powers, they can only enforce their conservation and management measures through member states. The main problem encountered by the RFMOs is the activity of non-party states. Unfortunately, the creation of EEZ has led to the relocation of many foreign fishing vessels to the high seas, thus intensifying fishing activities on the high seas.

With the intention of evading international conservation and management measures, owners of fishing vessels reflog their vessels with nations that are not parties to RFMOs regulating where they fish on the high seas. The IUU fishing activities of Arvisa 1 is a good example of how reflogging of vessels is used to avoid international conservation measures. The RFMOs also face the problem of curbing activities of recalcitrant state parties. When the Volga was arrested, it was registered in Russia and also flying the Russian flag, which is a party to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). The incapacitation of third-parties from taking further action anytime a flag state reasserts authority shows the extent to which the exclusive jurisdiction of flag states has severely undermined the effectiveness of RFMOs.

The inherent weakness of the dispute settlement provisions of the Convention also handicaps RFMOs from enforcing conservation and management measures on the high seas. Article 282 provides that if the states that are party to the Convention have agreed under any other international agreement to submit themselves to a dispute settlement procedure that entails a binding decision, that procedure shall apply instead of the procedures provided in the Convention, unless the parties to the dispute otherwise agree. The problem with this provision is: what happens if the states that are party to the RFMO fail to agree on conservation and management measures and disagreement among them hinders the use of the regional dispute settlement procedures, which the parties have agreed to submit themselves to? The problem becomes more apparent when Article 282 is read in conjunction with Article 281(1), which provides that the dispute settlement procedure under the Convention will apply only where the parties have reached no settlement through


choice of peaceful means and the agreement between the parties does not exclude any further procedure.

This is exactly what happened in the Southern Bluefin Tuna Cases (New Zealand v. Japan; Australia v. Japan). This case arose out of a dispute involving Australia, New Zealand and Japan over the allocation of quotas for Bluefin tuna. The Commission for the Conservation of Southern Bluefin Tuna had established national allocations, but Japan disputed the scientific validity of the quota allocated to it and unilaterally initiated a program of experimental fishing, thus exceeding its quota. Australia and New Zealand claimed that the experimental fishing programme would endanger the stock, which no one disputed was overexploited, and claimed that Japan was in breach of its conservation and cooperation obligations under the Convention.

The relevant legal issue for consideration at this point is the implication of the ad hoc Arbitral Tribunal’s (Tribunal) decision on August 4, 2000, that it lacked jurisdiction to determine the case on its merits. The Tribunal was asked to interpret Article 16 of the 1993 Convention for the Conservation of Southern Bluefin Tuna (CCSBT) vis à vis Article 282 of the Convention. Japan contended that Article 16 of the CCSBT, which contains dispute settlement provisions that may lead to adjudication by the ICJ or arbitration, is not compulsory since each state must consent to referral of the dispute to a binding method.

The Tribunal held that it lacked jurisdiction because the Convention falls significantly short of establishing a truly comprehensive regime of compulsory jurisdiction entailing binding decisions. The exceptions contained in section 3 of Part XV and Article 281(1) allow state parties to the Convention to confine the applicability of compulsory procedures to cases where all parties to the dispute have agreed to submit their dispute to compulsory procedures. The maze of prior requirements for binding dispute settlement under the Convention, and the ability of outside mechanisms to overrule ITLOS decisions, reveal the extent to which the Convention dispute settlement is taken hostage by the imperative for voluntary and consensus agreement between the parties to the dispute.

135 See Article 16(2), CCSBT. Article 16(3) of the CCSBT further requires that parties continue to seek resolution of the dispute by peaceful means. The text of CCSBT is available at http://www.ccsbt.org/docs/pdf/about_the_commission/convention.pdf (accessed last December 3, 2008).
Enforcement of conservation and management measures on the high seas is compounded by the involvement of state parties to the RFMO in fish laundering through the certification of illegally caught fish and fraudulently accepting evidence of illegal fish catches as coming from outside the region.\textsuperscript{138} In addition, some parts of the high seas, including the Gulf of Guinea, are not under the jurisdiction of any RFMO. Fishing vessels that are not willing to comply with international conservation measures only need to concentrate their fishing efforts in such unregulated areas.

3.3 The Regulation of Marine Fishery Resources under the FSA

While it was necessary to address all the fishing and other related problems that emerged after the adoption of the Convention, the FAO decided to focus its attention on how to deter reflagging of vessels as a means of avoiding international conservation measures. On the other hand, the UN was concerned with how to ensure effective regulation of SHMFS in the EEZ and the high seas. These efforts culminated in the adoption of the Compliance Agreement and the FSA. For reasons already stated,\textsuperscript{139} this part focuses on the FSA.

3.3.1 Conservation and Management Measures for Straddling Stocks and Highly Migratory Species

Article 5, entitled “general principles”, restates some of the conservation and management measures embodied in Articles 61(2-5) and 119(1-2) of the Convention and goes further to introduce new specific measures which states are required to apply in the conservation and management of SHMFS. Since the conservation and management measures stated in Article 5(b) and (e) of the FSA have already been examined under the Convention, only the new conservation and management measures introduced in the FSA will now be examined. The FSA makes it mandatory for states to apply an ecosystem-based approach in the conservation and management of SHMFS that inhabit both EEZs and the high seas.\textsuperscript{140} States are not only obligated to minimise waste, discard, ghost fishing, bycatch of fish and non-fish species and impacts on associated or dependent species, in particular


\textsuperscript{139} See pp. 98-99 of this Chapter.

endangered species, but are also required to protect biodiversity in the marine environment.\footnote{141 See Article 5(f-g) FSA.}

In dealing with the problem of inadequate fishing information, the FSA identifies vessel position, catch statistics on target and non-target species and fishing efforts as the specific fishing information that need to be timely collected, compiled, analysed, verified and shared by coastal states and states fishing SHMFS on the high seas.\footnote{142 Article 5(j) and Article 1 of Annex 1, FSA. The use of the words \textit{inter alia} in this paragraph leaves states that are concerned with the discretion of requiring for other fishing information.} Annex I titled “standard requirements for collection and sharing of data” elaborates on the principles for data collection, compilation and exchange of data,\footnote{143 See Article 2 of Annex 1 and Article 14, FSA. Among the important principles are (i) data should be collected according to the operational characteristics of each fishing method and in a timely manner; and (ii) data should be verified, presented in an agreed format and in a timely manner. Article 14 of the Agreement also requires that data collected should be in sufficient detail, the nature of the stocks and fisheries for those stocks should be taken into account, and states should develop as well as share data analytical techniques and stocks assessment methodologies.} basic fisheries data,\footnote{144 Article 3 Annex 1, FSA. The data required here has two components: (i) data relating to catch, effort and discard as appropriate to each fishing method; and (ii) data supporting stock assessment.} vessel data and information,\footnote{145 Article 4 Annex 1, FSA. Data required here consists of vessel identification, type and specification, fishing gear description, flag and port of registry, navigation and position fixing aids, communication equipment and international radio call sign and crew size.} reporting,\footnote{146 Article 5 Annex 1, FSA. Log book data on catch and effort including operation on the high seas must be transmitted to the flag state and, where agreed, to RFMO through radio, telex, facsimile, satellite transmission or by other means.} data verification\footnote{147 Article 6 Annex 1, FSA. Mechanisms for verification include position verification (vessel monitoring system), scientific observer programmes (monitor catch -target and non-target) effort and other details of fishing operation, vessel trip, landing and transshipment reports and port sampling.} and data exchange.\footnote{148 Article 7 Annex 1, FSA. Flag states are mandated to share the data they collect with other flag states and coastal states through RFMO. At the global level, the FAO has the responsibility of collection and dissemination of fishing data. The FAO has to perform the same function at regional level where no RFMO exists.} States are required to timely collect, compile, verify and statistically analyse data from fishing of SHMFS on the high seas and those in areas under national jurisdiction.\footnote{149 Annex I(1), FSA. Data is required on catch, fishing effort, non-target associated and dependent species.} In order to avoid a situation where states postpone or fail to take measures to conserve and manage SHMFS due to lack of data or insufficient scientific knowledge on the stocks, the FSA makes it mandatory for states to apply the precautionary approach in the management of SHMFS.\footnote{150 Articles 5(c) and 6, FSA.} The introduction of the precautionary approach makes SHMFS management more proactive and responsive to potential threats.\footnote{151 Kaye, S. M., \textit{op. cit.}, p. 462.}

Article 1(2) of Annex 1 makes it mandatory that assistance should be given to developing states to build capacity in the area of conservation and management of marine fishery
resources. The assistance, which should be in the form of training, financial and technical assistance, must focus on data collection and verification, observers’ programmes, data analysis and research projects supporting stock assessments. Importantly too, the FSA emphasises that the fullest possible involvement of developing states scientists and managers in the conservation and management of SHMFS should be promoted. In that sense, the FSA improves on the Convention’s vague call on developed countries to promote the development and transfer of marine technology to developing countries on fair and reasonable terms and conditions.\textsuperscript{152} What is more, the establishment of the Assistance Fund under Part VII of the FSA has strengthened the idea of assisting developing states in their implementation of the Agreement\textsuperscript{153}

The FSA recognises that prevention of marine pollution is an essential factor for the attainment of sustainability of SHMFS.\textsuperscript{154} By requiring all States to minimise marine pollution, the FSA establishes a link between the two most important aspects of marine science and further underscores the need to adopt a holistic approach to marine fisheries management.

Other specific measures embodied in the FSA are:

i. use of selective, environmentally safe and cost-effective fishing gear and techniques,

ii. development of measures to address over-fishing and excess fishing capacity,

iii. giving consideration to the interests of artisanal and subsistence fishers,

iv. promotion and conducting of scientific research and the development of appropriate technologies to support fisheries management, and

v. the implementation and enforcement of measures and polices through effective monitoring, control and surveillance.

3.3.1.1 Incompatibility of Conservation Measures

As a way of avoiding the application of different conservation and management measures to SHMFS found in the EEZ and on the high seas, the FSA makes it mandatory for coastal states and states fishing on the high seas to cooperate in order to ensure compatibility of
conservation and management measures for SHMFS in their entirety. For this purpose, the coastal states and states fishing on the high seas must inform one another of the measures they have adopted for conservation of SHMFS under their respective jurisdictions. Such information should be disseminated directly or through RFMOs, or through other appropriate means.

The FSA identifies a variety of factors which states should consider before determining measures that are compatible for stocks in the EEZ and the high seas. The factors are: any existing conservation and management measure adopted and applied in an EEZ in accordance with Article 61 of the Convention, and previously agreed measures established and applied for the high seas in accordance with the Convention in respect of the same stocks by the relevant coastal states and states fishing on the high seas, and by the relevant RFMO. Other factors include the biological unity and other characteristics of the stocks and the relationships between the distribution of the stocks, the fisheries and the geographical particularities of the region concerned. Importantly too, the extent to which stocks are found and fished in areas under national jurisdiction, the level of dependence on the stocks by the coastal states and the states fishing on the high seas, as well as avoiding harmful impacts to the living marine resources as a whole must be considered.

Unless they are properly managed, the socio-economic elements of some of these factors may lead to conflicts of interest between coastal states and states fishing on the high seas. Where such conflict makes it impossible for the coastal states and states fishing on the high seas to agree within a reasonable period of time on compatible measures for conservation and management of the stocks, any one of them may initiate the compulsory binding dispute settlement procedure under Part VIII of the FSA. Pending an agreement on compatible measures, they shall in a spirit of understanding and cooperation enter into provisional arrangements to achieve compatibility. Where such arrangements also fail, any one of them may invoke additional dispute settlement procedure for establishing

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155. Article 7 (2), FSA.
156. Article 7(7) and (8), FSA.
157. Article 7(2)(a) FSA. It is the responsibility of States to ensure that measures established for conservation and management of the stock in the high seas do not undermine the ones applicable in the EEZ. Ibid.
158. Article 7(2)(b-c) FSA.
159. Article 7(2)(d-f) FSA. The intentional use of the phrase “the living marine resources as a whole” here is to make the states and RFMOs realise that their conservation and management measures must take into account fish and non-fish species.
161. Article 7(4), (5) and (6), FSA.
provisional measures under Part VIII of the FSA. Provisional measures adopted shall have due regard to the rights and obligations of all states concerned. Such measures shall not jeopardise or hinder the reaching of final agreement on compatible conservation and management measures and shall be without prejudice to the final outcome of any dispute settlement procedure.

3.3.2 The FSA, Climate Change and Marine Fishery Resources
A careful perusal of the FSA reveals that there is no specific and unequivocal provision mandating States to integrate climate change into measures adopted by them in conserving and managing SHMFS. Before the adoption of the FSA in 1995, the IPCC had published its First and Second Assessment Reports. Each report assessed the impact of climate change on the marine environment. Climate change was not just a topical issue during the 1992 Rio United Nations Conference on Environment and Development: an international agreement (the United Nations Framework Convention on Climate Change) to regulate it was concluded during the conference. Since the general principles or specific conservation and management measures listed in Article 5 are designed to address specific fishing problems, negotiators of the FSA ought to have specifically included climate change in Article 5. It seems that the negotiators of the FSA took a cautious approach then because of lack of scientific consensus and polarisation of states’ opinions on the causes and consequences of climate change.

Nevertheless, by construing some provisions of the FSA purposefully, they strongly suggest that states must take the impact of climate change into account in the conservation and management of SHMFS. Article 5(b) of the FSA is similar to Article 61(3) of the Convention, hence the analysis of the effect of the words “environmental factors” in Article 61(3) holds here in full force. The coastal states and states fishing SHMFS on the high seas are obliged to assess the impacts of fishing and “other human activities” and environmental factors on target stocks and species belonging to the same ecosystem, or

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163 Article 7 (6) FSA.

164 Hereinafter referred to as the UNFCCC. Available at http:// unfccc.int/resources/conv/ratlist.pdf, (accessed June 14, 2007). In 1997 the 1997 Kyoto Protocol to the UNFCCC was adopted to give effect to the UNFCCC. Available at http:// unfccc.int/files/essential_background/Kyoto_protocolap plication/pdf/ (accessed June 14, 2007).

165 More or less these provisions are interpreted in line with the principle of contemporaneity. See pp. 113-114 supra.
dependent upon or associated with the target stocks. The interesting aspect of this provision is the implication of the words “other human activities.” The truth is that as of 1995, oil spillage, discharge of ballast water, dumping of toxic waste and channelling of land-based effluent into the seas were still the major human activities capable of affecting fish directly or through their aquatic habitat. Empirical studies on the impact of climate change on fisheries were just emerging then. Today, the findings from empirical works and physical observation on the correlation between fish stocks and climate change are so startling that ignoring them is impossible. The words “other human activities”, when construed within the context of emerging problems which fisheries managers and policy-makers are facing as a result of global warming will definitely include emission of GHGs into the atmosphere by humans.

The data which states have to collect in sufficient detail to facilitate effective stock assessments by the RFMOs include biological information such as age, growth, recruitment and distribution, as well as stock identity. States are required to conduct research on environmental factors that affect stock abundance. In fact, before selecting the stock to which conservation and management measures should be applied, states are required to take into account the biological characteristics of the stocks, nature of the stock and environmental factors. Findings in some of the scientific literature has revealed that increasing sea temperature, as a result of climate change, has affected aquatic ecosystems and fish in many ways, including development of egg, growth, recruitment and distribution, migration pattern and stock abundance. Information on these characteristics of fish can only be sufficient if states examine how climate change influences them.

Parties to the FSA must also protect biodiversity in the marine environment and minimise marine pollution. The FSA does not define pollution, but Article 4 provides that the FSA is to be interpreted and applied in the context of and in a manner consistent with the Convention. On that basis, earlier analysis of the provision of Article 1(4) of the

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166 Article 5(b) and (d), 1995 FSA.
168 Article 14 FSA and Article 3(2)(b) of Annex 1, FSA.
169 Article 3(2)(b)of Annex 1, FSA.
170 Article 9(1)(a) and (b) FSA.
171 See generally Chapters 1, 2 and 5 of this thesis.
172 Article 5(g) FSA.
173 Article 5(f) FSA.
Convention applies here. The only issue that needs stressing here is the likelihood of some states, especially developing states that are large emitters of GHGs, to construe the word “minimise” to their advantage. Moreover, there is no way states can effectively protect biodiversity in the marine environment without understanding the widespread implications of climate change on fish and their habitats. It is true, as pointed out by Burns, that climate related FSA action will face a number of barriers, but he did not mention that the obligation on states to integrate climate change into fisheries management would have been easier to enforce if the FSA had adopted a more specific approach on sources of marine pollution. Nevertheless, by applying a purposeful interpretation of the aforementioned provisions, coastal states and states fishing SHMFS could be compelled to take into account the impact of climate change in the management of SHMS.

3.3.3 Enforcement of Conservation and Management Measures under the FSA

The coastal states and states fishing SHMFS on the high seas have the duty to implement and enforce conservation and management measures through effective monitoring, control and surveillance. The inclusion of this duty under Article 5 of the FSA that prescribes specific conservation and management measures for states to implement, underscores the need for states to give equal weight to determining the appropriate conservation measures and their enforcement. Analysis of the FSA vis à vis the Compliance Agreement shows that both instruments have gone beyond the traditional approach of relying only on flag states for the implementation and enforcement of international conservation and management measures. The FSA gives enforcement powers to the coastal states, port states and flag states. It also mandates states to establish international enforcement procedures through regional or bilateral cooperation and arrangements.

3.3.3.1 Coastal States

There are a few provisions in the FSA which allow coastal states to enforce conservation measures applicable on the high seas and also strengthen their power to curb IUU fishing within sea areas under their jurisdiction. Article 20(6) of the FSA allows a coastal state to complain to a flag state about a vessel flying its flag on the high seas which had earlier fished illegally in the coastal state’s EEZ. The flag state is required to immediately

\[174 \text{ The barriers include difficulty of linking the cause of the deplorable state of fishery resources solely to climate change, inability to link causes of climate change to a specific state, reluctance of dispute resolution bodies to address climate change and the perceived threat to the legitimacy of a dispute resolution body should it enter a decision against a hegemonic state. Burns, W. C. G., (2006-2007) op. cit., pp. 37-38.} \]

\[175 \text{ Article 5(1), FSA.} \]

\[176 \text{ See Articles III, IV and V(1) and (2), Compliance Agreement where enforcement responsibility is given to flag States, port States and State parties to the Compliance Agreement.} \]
investigate the allegation made by the coastal state. The flag state must cooperate with the coastal state in taking enforcement action and may authorise the relevant authority of the coastal state to board and inspect the vessel on the high seas. This provision is without prejudice to right of hot pursuit, which the coastal state has under Article 111 of the Convention.

Another novel provision on the enforcement power of a coastal state is its right, while acting as an inspecting state, to apprehend a fishing vessel that navigates in sea areas under its jurisdiction if there is convincing evidence of violation of conservation and management measures on the high seas by the vessel before transiting into the coastal state’s jurisdiction. Exercising this power requires the coastal state and the flag state of the vessel to be members of the same RFMO that regulates the area of the high seas where the illegal fishing occurs. It is doubtful if developing coastal states with poor capability to identify and track vessels on the high seas can effectively exercise this power.177

3.3.3.2 Port States

Within the context of conservation and management of marine fishery resources, the theory behind the port states enforcement power is to ensure that only authorised catches can be landed and therefore IUU fishing will cease as a consequence.178 Until the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing adopted by the FAO Council on 22 November 2009 enters into force; the FSA remains the only binding instrument that regulates port state measures to combat IUU fishing.179 Under the FSA, port states have both the right and the duty to take actions to promote the effectiveness of conservation and management measures adopted by

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179 The objective of this Agreement is to prevent illegally caught fish from entering international markets through ports. Under the terms of the Agreement foreign vessels will provide advance notice and request permission for port entry, port states will conduct regular inspections in accordance with international law and universal minimum standard, offending vessels will be denied use of port and certain port services and information sharing networks will be created. FAO Legal Office: Treaties. Available at http://www.fao.org/Legal/Index_en.htm (accessed October 4, 2010). As at October 4, 2010 only 17 states had signed this Agreement and no state ratified the Agreement. See FAO Legal Office: Treaties. Available at http://www.fao.org/Legal/treaties?037s-e.htm (accessed October 4, 2010). Note that the Compliance Agreement only requires the port state to promptly inform the flag state of a fishing vessel that is voluntarily in its port, which was involved in any activity that undermines international conservation and management measures. It goes no further than directing the state parties to make an arrangement with regards to the port state undertaking to investigate if the vessels had actually violated the said measures. See generally Article V(2) Compliance Agreement.
RFMO, and to do so in a non-discriminatory manner.\textsuperscript{180} The measures which port states can take include inspection of documents, fishing gear and catch on vessels coming into their ports. Such measures may also include enactment of laws prohibiting landings or transhipments of catches when it is established that the taking of the catch undermined regional conservation and management measures on the high seas.\textsuperscript{181}

While the application of these provisions has strengthened the ability of port states to conduct close surveillance of vessels fishing for SHMFS,\textsuperscript{182} it has, on the other hand, triggered a conflict between rules on conservation of marine fishery resources under IFL and free trade under the WTO. In April 2000, the European Union (EU) brought an action before the WTO Dispute Settlement Body claiming that Chile’s prohibition of landing and transhipment of EU catches was inconsistent with Article V and XI of 1994 General Agreement on Trade and Tariff (GATT).\textsuperscript{183} In response, Chile argued that its decision was covered by Article XX(g) which permits it to adopt and enforce measures relating to the conservation of natural resources in conjunction with restrictions on domestic production or consumption.\textsuperscript{184}

In September 2000, Chile initiated arbitration proceedings under Annex VII of the Convention against the European Community.\textsuperscript{185} The case was also submitted to a special chamber of the Tribunal at the request of both parties in December 2000. The following issues were raised: whether the European Community had complied with its obligations

\textsuperscript{180} Article 23(1) FSA.


\textsuperscript{183} Chile – Measures affecting the Transit and Importing of Swordfish (Complainant: European Communities) DS193 19 April 2000. Summary of the dispute up-to-date is available at http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds193_e.htm (accessed last January 25, 2009) Article V of GATT 1994 provides for freedom of transit for goods through the territory of each contracting party while Article XI prohibits quantitative restriction on imports or exports.

\textsuperscript{184} Article XX(g) states that Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting parties of measures:...(g) relating to the conservation of exhaustible natural resources made effective in conjunction with restrictions on domestic production or consumption.

under the Convention to ensure the conservation of swordfish in the fishing activities undertaken by vessels flying the flag of its member states on the high seas adjacent to Chile’s EEZ; whether the Chilean decree which purports to apply Chile’s conservation measures to swordfish on the high seas is in breach of the Convention; and whether the Framework Agreement for the Conservation of the Living Marine Resources on the High Seas of the South Pacific (Galapagos Agreement) of 2000\textsuperscript{186} was negotiated in keeping with the provisions of the Convention. Neither the WTO nor the ITLOS heard the case on merit, because in between January 2001 and October 2008 both parties had continuously requested extensions to the time-limits for making preliminary objections, and also expressed their commitment to securing approval of a bilateral understanding concerning the conservation of swordfish stocks in the South-Eastern Pacific Ocean.\textsuperscript{187}

Presently, there is no international judicial pronouncement on prohibiting landings and transhipments under the FSA. At both global and regional levels, trade agreements typically require that restrictive measures be applied in a non-discriminatory manner. So long as this condition is met, parties to the FSA will be bound by the provisions of Article 23 whenever a port State establishes that the catch of a fishing vessel was taken in a manner which undermines the effectiveness of international conservation measures on the high seas.\textsuperscript{188} Bialek\textsuperscript{189} supports this view in his analysis of the effect of the Catch Documentary Scheme (CDS)\textsuperscript{190} adopted by the CCAMLR thus,

to the extent that the CDS creates trade restrictions among CCAMLR Parties, it can be viewed as an implied forfeiture among the Parties of any conflicting trade treaty obligations that might otherwise prohibit such measures. It is in the application of import restrictions against CCAMLR non-Parties that are also members of the WTO where questions could arise as to the consistency of such a trade measure with WTO obligations.

The inconsistency between trade restriction in the environmental treaties and the trade liberalisation principle which underpins the WTO Agreement has been resolved by the

\textsuperscript{186} Available at \url{http://www.jus.uio.no/english/services/library/treaties/08/8-02/living-marine-resources.xml} (accessed last January 25, 2009).
\textsuperscript{189} Bialek, D., \textit{op. cit.} p. 123.
\textsuperscript{190} The CDS is a certification system that prevents the landing of Toothfish at Contracting Part ports, or the transhipment to Contracting Party vessels, by both Contracting and non-Contracting Party fishing vessels, unless the load is accompanied by a valid CCAMLR Catch Document. The CDS was adopted by CCAMLR as Conservation Measure 170/XX 1999, 2000 and 2001.
GATT 1994 environmental exception provisions in Article XX(g).\(^\text{191}\) The application of a measure such as the CCAMLR’s CDS under Article XX(g) of GATT involves first, provisional justification by reason of characterisation of the measure under subparagraph XX(g); and second, further appraisal of the same measure under the introductory clauses of Article XX(g). In the *United States - Import Prohibition of Certain Shrimp and Shrimp Products* (II),\(^\text{192}\) the WTO Appellate Body finally accepted the US ban on import of shrimps and shrimp products from Malaysia and other countries, because the measure relates to conservation of exhaustible natural resources made effective in conjunction with restrictions on domestic production or consumption and was applied in a manner that no longer constitutes a means of arbitrary and unjustifiable discrimination.

The practical problem with port states enforcement is that vessels involved in IUU fishing use ports in developing states for landing their catches. It is difficult for these States to deprive themselves of the revenue from such sources without any external financial incentives. The effectiveness of port states enforcement powers is doubtful as factory fishing vessels are able to deep-freeze catches at sea and avoid using a nearby RFMOs contracting party’s port to offload or ship their catches.\(^\text{193}\) Nonetheless, with time port states measures will succeed, considering the cost and product quality implications of deep-freezing for a long period.

3.3.3.3 Flag State

It is the responsibility of a flag state to ensure that vessels flying its flag comply with conservation and management measures adopted by RFMOs and that they do not engage in

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\(^{191}\) See footnote 184 *supra* for the text of Article XX(g).

\(^{192}\) WT/DS58/AB/RW *United States – Import Prohibition of Certain Shrimp and Shrimp Products – Recourse to Article 21.5 – AB-2001-4 - Report of the Appellate Body* of 22/10/2001. In the first shrimp/turtle case, the US prohibited (under Section 609 of US Public Law 101 – 162) import of shrimp and shrimp products from countries that did not use turtle excluder devices (TEDs) in catching shrimps. TEDs is design to help the escape of sea turtles that are classified as endangered species. The Panel established at the request of India and some other states found the ban to be inconsistent with Article XI:1 of GATT 1994, and could not be justified under Article XX of GATT 1994. On Appeal by the US, the Appellate Body reversed the Panel’s findings and held that although the ban related to conservation of exhaustible natural resources and, thus, was covered by Article XX(g) exception, it could not be justified under the chapeau of Article XX because it constituted an “arbitrary and unjustifiable” discrimination. For the Report of the Appellate Body in the first shrimp turtle case see WT/DS58/AB/R United States – Import Prohibition of Certain Shrimp and Shrimp Products – AB-1998-4 - Report of the Appellate Body of 12 October 1998. On conflict between trade measures and the environment see generally Myers, B. K. (2005) “Trade Measures and the Environment: Can the WTO and UNCLOS Be Reconciled?” *UCLA Journal of Environmental Law & Policy*, Vol. 23, Issue 1, pp. 37-76.

any activity that undermines the effectiveness of such measures. A flag state can only authorise vessels flying its flag to fish on the high seas if it is able to effectively exercise its responsibility under the Convention and the FSA over such vessels. In order to fulfil the above condition, flag states must take a number of measures including issuing the fishing vessels with licences, authorisation or permits in accordance with any applicable regional or globally agreed procedures. Flag states are further required to enact regulations, which shall:  

(i) Apply terms and conditions to the licenses, authorisation or permits that will sufficiently fulfil flag States obligations under regional or international fisheries instruments.  
(ii) Prohibit non-licensed and unauthorised vessels from fishing on the high seas or authorised and licensed vessels fishing outside their authorisation and licence terms and conditions.  
(iii) Require the carrying of a license, authorisation or permit on board at all time and to produce it on demand for inspection.  
(iv) Prohibit vessels flying its flags from fishing in other states jurisdictions. 
(v) Establish a national record of authorised fishing vessels and mark fishing vessels and fishing gear for identification.  
(vi) Require records, verification and timely report of fishing vessel positions, catch of target and non-target species, fishing efforts and other relevant fisheries data.  
(vii) Monitor, control and carry out surveillance of fishing vessel, their operations and related activities.  
(viii) Enforce compliance of fishing activities with regional and global measures including those aimed at minimising catch of non-target species.

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194 Article 18(1), FSA. For similar provision in the Compliance Agreement, see Article III (1).  
195 Article 18(2), FSA. Article III(3) of the Compliance Agreement is similar to this provision but further requires the flag states to ensure that a genuine link exists between themselves and the vessels they register.  
196 See generally Article 18(3)(a-l) FSA.  
197 Identification fishing vessels shall be in accordance with uniform and internationally recognisable vessel and gear marking systems, such as the Food and Agriculture Organisation of the United Nations Standard Specifications for the Marking and Identification of Fishing Vessels. Article 18(3)(d), FSA. See Article III (6) and IV of the Compliance Agreement for the requirement of keeping record and marking of fishing vessels.  
198 Verification shall be done through observer programmes, inspection schemes, unloading reports, supervision of transshipment and monitoring of landed catches and market statistics. Article 18(3)(f), FSA.  
199 Articles 18(3)(e) and 1(1) of Annex 1, FSA. See also Article III (7) of the Compliance Agreement which mandates States to keep records of operation, catch and landing data.  
200 States must ensure that measures imposed on vessels flying their flags are compatible with subregional regional, global agreed systems for MCS. Article 18(4) FSA.
(ix) Implement national and international inspection and observer schemes, including access to fishing vessels by duly authorised inspectors and observers, installation of vessel monitoring systems, including, as appropriate, satellite transmitter systems.

(x) Regulate transshipments on the high seas

From the foregoing, the FSA now gives the flag state power to regulate all pre and post-high seas fishing activities of a fishing vessel flying its flag. This goes beyond the requirement of loose connection test of genuine link between the state and the vessel under Article 91(1) of the Convention. 201

For the purpose of ensuring compliance by fishing vessels with RFMOs conservation and management measures for SHMFS, flag states are mandated to: (a) enforce conservation measures irrespective of where violations occur; (b) investigate promptly and fully any alleged violation of RFMO’s conservation and management measures and report to the state alleging the violation as well as the relevant RFMO; 202 (c) require any vessel flying its flag to give all relevant information to the investigating authority; (d) refer the case to its authorities with a view toward instituting proceedings if evidence so warrants; and (e) ensure that a vessel established to have been involved in serious violation of conservation and management measures does not engage in fishing on the high seas until all sanctions imposed on it have been complied with. 203

It is the duty of flag states to ensure that investigation and judicial proceedings are expeditiously carried out and that sanctions are applied with such severity that they will secure compliance, discourage future violations and deprive the offenders of any benefit accruing from illegal activities. Sanctions applicable to the crew of fishing vessels shall include refusal, withdrawal, or suspension of authorisation to serve on such fishing vessels. 204 Unlike the Compliance Agreement, where sanctions for violating international conservation measures are directed only at owners and charterers of the vessels, 205 the FSA, in addition, applies sanctions to the crew of fishing vessels.

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201 Actually, “genuine link” is not defined in the Convention, but Article 10 of the UN Convention on the Conditions for Registration of Ships defines it as an economic connection between the vessel’s owners and the registering state. 26 I.L.M. 1240–41.

202 Flag states may request assistance from other states to effectively investigate any allegation. They may also undertake the investigation directly or in cooperation with other interested states and through RFMOs.

203 Article 19(1), FSA. On the last point (e) see Article III(5)(a) Compliance Agreement.

204 Article 19(2), FSA and Article III(8), Compliance Agreement.

205 Article III(8), Compliance Agreement.
The decision to sanction the Masters and other officers of a fishing vessel who have contravened or undermined applicable conservation and management measures is because the owners or charterers of the vessels cannot perpetuate their act without the connivance of the crew, who are the actual fishers and in *de facto* control of the vessels during fishing. The fishing industry is becoming heavily globalised, hence the Masters and other officers of vessels who are professionally qualified will want to avoid a situation where they are refused authorisation to serve on a fishing vessel; or where authorisation already given to them is withdrawn or suspended. As far as the enforcement power of flag states is concerned, the Compliance Agreement and the FSA over-relied on sanctions to induce their compliance. Both instruments underestimate the effectiveness of normative factors, which are capable of positively shaping compliance behaviour of fishers.

### 3.3.3.4 Regional Fisheries Management Organisations

The lack of a centralised authority to enforce international conservation measures and the complex nature of IUU fishing place RFMOs in a pivotal position in the implementation of the FSA. In an attempt to ensure effective conservation and management of SHMFS, the FSA encourages coastal states and states fishing on the high seas to cooperate either directly or through RFMOs and to establish one if there is none in a particular region. The areas where cooperation is needed include investigation and prosecution of offenders from other states, identification of vessels engaged in activities undermining the effectiveness of international conservation and management measures and deterrence of vessels that are either engaged in such activities or that have violated conservation and management measures from fishing on the high seas, until such time that flag states take appropriate action. By linking itself with RFMOs, the FSA is able to maintain flexibility in addressing varying conditions and circumstances in different fisheries and regions.


Articles 8(1) and (5), FSA.

Article 20, FSA. Article V Compliance Agreement deals with international cooperation in the areas of exchange of information, evidentiary material, identifying fishing vessels engaged in activities undermining international conservation and management measures (particularly between flag and port states) and achievement of the objectives of this agreement.

order to avoid a situation where the linkage does not end up with association with weak institutions, the FSA provides elaborate measures that will strengthen the FRMOs.

To commence with, the FSA clearly stipulates the form that cooperation with developing countries must take\textsuperscript{211} and mandates states to take into account the special requirements of developing states.\textsuperscript{212} States that are party to the FSA are encouraged to be members of RFMOs. Alternatively, they should agree to apply the conservation and management measures established by FRMOs. The FSA frowns at discrimination in the memberships of RFMOs and mandates that membership of RFMOs shall be opened to all states with real interest in SHMFS.\textsuperscript{213} By specifically listing the functions which states have to perform in fulfilment of their obligation to cooperate through FRMOs, the FSA sets a minimum standard of what is expected of them.\textsuperscript{214}

The duty placed on states to reach an agreement on how to accommodate the interests of new entrants or participants to the fishery reflects changes in traditional IFL whereby entrance into fishery was a matter of right associated with the principle of freedom of the seas. In order to avoid any conflict that such a revolutionary power may give rise to, the FSA lists some factors that states may take into account in determining the nature and extent of a new entrant’s participatory rights.\textsuperscript{215} Unfortunately, the FSA neither limits the states on which factors they have to consider nor establishes priority among the listed

\textsuperscript{211} These are financial assistance, capacity-building, transfer of technology, MCS, compliance and enforcement, development of fisheries for SHMFS by developing States, having access to and participating in high seas fisheries and RFMOs, establishing special fund to assist developing States implement the agreement and assisting developing States to established new RFO and arrangements or strengthen existing ones. Article 25 FSA.

\textsuperscript{212} Special requirements of developing States include nutritional requirements of their populations, access of local fishermen to SHMFS and avoiding a situation where conservation and management measures lead to transfer of a disproportionate burden onto developing States. See Article 24(2) FSA.

\textsuperscript{213} Article 8(3), FSA.

\textsuperscript{214} See Article 10, FSA. States are required to agree and comply with conservation and management measures which will ensure long term sustainability of SHMFS, determine participatory rights like allocations of allowable catch or level of fishing effort, apply generally recommended international standards, obtain and evaluate scientific data, review the status of stocks, assess the impact of fishing on non-target and associated or dependant species, agree on standards for processing, verification and dissemination of fishing data, ensure the availability of the best scientific evidence, determine the interests of new members, adopt effective mechanisms for monitoring, control, surveillance and enforcement of conservation and management measures, promote peaceful settlement of disputes, ensure full cooperation of their relevant national agencies and industries and give due publicity to established conservation and management measures. The function of RFMOs to agree on standards for processing, verification and dissemination of data on SHMFS is further detailed in Annex 1 to the Agreement.

\textsuperscript{215} The factors are state of the stocks, existing fishing effort, the respective interests, fishing patterns and practices of new and existing members, and the contributions of new and existing members or participants to conservation and management of the stocks, and accurate database and scientific research on the stocks. Also included among the factors are the needs of coastal states whose economies are overwhelmingly dependent on exploitation of fishery resources and the interest of developing states from the subregion or region in whose area of national jurisdiction the stocks also occur. Article 11(a-f).
factors. On this basis, Stokke argues that the FSA is too vague to provide more than general guidelines in the determination of participatory rights of new entrants in the fishing of SHMFS.\textsuperscript{216}

For the purpose of improving the effectiveness of RFMOs in establishing and implementing conservation and management measures for SHMFS, the FSA requires states to cooperate in strengthening existing RFMOs.\textsuperscript{217} To achieve this purpose, states have to ensure transparency in the decision-making processes and other activities of RFMOs. In addition, they must allow representatives from inter-governmental and non-governmental organisations to participate in the RFMO meetings and to have timely access to records and reports of the organisations without unnecessarily restrictive procedural rules.\textsuperscript{218} Public participation provision in the FSA is traceable to the Rio Declaration and Agenda 21, which acknowledges broad public participation in decision making as one of the fundamental prerequisites for the achievement of sustainable development.\textsuperscript{219}

In dealing with the problem of third states, Article 17(1) of the FSA provides that third states to RFMOs or non-participants in cooperative arrangements are not discharged from the obligation to cooperate in accordance with the Convention and the FSA.\textsuperscript{220} A third state is not allowed to authorise vessels flying its flags to engage in fishing operation for the SHMFS which are subject to the conservation and management measures established by RFMOs or arrangements.\textsuperscript{221} This provision reinforces Article 8(4) of the FSA, which forbids states that are not members of RFMOs or agree to apply conservation and management measures adopted by such RFMOs from fishing in the area of the high sea under the control of the RFMO. The workability of these measures depends on timely exchange of information on the activities of vessels of third states by state parties to the RFMOs. It also depends on the ability of the RFMOs to take measures that are consistent with the FSA and international law to deter activities of vessels which undermine the effectiveness of international conservation and management measures.\textsuperscript{222}

Having laid down a clear \textit{modus operandi} for cooperation among state parties, the FSA goes further to provide that a state party which is a member of a RFMO may board and inspect fishing vessels of another party to the FSA on the high seas area covered by that

\textsuperscript{216} Stokke, O. S., (2001) \textit{op. cit.}, p. 255.
\textsuperscript{217} Article 13, FSA.
\textsuperscript{218} Article 12(2), FSA.
\textsuperscript{219} Principle 10, Rio Declaration and, Chapters 23(2) and 17(49), Agenda 21.
\textsuperscript{220} Article 17(1) FSA.
\textsuperscript{221} Article 17(2) FSA.
\textsuperscript{222} Articles 17(4) and Article 20(4) FSA.
RFMO whether or not that other party is also a member of the RFMO.\textsuperscript{223} Where there is evidence that the vessel has violated conservation and management measures applicable in that region, the inspecting state must immediately notify the flag state.\textsuperscript{224} The flag state must respond within 3 working days and must either take enforcement action or authorise the inspecting state to investigate the incident. In the latter case, the inspecting state is required to communicate the results of the investigation to the flag state, which must, if evidence so warrants, take enforcement action or authorise the inspecting state to take such enforcement action as the flag state may specify.\textsuperscript{225} If a flag state fails to exercise either option and the violation is serious, the inspectors may stay on board and direct the vessel to the inspecting state’s port for further investigation.\textsuperscript{226}

As a safeguard against possible abuse of boarding and inspection powers, the inspecting states may not prosecute, or take any other enforcement action, without the consent of the flag state. Action taken by the inspecting states against vessels violating international conservation and management measures shall be proportionate to the seriousness of the violation.\textsuperscript{227} The inspecting state must also ensure the safety of the crew and avoid conducting boarding and inspection in a manner that would constitute harassment of the fishing vessel. Article 22 of the FSA lays the basic procedure for boarding and inspecting fishing vessels. It also provides “a code of conduct” for authorised inspectors of the inspecting state.\textsuperscript{228} Further limitations on the power of the inspecting state are entrenched in Article 21(12), which provides that the decision of a flag state to fulfil its responsibility under the FSA supersedes any action by inspecting state. The inspecting states are liable

\textsuperscript{223} See Article 21(1) FSA. Boarding and inspection is also permitted in cases where a fishing vessel has no nationality (Article 21(17) FSA) and where a fishing vessel during the same fishing trip enter the jurisdiction of an inspecting state after violating on the high seas the conservation and management measures of a RFMO which they are both parties (Article 21(14) FSA).

\textsuperscript{224} Article 21(5), FSA.

\textsuperscript{225} See Article 21(6), FSA and Tahindro, A., \textit{op. cit.} p. 37.

\textsuperscript{226} Article 21(6), FSA. Where the violation is not serious, the inspectors must disembark, but the inspecting state may bring the flag state to compulsory, binding dispute settlement for failure to exercise either option. Article 21(11) of the FSA provides an extensive list of violations deemed serious. The FSA provides some flexibility as to what constitute serious violation by stating that the list may be supplemented on a region-by-region basis.

\textsuperscript{227} See Article 21(16), FSA.

\textsuperscript{228} Procedure for boarding and inspection shall be established through subregional and regional organisations or arrangement within two years of adoption of the FSA by the respective regional fisheries organisation (Article 21(2) and (3)) otherwise the procedure established under Article 22 will apply. Such a procedure shall not discriminate against non-members of the organisations or non-participants in cooperative arrangements. Generally, Article 22 provides for initial notice and a report of the boarding and inspection to be given to the flag state and right of crew to communicate with the flag state. The use of force is prohibited, unless inspectors are endangered or obstructed from performing their functions. Where force is used, it must not exceed a level that is reasonably required in the circumstances. In a situation where a master of a vessel refuses boarding and inspection, the flag state is expected to order the vessel to submit to boarding and inspection and if he still does not, the flag state shall suspend the vessel’s authorisation to fish and order it to return immediately to port (Article 22(4) FSA).
for damage or losses caused to fishing vessels due to unlawful or excessive enforcement actions. Since boarding and inspection may not be effective in some regions, the FSA permits members of RFMOs to choose other alternative enforcement mechanisms.  

### 3.4 The FSA: Its Shadow and Unfinished Business

Even though the scope of the FSA is limited to ensuring the long-term conservation and sustainable use of SHMFS, the effects of implementing some of the measures and enforcement strategies embodied in it have widespread implications for the aquatic environment and other living resources. For instance, the FSA explicitly provides that states shall apply a precautionary approach in the management of SHMFS in order to protect the living marine resources and preserve the marine environment. Despite the central focus of the FSA on SHMFS, this provision and a number of others are aimed at improving the state of all marine living resources. Secondly, the fact that the newly established RFMOs have adopted the compliance and enforcement measures entrenched in the FSA means those measures will have an effect on other fish species. Based on this, it could be argued that the FSA may have a limited scope, but its shadow has a wider coverage. This is one of the greatest strengths of the FSA and why there is much hope that if its provisions are properly implemented and enforced, it will contribute immensely to the achievement of long-term sustainability of marine fishery resources.

Notwithstanding this, the FSA has a degree of unfinished businesses and criticisms to face. It adopts a specific approach in dealing with problems such as biodiversity protection and overcapitalisation etc., but does not specifically integrate the effects of climate change into fisheries management. Yet, at the rate of current trends in the emission of GHGs, climate change is the greatest challenge facing fisheries managers and policy-makers in the 21st century. The success of RFMOs will to an extent depend on how they can maintain incentives for members to cooperate despite the uncertainties, shifting opportunities and

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229 Article 21(15), FSA.
230 Article 6(1), FSA.
231 The measures set forth in the FSA that will affect other marine living resources are states’ obligation to (i) apply an ecosystem approach in the conservation and management of SHMFS, (ii) protect biodiversity, (iii) use selective and environmentally safe gear and nets and (iv) take into account fish and non-fish species that are associated with or dependent upon SHMFS.
232 Mack is of the view that the focus of FSA is only to maximise long-term fish catches by coordinating fishing efforts and not the mounting problems of global warming, pollution and decreasing biodiversity in the ocean’s ecosystems. However, he fails to take into account the efforts made by the FSA to address the last two issues. Mack, J. R. (1995-1996) “International Fisheries Management: How the U.N. Conference on Straddling and Highly Migratory Fish Stocks Changes the Law of Fishing on the High Seas", *California Western International Law Journal*, Vol. 26, Issue 2, pp. 313-333 at p. 333.
other problems that may result from climate-driven changes in the productivity, migratory behaviour, availability and catchability of fish stocks governed by them.\textsuperscript{233}

The radical and conventional enforcement power given to the coastal states, port states and inspecting states does not bar a flag state from reasserting its exclusive jurisdiction.\textsuperscript{234} Tyler posits that since inspecting third-party states may only bring the violating vessel to port in order to initiate enforcement proceedings after either the failure of the flag state to act or with the permission of the flag state, a period of inertia is created before enforcement can take place.\textsuperscript{235} The FSA relies almost exclusively on RFMOs for its implementation when these organisations are already saddled with the problems of getting either unwilling, widely dispersed or poor member states to effectively patrol, monitor and control fishing vessels operating within their jurisdiction.\textsuperscript{236} The FSA ignores the fact that most parts of the high seas are not under any RFMO, thus leaving SHMFS in such areas unprotected.

In Bratspies’ opinion, many successful fisheries organisations would not qualify as RFMOs under the FSA because either (i) their membership is limited to independent states and self-governing entities of a particular region; (ii) they have no regulatory powers; or (iii) they cover only one fish species.\textsuperscript{237} Another flaw of the FSA is its failure to address the issue of consensual quotas and opt out allowances, which undercut the efficacy of RFMOs.\textsuperscript{238} The exercise of this option by member states has crippled the effectiveness of some RFMOs.\textsuperscript{239} Indeed, state parties to RFMOs would have no moral justification to enforce conservation and management measures on third states when they themselves do not adhere to stock quotas decided by their RFMOs. By completely adopting the Convention’s dispute settlement procedure, the FSA failed to take account of the shortcomings inherent in the procedure. Finally, the FSA failed to address the problem of

\textsuperscript{235} Tyler, Z. \textit{op. cit.}, p. 66.
\textsuperscript{236} \textit{Ibid.}
\textsuperscript{238} Joyner, C. C., \textit{op. cit.}, p. 281.
\textsuperscript{239} This exactly what happens when Japan opted out of the quota set by the Commission for the Conservation of Southern Bluefin Tuna.
unsustainable consumption of fish and fish products. The best solution to the world fish crisis will require addressing both the supply and demand factors that have caused the crisis.

3.5 Binding IFL Solves the Marine Fish Crisis: Myth or Reality?

The best way to determine whether these instruments have solved the marine fish crisis is to examine one of the most authoritative reports on the state of marine fisheries globally. The report of the Secretary-General to the UN General Assembly on developments and issues relating to ocean affairs and the law of the sea\textsuperscript{240} states the following:

The trend between 1974 to the present showed a downward trend in the proportion of underexploited and moderately exploited stocks, while there has been an increasing trend in the proportion of overexploited, depleted and recovering stocks (from 10\% in the mid-1970s to an estimated 24\% in 2002).\textsuperscript{241}

Factors identified by the Secretary-General as responsible for this precarious state of marine fisheries are directly or indirectly related to overfishing, pollution and habitat destruction. All the same, the situation begs the question whether the provisions of the relevant international fisheries agreements have been implemented, and if so, whether actions taken have been properly directed to ensure their effectiveness.

Despite the lamentable state of marine fishery resources, world capture marine production has been relatively stable in the past decade. Over the last 10 years, the proportion of overexploited and depleted stocks has remained unchanged although the situation is still serious for stocks that are solely or partially exploited in the high seas and for SHMFS.\textsuperscript{242}

While it is not contestable that most stocks have reached their maximum potential, the effectiveness of the conservation and management measures and their enforcement at all levels, are forces contributing to the stabilisation in the world capture marine fisheries production. To start with, many countries and the European Community have adopted policies to limit or reduce their national fishing fleets.\textsuperscript{243}

\begin{footnotesize}
\begin{enumerate}[\textsuperscript{240}]
\item The size of the EU fishing fleet is following a downward trend, with reductions in power (17\%), tonnage (12\%) and numbers (20\%) in the period 1998-2006. European Environmental Agency (2009) CSI 034 –
\end{enumerate}
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fishing fleet appears to have stabilised at about 4 million units of which 1.3 million are decked vessels and 2.7 million undecked boats.\textsuperscript{244} Measures taken by the EU and other States to withdraw certain aspect of fisheries subsidies will further reduce the world fishing fleet.\textsuperscript{245}

Globally, there has been a significant reduction in bycatch and discard from an average of 27 million tonnes in 1994 to 7.3 million tonnes in 2005.\textsuperscript{246} One of several reasons for this is the development and use of environmentally safe gear and nets, particularly bycatch reduction devices.\textsuperscript{247} With advanced technology in fish tracking devices and vessel monitoring systems (VMS), data collection on fish, oceanic conditions and movement of fishing vessels has become easier. The use of VMS by fishing vessels is expanding exponentially with a global total of 25,000 vessels in February 2003.\textsuperscript{248} The majority of the RFMOs now require all member states’ vessels to install a VMS device to help track their position.\textsuperscript{249} This has led to 94% of larger fishing vessels of over 100 tons in countries under obligation to regional fisheries agreement to have VMS.\textsuperscript{250} The combined effect of asking fishing vessels to use VMS and to keep on board a logbook showing their area of fishing operations, catches and landings has reduced IUU fishing activities. Also, satellite

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See generally SOFIA 2000, 2002, 2004, and 2006.\textsuperscript{245} For example, the WTO members have agreed in principle to “strengthen disciplines on subsidies in the fisheries sectors, through the prohibition of certain forms of fisheries subsidies that contribute to overcapacity and overfishing.” See Paras 28, 31 and 44 of the Doha WTO Ministerial Declaration adopted on 14 November 2001; Decision 1(d) … Special and Differential Treatment of the General Council’s decision on the Doha Agenda Work programme (the “July Package”) adopted on 1 August 2004; Paras 35 and 36 of the Hong Kong WTO Ministerial Declaration adopted 18 December 2005, as well as para 9 of Annex D to the Hong Kong WMO Ministerial Declaration. For the different proposals made by the EU and other States on which approach and structure to adopt in prohibiting fisheries subsidies see the revised proposed on fisheries subsidies submitted by Indonesia on 29 June 2007 (TN/RL/GEN/150/Rev.1) to the Negotiating Group on Rules and the WWW Statement stating its reaction to the Indonesia’s revised proposal. Available at http://www.wto.org/english/forum_forum_e/posp69_wwf_e.doc (accessed last 2 June 2009). \textsuperscript{246}


Among the RFMOs that are using VMS are the North Atlantic Fisheries Organisation, North East Atlantic Fisheries Commission, CCAMLR and Indian Ocean Tuna Commission, Western and Central Pacific Fisheries Commission and Article 22 (1b) of EU Regulation 2371/2002. \textsuperscript{249}

FAO (2007c) Combating Illegal, Unreported and Unregulated Fishing through Monitoring, Control and Surveillance, Port State Measures and Other Means, Report of Twenty-Seven Session of Committee of Fisheries Italy, 5-9 March 2007, Rome: FAO, p. 9. \textsuperscript{250}
monitoring has reduced misreporting by area; although tampering with VMS data is increasingly being used to perpetrate IUU fishing.\(^{251}\)

The obligation on states to cooperate in the exchange of information between themselves and the FAO, as well as forestall activities of non-parties, has been instrumental in the publication of lists of vessels involved in IUU fishing and those duly authorised to fish by the RFMOs.\(^{252}\) The FAO High Seas Vessels Authorisation Record has been very useful in curbing IUU fishing.\(^{253}\) The easy access to these lists by the public has discouraged IUU fishing. Port states have relied on these lists in their decisions not to give vessels involved in IUU fishing, or which do not comply with international conservation measures, access to their port facilities. Although the UN claims that IUU fishing remains the most disturbing fishing problem in the 21st century, its lucrative days may soon be over. At the international and regional levels, efforts have been made to strengthen port state control measures.\(^{254}\) There is also wide implementation of trade information schemes,\(^{255}\) catch certification and trade documentation schemes, which makes it possible to identify vessels that harvest a particular fish and to trace the source of most commercial fish.\(^{256}\)

After the adoption of the FSA, five new RFMOs have been established.\(^{257}\) This development has subjected more high seas stocks and SHMFS, which before now

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\(^{252}\) The list of vessels involved in IUU fishing published by the Antarctic and Southern Ocean Coalitions and the Commission for the Conservation of Southern Bluefin Tuna are available at [http://www.asoc.org/REDLIST/redlistfront.htm](http://www.asoc.org/REDLIST/redlistfront.htm) and [http://www.ccsbt.org/docs/search.cfm](http://www.ccsbt.org/docs/search.cfm) respectively. (last accessed September 20, 2007) The Greenpeace maintains a more comprehensive list on vessels and companies involved in IUU fishing, and some RFMOs lists on IUU fishing. Available at [http://blacklist.greenpeace.org/vessel/show/252](http://blacklist.greenpeace.org/vessel/show/252) (accessed on September 20, 2007).


\(^{255}\) The scheme was introduced in June, 2000 by CCSBT to collect more accurate and comprehensive data on Southern Bluefin Tuna (SBT) fishing through monitoring trade in export and import of SBT. The trade information scheme also operates to deter IUU fishing by effectively denying access to markets for SBT.

\(^{256}\) Swan, J., *op. cit.*, p. 40.

inhabited the open and unregulated oceans, to be made subject to conservation and management measures. The interesting issue is that the agreements establishing the new RFMOs have adopted the FSA’s core conservation measures and enforcement mechanisms.\textsuperscript{258} This development has injected a new spirit of state compliance with, and enforcement of, international conservation and management measures at the regional and national levels.

There is evidence of a strong political will by major fishing countries and some of the largest fishing markets in the world to monitor and ensure that IUU fishing does not occur within their jurisdiction and on the high seas.\textsuperscript{259} Some states have responded positively to the call for adoption of sanctions having serious consequences against violators of international and national conservation measures.\textsuperscript{260} The increase in the number of prompt release cases is evidence of the high level of seriousness which some coastal states are paying to monitoring, control, and surveillance of their EEZs.\textsuperscript{261} For instance, in \textit{Commission of the European Communities v. Greece},\textsuperscript{262} the European Commission brought proceedings against Greece for failing to ensure that fishing vessels flying its flag are equipped with satellite position monitoring devices, as required under Article 3 of Council Regulation No 2847/93, as amended by Regulation No. 686/97. The European Court of Justice held that Greece had failed to comply with the regulation.

\textsuperscript{258} Analysis of these instruments reveals that almost all of them have provisions on the ecosystem approach, precautionary approach, compatibility of conservation measures between EEZ and the high seas, flag and port States responsibility, entrance of new States, and cooperation with developing States.


\textsuperscript{260} Article III (8), Compliance Agreement and Article 19(2), FSA. For example, Article 8.17 (2) of the Russian Code of Administration Offences provides, among other, penalties for the confiscation of fishing vessels to the State.

\textsuperscript{261} The United Nations Fish Stocks Agreement Review Conference of 2006 held similar view when it noted that even though more work needs to be done by RFMOs and states in the cluster area of monitoring, control and surveillance, and compliance and enforcement, both states and RFMOs have taken significant strides in addressing the problem. In fact, as at November 2009, 10 out of the 15 cases which the ITLOS decided so far deal with prompt release of fishing vessels that were involved in either illegal or unauthorised fishing. See generally Balton, D. A. and Koehler, H. R (2006-2007) “Reviewing the United Nations Fish Stocks Treaty”, \textit{Sustainable Development Law and Policy}. Vol. 7., pp. 5-9 at p. 6 and the ITLOS website http://www.itlos.org/start2_en.html (accessed last November 3, 2009).

\textsuperscript{262} Case No. C-22/04, Online summary is available at http://www.inffish.net/cases/fisheries/sbt2/award.pdf (accessed January 3, 2008).
There is no doubt whatsoever that binding international fisheries agreements have a mitigating effect on most of the factors responsible for the deplorable state of marine fisheries. The situation is likely to improve because of the positive impacts made by the FAO’s regional and national training programmes, seminars, conferences and technical assistance in various countries on how to actually implement and enforce these instruments. Mandatory actions taken under other international binding agreements\textsuperscript{263} and by a number of international organisations\textsuperscript{264} also have had positive impacts on the state of marine fisheries. The stagnation in the captured marine production for the past few years is because recovery of fish stocks usually takes a long time, and in most cases the stocks will be far less productive than they used to be. While reactive measures could in some cases lead to the recovery of overexploited or depleted stock, they are fundamentally limited, as the stock may not recover to its original state. This is particularly the case when unfavourable climate change sets in after a stock has been overfished.\textsuperscript{265}

In summary, the good news is that as a result of good conservation and management practices there are signs of recovery of species like the striped bass along the eastern coast of the U.S.,\textsuperscript{266} the Norwegian spring-spawning herring,\textsuperscript{267} the North Sea cod\textsuperscript{268} and some of the demersal finfish stocks in the Southern Scotia Arc region of the Antarctic.\textsuperscript{269} The \textit{SOFIA 2006} further reveals that production in the Eastern Indian Ocean and Western

\textsuperscript{263} Other international agreements having positive impacts on fisheries are the Ramsar Convention on Wetlands, Convention on Biological Diversity, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), International Convention for the Prevention of Pollution from Ships and Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, 1972 and Convention on Migratory Species of Wild Animals. Increasing important among this group are the various bilateral, subregional and regional fisheries agreements.

\textsuperscript{264} Examples of such organisations are the WTO, Greenpeace International, Marine Stewardship Council (MSC) World Wildlife Fund (WWF), United Nations Environmental Programme (UNEP), and International Coral Reef Initiative.

\textsuperscript{265} This is one of the hypotheses put forward to support failure of the Newfoundland cod to recover after a moratorium was declared in 1992. William, E. S. and Pontecorvo, G. (2007) “Scientific Uncertainty and Fisheries Management”, In: Bjørndal, T., Gordon D. V. and Arnas, R. (eds.) \textit{Advances in Fisheries Economics: Festschrift in Honour of Professor Gordon}, Oxford: Blackwell Publishing, pp. 270-282 at p. 274. According to the authors overfishing may have been the basic cause of the collapse of the Newfoundland cod, but the \textit{coup de grâce} was delivered by climate change. \textit{Ibid.}


Central Pacific continued their long-term rising trends, and recently, in the highly regulated Northwest Atlantic and Northeast Pacific areas, increases were observed following troughs in production. These are all dividends of states’ compliance with international conservation and management measures embodied in the binding international agreements on fisheries. From the foregoing assessment, there is hope that the international community will achieve a long-term sustainability of marine fishery resources if the existing conservation and management measures, particularly those that target IUU fishing, overcapacity and create marine reserves for depleted or collapsed species, are seriously implemented and enforced.

Regrettably, however, the hope vanishes as soon as one takes into account the state of marine fisheries in developing countries like Nigeria and the 2007 IPCC Report and other research findings on the general effects of climate change on the physiology and ecology of marine fishery resources as well as their ecosystems. While there is no doubt that, in certain areas, some species are positively influenced by increases in sea temperature, as thermal conformers, there is a temperature threshold which no fish species can tolerate. At the current rate of emissions of GHGs, the temperature in the world oceans and seas may soon reach that threshold. The determination of issues like the biomass or TAC of fish species will be very difficult, if not impossible, where changes in their distribution and migration patterns become very erratic. Indeed, other harvest-based measures adopted in the Convention and the FSA will be rendered ineffective.

The specific and predominant targeting of only harvest-based factors, which contribute to the marine fish crisis, by the binding international fisheries instruments is a myopic way of directing conservation and management measures. Climate change, which has been identified as the planet’s greatest environmental and developmental challenge in the 21st century, is not specifically or forcefully addressed. Having vague and ambiguous environmental and other related provisions in the Convention and the FSA creates...
uncertainty in the law. It is therefore not the best way to address a problem of this magnitude.

3.6 Conclusion

Between 1958 and the present day, the objective of marine fisheries conservation has developed from optimum sustainable yield of fishery resources so as to secure a maximum supply of food to embrace long-term conservation and sustainable use of fishery resources. The attempt to solve fishery problems through the extension of coastal states jurisdiction into the high seas and the use of force by maritime power states to maintain a narrow belt of territorial sea has changed. Now, core environmental principles and radical enforcement mechanisms have been employed in a bid to ensure long-term sustainability of marine fishery resources. The fundamental reason for this trend is the failure of Grotius’ *mare liberum* to cope with the reckless exploitation of fishery resources by humans.

Regrettably, whilst the implementation and enforcement of the far-sighted, far-reaching, bold and revolutionary measures under the existing binding international fisheries agreements have started to yield some positive results, particularly in developed countries, the effects of climate change on marine fish stocks are likely to render those measures ineffective and, in some cases, completely unworkable. As far as the vague environmental and other related provisions in the Convention and the FSA are concerned, interpreting them purposefully will give them the evolutionary character that is required to compel states and RFMOs to integrate the impacts of climate change into marine fisheries management. With such obligations in mind, coastal states and DWFNs are likely to think of how they can ensure the effectiveness of IFL by also complying with the climate change regime.
CHAPTER 4

LEGAL FRAMEWORK FOR THE CONSERVATION AND MANAGEMENT OF MARINE FISHERY RESOURCES: ADDRESSING CLIMATE CHANGE AND OVERFISHING FROM THE SOFT LAW PERSPECTIVE

4.1 Introduction

Since international soft law is not legally binding, the discourse on sources of international law and, most importantly, how to regulate global environmental problems was, until recently, focused on binding or hard sources of international law.\(^1\) The contribution of international soft law to the development of both treaty and customary law and its capacity to change the behaviour of states and non-states actors are the main reasons why jurists are beginning to pay serious attention to its role in the development of international law.\(^2\) These great achievements of soft law are evident in both international and municipal law.\(^3\)

As far as the parlous state of marine fishery resources is concerned, the United Nations Food and Agricultural Organisation (FAO) Code of Conduct for Responsible Fisheries,\(^4\) a non-binding international instrument, has revolutionised the behaviour of most states and non-states actors on how they seek to address the problem. While the success of the Code depends largely upon its proactive and holistic approach towards addressing the deplorable state of marine fisheries, the existing literature has not examined whether or not the Code has adequately addressed the effects of climate change on fishery resources. This chapter

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\(^4\) Hereinafter referred to as the Code.
argues that in light of the changing climate, the effectiveness of the Code will depend among other factors on whether its member states integrate climate change into the harvest-based measures adopted by them and whether they also comply with the climate change regime.

This chapter consists of four parts. The first part examines the conservation and management measures adopted in the Code and the extent to which the Code has integrated climate change into fisheries management. In addition, this part tries to ascertain whether the Code has established an interconnection with the climate change regime. The second part focuses on the novel provisions of the relevant international plans of action (IPOAs) developed to enhance the implementation of the Code. This part buttresses the earlier argument that IFL is predominantly focused on addressing the overfishing problem. The third part argues that while literary works by the FAO reflect the current state of knowledge on the impact of climate change on fish, the organisation failed to specifically integrate climate change into any of its fisheries instruments. This part also evaluates the landmark UN General Assembly resolutions on climate change and fisheries, but notes with disappointment that by adopting the Bush climate change strategy, the UN General Assembly A/Res/62/215 has jettisoned the 1997 Kyoto Protocol. The concluding part notes the problem of congestion of international soft law on fisheries. More importantly, it stresses the fact that a long-term sustainability of marine fishery resources can only be achieved if the impact of climate change is specifically integrated into marine fisheries management and coastal states and DWFNs also comply with the climate change regime.

A few cogent reasons support the legislative scope of this chapter. Firstly, Paragraph 5 of the Code’s Preface confirms that the FAO took into account all the pre-1995 international soft law instruments on fisheries while drafting the Code and ensured the consistency of the Code with them. Secondly, before the adoption of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU fishing) by the FAO Council in 2001, the problem of IUU fishing was the focus of attention in other fora, but none addressed the problem in a comprehensive manner like

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5 Note that because the Code addresses all types of fisheries, the examination of the conservation and management measures is done in a broad and general language. Immediately, after that the specific reference to marine fishery resources or marine fisheries/management resumes.

6 This word “interconnection” is synonymous with words like interlinkages, interrelationship, interplay, and synergy and is sometimes used interchangeably with these words.

7 See Para 8 of Annex 1 to the Code entitled Background to the Origin and Elaboration of the Code.

8 Swan, J. (2004) “International Action and Responses by Regional Fishery Bodies or Arrangement to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing”, FAO Fisheries Circular No. 996,
the IPOA-IUU fishing. Except on very few issues, even the post IPOA-IUU fishing instruments like the FAO’s Conference Resolution 6/2003, the March 2005 Rome Declaration on IUU Fishing and the 2005 FAO Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing have not addressed the problem of IUU fishing better than the IPOA-IUU fishing. Thirdly, this chapter has not specifically examined the FAO technical guidelines because there was no negotiation for them and they have no formal legal status.9 Despite the decision not to specifically examine the mentioned instruments, references have been made to them where necessary.

4.2 The Code - Introductory Aspects

The Code is a voluntary instrument although certain aspects of it may have a binding effect by means of their incorporation into the general principles of law recognised by civilised nations or inclusion in binding international fisheries agreements.10 The Code has a wide scope covering all aspects of fisheries including captured fisheries, aquaculture and post-harvest activities.11 Its targets are member and non-member states of the FAO, international organisations whether governmental or non-governmental, fishing entities, all persons concerned with conservation and management of fishery resources, those engaged in processing and marketing of fish and fishery products, and other users of the aquatic environment in relation to fisheries.12 The Code is the first fisheries instrument within the framework of the UN system to adopt an integrated approach covering all dimensions of fisheries and the broadest spectrum of actors. It represents the most advanced, complete and up-to-date expression of the principles of sustainable fisheries management.13 Some

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9 According to Doulman, there is no standard approach to the development of technical guidelines. Depending on their subject matter and complexity; they may be developed by either an individual or a group of experts. Doulman, D. J. (2007) “Coping with the Extended Vulnerability of Marine Ecosystems: Implementing the 1995 FAO Code of Conduct for Responsible Fisheries”, Social Science Information, Vol. 46, No. 1, pp. 189-237 at p. 210. Legally, the FAO guidelines are intended to provide general advice and a framework in support of development, implementation and understanding of the various aspects of the Code and ensure the achievement of sustainable development in a fisheries context. They are to be used on voluntary basis hence no formal acceptance process or obligation to implement it is required. The language and substantive articles may not be strictly followed. They are intended to be flexible and capable of evolving as experience is gained and constructive suggestions accumulated.


12 Article 1.2, Code.

commentators argue that the wide scope of the Code may not have been possible without its voluntary nature.\textsuperscript{14}

\section*{4.3 Objectives of the Code}

The Code has ten objectives without any indication whether or not they are listed in order of priority.\textsuperscript{15} The objectives include:

\begin{itemize}
\item[(i)] Establishing principles for responsible fishing.
\item[(ii)] Establishing principles and criteria for the elaboration and implementation of national policies on conservation and management of fishery resources.
\item[(iii)] Serving as a reference instrument for the establishment, improvement and implementation of legal and institutional frameworks on responsible fisheries.
\item[(iv)] Providing guidance for formulation and implementation of all forms of international fisheries agreements.
\item[(v)] Facilitating and promoting all forms of cooperation relating to conservation and management of fishery resources.
\item[(vi)] Promoting the contribution of fisheries to food security and food quality.
\item[(vii)] Promoting protection of living aquatic resources and their environments.
\item[(viii)] Promoting trade in fish and fishery products.
\item[(xi)] Promoting research in fisheries, associated ecosystems and relevant environmental factors.
\item[(x)] Providing standards of conduct for everyone involved in fisheries.\textsuperscript{16}
\end{itemize}

The practical problem with the implementation of the Code’s objectives is how to address the inherent conflict between some of them,\textsuperscript{17} the associated high cost of implementing each of them and conflicting states’ interests with respect to setting priorities between the objectives.\textsuperscript{18} Some of the Code’s objectives are expressed in generalised and vague terms.


\textsuperscript{15} Article 2, Code.

\textsuperscript{16} See generally Article 2(a-j), Code and Doulman, D. J., \textit{op. cit.}, p. 194.


\textsuperscript{18} The last of these problems is evident in the manner states changed their ranking of the relevance of the objectives with respect to specific national context. For instance, top priorities were attributed to objectives (i) and (a) in 2005 and 2007 respectively, while the lowest relevance was attributed to objectives (iv) and (viii). The 2001 top priority, objective (vi), slipped from third in 2005 to fifth in 2007. See FAO (2007c)
For example, it is among the Code’s objectives to “promote the contribution of fisheries to food security and food quality, with priority given to the nutritional needs of local communities”. While food insecurity is a global phenomenon, malnutrition is a serious problem associated with poverty-stricken local communities in the developing countries. Expressing this objective in a generalised manner without any specific reference to the people in developing countries who are living in penury may lead to paying equal attention to local communities in developed and developing states. Nevertheless, the multi-objective approach of the Code has its advantages. It enables all the stakeholders in the fishing and associated industries to take a more holistic approach towards achieving responsible and sustainable fishery resources. The generic nature of the objectives makes them applicable in all fisheries and aquaculture situations, irrespective of their scale, and in all countries, irrespective of their levels of development.

4.4 Relationship between the Code and other Fisheries Instruments

The interpretation and application of the Code should be in conformity with the relevant rules of international law as reflected in the Convention. The Code preserves the rights, jurisdiction and duties of states under international law as reflected in the Convention by providing that nothing contained in it prejudices such rights, jurisdiction and duties. Technically, the use of the word “conformity” in Article 3.1 bars the Code from derogating on the fisheries provisions in the Convention. Non-member states of FAO could rely upon such a restricted and non-purposeful interpretation to support their non-compliance with some of the novel provisions of the Code; since such provisions deviate from the traditional conservation and management measures and the ways of enforcing them. A purposeful interpretation of the word ‘conformity’, which enhances the Convention’s conservationist objective, is necessary. On that basis, any derogation by the Code on the rights, jurisdiction and duties of States under the Convention could be justified.

The Code provides in Article 3.2(a) and (b) that its provisions are to be interpreted and applied in a manner that is consistent with the relevant provisions of the FSA and in accordance with the applicable rules of international law, including the respective


19 Article 2(f), Code.
20 Doulman, D. J., op. cit., p. 194.
21 Article 3.1, Code.
22 Ibid.
23 Examples of such novel provisions include the one dealing with issues like the ecosystem and precautionary approaches, the trade-related measures and the enforcement powers of port and flag states. These issues are dealt with in detail later.
obligations of states under international agreements to which they are a party. The phrases ‘in a manner consistent with’ and ‘in accordance with’ mean compatible with or in agreement with. Considering the wide scope of the Code, the words “international agreements” in Article 3.2(b) of the Code include sub-regional and regional fisheries agreements (RFMOs), the Compliance Agreement and non-fisheries international agreement. 24 The Code limits the “non-fisheries international agreements” by expressed or implied reference to them.

Article 3.2(c) of the Code provides that the Code is to be interpreted and applied in the light of the 1992 Declaration of Cancun, the 1992 Rio Declaration on Environment and Development, Chapter 17 of Agenda 21 and other relevant declarations and international instruments. The phrase ‘in the light of’ implies taking into consideration the declarations and other international instruments mentioned or implied under the Article. The explicit listing of only non-binding declarations and international instruments before the general clause “and other relevant declarations and international instruments” limits the interpretation of the general clause within the context of non-binding soft laws. 25 The general clause itself reflects the reality that the list would indeed be very long and is not limited to only declarations and international instruments dealing with fisheries because of the Code’s wide scope.

4.5 Conservation and Management Measures under the Code

The provisions of the Code on the general principles, fisheries management and fishing operation provisions deal directly with conservation and management of fishery resources. 26 However, it is impossible to achieve the overriding objective of the Code without the effective implementation of the other aspects of the Code. 27 Given that the negotiation of the Code was done contemporaneously with the Compliance Agreement and the FSA, this part briefly identifies the similarities between these instruments while focusing on the novel aspects of the Code on conservation and management measures.

24 FAO Conference Resolution 15/93 para 3. Failure to expressly mention the Compliance Agreement in Article 3.2 has been addressed in Article 8.2.6 which provides that “States which are not party to the Compliance Agreement are encouraged to accept it and to adopt laws and regulations consistent with its provisions”.

25 See Article 31(1) of the Vienna Convention on the Law of Treaties 1969, which provides that “A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose”. United Nations, Treaties Series, Vol. 1155, p. 331. According to Article 31(2) among the factors that shall be taken into consideration when interpreting the word “context” in Article 31(1) are the text, preamble and annexes of the treaty.

26 See Article 6 (general principles), Article 7 (fisheries management) and Article 8 (fishing operation).

27 The other aspects of the Code deal with aquaculture development (Article 9), integration of fisheries into coastal area management (Article 10), post-harvest practices and trade (Article 11) and fisheries research (Article 12).
especially its provisions relating to climate change. Apart from the general principles, which epitomise the nucleus of the objectives and conservation and management measures adopted in the Code, thus requiring elaborate analysis, the discussion in this part is more thematic in its approach. This approach helps to minimise the unnecessary verbosity and essay style of the Code, as well as the problem of understanding the Code due to incoherency in the manner in which most actions and measures are presented.

4.5.1 General Principles
Considering the voluntary nature of the Code, the general principles are akin to a fisheries manifesto designed to guide the behaviour of states and other stakeholders in the fishing industry, including pre and post-fishing activities. A critical analysis of the Code indicates that there are similarities between some of the Code’s general principles and a number of principles in Article 5 of the FSA. On the other hand, certain aspects of the Code’s general principles form part of the substantive provisions of the FSA and the Compliance Agreement, while others have actually developed upon the provisions of the FSA and the Compliance Agreement. For example, the FSA over-relied on cooperation of states as the only source of assistance to the needs of developing states. The Code takes a more comprehensive and pragmatic approach in addressing the needs of developing states. It recognises the fact that non-governmental organisations (NGOs) and financial institutions, which the developing states frequently interact with at different fora, are also capable of assisting the developing states.

Some of the general principles expressed in the Code are quite novel. One example is the correlation between rights and obligations under the Code. Article 6.1 of the Code provides that the right to fish carries with it the obligation to do so in a responsible manner in order

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29 The principles that are common in the two instruments include the application of ecosystem and precautionary approaches, conservation and management of both targeted and non-targeted species, prevention of overfishing and excess fishing capacity, use of the best scientific evidence available and taking into account environmental, economic and social factors before taking conservation and management decisions. Other principles of the Code that are listed in Article 5 of the FSA are the use of selective and environmentally safe fishing gear and practices, protection of biodiversity, protection of the rights of subsistence, small-scale and artisanal fisheries, and the implementation and enforcement of conservation measures through monitoring and control of fishing activities.
30 The general principles are (i) ensuring compliance with conservation and management measures by fishing vessels which they have authorised to fish and are entitled to fly their flags, (ii) promotion of awareness of responsible fishery activities through education and training, (iii) peaceful and timely settlement dispute concerning fishing, (iv) cooperation at subregional, regional and global levels, and (v) compatibility of conservation and management measures within and beyond national jurisdictions.
31 Article 25(2)(c), FSA.
32 Article 5(1) and (2), Code.
to ensure effective conservation and management of living aquatic resources. This means that states’ fishing on the high seas cannot exercise their freedom of fishing in isolation of their obligation to conserve and manage the stocks. Similarly, coastal states must bear in mind that while exercising their right to exploit fishery resources within their maritime jurisdictions they have a concomitant obligation to conserve and manage the resources. Article 6.1 of the Code encourages states to adopt a proactive approach toward managing their fishery resources and not to wait until their fish stocks deplete or collapse before they rush to implement conservation and management measures.

Other novel aspects of the Code’s general principles are the requirements that states should take into account traditional knowledge in deciding the applicable conservation and management measures, transparency in decision-making process and participation of all stakeholders at the national level in the development and implementation of fisheries law and policies. It is also unprecedented that issues such as maintaining the nutritional value, quality and safety of fish and fishery products, trade in fish and fishery products and the protection of critical fishing habitat such as wetlands, mangroves, reefs, lagoons, nurseries and spawning areas, most of which are located within national jurisdiction, are specifically included in the Code as principles. Other novel aspects of the Code’s general principle include working conditions of seafarers, diversification of income and diet using aquaculture and culture-based fisheries, integration of fisheries into coastal area management and multiple uses, and minimising adverse impacts of fishing on the environment and on local communities.

These novel principles epitomise the significant departure of the Code from the previous international fisheries instruments. As far as the Code is concerned, fisheries management should not be limited to fishery resources and the aquatic environment. Contemporary fisheries management should address inter alia issues such as the rights of seafarers and consumers, trade in fish and fishery products, sanitary conditions of fish and fishery products, and the right of indigenous people, especially the need to integrate their traditional knowledge into fisheries management.

33 Article 6.4, the Code.
34 Article 6.13, Code.
35 Articles 6.7 and 6.8, Code.
Unfortunately, some of the general principles suffer from vagueness and ambiguity. For instance, Article 6.3 of the Code provides that states should prevent overfishing and excess fishing capacity, and should implement management measures to ensure that fishing efforts are commensurate with the productive capacity of the fishery resources and their sustainable utilisation. Furthermore, states are expected to take measures to rehabilitate populations as far as possible and where appropriate. Bratspies\textsuperscript{37} rightly points out that the Code does not specify where states may take these measures, by what means states should prevent overfishing, and what in fact constitutes overfishing. The real problem of vagueness and ambiguity in expressing some of the general principles lies in how states will construe elusive and vague words or phrases such as “effectiveness”\textsuperscript{38}, “when appropriate”\textsuperscript{39}, “as appropriate”\textsuperscript{40}, “where appropriate”\textsuperscript{41} “to the extent practicable”\textsuperscript{42}, and “as far as possible”.\textsuperscript{43} While lack of precision in the Code’s language may increase the likelihood of its acceptance by states, it makes subsequent implementation difficult because states can legitimately claim differing understandings of the indeterminate language.\textsuperscript{44}

4.5.2 Objective of Fisheries Management

The Code recognises the long-term sustainable use of fishery resources as the overriding objective of conservation and management of fishery resources.\textsuperscript{45} The Code further provides that the objective of fisheries management at all levels is to ensure optimum utilisation of fish stocks and maintain their availability for present and future generations.\textsuperscript{46} In order to achieve these objectives, the Code expressly warns that short-term considerations should not compromise these objectives.\textsuperscript{47} Bearing in mind the overriding objective of IFL, States and RFMOs should through appropriate policy, legal and institutional frameworks adopt conservation and management measures based on the best scientific evidence available.\textsuperscript{48} The aim of such scientific evidence should be to ensure maintenance or restoration of stocks at levels capable of producing MSY subject to

\textsuperscript{38} Articles 6.1, 6.10, 6.11 and 6.13 of the Code.
\textsuperscript{39} Article 6.3 of the Code.
\textsuperscript{40} Articles 6.4 and 6.10 of the Code.
\textsuperscript{41} Article 6.18 of the Code.
\textsuperscript{42} Article 6.6 of the Code.
\textsuperscript{43} Articles 6.3 and 6.8 of the Code.
\textsuperscript{44} Bratspies, R., *op. cit.*, p. 235 particularly footnote 129.
\textsuperscript{45} Article 7.2.1, Code.
\textsuperscript{46} Article 7.1.1, Code.
\textsuperscript{47} Article 7.1.1, Code.
\textsuperscript{48} Articles 7.1.1 and 7.2.1, Code.
relevant environmental and economic factors, including the special requirements of developing states.  

Another novel aspect of the Code is the repeated use of the phrase “for the present and future generations” to underscore the importance of fisheries, the quality, diversity and quantity of fish as well as the quality of aquatic environments which conservation and management measures should maintain. This supports the fact that fisheries management as envisaged under the Code is not rooted in conservation of resources for conservation’s sake, but rather to ensure the continued availability of fishery resources of good quality, and in such diversity and quantity as to meet the demand of present and future generations.  

4.5.3 Participation and Transparency

Participation pertains to the inclusion of stakeholders in policy-making and implementation, while transparency has to do with public access to information. At the national level, Article 7.1.2 of the Code provides that states should identify and consult with the relevant domestic stakeholders having a legitimate interest in fishery resources. Unlike the centralised system of management, the co-management system involves both government and resource users in shared decision-making and planning. In order to ensure equal participation and collaboration of all the stakeholders in fisheries management, the Code emphasises the need to take into account the interests of all fishers and transparency in the decision making process. Transparency could be enhanced through publicity being given to conservation and management measures adopted, with the bases as well as the purposes of such measures explained to users of the resources. Furthermore, the Code urges that all those having a legitimate interest in fishing should be empowered to participate through established arrangements for consultation and public awareness through education and training.

49 Article 7.2.1, Code.
52 SOFIA (2006), op. cit., p. 72.
53 Article 7.2.2(c), Code.
54 Article 7.1.9, Code.
55 Article 7.1.10, Code.
56 Articles 6.16, 7.1.2 and 10.2.1, Code.
Although the Code identifies the stakeholders who should be consulted, it neither defines what is ‘legitimate interest’ nor specifically provides whether or not states are bound to accept the opinion of their domestic stakeholders having a legitimate interest in the use and management of fish stocks. Legitimate interest should be construed within the context of the wide scope of the Code. In that sense, for instance, dwellers in the coastal areas need to be consulted and their views taken into account when fishing projects that are likely to affect their lives and environment are planned.

At the subregional and regional levels, states in whose jurisdiction fishery resources occur, and states having a real interest in fisheries outside national jurisdiction, should actively participate in the works of RFMOs having the competence to establish conservation and management measures for fish stocks. The Code goes beyond the FSA by urging RFMOs to give representatives of both governmental and non-governmental organisation the opportunity to take part in their meetings and have timely access to records and reports of such meetings. At the national and regional levels, participation and transparency enable all the stakeholders to be involved in fisheries management thereby promoting a high degree of consensus among them and compliance with conservation and management measures through voluntary acceptance.

4.5.4 Cooperative Arrangement

The Code urges states to cooperate through the establishment of RFMOs in order to ensure effective conservation and management of straddling fish stocks and highly migratory fish stocks (SHMFS). The straddling and highly migratory nature of most fish species and increasing high seas fishing activities after the crystallisation of the EEZ regime have meant marine fish crises have no respect for maritime boundaries. The effectiveness of the Code will be difficult to achieve if states that harvest fish species regulated by RFMOs are allowed to remain outside the RFMOs system. In order to counter the activities of third States undermining the effectiveness of conservation and management measures adopted

57 The fishing industry, fish workers, environmental and other interested organisations are some of the stakeholders identified in Article 6.13 of the Code.
58 Article 7.1.4, Code.
59 Article 7.1.6, Code. Under Article 12(2) of the FSA, these rights are restricted to only intergovernmental and non-governmental organisations concerned with Straddling and highly migratory fish stocks.
61 Article 7.1.3, Code.
by such FRMOs, the Code makes it clear that states which are not members or participants of RFMOs are still expected to cooperate and give effect to conservation and management measures adopted by the RFMOs. Unfortunately, because of its non-binding nature, the Code cannot adopt the radical and non-conventional rules approach of the FSA in which states that refuse to be member of RFMO or apply conservation and management measures established by FRMOs are denied access to fishery resources in which those measures apply.

Cooperative arrangements between states should also cover information gathering and exchange, fisheries research, management and development. With regard to fisheries research, if no RFMO exists to foster and promote international cooperation as required by the Code, concerned states should agree on a mechanism for cooperation, which will enable them to compile and exchange data. The Code takes a bold step to specifically address the issue of finance, which has been one of the fundamental problems hindering the successful operation of RFMOs. States and RFMOs should agree on the means to finance the activities of RFMOs. Of course, it is important that whatever finance the RFMO is able to raise must cover the cost of fisheries conservation, management and research. In order to avoid a situation where some states cannot or refuse to fulfil their financial commitments, the relative benefits derived from fisheries and the different financial capabilities of states should be taken into consideration when deciding any state’s financial commitment.

4.5.5 Overcapitalisation

In the first place, the Code acknowledges the fact that the economic conditions under which fishing industries operate promote responsible fisheries. The Code calls on states and RFMOs to take measures that will prevent or eliminate excess fishing capacity by ensuring that fishing efforts are commensurate with the reproductive capacity and sustainable use of fishery resources. Such measures should include monitoring fishing capacities in order to reduce any excess fishing capacity and ensuring that exploitation of

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62 Article 7.1.5, Code.
63 Articles 17 and 8(4), FSA.
64 Article 7.3.4, Code.
65 Article 7.3.4, Code. See also Article 12.2 which re-emphasises the need for institutional framework for the conduct of required research and its proper use.
66 Article 7.7.4, Code.
67 Article 7.7.4 of the Code.
68 Article 7.2.2 (b), Code.
69 Articles 6.3, 7.1.8, and 7.6.1, and 7.6.3, Code.
the stocks is economically viable.\textsuperscript{70} Importantly too, states are to ensure that fishing within their national jurisdictions, or on the high seas, is authorised and compliance is in line with municipal law or international law, as the case may be.\textsuperscript{71} By adopting these measures, the Code intends to ensure that at no time should fishing capacity reach a level where it will hinder the long-term conservation and sustainable use of fisheries resources.

Unfortunately, as good as these measures may be they fall short of specifically addressing issues such as subsidies and flag hopping identified as the major factors responsible for overcapacity and IUU fishing. Presently, decommissioning of fishing vessels or converting them for other uses is widely used.\textsuperscript{72} This measure has its inherent weakness. The UK’s decommissioning scheme, which is targeted at removing excess vessels, shows that this measure only addressed the problem of too many fishing vessels chasing too few fish, but failed to address the increased efficiency of the remaining fishing fleet, which means that the true level of capacity reduction is likely to be less than it appears.\textsuperscript{73}

Another problem with the decommission measure is that unless reasonable compensation is paid to both the vessels owners and crew members who would be affected by such exercise, fishing states are not likely to give full support to it. The obvious reasons are first, millions of people employed in the fishing industry will lose their jobs and secondly, declining investment in fishing will have a negative impact on their economies. The huge success recorded from the 1996 U.S.-Italy Driftnet Agreement under which a compensation of US$235 million was paid to 85 percent (%) of Italy’s driftnet fleet of 679 vessels, which were either converted to other fishing methods or scrapped by March 2000,\textsuperscript{74} suggests that establishing an international fund for the purpose of decommissioning

\textsuperscript{70} Articles 7.2.2 (a) and 7.6.3, Code.
\textsuperscript{71} Article 7.6.2, Code.
\textsuperscript{73} For a detailed analysis of the effect of increase in fishing vessel efficiency on fishing capacity reduction using decommissioning measures, see Pascoe, S. and Coglan, L., \textit{op.cit}. The authors argue that although their analysis is specific to the UK’s beam and other trawlers, it is likely that similar variations in efficiency are present in other European fleets. Apart from fishing vessel efficiency, other factors like fleet tonnage, engine power and other indicators of technology change including the use of spotter planes, satellites and sonar system are capable of increasing fishing capacity even when the number of fishing vessels has been reduced. See Price, T. M. (2005) “Negotiating WTO Fisheries Subsidy Disciplines: Can Subsidy Transparency and Classification Provide the Means Towards an End to the Race for Fish?” \textit{Tulane Journal of International and Comparative Law}, Vol. 13, Issue 1, pp. 141-175 at p. 150.
\textsuperscript{74} See The 2004 Report of the Secretary of Commerce to the Congress of the United States concerning U.S. Actions taken on Foreign Large-Scale High Seas Driftnet Fishing Pursuant to Section 206(e) of the Magnuson-Stevens Fishery Conservation and Management as Amended by Public Law 104-297, The Sustainable Fisheries Act of 1996, pp 14-17 available at
of fishing vessels or converting them for other uses may be one of the best solutions. Unless such a fund is established, countries having excess fishing capacity may not be willing to accept either the Code’s provision or RFMOs measures on capacity reduction.

4.5.6 Building of Depleted Stock

The Code is very explicit on the measures, which should be taken to maintain underexploited stock at sustainable levels or build stocks that are depleted or threatened with depletion.\textsuperscript{75} The most direct way of rebuilding depleted stocks is for states and other users of fishery resources to encourage sustained recovery or restoration of the stocks.\textsuperscript{76} One of the factors responsible for stock depletion is the use of non-environmentally safe gear. In order to address the problem, states are to ensure that fishing gear, methods and practices employed in fishing by their nationals and other persons authorised by them are sufficiently selective, environmentally safe and cost effective to avoid waste, discards, and catch by lost or abandoned gear. In addition, states should only authorise the use of fishing gear that has no negative impacts on target and non-targeted fish, in particular endangered species, non-fish species and critical aquatic habitats.\textsuperscript{77}

For states to be able to meet the foregoing responsibilities, they have to enact laws and regulations on selective use of fishing gear bearing in mind the range of selective fishing gear, methods and strategies used in the industry. They should phase out and replace fishing gear, methods and practices that are not consistent with responsible fishing with more acceptable alternatives.\textsuperscript{78} Furthermore, states are urged to adopt technical measures relating to fish size, mesh size or gear, discards, closed seasons as well as areas and zones reserved for selected fisheries, particularly artisanal fisheries and to protect juveniles and spawners.\textsuperscript{79} Achieving such a condition would be possible if conflicts of interest among different fishers are avoided and the social impacts as well as the cost-effectiveness of conservation and management measures adopted are taken into consideration.\textsuperscript{80} Lastly, considering the importance of habitat to the success of any conservation and management

\textsuperscript{75} Article 7.6.10, Code.
\textsuperscript{76} Articles 7.2.2 (e) 7.6.10, Code.
\textsuperscript{77} Articles 7.2.2 (g) and 7.6.9, Code.
\textsuperscript{78} Article 7.6.4, Code.
\textsuperscript{79} Article 7.6.9, Code.
\textsuperscript{80} Articles 7.6.5 and 7.6.7, Code.
measures, the Code admonishes states to restore critical habitats adversely affected by fishing and other human activities.\textsuperscript{81}

At the international level, states are encouraged to cooperate and take into account the need for the transfer of technology, joint conduct of research on selective fishing gear, fishing methods and strategies.\textsuperscript{82} Despite the soundness of these provisions, states have to develop a strong political will to implement them. Considering the importance of technology to the developed states in the new world order, it is difficult to say with certainty that they will, in utmost good faith, participate in joint research or set fair and reasonable conditions for transfer of technology to the developing states.

4.5.7 **Pollution**

Unlike the Convention where fisheries provisions were silent on marine pollution, the Code urges States to minimise pollution from fisheries activities and external sources in the aquatic environment, especially in critical habitats like wetlands, mangroves, lagoons and reefs, which serve as nurseries and spawning areas.\textsuperscript{83} It prohibits dynamiting, poisoning and other comparable destructive fishing practices.\textsuperscript{84}

4.5.8 **Fisheries Research**

The requirement that decisions on conservation and management measures should be taken on the basis of the best scientific evidence available can hardly be fulfilled in the absence of sound scientific research on fisheries and associated ecosystems.\textsuperscript{85} Similarly, the requirement to maintain the efficacy of conservation and management measures by continuously revising or abolishing them in the light of new information is difficult to meet in the absence of best scientific evidence.\textsuperscript{86} In order to fulfil these requirements, which are designed to guarantee flexibility in the implementation of conservation and management measures, states should ensure that appropriate research is conducted into all aspects of fisheries,\textsuperscript{87} effects of climate, environmental factors, socio-economic factors and nutritional science.\textsuperscript{88} Apart from timely collection of complete and reliable statistics on

\textsuperscript{81} Article 7.6.10, Code.
\textsuperscript{82} Articles 8.5.1 and 8.5.4 of the Code.
\textsuperscript{83} Articles 6.8 and 8.9.1 (d), Code.
\textsuperscript{84} Article 8.4.2, Code.
\textsuperscript{85} This fact is emphasised in Article 12.1, Code.
\textsuperscript{86} Article 7.6.8, Code.
\textsuperscript{87} Article 7.4.2, Code. For fisheries data to be accepted as being reliable and accurate for use in determining the status of fisheries and ecosystems, it must include data on bycatch, discards and waste. Article 12.4, Code
\textsuperscript{88} See also Article 7.4.5 where the Code calls on states to ensure their involvement in data gathering, analysis and research on social, economic and institutional factors. The most comprehensive list of what fisheries research should include is provided for in Article 12.1 which states that research should be conducted into all
catch and fishing efforts as well as verification of such data, it is clear that fisheries research should include fishery related and other supporting scientific data.\textsuperscript{89} In the case of SHMFS, the Code emphasises the need for collaborative technical and research programmes to improve understanding of their biology, environment and status.\textsuperscript{90}

The Code jettisons the Convention and the FSA’s idea of only relying on the best scientific evidence to determine which conservation and management measures to adopt. States and RFMOs are now required to also take into account traditional knowledge of the resources and their habitats, which is evident in the traditional practices of indigenous people and local fishing communities, before taking decisions on conservation and management of fishery resources.\textsuperscript{91} The Code sets the condition for determining the type of traditional knowledge and practices which states should take into account by providing that

\begin{quote}
States should investigate and document traditional fisheries knowledge and technologies, in particular those applied to small-scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development.\textsuperscript{92}
\end{quote}

Based on this provision, states are expected to assess whether traditional fisheries knowledge is useful in the pursuance of sustainable fisheries conservation, management and development. In fact, the Code encourages states to document such traditional fisheries knowledge.\textsuperscript{93} The aim of integrating indigenous knowledge and traditional practices into fisheries management is to empower indigenous people by ensuring their participation in fishery resources management.\textsuperscript{94}

Another unique aspect of the Code’s provisions on research is the emphasis on making available research findings to interested parties, including RFMOs. Achieving this depends

\footnotesize{\begin{quote}
\textsuperscript{89} Articles 7.4.4 and 7.4.6, Code. \\
\textsuperscript{90} Article 12.17, Code. \\
\textsuperscript{91} This change is traceable to the Rio Declaration and Agenda 21. See Para 22 of Rio Declaration and Paragraph 26.3(a)(iii), Chapter 26 of Agenda 21. \\
\textsuperscript{92} Article 12.12, Code. \\
\textsuperscript{93} This idea also underpins Para 17.82 (c) of Agenda 21 which urges States to develop, at the national level, systems for the acquisition and recording of traditional knowledge concerning marine living resources and environment and promote the incorporation of such knowledge into management systems. See also Article 8(j) of the Convention on Biological Diversity, 31 I.L.M. 818 (1992). \\
\textsuperscript{94} Para 26.3(a) (iii), Chapter 26 of Agenda 21. On indigenous peoples’ participation in environmental management, see generally Firestones, J., Lilley J. and Noronha, I. T. de (2005) “Cultural Diversity, Human Rights, and the Emergence of Indigenous People in International and Comparative Environmental Law”, American University International Law Review, Vol. 20, Issue 2, pp. 219–298 at pp. 242-262 where the authors examine the extent to which some international hard and soft laws have recognised the right of indigenous people to participate in the sustainable management of their natural resources.
\end{quote}}
on efficient data collection, data analysis, publication and dissemination of research findings and results in a timely and agreed format, taking into consideration the applicable rules of confidentiality. Presently, most developing states lack the capacity to manage their fishery resources, including conducting fisheries research. In an attempt to solve this problem, the Code recommends that states and relevant international organisations should enhance the research capacity of the developing states. Aside from other recommendations of the Code on research, in 2003, the FAO Council adopted the Strategy for Improving Information on Status and Trend of Captured Fisheries. The overall objective of the Strategy for Improving Information on Status and Trend of Captured Fisheries is to provide a framework strategy for the improvement of knowledge and understanding of status and trends of captured fisheries. To achieve this objective, the Strategy for Improving Information on Status and Trend of Captured Fisheries identifies six guiding principles and a nine point action plan with primary emphasis on the need for capacity building in developing states.

4.6 Promoting Responsible Fisheries Using Other Measures

4.6.1 Aquaculture

It is difficult to restore depleted captured fish stocks or maintain the sustainability of healthy ones if the present pressure on stocks continues. In order to reduce the pressure on stocks and still meet global demand for fish, the Code sets the standard on how to conduct responsible aquaculture development in areas under national jurisdiction and within transboundary aquatic ecosystems. The Code recommends that the development of aquaculture should be under an established legal and administrative framework, because of

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95 Articles 7.4.7 and 12.3, Code.
96 Articles 12.1 and 12.18 Code. It is only by enhancing the research capacities of the developing countries in the areas of data collection and analysis, information, science and technology, human resource development and provision of research facilities that they can participate effectively in the conservation, management and sustainable use of fishery resources within their jurisdiction and on the high seas. Ibid, Article 12.18, Code.
97 For example, the Code urges states and RFMOs to be involved in researching areas such as environmental and social impact of fishing gear (Articles 8.4.8 and 12.11 Code); use of artificial structures for increasing stock population (Article 8.11.1, Code); Coastal area management (Article 10.2.5, Code); adverse health impact on consumers that may result from aquatic environments (Article 12.9, Code); setting objectives, reference points and performance criteria (Article 12.13, Code); selectiveness with regard to fishing gear, methods and practices (Article 8.5.3); environmental and social impact of fishing gear (Articles 8.4.8 and 12.10); fish technology and quality assurance (Article 11.1.6); ensure optimum utilisation of fisheries resources (Article 12.7); impact assessment of new fishing gear (Article 12.11) and traditional fisheries knowledge and technologies (Article 12.12).
98 Para 12, Strategy for Improving Information on Status and Trend of Captured Fisheries.
99 The principles are sustainability, best scientific evidence, participation and cooperation, Objectivity and transparency, timeliness and flexibility. See generally Part 4, Strategy for Improving Information on Status and Trend of Captured Fisheries.
100 For other actions plan, see Part 5, Strategy for Improving Information on Status and Trend of Captured Fisheries.
101 Article 9.1 and 9.2, Code.
the environmental and health hazards associated with it. The measures recommended in the Code centre on the following themes: introduction and transfer of organisms, genetic diversity and ecosystem integrity, environmental impact assessment and monitoring, data collection, sharing and dissemination, and cooperation. States are further urged to adopt measures on research, use of feeds and chemicals, participation of fish farmers and product quality.

4.6.2 Integration of Fisheries into Coastal Area Management

In the last fifty years or so, the shift in economic and developmental activities globally to the coastal areas and the coastward movement of people have escalated the rate of conflicts within the fisheries sector, on one hand, and between the fisheries sector and other sectors operating within these areas, on the other. Because of the multiple interests competing in coastal areas states are required to adopt an appropriate policy, legal and institutional framework for the sustainable and integrated use of the coastal resources, including fish. Any measures adopted by states for the protection and management of coastal resources should take into account the fragile and finite nature of the coastal ecosystems and their resources. As an additional measure, states should take into account customary practices of the coastal fishing communities to the extent that they are compatible with sustainable development. The Code emphasises the need for consultation with and participation of all the stakeholders, including the coastal communities, in the decision-making processes. Insofar as it is possible, states should adopt fisheries practices that avoid conflict and establish administrative procedures and mechanisms for settling any conflicts.

102 Article 9.3.1, Code.
103 Article 9.1.2, Code.
104 Article 9.1.5, Code.
105 Article 9.2.5, Code.
106 Article 9.3.2, Code.
107 Article 9.3.5, Code.
108 Articles 9.4.3 and 9.4.5, Code.
109 Article 9.4.2, Code.
110 Article 9.4.7, Code.
112 Conflicts within the fisheries sector occur between (i) coastal and industrial fisheries, (ii) captured and aquaculture fisheries (iii) the use of different types of gear in coastal waters.
113 Article 10.1.1, Code. Authority or authorities representing the fisheries sector in the coastal management process should have the appropriate technical capacities and financial resources. Article 10.4.2, Code.
114 Article 10.1.1, Code.
115 Articles 10.1.2 and 10.2.1, Code.
116 Articles 10.1.4 and 10.1.5, Code.
States should promote multi-disciplinary research and public awareness of policy measures adopted by them for the protection and management of coastal resources.\(^{117}\) Decisions on such measures should take into account the risks and uncertainties involved, as well as an assessment of the economic, social and cultural value of the resources.\(^{118}\) As part of the coastal management process, states are required to promote the use of physical, chemical, biological, economic and social parameters to monitor their coastal environments.\(^{119}\) Where activities have adverse transboundary environmental effects on coastal states, states should provide timely information and, if possible, prior notification to potentially affected states. They are required to consult among themselves as early as possible.\(^{120}\) The effective way to integrate fisheries into coastal area management is through cooperation at the sub regional, regional and between neighbouring coastal States. This involves coordination of national authorities in the areas of planning, development, conservation and management of coastal areas.\(^{121}\)

### 4.6.3 Post-harvest Practices and Trade

In Article 11, the Code recommends a plethora of post-harvest practices and trade measures for states adoption. The said article reveals four broad measures, namely consumers’ protection, trade liberalisation, environmental protection, and fisheries conservation.

As a way of promoting responsible utilisation of fisheries, the Code calls on states to take measures that will guarantee consumers safe, wholesome and unadulterated fish.\(^{122}\) For these measures to be effective, states should establish minimum standards for safety and quality of fish and fisheries products that is applicable in the whole industry.\(^{123}\) The implementation of quality assurance standards should be set in accordance with the FAO/WHO Codex Alimentarius Commission and other relevant organisations.\(^{124}\) Article 11.1.2 of the Code urges States to establish national systems that will protect consumers’ health and also prevent commercial fraud. At the international level, the effectiveness of

\(^{117}\) Articles 10.2.1 and 10.2.5, Code.
\(^{118}\) Articles 10.2.1 and 10.2.3, Code.
\(^{119}\) Articles 10.2.1 and 10.2.4, Code.
\(^{120}\) Article 10.3.2, Code.
\(^{121}\) Articles 10.3.1, 10.3.3, and 10.4.1, Code.
\(^{122}\) Article 11.1.1, Code.
\(^{123}\) Article 11.1.3, Code.
\(^{124}\) Ibid.
these rights depends on cooperation by states to achieve harmonisation or mutual recognition of national sanitary measures and certification programmes.\textsuperscript{125}

The conduct of liberalisation of trade in fish and fishery products should be in accordance with the principles, rights and obligations under the World Trade Organisation (WTO) Agreements, especially the Agreement on the Application of Sanitary and Phytosanitary Measures and the Agreement on Technical Barriers to Trade of the WTO.\textsuperscript{126} Trade in fish and fishery products should also comply with international agreements on endangered species.\textsuperscript{127} The Code integrates the basic principles of free trade, including transparency,\textsuperscript{128} non-discrimination,\textsuperscript{129} elimination of barriers and distortions to trade such as duties, quotas and non-tariff barriers,\textsuperscript{130} and equity.\textsuperscript{131} Article 11.3 of the Code elaborates on the features which states should ensure that their laws, regulations and administrative procedures on international trade in fish and fisheries products should possess.\textsuperscript{132} The Code recognises the nutritional rights of people for whose health and well-being fish is critical and for whom other comparable sources of food are not readily available or affordable. In order to safeguard this right, the Code frowns on trade and export production in fish that adversely impacts on this right.\textsuperscript{133} Indeed, with the exception of the 1973 Convention on International Trade on Endangered Species of Wild Fauna and Flora,\textsuperscript{134} which restricts trade in a few endangered fish species, the Code is the first international fisheries instrument to consider, in comprehensive terms, trade implications on fisheries.

With regard to protection of the environment, states, aid agencies, multilateral development banks and other relevant financial institutions should ensure that their policies to promote international fish trade and export production do not result in

\textsuperscript{125} Article 11.1.4, Code.
\textsuperscript{126} One of such principles is the non-discriminatory nature of fish trade measures. See Article 11.2.4, Code.
\textsuperscript{127} Article 11.2.9, Code.
\textsuperscript{128} Article 11.2.3, Code.
\textsuperscript{129} Articles 11.2.4 and 11.2.14, Code.
\textsuperscript{130} Article 11.2.5, Code.
\textsuperscript{131} Article 11.2.14, Code.
\textsuperscript{132} Thematically, the features include transparency, simplicity, consultation and participation of the industry, environmental and consumer groups in development and implementation, periodical review, and harmonisation of standards according to international law. Other features are collection, dissemination and timely exchange of statistical information, prompt notification of interested states, WTO and other international organisations of changes in law on international trade, and consultation and giving those that will be affected by such change sufficient information and time to implement them. See generally Articles 11.3.1 to 11.3.8, Code.
\textsuperscript{133} Article 11.2.15, Code.
\textsuperscript{134} The Text of this Convention is available at http://www.cites.org/eng/disc/text.shtml last visited May 20, 2005.
environmental degradation. The Code specifically urges states to consider the environmental effects of post-harvest activities in the development of related law, regulations and policies without creating market distortions. More particularly, states and relevant organisations have to take into account the environmental impact of projects initiated by them to improve post-harvest handling of fish. Lastly, the Code encourages the development of international agreements for the regulation of trade in live specimens, where there is risk of environmental damage in importing or exporting states. Other environmental provisions, particularly Articles 11.1.7 and 11.1.8(c), which have some elements of climate change, are examined in the next part.

Apart from the foregoing general provisions on protection of the environment, the Code contains a number of specific provisions aimed at ensuring that international trade in fish and fisheries products does not undermine fisheries conservation. To start with, whether trade in fish and fisheries products takes place at the international or domestic level, it is necessary that it accords with sound conservation and management practices. The Code does not define the adjectival word “sound”, but the specific conservation and management measures mentioned under Article 11 give a clue to the type of measures which states are expected to adopt. For instance, measures such as identification of the origin of fish and fisheries products, certification programmes, establishment of mutually recognised control and certification agencies, and research in fish technology could be termed as being sound within the context of Article 11. Other measures include reduction in post-harvest losses and waste, and improvement in the use of bycatch. The Code stresses the importance of states’ cooperation and participation in regional and international institutions in order to ensure compliance with free trade rules as well as fisheries instruments.

The novel manner in which the FAO Open-ended Technical Committee addressed the world fish crisis under Article 11 merits some commendations. The Code gives states with the responsibility of not just encouraging the use of fish for human consumption but

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135 Article 11.2.15, Code.
136 Article 11.1.12, Code.
137 Article 11.1.6, Code.
138 Article 11.2.10, Code.
139 Article 11.2.2, Code. The verbosity of the Code can also be illustrated here with the Code later providing that international trade in fish and fisheries should not compromise the sustainable development of fisheries and responsible utilisation of living aquatic resources. See Article 11.2.2, Code.
140 Article 11.1.11, Code.
141 Ibid.
142 Article 11.1.4, Code.
143 Ibid.
144 Article 11.1.6, Code.
actually promotion consumption of fish whenever appropriate by its citizenry. Vesting states with this responsibility indirectly shows the FAO’s deep concern over the large amount of fish processed for animal feed and the unsustainable patterns of human consumption of fish. The phrase “whenever appropriate” underscores the latter concern of the FAO. Until the adoption of the Code, none of the UN fisheries instruments seriously addressed the problem of unsustainable patterns of utilisation or consumption of fish identified in the Rio Declaration as one of the factors that contributes to the depletion of natural resources generally. Analysis of the provision of Article 11.1.9 in conjunction with some of the trade provisions in the Code indicates that the Code adopts a demand and supply approach towards solving the world fish crisis. The appropriateness of this approach is that overexploitation of fishery resources would not have been possible if there was no excessive demand for fish and fishery products. The Code goes beyond the supply-related approach of other IFL Instruments, by addressing one of the root causes of the world fish crisis.

The realistic manner in which the Code addresses the problem of bycatch is also worth mentioning. While it is true that development in the technology and enforcement of environmentally safe gear and nets by all states will continue to reduce the rate of bycatch, it is impossible to completely eradicate bycatch from fishing. Fishers have recently started to process bycatch fish into value-added products for human consumption instead of dumping bycatch in the sea or processing it only for animal and aquaculture feed. The Code encourages this by urging states to improve the use of bycatch and to cooperate in order to facilitate the production of value-added products by developing countries. Unfortunately, the Code targets only the developing states as if bycatch is a problem associated only with them.

4.6 Impact of Climate Change on Fish Stocks

The Code does not specifically mention the impact of climate change on fish among the measures listed under Articles 7.2.2 (a-g) and 7.6 or in any other article. However, people who are optimistic about the Code’s ecosystem approach to fisheries management may

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146 Article 11.1.9, Code.
147 Principle 8 of Rio Declaration urges States to reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies. All IFL instruments completely ignore the demographic aspect of this recommendation. Article 62(1) of the Convention and Articles 5(a) and 7(2)(b) of the FSA only mandate states to promote the objective of optimum utilisation of fish. Although this must be done within the context of conservation and management measures adopted by them, the vexed issue of unsustainable pattern of utilisation or consumption was not specifically addressed.
148 Articles 11.1.8(b) and 11.1.10, Code.
argue that by calling on states to promote and develop the research capacity necessary to assess the “effects of climate” or “environmental change” on fish stocks and aquatic ecosystems, the Code has integrated the impact of climate change into fisheries management.\(^\text{149}\) It could also be argued that emission of GHGs from fishing and associated activities are among human activities that have adverse environmental impacts on fish or threaten the health and viability of fish.\(^\text{150}\)

Sound as these arguments may be, it should not be forgotten that when the Code was adopted in 1995 climate change was already a topical issue. If the FAO Open-ended Technical Committee, which revised and approved the final text of the Code before its adoption by the FAO Council, had intended the meaning of “effects of climate” or “environmental change” to include human-induced climate change, then it would probably have used the words “climate change.” After all, the Code is very specific in the first sentence of Article 12.5 in listing the major threats that affect fish stock biomass as fishing pressure, pollution and habitat alteration. Secondly, in 1995, while the US and its allies would not object to asking states to address the impacts of natural variations in climate on fish, they certainly would have objected to integration of climate change into fisheries management. This notwithstanding, the mere fact that the Code acknowledges the impossibility of achieving sustainable development of fishery resources without taking into account natural variations in climate, has in the face of the current global warming supported the integration of human-induced climate change into marine fisheries management. What is more, including climate change into the purposeful interpretation of the words “environmental change/factors”, “human activities” and “pollution” is relatively easy since the Code has established the interconnection between responsible fisheries and the protection of marine environments\(^\text{151}\) and the atmosphere.\(^\text{152}\)

A purposeful interpretation is also required when construing Article 7.6.8 of the Code, which urges states to keep the efficacy of conservation and management measures under continuous review and to revise or abolish measures taken in that regard in the light of new information. Based on Article 7.4.6 of the Code, the scope of the information covers

\(^{149}\) Articles 7.4.2 and 12.5, Code.

\(^{150}\) Article 6.8 and 7.2.2(f), Code.

\(^{151}\) Article 8.7 of the Code urges States to introduce and enforce laws and regulations for the protection of the aquatic environment by owners, charterers and managers of fishing vessels based on the International Convention for the Protection of Pollution from Ships 1973 as modified by the MARPOL 73/78.

\(^{152}\) Article 8.8.1 of the Code generally urges States to protect the atmosphere through reduction of dangerous substances in exhaust gas emission. Articles 8.8.2 – 8.8.5 urge States to reduce the substances (chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and Halons) that led to depletion of the ozone layer.
fishery-related and other supporting scientific data relating to fish stocks, which states are expected to compile and exchange. The obligation on states to disseminate results from fisheries research to interested parties is to enable such interested parties integrate new information into their conservation and management measures.\textsuperscript{153} Today, the most important environmental challenge facing humanity is climate change. It will therefore be absurd for anyone who is conversant with the implications of present global warming on marine fishery resources to ignore climate change in the process of identifying what new information to consider when reviewing conservation and management measures.

The provisions of the Code relating to energy optimisation and utilisation implicitly take into account the need for states to include the impact of climate change on marine fish stocks among the measures adopted for their conservation and management. Article 8.6.1 of the Code urges states to promote the development of appropriate standards and guidelines, which will lead to a more efficient use of energy in harvesting and post-harvest activities within the fisheries sector. As a way of strengthening the aforementioned provision, Article 8.6.2 of the Code goes further to urge states to promote the development and transfer of technology in relation to energy optimisation within the fisheries sector and, in particular, encourages owners, charterers and managers of fishing vessels to fix energy optimisation devices to their vessels. The implication of these two Articles becomes clearer if read in conjunction with Articles 8.8.1 and 11.1.8(c) of the Code.

Article 8.8.1 provides thus: “States should adopt relevant standards and guidelines which would include provisions for the reduction of dangerous substances in exhaust gas emissions.” On the other hand, Article 11.1.8(c) provides that “States should encourage those involved in fish processing, distribution and marketing to...(c) use the resources, especially water and energy, in particular wood, in an environmentally sound manner.”\textsuperscript{154} The relevant words in these two provisions, which need to be read in conjunction with Article 8.6, are “exhaust gas emissions” (Article 8.8.1) and “wood” (Article 11.1.8(e)). Technically, exhaust gas emissions are the result of burning of carbon stored as fossil fuel deposits. This process contributes to global warming despite the fact that global fisheries only consumed approximately 1.2% of the total global fuel consumption and emitted 134

\textsuperscript{153} Article 7.4.2 of the Code.

\textsuperscript{154} As a matter of fact, Articles 8.8.1 and 11.1.8(c) particularise the general responsibility on states under Article 11.1.7 of the Code to ensure that processing, transporting and storage methods are environmentally sound.
million t of CO$_2$ into the atmosphere.\textsuperscript{155} The importance of using wood in an environmentally sound manner refers to the role of trees as carbon sinks, and source, and problems associated with deforestation.\textsuperscript{156} Deforestation is the second greatest contributor to global GHG emissions, accounting for 20\% of all emissions.\textsuperscript{157}

While the responsibility of optimising utilisation of fossil fuel will be borne more by the developed countries, Article 11.1.8(c) targets developing countries where one of the reasons for deforestation is using wood as an energy source. Currently, GHG emissions from the fisheries sector is quite insignificant, but with overcapitalisation of the fishing industry and increasing dependence on firewood by the local fishing communities in developing countries the contribution of the fishing sector to GHG emissions is likely to increase. The Code integrates climate change into fisheries management by indirectly urging states to take measures that will reduce emissions of GHGs into the atmosphere.

The Code, in clear and emphatic language, adjures owners, charterers and managers of new fishing vessels to ensure that their vessels are fitted with equipment to reduce emissions of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), which are scientifically proven as the cause of ozone layer depletion.\textsuperscript{158} Those operating old vessels are required to refit their vessels with alternative refrigerants to CFCs and HCFCs.\textsuperscript{159} Owners and managers of firefighting equipment are required to use alternatives gases to Halons, which deplete the ozone layer.\textsuperscript{160} The competent authorities are to make provisions for the phasing out of CFCs and HCFCs, as well as ensuring that the shipbuilding industry and other affected industries, such as refrigerating companies, comply with such

\textsuperscript{155} Tyedmers, P. H., Watson, R. and Pauly, D. (2005) “Fuelling Global Fishing Fleets”, Ambio, Vol. 34, No. 8, pp. 635-638 at p. 636. It is crucial to note that this estimate does not account for fuel consumption by freshwater fisheries, IUU fishing and indirect energy inputs associated with the provision of fishing vessels, gear, labour, or the fuel itself. \textit{Ibid}. Increasingly important, the data presented by Tyedmers, Watson and Pauly and the recent claim by the International Maritime Organisation (IMO) that domestic shipping and fishing contribute 0.6\% of global CO$_2$ emissions do not take into account majority of developing states’ fisheries. Tyedmers, P. H., Watson, R. and Pauly, D., op. cit., p. 636. See particularly Figure 1 which shows the distribution of case studies from which fisheries-specific estimates of fuel use intensity were derived. See also International Maritime Organisation (2009) “Executive Summary” Second IMO GHG Study 2009, London: IMO, pp. 1-9 at p. 3

\textsuperscript{156} The concept of carbon sinks is the natural ability of trees, other plants and the soil to soak up carbon dioxide and temporarily store carbon in wood, roots, leaves and the soil. As sources, when wood decays or is burnt, the stored carbon dioxide is released back into the atmosphere.


\textsuperscript{158} Article 8.8.2, Code.

\textsuperscript{159} Article 8.8.4, Code.

\textsuperscript{160} \textit{Ibid}.
provisions.\textsuperscript{161} While CFCs and HCFCs are widely known to deplete the ozone layer, their presence in the atmosphere also contributes to global warming. Although the FAO Open-ended Technical Committee may not have intended to address the climate change problem using the specific provisions of Article 8.8.2 to 8.8.5 in the Code, this, in effect, is what it has done.

4.8 Compliance with Conservation and Management Measures under the Code

The Code adopts two approaches to ensure its implementation and enforcement. First, the Code establishes an institutional mechanism to ensure that member states and all those concerned with the conservation, management and utilisation of fishery resources and trade in fish and fishery products collaborate in the fulfilment and implementation of its objectives and principles.\textsuperscript{162} The FAO, through its Secretariat, has the institutional role of monitoring and reporting to the Committee on Fisheries (COFI) on the application and implementation of the Code as well as its effects on fisheries.\textsuperscript{163} All states and international organisations are urged to actively cooperate with the FAO in achieving its assigned role.\textsuperscript{164} With this provision, the Code becomes the first UN fisheries instrument to establish an institutional mechanism to monitor implementation by states and its effects on fisheries. Importantly to, the FAO is required to revise the Code based upon new developments in fisheries. The integration of a review process into the Code’s implementation mechanism ensures that the Code responds to frequent changes in the fishing industry brought about by rapid development in technology and constant changes in biological and socio-economic factors. The institutional role of the FAO is restricted only to monitoring, reporting and review, but these mechanisms are effective tools for ensuring compliance by states and non-state actors with international law.\textsuperscript{165}

Secondly, the Code focuses on states as the main institution responsible for its implementation and enforcement. The Code urges states to put in place an effective legal and administrative framework at the local and national level that will enable them to

\textsuperscript{161} Article 8.8.3, Code.
\textsuperscript{162} Articles 4.1 and 4.2 Code. In Annex 2 entitled “Resolution” the Conference further extended the responsibility of the FAO to include monitoring and reporting on actions taken under other instruments and resolutions by UN organisations and, in particular, the resolutions adopted by the General Assembly to give effect to the FSA. See in particular Para 6. As usual, reports on the implementation of the Code is prepared based on information collated and analysed on the basis of self-assessment questionnaires submitted to FAO by member states. See FAO (2007c) Progress in the Implementation of the 1995 Code of Conduct for Responsible Fisheries, Related International Plans of Action and Strategy, COFI/2007/2, Rome: FAO, p. 2.
\textsuperscript{163} Article 4.3, Code.
\textsuperscript{164} Article 4.2, Code.
implement and ensure compliance with and enforcement of the prescribed conservation and management measures. The truth is that unless states are prepared to address the problem of delay in trial for violations of fisheries law and unnecessary bureaucratic processes, compliance by fishers with conservation and management measures will still remain at a low level. Indeed, a critical analysis of the Code reveals that it directs states to adopt most of the strategies on implementation and enforcement of conservation and management measures that are entrenched in the Compliance Agreement and the FSA. The Code assigns to all states, flag states and port states the responsibility of ensuring that the conduct of fishing is done in a responsible and sustainable manner. RFMOs are only required to promote and, where appropriate, implement the enforcement measures adopted by the states. There is no doubt that the concentration of implementation and enforcement powers on states will water-down the importance of RFMOs.

Concerning the implementation of the Code by developing countries, the Code urges states, relevant intergovernmental and NGOs, and financial institutions to adopt measures that will assist developing states, especially in the areas of financial and technical assistance, technology transfer, training and scientific cooperation and in enhancing their ability to develop their own fisheries as well as to participate in high seas fisheries, including access to such fisheries. Unfortunately, like the previous UN fisheries instruments, the Code fails to address the problems of poverty, rising populations and foreign debt in these countries, which are among the primary reasons why they over-exploited their natural resources including fish. Whatever yardstick is used to rank the

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166 Articles 6.10 and 7.7.1, Code.
167 Such measures include observers programmes and inspection schemes (Article 7.7.3, Code), severity of sanction including refusal, withdrawal and suspension of authorization to fish (Articles 7.7.2 and 8.2.7, Code) and authorisations to serve as masters or officers of a fishing vessel (Article 8.1.9, Code), authorisation of fishing activities (Article 8.1.1, Code), maintaining and updating authorisation records (Article 8.1.2, Code), maintaining and updating statistical data on fishing operation (Article 8.1.3, Code), cooperation with regards to MCS and enforcement of conservation measures on the high seas (Article 8.1.4, Code), registration of fishing vessels and issuing them with Certificate of Registration (Article 8.2.2, Code), marking of fishing vessels (Article 8.2.3, Code), and marking of fishing gear (Article 8.2.4, Code).
168 Article 7.7.3, Code. As a matter of fact, the duty to “promote” does not seriously add to the responsibility of RFMOs to collaborate in the fulfilment and implementation of the objectives and principles contained in the Code. Article 4.1, Code.
169 Article 5, Code. Note that these areas have been further elaborated in other sections of the Code.
170 The Brundtland Report illustrated this fact by reference to the famine in some African countries during the 1980s. Although the immediate cause was drought, its underlying causes were more complex. They included rapidly rising populations and debts owed by African countries. In order to feed their teeming population and meet the repayment or servicing conditions for their debts, African nations have over-exploited their natural resources. The truth is that both land and marine resources have been over-exploited. In fact, the last decade has witnessed the shifting of attention from depleted land natural resources to marine living resources by most developing coastal states. See generally, Thornton, J. & Beckwith, S. (2004) Environmental Law, London: Sweet & Maxwell, p. 12.
risk assessment of the perils posed by poverty against other factors that contribute to the marine fish crisis, poverty will rank among the most important and urgent.\textsuperscript{171}

In order to avoid unnecessary repetition of issues earlier examined in Chapter 3 under implementation and enforcement measures, this section only discusses novel enforcement measures introduced in the Code.

\subsection*{4.8.1 All States}

The Code urges all states to maintain records of the authorisations to fish and fishing operations issued and allowed by them respectively.\textsuperscript{172} All states should ensure that fishing operations within waters under their jurisdiction are carried out in a responsible manner.\textsuperscript{173} In addition, they should cooperate to establish systems for monitoring, control, surveillance and enforcement of conservation and management measures in waters outside their national jurisdiction.\textsuperscript{174} The Code further requires all states to maintain records of fishers, which incorporate their service and qualifications, including certificates of competency.\textsuperscript{175} By keeping such records, owners of fishing vessels can easily find out which seafarers have a good record for employment. All states should integrate fishing into their maritime search and rescue systems.\textsuperscript{176} This measure aims to protect life at sea,\textsuperscript{177} but it is also very effective in determining whether or not a vessel is fishing in a prohibited area.

Lack of capacity building has been one of the factors hindering enforcement of conservation and management measures. In order to address the problem, the Code urges states to enhance the education, skills and, where appropriate, professional qualifications of fishers.\textsuperscript{178} Article 4.4 also calls on states and international organisations to promote the understanding of the Code by introducing, where practicable, schemes that would ensure voluntary acceptance and effective application of the Code. Furthermore, states are required to inform all those engaged in fishing operations of the most important provisions of the Code and other fisheries instruments that are essential to responsible fishing

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\textsuperscript{172} Articles 8.1.2 and 8.1.3, Code.
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\textsuperscript{173} Article 8.1.1, Code.
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\textsuperscript{174} Article 8.1.4, Code.
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\textsuperscript{175} Article 8.1.8, Code.
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\textsuperscript{176} Article 8.1.6, Code.
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\textsuperscript{177} This measure further strengthens states’ duty to adopt health and safety standards for seafarers which should not be less than the minimum requirement under relevant international agreement. Article 8.1.5, Code.
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\textsuperscript{178} Article 8.1.7, Code.
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operations. Unfortunately, the Code neither elaborates on the sort of scheme that states should introduce nor provides a yardstick that will guide states in choosing from the nine closely inter-related themes in which the Code is subdivided. Experience over the years has shown that because states identified fishing management and aquaculture as the most important themes, they regarded the other aspects of fisheries covered in the Code as inconsequential, thereby relaxing their implementation.

On how to tackle the problem of reflagging of fishing vessels, the Code urges states to encourage their banks and financial institutions to refrain from making, as a condition of loan and mortgage, the flagging of fishing vessels or fishing support vessels in a jurisdiction other than that of the state of beneficial ownership. Such a requirement should be discouraged, especially where it has the effect of increasing the likelihood of fishing vessels not complying with international conservation and management measures. A few problems may hinder the implementation of this provision. First, unless a vessel has a known history of violating international conservation and management measures it is difficult for the banks and financial institutions to know the intention of those responsible for the reflagging of the vessel. Secondly, the directors of banks and financial institutions may not perform in good faith their corporate social responsibility of protecting the environment, including ensuring sustainable use of fishery resources, where it reduces the profitability of their businesses. This is likely to be the case especially now that the world is experiencing economic recession.

4.8.2 Flag States

Apart from reiterating the enforcement measures contained in the FSA and the Compliance Agreement, the Code directs flag states to promote access to sufficient insurance cover so the vessels, crew and third parties are covered. Although this measure directly enhances fishing operations and safety of seafarers, it will motivate the fishing crew to comply with conservation and management measures if properly implemented. As a matter of fact, poor working conditions have contributed to non-compliance with conservation and management measures by fishing crews.

179 Article 8.1.10, Code.
180 FAO (2007c) op. cit., para 5 at p. 3
181 Article 7.8.1, Code.
182 Ibid.
4.8.3 Port States
The significant differences between the provisions of the Code on port state duties and Article 23 of the FSA are first, Article 8.3.1 of the Code lacks the broadness and conventional rule nature of Article 23. Second, the Code provides that port states should extend their assistance to flag states beyond fishing matters, i.e. safety and health. Although the Code does not direct port states to prohibit landings and transhipment, the underlying principle enunciated in the Preamble to the Marrakesh Agreement Establishing the WTO and Article XX(g) of the General Agreement on Tariffs and Trade (GATT) 1994\textsuperscript{184} dealing with the environmental exceptions to trade liberalisation under the WTO Agreement has been incorporated into Article 11.2.2 of the Code thus:

International trade in fish and fishery products should not compromise the sustainable development of fisheries and responsible utilisation of living aquatic resources.\textsuperscript{185}

This provision places sustainability of marine fishery resources at the level of importance with international trade. This is likely to influence states positively on how they resolve conflicts between port states’ power to prohibit landings and transhipment of IUU fish and the principles of free trade under the WTO Agreement.

4.9 Interconnection between the Code and other Related Regimes
Probably, the most important innovation of the Code is its ability to establish interconnection between fisheries and other interrelated issue areas as well as the regimes regulating such issues. Apart from the strong interconnection between the Code and other international fisheries instruments,\textsuperscript{186} the Code urges states to conduct international trade in fish and fishery products in accordance with the principles, rights and obligations established in the WTO Agreement.\textsuperscript{187} On the protection of the aquatic environment, States can only introduce or enforce laws and regulations based on the International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating

\textsuperscript{184} The Preamble to the Agreement Establishing the WTO acknowledges that the rules of international and economic relations of state parties should be “in accordance with the objective of sustainable development” and should seek to “protect and preserve the environment”. Article XX(g) of GATT 1994 deals with the environmental exceptions to the liberalisation of trade under the WTO Agreement. For the text of Article XX(g) GATT 1994 see footnote 184 on p. 131 of Chapter 3.

\textsuperscript{185} Article 11.2.2, Code.

\textsuperscript{186} See generally Article 3.2 (a) and (b) of the Code on relationship with other international instruments and Article 8.2.3 of the Code on marking of vessels in accordance with FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.

\textsuperscript{187} Articles 6.14 and 11.2.4, Code. More particularly, States should ensure that international trade in fish and fishery products complies with the Agreement on the Application of Sanitary and Phytosanitary Measures and the Agreement on Technical Barriers to Trade of the WTO.
thereto (MARPOL 73/78). The Code directs the owners, charterers and managers of fishing vessels to ensure that their vessels are fitted with appropriate equipment prescribed under MARPOL 73/78. In addition, the crew of fishing vessels should ensure that disposal of oily waste and garbage and other shipboard waste does not exceed the discharge levels set by MARPOL 73/78. Finally, flag states should ensure compliance with appropriate international conventions, agreed codes of practice and voluntary guidelines on safety requirements for fishing vessels and fishers. Establishing a linkage between the Code and other binding obligations will contribute to state compliance with the Code and interrelated international agreements.

Regrettably, the Code does not urge its member states to comply with the United Nations Framework Convention on Climate Change (UNFCCC) or any instrument made in furtherance of the primary objective of the UNFCCC. Article 8.8.1 of the Code merely provides that states should adopt relevant standards and guidelines, which should include provisions for the reduction of dangerous substances in exhaust gas emissions. It does not specifically direct states to ensure that measures adopted by them comply with any international standard or guideline, which would have allowed one to infer reference to the UNFCCC and the 1997 Kyoto Protocol. It is true that the Code does not explicitly mention some of the international instruments, which its member states should comply with. However, the international agreements implied in such provisions are easily discernible from the provisions of the Code. For example, the Code provides that:

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188 Article 8.7.1, Code.
190 See Article 8.7.2 and 8.7.4, Code. Other instances where the Code expressly provides that the conduct of fishing activities should be in accordance with other specific non-fish international instruments include safety of human life regulated by the International Maritime Organisation International Regulations for Preventing Collisions at Sea (8.4.1, Code); repatriation of crew members regulated by the Repatriation of Seafarers Convention (revised) 1987 (No. 166) (Article 8.2.9); quality standard of fish regulated by the food standards and guidelines set by FAO/WHO Codex Alimentarius Commission and other relevant organisations (Article 11.1.3, Code); protection of endangered species regulated by the Convention on International Trade in Endangered Species (Article 11.2.9, Code) and removal of redundant offshore structures regulated by International Maritime Organisation guidelines (Article 8.10.1, Code).
191 Article 8.2.5, Code. The Code directs that safety measures taken by States should cover small vessels not covered by international law. Ibid.
States and owners, charterers and managers of fishing vessels as well as fishers should follow international guidelines for disposal of CFCs, HCFC, and Halon.\textsuperscript{193} Even though the aforementioned provision does not specifically allude to the Vienna Convention for the Protection of the Ozone layer 1985 and the Montreal Protocol on Substances that Deplete the Ozone layer 1987 as subsequently adjusted, reference to these instruments is implied in the Code’s mention of CFCs, HCFC and Halon. The words “should follow” in the provision indicate the level of seriousness which the Code attaches to compliance with the Ozone Layer regime by its member states and other stakeholders.\textsuperscript{194}

### 4.10 Post Code Era

After the adoption of the Code, the FAO shifted its focus to the problems of incidental catch of seabirds in longline fisheries, the rapid rate of depletion in numbers of sharks due to the high demand for shark fins, over-capitalisation of the fishing industry globally, and IUU fishing. The FAO has adopted four different voluntary International Plans of Action (IPOAs) to address each of the problems.\textsuperscript{195} The need to ask states to develop and implement the IPOAs through their National Plans of Action (NPOAs) is based upon the fact that efforts by the international community to achieve a long-term sustainable development of marine fishery resources must commence at the state level. In order words, the FAO now accepts the position, which this thesis shares with scholars like Burke-White and Slaughter, that because the marine fish crisis has a domestic root, the effectiveness of IFL lies in the capacity of states and domestic institutions to respond to the crisis.\textsuperscript{196} The IPOA-Seabirds addresses one aspect of the bycatch problem – an increase in the incidental catching of seabirds in longline fishing nets due to fishers shifting from using driftnets to longline nets– and has taken into account the relevant provisions of the Code.\textsuperscript{197} A separate

\textsuperscript{193} Article 8.8.5, Code.
\textsuperscript{194} Other phrases and words used in the Code are “should ensure ... comply”, “in complying” and “are followed”. See Articles 8.8.3, 11.2.9, 12.14, and 8.10.1.
\textsuperscript{195} The 1999 FAO International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds), the 1999 FAO International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity); the 1999 FAO International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) and the 2001 FAO International Plan of Action on Illegal, Unreported and Unregulated Fishing (IPOA-IUU). The IPOAs were elaborated as envisaged by Article 2 (d) of the Code. Importantly too, Article 3 of the Code applies to the interpretation and implementation of the IPOAs and their relationships with other international instruments. Para 8, IPOA-Seabirds.
\textsuperscript{197} The provisions are Articles 7.6.9 and 8.5 which deal with catch of non-targeted species, non-fish species and fish gear selectivity.
examination of the IPOA-Seabirds is not necessary because of the scope of this thesis. Importantly too, incidental catch of seabirds by fishers is integral to the bycatch discourse.

4.10.1 IPOA-Sharks
More specifically, the objective of the IPOA-Sharks is to ensure the conservation and management of sharks and their long-term sustainable use. Most of the conservation and management measures recommended by the IPOA-Sharks are those entrenched in Article 7 of the Code. The IPOA-Sharks further urges states to cooperate with RFMOs and where appropriate, to develop a subregional or regional shark-plan. Appendices A and B of the IPOA-Sharks, which contain suggested content of the NPOA-Sharks and Sharks Assessment Reports respectively, list additional conservation measures that should be incorporated into NPOA-Sharks. Apart from the obligation of each state to monitor implementation of its NPOA-Sharks, the IPOA-Sharks do not contain any substantial provision on State compliance with its provisions.

4.10.2 IPOA-Capacity
The main objective of the IPOA-Capacity is to ensure that states and RFMOs achieve globally efficient, equitable and transparent management of fishing capacity. The four strategies adopted by the IPOA-Capacity for the achievement of its objective are:

i. assessment and monitoring of fishing capacity;
ii. preparation and implementation of national plans;
iii. strengthening of RFMOs and related mechanisms;
iv. taking immediate actions regrading major transboundary and shared fish stocks requiring urgent measures.

In addition, the IPOA-Capacity identifies urgent actions and measures that states and RFMOs should implement in their NPOAs when faced with overcapacity and once a particular fish stock has been identified as being significantly overfished. The IPOA-Capacity urges states to adopt appropriate measures that will avoid transfer of overcapacity

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198 Para 25, IPOA-Sharks. This measures is of utmost importance where transboundary or share shark stocks are exploited by two or more States in which case they have to strive to ensure effective conservation and management of the stocks (Para 26, IPOA-Sharks) and , where appropriate, to develop a subregional or regional shark-plan (Para 25, IPOA-Sharks) and collaborate on data collection and data sharing systems. (Para 25, IPOA-Sharks). Fordham, S., and Dolan, C., op. cit., p. 545.
199 E.g. regulation of access to fishing ground, closed season and sanctuaries.
200 Para 8, IPOA-Capacity.
201 Para 21, IPOA-Capacity.
to fully exploited or overexploited fisheries. Unfortunately, most of the deadlines set for states and RFMOs to achieve the objective of the IPOA-Capacity, as well as implement the foregoing strategies, have passed with very few states and RFMOs able to meet them.

### 4.10.3 IPOA-IUU Fishing and its Enforcement Measures

The objective of the IPOA-IUU fishing is to prevent, deter and eliminate all aspects of IUU fishing by providing all states with comprehensive, effective and transparent measures by which to act, including through appropriate regional fisheries organisations. In order to achieve this objective, all states, RFMOs and the FAO, bearing in mind Article 5 of the Code, should be guided by six principles and strategies namely: participation and coordination, phased implementation, comprehensive and integrated approach, conservation, transparency and non-discrimination. The IPOA-IUU fishing adopts a comprehensive and integrated enforcement mechanism to address IUU fishing. The responsibility to enforce the IPOA-IUU fishing is given to all states, flag states, port states and RFMOs. In addition, the IPOA-IUU fishing recommends market-related measures such as catch documentation, certificate requirements, import and export controls or prohibitions and stock or species-specific trade-related measures for tracking IUU fish and fishery products to their final destination - market.

Most of the responsibilities of flag states, port states and RFMOs are a reiteration of their responsibilities under the Code and FSA. There is no doubt that the IPOA-IUU fishing adopts a few novel stands by:

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202 Para 40 (i) and (ii), IPOA-Capacity.
203 The deadlines are as follows: technical consultation on the definition and measurement of fishing capacity (1999), assessment and diagnosis (2000), identification of national fisheries and fleets requiring urgent measures (to have commenced at the end of 2001) and establishment of an international record of fishing vessels operating in the high seas based on the model indicated in the Compliance Agreement (by the end of 2000).
204 Paragraph 8 of the IPOA-IUU.
205 This article deals with the special requirement of developing States.
206 See generally Para 9, IPOA-IUU Fishing.
208 The IPOA-IUU fishing encourages States to ensure that trade-related measures are consistent with the WTO and internationally agreed rules. See Par 66, 67 and 68, IPOA-IUU Fishing.
i. acknowledging that individuals and corporate entities are the driving force behind IUU fishing, hence enforcement measures adopted by States should primarily target nationals who are subject to their jurisdiction.  

ii. shifting the forum for tackling IUU fishing from the open sea, where perpetrators of IUU fishing have the upper hand, to land where it is easier to trace and identify them with less cost and risk to the life of enforcement officers.

iii. encouraging states to act through RFMOs in taking action to strengthen and develop innovative ways, in conformity with international law, which will prevent, deter and eliminate IUU fishing

All NPOAs are subject to review every four years. This is to enable states to identify cost effective strategies that will increase the effectiveness of their NPOAs. All states are expected to report biennially to the FAO their progress with the assessment, development and implementation of their NPOAs. On the other hand, the FAO has the responsibility of supporting states and RFMOs in the implementation of the IPOAs as well as reporting biennially on the state of progress in the implementation of the IPOAs.

The 2005 FAO Model Scheme on Port State Measures to Combat IUU Fishing aims at strengthening the IPOA-IUU Fishing and the port state measures adopted in the Code. Under the Model Scheme, foreign fishing or related vessels will give advance notice to port states and request permission for port access, port states will conduct regular inspections in accordance with international law, offending vessels will be denied use of port and certain port services and information sharing networks will be created. Already, the Pacific Islands region and the Northeast Atlantic Fisheries Commission have started

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210 Under Para 80.1-80.14 of the IPOA-IUU Fishing, some of the innovative actions which States could take include developing and maintenance of records of fishing vessels engaged in or supporting IUU fishing and compiling and using trade information to monitor IUU fishing.

211 Para 23, IPOA-Sharks; Para 24, IPOA-Capacity; and Para 26, IPOA-IUU Fishing.

212 Para 28, IPOA-Sharks; Para 44, IPOA-Capacity and Para 87, IPOA-IUU Fishing. (The RFMOs are also required to report on their RPOA-IUU Fishing. *Ibid*).

213 Paras 22-24 IPOA-Seabirds; Paras 29-31, IPOA-Sharks; Paras 45-48, IPOA-Capacity; and Para 87, IPOA-IUU Fishing.

214 See generally Section 2 on port states duties, Section 3 on Inspections, Sections 4 and 5 on Actions, Sections 6-8 on Information and Sections 9-12 on the need to apply the measures provided under the Model Scheme in accordance with international law as well as the need to ensure the implementation of the measures in a fair, transparent and non-discriminatory manner. As a matter of fact, the 2009 FAO Port State Agreement is largely based on the Model Scheme.

implementing binding port state measures based on the 2005 FAO Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing. The Northeast Atlantic Fisheries Commission action will effectively close European ports to the landing of frozen fish not verified as being legal by the flag states of the vessels.\(^{216}\)

4.11 International Soft Law on Fisheries Solves the Marine Fish Crisis: A Myth or Reality?

The 2007 *Report of Progress in the Implementation of the Code, Related International Plans of Action and Strategy*, which is an analysis of the self-assessment questionnaires submitted by seventy member states of FAO, nineteen RFMOs and nine NGOs indicates an improvement in the implementation of almost all aspects of the Code. The report reveals that FAO supported the implementation of the Code through a series of meetings, workshops, seminars and conferences in many countries, including Nigeria. Between 2005 and 2007, new technical guidelines on the contribution of small-scale fisheries to poverty alleviation was published, while work on a host of other sets of guidelines had commenced. Actions taken by FAO members to address the marine fisheries crisis indicated that only one in four members do not have fisheries management plans in place. The majority of states used management measures ranging from prohibition of destructive fishing methods to application of a precautionary approach in managing their marine fishery resources.\(^{217}\) Fishing operations within and outside national jurisdictions are regulated by mandatory licensing systems, improved MCS, cooperation between states

\(^{216}\) Basically, the Northeast Atlantic Fisheries Commission’s regime, which is described as going beyond the FAO Model Scheme, requires fishing vessels to send prior notification of landing to the port state. The flag state must confirm to the port state that (i) the vessel in question has a sufficient quota for the catch, (ii) the catch has been reported to the flag state for quota settlement (iii) the vessel has a licence to fish in the area in question, and (iv) the fishing activity agrees with the flag state’s satellite tracking data. Without such information, frozen fish may not be landed. Norwegian Ministry of Fisheries and Coastal Affairs (2007) “A Breakthrough in Combating Illegal Fishing” Press Release No. 24/2007 of April 29, 2007. Available at [http://www.regeringen.no/en/dep/fkd/Press-Centre/Press-releases/2007/A-breakthrough-in-combating-illegal-fish.html?id=464637](http://www.regeringen.no/en/dep/fkd/Press-Centre/Press-releases/2007/A-breakthrough-in-combating-illegal-fish.html?id=464637) (accessed February 24, 2008). Other RFMOs like the Western and Central Pacific Fisheries Commission (WCPFC) and the Permanent Commission for the South Pacific (CPPS) have adopted port measures based on the FAO Model Scheme while the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Northwest Atlantic Fisheries Organisation (NAFO), the Indian Ocean Tuna Commission (IOTC) and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) have established port inspection schemes such as catch documentation. See FAO (2007d) *Report of the Twenty-seventh Session of the Committee on Fisheries Rome, 5–9 March 2007*, FAO Fisheries Report No. 830, Rome: FAO, pp. 7-8 Available at [ftp://ftp.fao.org/docrep/fao/010/a1160e/a1160e00.pdf](ftp://ftp.fao.org/docrep/fao/010/a1160e/a1160e00.pdf) (accessed June 2, 2008).

\(^{217}\) Other measures used were involving stakeholders in fisheries management and selectivity of fishing gears. The least used measures are those related to capacity issues, economic conditions in the sector and stock specific reference points which usage in marine fisheries rose from 44% in 2005 to 68% in 2007. FAO (2007c) *op. cit.*, p. 3.
with 72% of members implementing VMS, to some extent, while others are planning to do so in the future.\textsuperscript{218}

The integration of marine fisheries with coastal management, post-harvest practices and trade and fisheries research indicates a positive change in states’ implementation of the Code. The questionnaire response from the RFMOs and the NGOs revealed the same encouraging trend. The few noticeable constraints in the areas of institutions, human resources, financial weakness of some states, inability to trace the origin of certain marine fish species by some states and poor understanding of the precautionary approach reflect the inherent socio-legal nature of national fishing industries, which, by their nature will always be imperfect. In sum, the general problem of lack of political support for implementation of the Code identified by FAO seems to have eased.\textsuperscript{219}

Unfortunately, despite the improvement in the FAO, States, RFMOs and NGOs implementation of the Code and the IPOAs, the 2007 Report of Progress in the Implementation of the Code revealed that stock specific target reference points were either being approached or exceeded, indicating that managed fisheries were either nearing full exploitation (72%) or being overexploited (53%).\textsuperscript{220} The implication of this is that there may be a change in the behaviour of states and RFMOs toward complying with certain aspects or articles of the Code and its associated instruments; but the problem – the precarious state of fishery resources which led to the adoption of these instruments in the first place, still persists. This could be linked to the problem of states’ concern over the application of complex management measures such as the precautionary and ecosystem approaches earlier identified by the FAO.\textsuperscript{221} There is also the problem of complementarity of the Code with the Johannesburg Plan of Implementation which causes states to feel that efforts to implement the Code imply concurrent action to implement the time-bound fisheries component of the plan.\textsuperscript{222} This is exactly what such states are avoiding.

In an area such as marine fisheries, which is regulated by so many hard and soft law instruments, it is difficult to claim with complete accuracy that only hard or soft law instruments are responsible for any changes in the behaviour of states or the recovery of depleted or collapsed fish stocks. While the temptation is always to first identify the

\textsuperscript{218} Ibid.
\textsuperscript{219} SOFIA 2006, p. 67.
\textsuperscript{220} FAO (2007c) \textit{op. cit.}, p. 4.
\textsuperscript{221} SOFIA 2006, p. 67.
\textsuperscript{222} Ibid.
Convention, the FSA, the Compliance Agreement, and other relevant binding agreements as being responsible for state compliance with IFL, in reality there is a dynamic interplay between the Code and its associated international soft instruments, and the mentioned binding international agreements. Indeed, the Code and its associated international soft law instruments can hardly stand in isolation. They are primarily used as precursors\textsuperscript{223} or to supplement and enhance the implementation of the hard international fisheries agreements.

In any case, assuming one or more depleted or collapsed fish stocks had recovered because of states and RFMOs compliance with the Code and its associated international soft law instruments, would that guarantee the long-term sustainability of such fish species? The short online articles\textsuperscript{224} based on the FAO Technical papers\textsuperscript{225} and other literature\textsuperscript{226} emphasise the fact that climate change will have an impact on the biological productivity of marine ecosystems, as well as modifying the area of distribution of marine fishery resources.\textsuperscript{227} Since climate change will affect a sector that is already characterised by full utilisation of resources, large overcapacity and conflicts among fishers and others vying for alternative uses of marine ecosystems, the consequences for the marine fishing industry could be significant.\textsuperscript{228} Under such conditions, achieving long-term sustainability of marine fishery resources may not be possible.

The common idea in the short online articles is that fish production models must explicitly take into account environmental variability including climate change along with fishing pressure, pollution and habitat degradation, particularly as environmental forecasts become

\textsuperscript{223} A good example of this is the binding port states regime that has evolved from the 2005 FAO Model Scheme on Port State Measures to Combat IUU Fishing.


\textsuperscript{227} Farmer, T., op. cit.

\textsuperscript{228} Ibid and Everett, J., op. cit.
increasingly accurate.\textsuperscript{229} This requires the development of effective and flexible fisheries management systems based on the ecosystem approach\textsuperscript{230} and a wide implementation of the precautionary approach in fisheries management.\textsuperscript{231} The paradox of FAO’s solution to the marine fish crisis can be seen from the abundance of authoritative literature at its disposal confirming that climate change will hinder the achievement of sustainable development of marine fishery resources and endanger fish supplies and food security,\textsuperscript{232} yet none of its fisheries instruments specifically integrates climate change into marine fisheries management. In fact, it was not until March 2007, that the COFI proposed that FAO should undertake a scoping study to identify the key issues on climate change and fisheries.\textsuperscript{233}

4.12 The Wind Changes in International Soft Law Regulation of Marine Fisheries – The UN General Assembly Initiative

After the adoption of the Convention in 1982, the UN General Assembly’s first serious concern regarding the marine fish crisis was with large-scale pelagic drift nets, but this gradually became extended to cover almost all the factors identified as contributing to the crisis. The only issue that was not addressed either in the UN General Assembly resolutions on fisheries or oceans and the law of the sea was the consequences of climate change on marine fishery resources. The position changed in December 2006 when the UN General Assembly expressed its concern over the projected adverse effects of anthropogenic and natural climate change and ocean acidification on marine environment and marine biodiversity.\textsuperscript{234} In 2007, the UN General Assembly openly welcomed the COFI’s proposal on the need for FAO to conduct a study on key issues on climate change and fisheries.\textsuperscript{235} UN General Assembly Resolution A/RES/62/215\textsuperscript{236} marked a new

\textsuperscript{229} Everett, J., \textit{op. cit.}, and Farmer, T., \textit{op. cit.}
\textsuperscript{230} Everett, J., \textit{op. cit.}
\textsuperscript{231} Maguire, J. J., \textit{op. cit.}
\textsuperscript{232} Maguire, J. J., \textit{op. cit.}
departure in the history of UN law making on marine fisheries. The resolution reiterated the UN General Assembly’s earlier concern with the adverse effects of climate change on marine environment and marine biodiversity.\textsuperscript{237} It also stressed the increasing importance of states understanding the ocean and atmosphere interface, as well as their development of ways and means of adaptation.\textsuperscript{238}

Notably, UN General Assembly Resolution A/Res/62/215 called on states to enhance their efforts to reduce the emission of GHGs, in accordance with the principle contained in the UNFCCC, in order to reduce and tackle the projected adverse effects of climate change on marine environment and marine biodiversity.\textsuperscript{239} Unfortunately, the resolution that could have gone into the annals of history as the most decisive UN legislative instrument to address the impact of climate change on marine fishery resources was couched in such a way as to help bury the 1997 Kyoto Protocol and not to build upon it. By referring only to the UNFCCC, the UN General Assembly tactically conceded to the Bush strategy\textsuperscript{240} of addressing climate change through voluntary emission reduction and greener technology in accordance with the UNFCCC principles and not the binding emission cutting targets by States contained in the 1997 Kyoto Protocol.

4.10 Conclusion

The measures adopted in the Code and its associated international soft law instruments show a strong commitment by member states of the FAO to use a holistic and integrated approach to address all factors responsible for the deplorable state of marine fishery resources. The major problem that continues to hinder the implementation and enforcement of the harvest-based measures is the idea of over-relying on flag states and port states when the majority of them lack the required political will and capability.

The Code has indirectly established a link between IFL and climate change, but it failed to specifically direct its member states to comply with international agreements on climate change. The UN General Assembly in its Resolution A/Res/62/215 took a bold and revolutionary step by calling on all states to reduce their emission of GHGs in order to be

\textsuperscript{237} Para 81, UNGA Resolution A/Res/62/215.
\textsuperscript{238} Paras 82 and 124, UNGA Resolution A/Res/62/215.
\textsuperscript{239} Para 83, UNGA Resolution A/Res/62/215.
able to address the impact of climate change on marine environment and biodiversity. Regrettably, however, the effectiveness of UN General Assembly Resolution A/Res/62/215 in achieving its objective is weak because of its reference to only the UNFCCC. Mainstreaming climate change into marine fisheries management, with a specific obligation on coastal states and fishing states to comply with international agreements dealing with the two issue areas, is the best way of getting countries like the U.S., China and Nigeria, which have strong interests in marine fisheries, to fulfil their obligations under the UNFCCC and the 1997 Kyoto Protocol.

One is tempted to canvass for the FAO adopting an International Plan of Action on Climate Change, but there is already the problem of congestion of international soft law on marine fisheries. The implementation of all the instruments requires a lot of human, material and financial resources as well as time. The overlapping nature of the scope of some of the instruments will lead to conflicts and duplication of roles during the implementation process. Since the Code is more comprehensive in scope and application, updating it with the aim of integrating the salient provisions underpinning other international soft law instruments and mainstreaming climate change into fisheries management will definitely solve the problem of congestion of international soft law marine on fisheries.
CHAPTER 5

CLIMATE CHANGE AND MARINE FISHERY RESOURCES: MANAGEMENT
AND LEGAL LESSONS FROM THE NORWEGIAN SPRING-SPAWNING
HERRING AND THE FRASER RIVER SOCKEYE CASE STUDIES

5.1 Introduction

Before the consensus on the basic science and key aspects of climate change was reached\(^1\), a number of fisheries conflicts had arisen, whose causes were either linked predominantly to, or exacerbated by, natural variations in climate.\(^2\) This chapter examines the Norwegian spring-spawning herring (NSS herring) and the Fraser River sockeye *Oncorhynchus nerka* (Fraser sockeye) cases, with the aim of identifying the major management and legal lessons to be gained from them.\(^3\) These are well-established cases where natural variations in climate contributed immensely to the breakdown in management as well as the international agreements regulating exploitation of the stocks.\(^4\) The truth is that while the impact of climate change on fish and the aquatic ecosystems may be more intensified and unpredictable than impacts from natural variations in climate increases in sea temperature remain a common consequence of both phenomena. By understanding how in the past states exploiting these stocks responded to the effects of climate variations on the stocks, fisheries managers and policy-makers in Nigeria, where the impact of climate change on marine fishery resources is still a novel issue and not well understood, can learn useful

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\(^2\) The word “predominantly” is used here because from the 1950s empirical studies revealed that anthropogenic induced climate change exacerbated natural variations in oceans’ conditions like the North Atlantic Oscillation (NAO), Pacific Decadal Oscillation (PDO) and El Niño – Southern Oscillation (El Niño).


legal and management lessons. The caveat as earlier mentioned in Chapter 1 is that the lessons learned from the analogies must be placed in the context of greater uncertainty, which also includes the peculiarities of Nigeria’s marine fisheries sector.\textsuperscript{5}

This chapter aims at strengthening the argument that climate change should be integrated into marine fisheries management. It is divided into five parts, excluding the introduction and conclusion. The first part examines the effects of rising ocean temperature on the migratory pattern of the NSS herring and the Fraser sockeye. The second part provides an insight into the management and legal problems which climate-induced migration of fish stocks could cause. Part three analyses the international agreements regulating the two stocks, and goes further to explain how the cooperative arrangements adopted by the states exploiting these stocks are designed to simultaneously address the effects of overfishing and climate change on the stocks. The next part critically examines some of the suggestions put forward by lawyers, bioeconomists and physical scientists as to the most appropriate way to address the NSS herring and Fraser sockeye crises. The sixth part briefly identifies significant lessons emanating from the responses of states to the NSS herring and Fraser sockeye crises. The nature of ecosystem and precautionary approaches, as well as the extent to which they are incorporated into international fisheries law (IFL), are also examined. The concluding part reiterates the first segment of the argument of this thesis which states that long-term sustainability of marine fishery resources can only be achieved if States adopt a holistic and proactive approach to fisheries management. This approach entails, among other issues, the integration of climate change into marine fisheries management through the application of the ecosystem and precautionary approaches.

\subsection*{5.2 The Effects of Climate Variations on NSS Herring and Fraser Sockeye}
While the plethora of scientific literature reviewed in Chapter 2 reveals the various ways that climate change impacts on fishery resources, this section specifically elaborates on how changes in sea temperature affect the migratory patterns of NSS herring and Fraser sockeye. Sissener and Bjørndal\textsuperscript{6} provide the most recent and authoritative evidence on the


effect of sea temperature on the migration pattern of NSS herring.\textsuperscript{7} Theoretically, they argue that temperatures in the Norwegian Sea, Barents Sea and Arctic Sea are the primary factor responsible for the changing migration pattern of NSS herring.\textsuperscript{8} In their view, the observable strong year-classes and large stock size of NSS herring seem to coincide with climate warming. Moreover, during this period the migratory pattern of the stock spreads over a greater area than with weaker year-classes and small stocks size.\textsuperscript{9}

According to Sissener and Bjørndal, one of the factors that influence environmental conditions in the Norwegian, Barents and Arctic Seas is the North Atlantic Oscillation (NAO). The positive NAO during the first half of the 20\textsuperscript{th} century transported warm Atlantic water into the Norwegian, Barents and Arctic Seas.\textsuperscript{10} During this period, the NSS herring recruitment rate and spawning stock size increased, thereby leading to stronger year classes.\textsuperscript{11} Previous research by Ottersen and Loeng\textsuperscript{12} reveals that the strong year-class developed as result of high sea temperature. High sea temperature gives better growth rates, better survival rates and lower mortality during the vulnerable larvae and juvenile stages of the stock. With a strong year-class of about 10 million in 1957, the NSS herring maintained its spawning area along the western coast of Norway. Its juveniles stayed in the maturing area along the Norwegian coast and the Barents Sea. The feeding area for the


\textsuperscript{8} Other factors through which climate change affects herring are early development of phytoplankton, zooplankton and capelin, which herring feeds on, and cod that feeds on herring, high wind speed that transports the herring larvae away from predators (young puffins on the continental shelf), Norwegian current, growth rate and maturity age which contribute to early or late recruitment of matured herring into spawning stock. Sissener, E. H. and Bjørndal, T. \textit{op. cit.}, p. 303. Sætre R, Torensen R, and Anker-Nilsse T., (2002) “Factors Affecting the Recruitment Variability of the Norwegian Spring-Spawning Herring (\textit{Clupea harengus L.})”, \textit{ICES Journal of Marine Science}, Vol. 59, No. 4, pp. 725-736.

\textsuperscript{9} Sissener, E. H. and Bjørndal, T. \textit{op. cit.}, p. 303.


\textsuperscript{11} Sissener, E. H. and Bjørndal, T. \textit{op. cit.}, p. 303.

adult NSS herring was located in the Norwegian Sea and, east and north of Iceland, while the wintering area was situated east of Iceland.\(^\text{13}\) (Figure 5.1(a))

Figure 5.1 - The Migratory Pattern for NSS Herring: (a) 1950, (b) 1965-66, (c) 1972-1986 and (d) 1995-1999

Source: Vilhjalmsson, H. cited in Sissner E. H. and Bjørndal, T.\(^\text{14}\)

The negative NAO in the 1960s to early 1970s led to the cooling of the Norwegian, Barents and Arctic Seas. During this period, because of overfishing and environmental changes, the NSS herring spawning stock biomass was reduced drastically to three million

\(^{13}\) Sissener, E. H., and Bjørndal, T., op. cit., p. 300. See also Krovnin A. S. and Rodionov, S. N. op. cit., pp. 232-234 and Fig. 11.1 and Fig. 11.2 on pp 232 and 234 respectively.

tonnes in 1963 and almost to extinction in the 1970s.\(^5\) The interesting point to note here is that during the cold period of 1870 -1890 the annual catches of NSS herring declined sharply to 13,000 metric tons, far less than the 1860s’ annual catches which exceeded 100,000 metric tons.\(^6\) By analogy, the abundance of NSS herring would have ended in the late 1960s or the 1970s even if the stock had not been overfished.\(^7\) Apart from change in abundance of the stock a new migration pattern emerged from 1963-1966. Instead of the stock maintaining one wintering area east of Iceland, part of the stock wintered near Lofoten and then migrated further to north-eastern part of the Norwegian Sea where it maintained its feeding area. Meanwhile the other part of the stock followed the 1950s migratory pattern. According to Sissener and Bjørndal, the two stocks later joined, but from 1967-1969 the stock continued with the northern migratory pattern for feeding while wintering close to the spawning grounds in the fjords of Nordmøre. During this time, the boundary of the arctic water was moving south and east of Iceland.\(^8\) (Figure. 5.1(b))

Between 1972 and 1986, the stock, whose year-class could hardly be determined, consisted of two components that confined their spawning, feeding and wintering areas almost entirely to the Norwegian coastal waters and fjords\(^9\) (Figure. 5.1(c)). With the emergence of a new warming period in the 1980s and 1990s the NSS herring resumed its migration pattern of the 1950s, except for the wintering areas\(^10\) (Figure. 5.1(d)). During the summer of 1994 there were catches of NSS herring in the offshore areas of the Norwegian Sea for the first time in 26 years.\(^11\) The 2007 cruise report on the geographical distribution and abundance of NSS herring during spawning season reveals that between 16\(^{th}\) February and 15\(^{th}\) March 2007 the main part of the stock had already finished spawning, and was

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17 Ibid, p. 252.

18 Sissener, E. H. and Bjørndal, T., op. cit., p. 300.


migrating westwards into the Norwegian Sea. 22 This further confirmed the migration path established in (Fig.5.1(d)) where the maturing area in the Barents Sea and the northward migration into the Svalbard fisheries zone was abandoned, thereby making the stock available for fisheries in international waters.23

In 2003 the migration pattern of the NSS herring was unique in that the stock remained in Norwegian waters, despite its large size and having resumed its international migration pattern in 1994.24 According to Todd et al, the accelerated warming of the North Atlantic may have peaked in 2003.25 A high index NAO combined with anthropogenic global warming must have resulted in high rainfall and greater river flows into the North Atlantic. As the melting iceberg and glaciers in the Greenland moved further south,26 the cold water prevented the NSS herring from migrating far north into the Norwegian Sea or around Greenland. Logically, this finding supports the assumption that the non-migration of NSS herring was due to the cold waters around Iceland, which prevented the stock from migrating to its feeding and wintering areas in the Icelandic waters.27 The zonal attachment of the NSS herring to the Norwegian coast in 2003, despite its large stock, debunks previous claims that the small size of the stock, due to heavy overexploitation during 1960s, was responsible for changes in its migration and distribution pattern.

Recently, there has been a difference between the stock’s migration patterns in the last two warm periods of 1950s to 1960s and 1980s to 2000s.28 The gradual increase in the North Atlantic Ocean’s temperature is reflected in the migration pattern of the stock.29 For example, the report on the spawning of the stock during the 2007 spawning season reveals

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23 Sissener, E. H. and Bjørndal, T., op. cit., p. 301.
26 Greenhalgh, M., op. cit., p. 220.
27 Sissener, E. H. and Bjørndal, T., op. cit., p. 304.
29 This is primarily associated with the effect of high NAO (between 1980s and 2000s) which is further exacerbated by the current global warming.
that after spawning, the stock migrated westwards entering the Norwegian Sea.\textsuperscript{30} Even if the NSS herring’s migration pattern is determined by its size, existing scientific literature has established a strong correlation between warm sea temperature and the formation of good year classes in the stock.\textsuperscript{31} With a weak relationship established between the stomach content of NSS herring and zooplankton biomass in May 1995-2005, sea temperature in the Norwegian Sea stands out clearly as the most dominant factor that drives the migration pattern of NSS herring.\textsuperscript{32}

Concerning the Fraser sockeye, Miller and Fluharty\textsuperscript{33} described how the 1982 and 1983 El Niño events in the central and eastern equatorial Pacific Ocean led to the alteration of the migration pattern of the stock.\textsuperscript{34} More recent works have also confirmed that the migration pattern and distribution range of Fraser sockeye are sensitive to ocean temperature change.\textsuperscript{35} One important development in the salmon literature is the identification of the Pacific Decadal Oscillation (PDO), as the cause of the abrupt climate and biological shift in the North Pacific.\textsuperscript{36}

In the equatorial Pacific and along the west coast of North America the impacts of El Niño are evidenced by elevated high seas temperatures (1-3°C), warmer subsurface temperatures (to 300m), a rise in sea level and a depressed thermocline.\textsuperscript{37} In the absence of an El Niño event, Miller and Fluharty claimed that the majority of Fraser sockeye returning to the Fraser River migrated through the Strait of Juan de Fuca where, historically, they were harvested first by the United States of America (U.S.) fishers.\textsuperscript{38} Thereafter, the stock migrated northeast into Canadian waters where they were fished by Canadians. According

\begin{footnotesize}
\textsuperscript{30} Slotte, A. and Tangen, Ø., \textit{op. cit.}, supra, footnote 22.
\textsuperscript{32} ICES Advice 2007, Book 9 and Olsen, E. M., \textit{et al.} (2007) “Spatially Structured Interactions Between a Migratory Pelagic Predator, the Norwegian Spring-Spawning Herring \textit{Clupea harengus} L., and its Zooplankton Prey”, \textit{Journal of Fish Biology}, Vol. 70, No. 3, pp. 799-815 at pp. 811-812. The fact that NSS herring were more often observed in abundance in water masses of intermediate temperature c. 6°C (central Norwegian Sea), compared to the warmest water masses of southeast of Norwegian Sea (up to c. 8°C), and colder water masses of west and north of Norwegian Sea (c. <4°C), further supports the claim that the size of the stock may not really determine its migration pattern. \textit{Ibid.}, p. 812. Although there was a tendency for an increased probability of observing NSS herring in areas with high salinities, Olsen and his co-researchers admitted that the salinity effect was less clear. \textit{Ibid.}, p. 806.
\textsuperscript{34} \textit{Ibid.}, see generally pp. 60-64 particularly p. 63 for changes in the migration pattern of sockeye.
\textsuperscript{35} Miller, K. A. and Munro, G. R., \textit{op. cit.}
\textsuperscript{37} Miller K. A. and Fluharty, D. L. \textit{op. cit.}, p. 60.
\textsuperscript{38} \textit{Ibid.} 63 and Miller, K. A. and Munro, G. R., \textit{op. cit.}, p. 380.
\end{footnotesize}
to Miller and Fluharty, usually a small fraction of the stock passed around the northern end of Vancouver Island, through Johnstone Strait and then southward to the Fraser estuary (See Figure 5.2 below).

Figure 5.2 - Map of Vancouver Island showing Juan de Fuca Strait and Johnson Strait.

The Canada-United States Convention for Protection, Preservation and Extension of the Sockeye Salmon Fisheries in the Fraser River System divided the harvest of Fraser sockeye equally between the two nations. During the El Niño events of 1957-58 and 1982-83 the percentage of sockeye salmon that passed through the northern end of Vancouver Island to the River Fraser was 35 and 80 percent (%) respectively. As at July 2004 the diversion rate of Fraser sockeye through Johnstone Strait was about 70%. The

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39 Article VII. The 1930 Canada-United States Convention later added pink salmon to its scope.
40 Miller, K. A. and Fluharty, D. L., op. cit., p. 63. According to Miller and Munro, the warm conditions became exacerbated because of the 1977 climate regime shift caused by the PDO that prevailed until that date. Miller, K. A. and Munro, G. R., op. cit., p. 382.
41 Fisheries Management Division of the Pacific Salmon Commission (2008) Report of the Fraser River Panel to the Pacific Salmon Commission on the 2004 Fraser River Sockeye Salmon Fishing Season, Vancouver BC: Pacific Salmon Commission. See para 11 of the Executive Summary at p. 2 Available at http://www.psc.org/pubs/FRP2004AnnualReport.pdf (accessed July 30, 2008). The average diversion rate is low in 2008 (9%) although the Panel noted in its meeting of August 15 2008 that the rate had increased to 20% in the last three days before the meeting. The most worrisome aspect of the Panel’s News Release was
diversion made a difference in terms of which nation’s fishers has more access to the stock.\textsuperscript{42}

According to Miller and Munro, the 1977 climate regime shift had important effects on the productivity of the other salmon stocks. For instance, the associated changes in the upwelling, nutrient transport and related physical and biological processes led to an increase in the productivity of Alaska pink salmon from less than 22 million salmon in 1974 to 217 million in 1999.\textsuperscript{43} On the other hand, catches of the Chinook and Coho salmon in the southern States of California, Oregon and Washington dropped from the late 1970s, hitting EL Niño-related lows in 1983 and 1984. A brief recovery in 1986 and 1987 declined again to a record low in the mid-1990s, due to high mortalities.\textsuperscript{44} Intermingling of salmon from rivers of both countries meant that Canadian fishermen could intercept salmon of US origin while US fishermen could also intercept salmon of Canadian origin. The large mixed-stock of salmon available in Alaska meant that the interception was in favour of Alaska. Alaska rejected the initial effort by Canada to address this imbalance. Canada then resorted to aggressive fishing and interception of Chinook and Coho salmon of Oregon and Washington origin that intermingled with its sockeye outside the 1930 Convention area. This was possible because of the northward shift in the migration pattern of the stocks.\textsuperscript{45} Although the unequal rate of interception of all the salmon species further complicated the problem, the main focus of the two states, which is relevant to this study, has always been the Fraser sockeye.\textsuperscript{46}

It is true that NAO, El Niño and PDO events are natural variations in climate, but their relevance as analogies in this study stems from the fact that their frequency and intensity has increased because of global warming. Besides, Stenevik and Sundby posit that since changes in sea temperature due to decadal-scale climate variations have a strong influence.

\textsuperscript{42} Miller, K. A. and Munro, G. R., op. cit., p. 382.
\textsuperscript{45} The interception of Chinook and Coho salmon by Canadian fishermen further increased because they were able to catch them as they migrated back to spawn in Columbia River system and other West Coast streams. Miller, K. A. and Munro, G. R., op. cit., pp. 382 and 385.
\textsuperscript{46} Ibid, p. 380 and Shepard, M. P., and Argue, A. W., op. cit., p. 121.
on productivities, distribution and migratory patterns of fish stocks, such impacts are expected to become evident under global warming.47

5.3 Management and Legal Implications of Climate-Induced Fish Migration

Total allowable catch (TAC) is the most important measure for the conservation and management of fishery resources under the United Nations Convention on the Law of the Sea.48 It underpins and essentially determines all other consequential decisions about access to the fishery resources.49 From the fishermen position, after a State or RFMO has fixed the TAC of a stock the effective implementation of the catch limit depends on the availability and catchability of the stock. The availability of a stock is how many fish there are for the fishermen to catch. The catchability of a stock is how difficult it is for the fishermen to catch fish.50 Availability and catchability depend upon the total abundance of fish as well as when and how they are distributed.51 With increasing sea temperatures altering the distribution and migration pattern of so many species, the actual stock of most species available for fishing may not represent the expected stock at the time of setting the TAC.

In 2007, even though the NSS herring had assumed its international migration pattern, the stock migrated westward into the Norwegian Sea.52 This means that when Slotte and Tangen conducted their survey the stock was not available in the Icelandic EEZ, Jan Mayen fishery zone, Svalbard fishery protection zone, Grey zone or in the international waters between Jan Mayen fishery zone and Svalbard fishery zone. With respect to the Frazer sockeye there is a strong presumption that the Northeast Pacific Ocean temperature will continue to rise because of the current global warming, which has also intensified the El Niño and PDO events. The implication of this is that even if other oceanic conditions do not affect Fraser sockeye, the percentage of the stock migrating through Johnstone strait may likely increase because of its low tolerance to a warming environment.53 In practical terms, the TAC set by the United States and Canada for their fishermen who fish Fraser

48 Hereinafter referred to as the “Conventino”, see Articles 61(1) and 119(1).
50 Ottersen, G., op. cit., p. 80.
51 Ibid.
52 Slotte, A and Tangen, Ø. op. cit.
sockeye in the Juan de Fuca strait will be difficult to implement, because of non-availability of the stock as expected. A similar situation is likely to be faced by the Icelandic authority with regard to setting TAC for the NSS herring.

Even though Norway and Canada seem to benefit respectively from changes in the migration pattern of the NSS herring and the Fraser sockeye, there are still many fisheries management problems associated with changes in the stock’s migration pattern. Changes in the migration pattern of any species could possibly lead to the relocation of the centre of abundance of the species, which could be either negative or positive. The centre of abundance could be negative in the sense that some species, for example salmon, have a very complex and variable life history, both within one river system and from one river system to another that may inhibit its survival in new areas. Where the centre of abundance is positive, there is a strong tendency that the species may be overexploited or underexploited because of sudden changes in stock availability and catchability. This was exactly what the Alaska and Canadian fishermen were experiencing, which eventually led to not only overfishing of the Fraser sockeye, Chinook and Coho salmon, but also to the listing of the last two stocks by the United States National Marine Fisheries Service, as “threatened species” under the Endangered Species Act.

Changes in the spawning environment due to climate change could limit the reproductive success and the survival of eggs and larvae. Shepard and Argue reported that beginning in the mid-1990s, late-run Fraser sockeye that normally delay for six weeks or so at the mouth of the Fraser River before migrating upstream to spawn in September began moving upstream a month or more ahead of time. This exposed the spawners to abnormally high temperature, resulting in excessive energy loss and high incidence of disease and parasite infestation. These led to the death of about 90% of the spawners of many late-run stocks before spawning. Recently, the temperature of the Fraser River at Qualark Creek rose to 18. 4°C, which was 0.7°C warmer than average for that period. According to the Fraser

57 Feingold, L. E., op. cit., p. 126.
58 Shepard, M. P. and Argue, A. W., op. cit., p. 211 and endnote 22 at p. 275.
Panel, water temperatures higher than 18° C may decrease the swimming capability of Fraser sockeye.\textsuperscript{59}

The truth is that as the Pacific Ocean temperature increases the Fraser sockeye’s migration pattern may be totally altered. Salmon generally are cold-water species, and water temperature is a principal factor in establishing their range.\textsuperscript{60} Taking into consideration Magnuson’s findings that the northern boundaries of distribution of some species would move at least 500km poleward with a doubling of carbon dioxide in the atmosphere, it is possible that the Fraser sockeye may migrate further north, thus abandoning both Juan de Fuca and Johnstone Straits.\textsuperscript{61} Despite the well known ability of salmon to return from feeding areas in the open oceans to the exact areas of their birth in coastal freshwater river, Babaluk \textit{et al} report the first record of sockeye and pink salmon straying to the Sachs River estuary near Sachs Harbour, Banks Island.\textsuperscript{62} A more worrisome prediction is the claim by Welch, Ishida and Nagasawa that:

\begin{quote}
At current rates of greenhouse gas emission, predicted temperature increases under a doubled CO\textsubscript{2} climate are large enough to shift the position of the thermal limits into the Bering Sea by the middle of the next century. Such an increase would potentially exclude sockeye salmon from the entire Pacific Ocean and severely restrict the overall area of the marine environment that would support growth.\textsuperscript{63}
\end{quote}

One conservation issue that should worry policy-makers and fisheries managers is whether or not Fraser sockeye finds another river as suitable as the Fraser River for spawning. There is no doubt that within certain populations the environmental preferences favouring the survival of eggs and larvae may be specific, leading to spawning at specific locations.\textsuperscript{64}


\textsuperscript{61} See instances of significant extensions of known normal distribution of the North Pacific salmons in 1993 when the warmest record of the Southern Canadian Basin of the Arctic Ocean was taken in three decades. Babaluk, J.A., \textit{et al.}, \textit{op. cit.}, pp. 162 - 164 and Carmack, E.C., \textit{et al.}, \textit{op. cit.}


Generally, it is true, as discovered by Hiddink and Hofstede, that climate-induced migration of fish may lead to changes in local and regional species richness through species extinction and latitudinal shift. But the same authors are also worried about the negative socio-economic and ecological (e.g. prey/predator) consequences as a result of species richness and species extinction. For instance, in the North Sea, while large species moved further north, only small southern species are observed to have moved to the North Sea. In economic terms, it means replacement of high value species by lower value ones. The observed replacement of large species by small species will have an effect on energy flow through the food web. Any change in the dynamics of the ecosystem will affect both the structure and productivity of species, and the prey/predator relationships among them. Competition for food and space as a result of the introduction of new species may lead to cannibalism by the stocks, decrease in growth rate and increasing mortality rate due to environmental stress. The long-term consequences of one extinct species on other species and on the ecosystem may be difficult to determine.

The problems of the lack of reliable data and underreporting of catch by fishers could become more complicated when new species migrate into the fishery. Under such an unpredictable and uncertain situation fisheries managers and policy-makers will find it difficult to determine the optimum utilisation level or maximum sustainable yield (MSY) of any stock. Indeed, the difficulty of achieving long-term sustainability of the NSS herring and the Fraser sockeye, or any other species, can be inferred from the likely chain of management problems that would ensue as a result of changes in their migration patterns.

There are a few but extremely important legal implications associated with changes in the migration pattern of the NSS herring and the Fraser sockeye. First, negotiations on the size of the TAC and sharing the TAC among Norway, Iceland, Russia, Faeroe Islands and the EU (countries involved in fishing the NSS herring either in their exclusive economic zones (EEZs) or in the international waters) became very problematic with the stock remaining in the Norwegian coast since 2003. Reconciling the principles of catch allocation under the 1997 Five Party Agreed Record of Conclusions of Fisheries Consultations on the Management of the Norwegian Spring-Spawning (Atlanto-Scandian Herring) Stock in the

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66 Ibid, pp. 455 and 458.
68 Ibid.
Northeast Atlantic\textsuperscript{70} with the “zonal attachment principle”\textsuperscript{71} of the stock to Norway jurisdiction was a difficult task.\textsuperscript{72} From 2003-2006 parties to the 1997 Agreed Record could not reach an agreement on how to manage the stock, because Norway’s demand for a higher quota share of 70% from 57% on the basis of zone affiliation was rejected by other parties.\textsuperscript{73}

The second legal problem borders on whether there is an effective treaty to protect Fraser sockeye and other fish species that migrate northward into the high seas. The Convention gives the State of origin the primary interest and the authority to manage anadromous stocks both within its EEZ and on the high seas.\textsuperscript{74} Apart from the difficulty involved in determining the national origin of salmon,\textsuperscript{75} climate change will cause many species to migrate from high seas areas where monitoring, control and surveillance of fishing activities is relatively easier to the polar waters where illegal, unreported and unregulated (IUU) fishing thrives because the dangerous nature of the polar waters makes monitoring, control and surveillance of the area by States and RFMOs extremely difficult. Since the increase in sea temperature pushes fish stocks northward, the polar waters have become new fishing grounds for species not covered by any treaty. This assertion is based on the fact that most regional fisheries instruments are limited either with respect to species or areas of jurisdiction.

Legal problems are also bound to occur where Fraser sockeye migrates into other coastal states sea areas. The Convention allows such coastal states to fish the stock, but mandates them to co-operate with the state of origin on the conservation and management of the

\textsuperscript{70} Hereinafter referred to the 1997 Agreed Record. Although the 1997 Agreed Record only set fishing opportunity for 1997, the five parties concerned continue to consult annually on the management of the herring stock on the basis of the 1997 Agreed Accord. Text of this agreed record is available at http://www.intfish.net/treaties/herring97.htm (accessed March, 12 2008).

\textsuperscript{71} Basically, the zonal attachment principle is a method of sharing shared fish stocks between parties to international agreement or cooperative arrangements by looking at how much of each stock is located in each country’s exclusive economic zone (EEZ). See Hannesson, R. (2007) “Incentive Compatibility of Fish-sharing Agreements”, In: Bjørndal T. et al (eds.) Advances in Fisheries Economics: Festschrift in Honour of Professor Gordon R. Munro. Oxford: Blackwell Publishing Ltd., pp. 196-206 at p. 196.


\textsuperscript{74} Article 66(1),(2) and (3)(a) Convention.

stock.\textsuperscript{76} Notwithstanding the customary rule on the state of origin’s primary interest and responsibility to conserve anadromous species, it is likely to negotiate any cooperative arrangement with the coastal states from a weak position. This is because all coastal states have the right to the permanent sovereignty over fishery resources found within their maritime jurisdictions and wide discrentional management powers under Article 297(3) of the Convention. Importantly too, they may strategically overfish the alien stock in order to avoid negative ecological effects which it may cause in their freshwater and marine ecosystems.

5.4 The Legal Regime on Conservation of NSS Herring and Fraser Sockeye

The NSS herring is a pelagic straddling stock while the Fraser sockeye is a highly migratory anadromous species. The legal regimes for the management of these stocks are (i) the United Nations and FAO fisheries instruments; and (ii) cooperative arrangement by the states exploiting them. Since regulation of the stocks under (i) has been examined in Chapters 3 and 4, this section focuses on the conservation and management of these species under their respective cooperative arrangements.

Between 1950 and the late 1960s when NSS herring maintained its international migration path, it was overexploited to the extent that its strong year class in 1959, 1960, 1963, and 1966 could not stop it from collapsing in 1969.\textsuperscript{77} Between 1970s and 1980s when the stock attached itself to the Norwegian coast, the stringent conservation and management measures enforced by Norway led to the stock recovering to its full reproductive capacity.\textsuperscript{78} It is not surprising therefore that when the stock resumed its international migratory path in 1994 Norway had to call for urgent international cooperation to manage the stock. The first multilateral cooperative arrangement to manage the stock was reached in 1996.\textsuperscript{79} On December 14 1996 the Protocol was replaced with the 1997 Agreed Record, which came into force on January 1 1997, but continued the arrangement for the management of the stock that was developed under the 1996 Protocol. The changing

\textsuperscript{76} Article 66 (4) Convention. Canada is a party to the Convention while the U.S is yet to ratify it. Nevertheless, both countries have accepted the provisions of the Convention on anadromous and migratory species as part of customary law. See Weymuller, S. G., \textit{op. cit.}, p. 820.

\textsuperscript{77} Sissener, E. H. and Bjørndal, T., \textit{op. cit.}, p. 300.

\textsuperscript{78} ICES Advice 2007, Book 9, \textit{supra}, footnote 19. This is technically termed as spawning stock biomass (SSB).

\textsuperscript{79} In May 1996 Norway, Iceland, Faeroe Iceland and Russia signed the Protocol on the Conservation, Rational Utilisation and Management of Norwegian Spring Spawning Herring in the Northeast Atlantic.
migratory pattern of the NSS herring made it difficult for parties to the 1997 Agreed Record to maintain agreement on what constitutes an equitable distribution of harvest.\textsuperscript{80}

Negotiations after the 1997 Agreed Record collapsed in 2003 led to the 2007 Five Party Agreed Record of Conclusions of Fisheries Consultations on the Management of the Norwegian Spring-Spawning (Atlanto-Scandian Herring) Stock in the Northeast Atlantic.\textsuperscript{81}

The 2007 Agreed Record was replaced with the Agreed Record of Conclusions of Fisheries Consultations on the Management of the Norwegian Spring-Spawning (Atlanto-Scandian) Herring Stock in the North-East Atlantic for 2008, which was signed by the parties on November 12, 2007.\textsuperscript{82} The 2008 Agreed Record sets the TAC of the NSS herring, divides the TAC among the state parties and directs that further arrangements including those for access and other fishing conditions in the respective zones of fisheries jurisdiction of the parties should be regulated by bilateral arrangements.\textsuperscript{83} Three new paragraphs, which were not in the 2007 Agreed Record, were introduced into Annex I. Paragraph 3 states that each party may transfer its unutilised quota quantities up to 10% to 2009. Such transfer shall be an addition to the party’s 2009 quota allocation. Paragraph 4 states that each party may authorise fishing by its vessels up to 10% beyond the quota allocated for 2008 but this shall be deducted from its quota allocation for 2009. Paragraph 5 calls on the parties to provide information on quota and catches in the format set in the appendix to the Annex.

Under Annex II of the 2008 Agreed Record, the parties agreed to (i) restrict their fishing based on a TAC consistent with a fishing mortality rate of less than 0.125 for appropriate age groups, as defined by the International Council for the Exploration of Seas (ICES); and (ii) that should the spawning stock biomass (SSB) fall below 5,000,000 t(B\textsubscript{pa}) then the fishing mortality referred to in (i) will be reduced from 0.125 at B\textsubscript{pa} (5,000,000) to 0.05 at B\textsubscript{pa} (2,500,000).\textsuperscript{84}


\textsuperscript{81} Referred hereinafter to as “the 2007 Agreed Record.” Available at http://www.regjeringen.no/en/dep/fkd/Press-Centre/Press-releases/2007/Five-party-agreement-on-management-of-th.html?id=444823 (accessed March 12, 2008) Note that this website links to the 2007 Agreed Record, Annexes I and II to the 2007 Agreed Record and the different bilateral arrangements between the parties to the 2007 Agreed Record.

\textsuperscript{82} Hereinafter referred to as the “2008 Agreed Record”. Available at http://neafc.org/news/docs/herring_2008_agreedrecord_signed.pdf (accessed March 12, 2008).

\textsuperscript{83} Paras. 1, 2 and 6, Annex I, 2008 Agreed Record.

\textsuperscript{84} Paras 1-3, Annex II.
approach that the parties first introduced in the 1999 long-term management plan.\textsuperscript{85} The said reference points shall be reviewed or revised by the parties based on any new advice provided by the ICES.\textsuperscript{86} This implies that management of the NSS herring is based on sound science emanating from a third party whose scientific findings are respected globally.

Regulation of the exploitation of the Fraser sockeye between the US and Canada started with the 1930 Canada-U.S Convention for Protection of Sockeye Salmon Fisheries and Protocol of Exchange Ratifications.\textsuperscript{87} Aside from the equal harvest, each of the parties was given equal responsibility in the management and restoration cost of Fraser sockeye within an area designated as the “Conventional waters”.\textsuperscript{88} The dissatisfaction of Canadians with the 1930 Canada-U.S Convention culminated in the adoption of the Treaty between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon, 1985.\textsuperscript{89} The implementation of the 1985 Treaty was anchored on the equity and conservation principles expressed in Article III as follows:

(1) … each party shall conduct its fisheries and its salmon enhancement programme so as to
(a) Prevent overfishing and provide for optimum productions; and
(b) Provide for each party to receive benefit equivalents to the production of salmon originating in its waters

In order to fulfil the above stated obligations Canada and the U.S. are mandated to cooperate in management, research and enhancement. Importantly too, they must take into account the need to reduce the interception of each other’s salmon, avoid undue disruption of existing fisheries and annual variations in abundance of the stock.\textsuperscript{90} Shepard and Argue rightly contend that Article 1(a) of the 1985 Treaty reflects the dual conservation aim of ‘not endangering the stock by over-exploitation’ and ‘optimum utilisation’ entrenched in

\textsuperscript{85} ICES Advice 2007, Book 9, supra, footnote 19.
\textsuperscript{86} Para. 4, Annex II.
\textsuperscript{87} Hereinafter referred to as the 1930 Canada-U.S Convention. The scope of the 1930 Canada-U.S Convention was later extended to cover pink salmon by virtue of the Protocol to the Convention signed on December 28, 1956. Volume CLXXXIV 1938 League of Nations Treaty Series No. 4255, pp. 305-317.
\textsuperscript{88} Article 1(1),(2), and (3), 1930 Pacific Salmon Convention.
\textsuperscript{89} Hereinafter referred to as the “1985 Pacific Salmon Treaty” or the “1985 Treaty”. The Canadian fishermen were dissatisfied with the 1930 Canada-U.S Convention because of the prospects for increasing runs and the very large total cost of maintaining the Fraser runs including habitat protection, forbearance with respect to hydropower dams on the Fraser and development in the United Nations Conference on the Law of the Sea (UNCLOS III) with regard to anadromous species and the primary responsibility of state of origin to manage such stocks developments. Miller, K. et al., op. cit., pp. 2-3, Shepard, M. P. and Argue, A. W., op. cit., pp. 55-56, 120 and 123 and Burke, W. T., (1991) Anadromous Species and the New International Law of the Sea, Ocean Development & International Law, Vol. 22, Issue 2, pp. 95-131 at p. 110.
\textsuperscript{90} Article III (2) and (3), 1985 Treaty. Structure wise, the 1985 Treaty established the Pacific Salmon Commission (Commission) to superintend implementation of the agreement based on consensus rule, three Panels to provide information and make recommendations to the Commission. See Article II(1),(18) and Annex 1.
Articles 61 and 62 of the Convention. Since the intermingling of the various species of salmon is natural and interception of all species during fishing is unavoidable, the equity principle entrenched in Article 1(b) is to enable each State of origin to get a return benefit that is commensurate with its salmon production.

The 1985 Treaty set a fixed-catch ceiling for the parties taking into account the specific species and location without any provision for adjustment even where the stock could not sustain the allotment. The assumption was that by fixing the ceiling, the party making the investment or on whose river salmon originates, would be able to reap the rewards from the subsequent expected increase in the stock’s production. Unfortunately, the increasing sea surface temperature led to the northward migration of the salmon stocks and the high rate of interception by the parties. Inability of the parties to define “equitable share”, which underpins the foundation of the 1985 Treaty and the imbalance between interceptions of the salmon originating from each party’s river, eventually hampered the implementation of the 1985 Treaty in 1994.

After seven years of protracted negotiations and threatened violence by fishermen from both States, Canada and the U.S. re-authorised the 1985 Treaty by signing the 1999 Agreement. The 1999 Agreement did not replace the 1985 Treaty; rather it introduced a number of fundamental new elements. The elements are: (i) long-term fishing arrangements of ten to twelve years for all shared stocks, instead of the expired two or four short-term harvest management measures entrenched in the 1985 Treaty; (ii) an

91 Shepard, M. P. and Argue, A. W., op. cit., p. 95.
93 See Annex IV, Chapters 1 – 6, 1985 Treaty.
95 Miller, K. A. and Munro, G. R., op. cit., p. 383.
96 Apart from the disagreement of the parties over the interpretation of Article 1(b), the parties also disagreed over the relationship of paragraph 1(b) of Article III of the Treaty to the other paragraphs of Article III and the other provisions of the Treaty, and over the application of Paragraph A of the MOU. See Article II and paras 2 and 3 of the preamble to the Agreement Between the Government of Canada and the Government of the United States of America on the Establishment of a Mediation Procedure Regarding the Pacific Salmon Treaty, 1995. Available at http://www.intfish.net/treaties/bilaterals/texts/can-usa/1005.htm (accessed January 10, 2008).
abundance-based management strategy replaced the rigid fixedceilings in the 1985 Treaty with harvest limits that fluctuate according to the strength of salmon population in any given year, (iii) the setting up of two endowment funds to assist in habitat protection and restoration, (iv) a renewed commitment to scientific cooperation, staff exchange arrangements, workshops and timely exchange of data, and (v) a joint commitment by the two states to restore salmon habitat, water quality and quantity for the purpose of increasing the natural stocks and allowing safe passage of adult and juvenile salmon to and fro their natal streams. Structure-wise, the 1999 Agreement retained the Pacific Salmon Commission and established two new panels. Chapters 1, 2, 3, 5, and 6 of Annex IV of the 1999 Agreement were amended in December 2008, and would be in force for the period of 2009 through 2018. Chapter 4 of Annex IV of the 1999 Agreement regarding Fraser Sockeye and Pink Salmon does not expire until December 2010.

With regard to the conservation and enhancement of Fraser sockeye, the 1999 Agreement retained the original area of operation of the Fraser River Panel (Panel). The Panel’s area could be adjusted in order to simplify domestic fishery management, and for the purpose of taking into consideration the effect of fishing salmon on other stocks and species harvested in the Area. It is the responsibility of the Panel to develop fishing plans and in-season decision rules for the implementation of the provisions of Chapter 4 of Annex IV for the period 2005 through 2010. The annual share of the U.S. catch of Fraser sockeye in the Panel’s area shall not exceed 16.5% of the TAC. The U.S. is required to provide forecast of Fraser sockeye run size affected by the Panel management.

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100 The provision on the principle of abundance-based regime is repeated in many subparagraphs of Annex IV See, for example, Chapter 1(2), 1999 Agreement.
101 Attachment C 1999 Agreement. In fact, it was the role of the Funds and the U.S. government’s commitment to financially sustain them that led to Canada abandoning its demand for compensation from the US for the many years imbalance inception of Canada’s salmon.
102 Attachment D, 1999 Agreement.
103 Attachment E, 1999 Agreement.
104 Referred hereafter as “the Commission”. Article II, 1999 Agreement.
105 The panels are (i) the Transboundary Panel for salmon originating in the Alsek, Stikine and Taku Rivers which flow from Canada through Alaska before entering the Pacific Ocean and (ii) the Yukon River for salmon originating in the Yukon River). Annex I (d) and (e).
106 See Article 1 of the 1930 Convention and Annex II of the 1999 Agreement.
107 Para 7 Chapter 4, 1999 Agreement.
108 Paras 1 and 5 of Chapter 4, Annex IV, 1999 Agreement. Whether the Panel succeeds or not will depend not only on the effective implementation of these measures but also on the post-evaluation of the season by the Technical Committee and the Commission staff to ensure that full consideration are given to: (i) domestic allocation objectives, (ii) conservation requirements and management objectives of other species and stocks within the Panel Area, and (iii) Commission staff are informed of management actions taken by the parties with regard to fishing of Fraser sockeye outside the Panel Area in a timely manner, which should not prevent achievement of the objectives of the fishery regimes for Fraser sockeye. See Para. 9(d)(i-iii) of Chapter 4, Annex IV and Para 7 Article VI, 1999 Agreement. Note that the online copy of the 1999 Agreement used for analysis purpose in this study was amended on June 30, 1999, December 4, 2002 and February 18, 2005.
109 Para (2)(a) Chapter 4, Annex IV, 1999 Agreement.
in a timely fashion. For the purpose of determining the pre-season planning, where possible, Canada must provide forecasts of the run size and spawning escapement requirement to the Fraser River Panel. In addition, Canada must provide to the Panel forecasts of migration patterns, gross escapement needs, and any in-season adjustment requirements as they become available. The Panel may adjust fishing times and areas stipulated in the annual regulations in response to variations in anticipated conditions.\textsuperscript{110}

The 1999 Agreement set out the decision process which the Panel must follow in discharging its obligations under Article VI of the Agreement.\textsuperscript{111} After the parties have agreed on a pre-season plan, Fraser sockeye fisheries under the Panel’s jurisdiction will remain closed until opened for fishing by in-season order of the Panel.\textsuperscript{112} The Panel is required to use the mid-point forecast provided by Canada for management purposes until in-season updates of run size become available. Alternatively, based on the advice of the Commission staff and the Panel Technical Committee, the Panel may adopt a more precautionary or optimistic application of the mid-point forecast information until in-season updates of run size are available.\textsuperscript{113} In order to ensure that the Panel takes the right decisions in managing Fraser sockeye, the Commission is expected to make recommendations to the Panel on in-season run size and other factors relevant to sound fisheries management and in-season decision making. Part of the information which the Commission will base its recommendations on includes in-season estimates of run timing and diversion rate.\textsuperscript{114} The Commission staff will provide the Panel with projected harvestable surpluses and the status of harvest from fisheries under the Panel’s management.\textsuperscript{115} Lastly, paragraph 13(c-e) of Chapter 4 Annex IV lays down detailed procedures on how recommendations mentioned earlier can be changed; and, importantly too, how respective National Sections of the Panel will propose regulations for their domestic Panel water fisheries that are consistent with the recommendations of the Commission staff and the Panel Technical Committee.

\textsuperscript{110} Para 6 Article VI, 1999 Agreement.
\textsuperscript{111} Basically, Article VI deals with the procedure for the establishment of regulations for harvesting of Fraser River sockeye and implementation and enforcement of the regulations and regimes on other stocks by the Panel and the Commission in the parties waters.
\textsuperscript{112} Para 12 Chapter 4, 1999 Agreement. Note that Chapter 4 of Annex IV to the 1999 Agreement deals with the management of Fraser River sockeye and Pink salmon. However, discussion is limited here to sockeye because of its choice as one of the case studies for this research.
\textsuperscript{113} Para 13(a) Chapter 4, 1999 Agreement.
\textsuperscript{114} Ibid.
\textsuperscript{115} Para 13(b) Chapter 4, 1999 Agreement.
Even though the 1999 Agreement as a whole represents a more sustainable way of management of North Pacific salmon, the effectiveness of the conservation and enhancement measures adopted in Chapter 4 Annex VI will always depend on how Fraser sockeye is directly or indirectly affected by climate conditions during its life cycle. The ability of Canada to forecast the stock’s run size, migratory pattern, run timing, and diversion rate depends on how climate change affects the marine and freshwater ecosystems, which the stock traverses during its life cycle, and how the stock responds to such changes.

Predicated on all these, the key question for fisheries managers, policy-makers and legal scholars is do the 1999 Agreement and the 2008 Agreed Record effectively address the effects of climate change? The answer to this question takes a disciplinary pattern.

5.4.1 Lawyers’ Perspective

To begin with, there is a dearth of legal literature on the NSS herring and climate change discourse. Analysis of the 2008 Agreed Record reveals that it does not integrate climate change into the measures prescribed for conservation and management of NSS herring. However, beginning from 1998, research conducted by the ICES on ocean climate status, and other specific issues on climate and marine fisheries, as well as the introduction of an ecosystem approach to fisheries management in its advice to its clients suggest that the climate change factor is not being ignored.

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116 The incorporation of in-season monitoring, attempt to reduce mixed-stock fisheries and adoption of a slightly more precautionary approach are measures that afford increased protection for the dwindling stocks. Williams, A., op. cit., p. 172 and Shepard, M. P. and Argue, A.W., op. cit., p. 209.

117 The life cycle of any salmon (whether of Pacific Ocean or Atlantic Ocean) is divided into the following three stages: the river juvenile stage, the marine stage and homecoming to freshwater (natal river or streams). At each of these stages the consequences of climate change on Fraser sockeye may be direct (e.g. growth, survival, reproduction and migration) and indirect (e.g. changes in abundance of food, interactions with predators, competitors, pathogens). See Greenhalgh, M., (2005) “The Many Problems of Managing Atlantic Salmon (Salmo salar) Populations”, In: Winfield, I. J., (ed.) Fisheries on the Edge, Conference Proceedings, Institute of Fisheries Management Annual Conference, Salford, November 15th -17th 2005, pp. 217-225 at pp. 218-223.


Contrary to the position taken in this study, and in numerous social sciences and natural science literature, legal scholars, particularly Williams and Phelan, only have acknowledged in passing that climatic conditions and global warming have an impact on the abundance of Pacific Salmon. Unfortunately, neither Williams nor Phelan evaluated the extent to which the 1999 Agreement has integrated human-induced climate change into Pacific salmon management. Instead, both authors were concerned about, among others, the problem of habitat protection.

It is true that no habitat, no salmon. However, it is also true that climate change has rendered ineffective measures taken to protect freshwater and marine habitats in many jurisdictions. For instance, despite British Columbia’s efforts to preserve the natural habitat of its salmon, beginning from the mid 1990s, extreme freshwater conditions including high temperatures and low flows led to high levels of pre-spawning mortality of Fraser sockeye both during upriver migration and in the spawning grounds. Similarly, warm marine ocean conditions and low food availability for juvenile Fraser sockeye in 2005 led to a poor year four old Fraser sockeye return in 2007. An instructive point, which advocates of habitat protection should note, is that:

120 For example, see Miller, K. A., and Munro, G. R., *op. cit.*, pp. 367-393, Beamish, R. J. and Noakes, D. J., *op. cit.*, pp. 231-244.
121 Williams, A., *op. cit.*
122 Phelan, S., *op. cit.*
It is impossible to “fence in” living marine resources or the critical ecological processes that support them, just as it is impossible to “fence out” the degradation of ocean environments and ... ecological disruption occurring in areas adjacent or linked to protected area”

In Hannesson’s opinion measures such as protected areas can only work if species are not excessively mobile. Likewise, a marine sanctuary cannot be effective if increasing sea temperature destroys its coral reefs, which harbour about one-third of all marine fish. Generally, as far as salmon management back on the home river is concerned, there is nothing that freshwater salmon fishery managers can do once the post-smolts migrate into the ocean. Their survival depends on factors such as the size of feeding area, availability of food, presence of predators and temperature, all of which are now influenced by climate change. Predicated upon all these, advocates of active adaptive management of marine reserves have emphasised the need to integrate climatic factors such as temperature, ocean current, and source-sink dynamics, which are capable of affecting all facets of fish life including migration and distribution patterns.

5.4.2 Bioeconomists’ Perspective

Bioeconomists engaged in the Fraser sockeye and NSS herring crises discourse agree that these stocks respond to natural climate variability. In their view, because of the unpredictable and unanticipated changes that variations in climate pose to the stocks, cooperative arrangements for their management need to be more resilient to climate variations. Theoretically, when a stochastic event (either imperfect information concerning environmental shift or poorly anticipated climate variations) results in asymmetric...

135 Greenhalgh, M., op. cit., p. 220.
payoffs to the players in a Game theory analysis, the favoured player will insist on cooperation while the disfavoured player will prefer a non-cooperative situation. Under such a situation, what is required is a flexible and resilient regime that can maintain incentives of the parties to cooperate in the presence of environmental changes taking place at unpredictable intervals.

Some of the tools which can be used to achieve flexibility of cooperative arrangements include side-payment or negotiation facilities, subtle incentives like quota swap, mutual access to the fish stocks, negotiation of pre-agreement on actions to be taken by states in the event of climate variation affecting fish stocks and adopting a portfolio management approach, which involves fleet diversification and flexible licensing that allows easy movement of fishing vessels between fisheries. Because scientists from the state parties to the cooperative arrangement may allow their individual state’s interests to cloud their expert opinion, some commentators have advised that scientific assessments should be insulated from partisan interpretations. This could be achieved through jointly funded research or by taking advice from impartial scientific bodies on stock assessment.

There is no doubt that some of these tools have been applied successfully in a number of cooperative agreements. For example, Miller argues that the abundance-based management strategy and the two endowment Funds established under the 1999 Agreement provide the needed flexibility and anticipation of changes in the condition of Pacific salmon as a result of climate regime shift. There is also no doubt that the 1976 Agreement Concerning Mutual Relations in the Field of Fisheries between Norway and Russia helped both

Ordinarily the two conditions required for a cooperative game to be stable are: (i) the solution must be Pareto Optimal - this means that it must not be possible to make one player better off without harming the other - and (ii) the Individual Rationality Constraint must be satisfied – this means that it must not be possible for any player to do better by refusing to cooperate. Miller, K. A. and Munro, G. R., op. cit., 375, and Miller, K. (2000) op. cit., IIFET 2000 Proceedings, p. 7.


states to jointly manage their fishery resources. Nevertheless, a deep reflection on the
majority of the tools reveals that their main objective is to keep cooperative arrangement
alive by addressing inequities in harvesting the stocks by the states involved. For example,
the harvest-based motive of portfolio management strategy suggested by Hilborn et al is
clear. The model’s primary aim is to enhance fisheries’ profitability, income distribution
and to create less social inequality. The mere fact that Hilborn et al know that portfolio
management may not have the desirable biological effect leads to the conclusion that
bioeconomists indirectly encourage the ongoing practice of fishing down the food web,
as well as ignoring what will happen in a situation where fish move completely away from
some areas because of increases in sea temperature. These apart, published works by
Miller in this area of study point to the fact that only natural variations in climate underpin
her conceptualisation of side payment.

In any case, the idea of bioeconomists being aware that climate variations influence fish
abundance, distribution and migration patterns, and yet decide to only canvass for
incentives that will ensure continuation of cooperation in the face of such environmental
changes calls into question their conservationist concerns. It seems also that
bioeconomists integrate climate factor into fisheries management from a very narrow
perspective. Bioeconomists seem to be concerned with (i) preserving economic interests of
the fishers; (ii) measures that will mitigate the inequities in harvest; and (iii) changes in
fisheries that are caused by natural variations in climate. Assuming that the “climate
problems” encountered in managing the NSS herring and the Fraser sockeye were limited
only to inevitable natural climate variations, then integration of climate factor into fisheries
management in the narrow sense may suffice. But when there is incontrovertible evidence

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146 Hilborn, R., et al., op. cit., pp. 102 and 106.
147 Ibid, p. 106.
279, No. 5352, pp. 860-863. The authors conclude that landings from global fisheries have shifted in the last
45 years from large piscivorous fishes toward smaller invertebrates and planktivorous fishes (trophic levels
of fisheries landings) at a rate of about 0.1 per decade. This trend in their views will lead to widespread
fisheries collapses. Ibid, pp. 860 and 863.
150 For example El Niño, La Niña, NAO, and PDO.
152 This can be deduced from Munro’s explanation of the economic consequence of introducing side
payments as encouraging joint owners of shared fishery resources to focus upon the allocation of net
economic benefits from the fishery, rather than upon the allocation of harvest. On this basis, the goal which
managers of such fishery try to achieve is to adopt management policies designed to maximise the global net
economic benefit from the fishery through time. Munro, G. R. (1986) “The Management of Shared Fishery
Resources under Extended Jurisdiction”, Marine Resource Economics, Vol. 3, No. 4, pp. 271-296 at pp. 282-
283.
that most of the observed late 20th century and early 21st century warming (over the last 57 years) is attributable to human activities, and that such activities still continue, then commonsense reasoning demands that the word “integration” should be construed broadly and functionally so as to include taking measures that will curtail or stop further human emissions of greenhouse gases that are causing global warming.

5.4.3 Physical/Biological Scientists’ Perspective
Regrettably, none of the scientific literature reviewed in this study has critically examined the strengths and weaknesses of the 2008 Agreed Record or the 1999 Agreement. No doubt, the ICES extolled the management plan in the 2008 Agreed Record as being consistent with a precautionary approach. Whether such a claim is tenable when the 2008 Agreed Record allows state parties to either exceed or save 10% of their assigned quota, is a different issue altogether. However, the consensus in the scientific literature is that the effects of climate change are being taken into account in the management of NSS herring and Fraser sockeye.

5.5 Lessons from Management of NSS herring and Fraser sockeye
An examination of how the states involved in the exploitation of the NSS herring and Fraser sockeye responded to the impact of variation in climate on the stocks will provide useful lessons for fisheries managers and policy-makers in their attempts to identify their country’s strengths and weaknesses in coping with the impact of climate change on fishery resources.

5.5.1 Lesson 1: Reckoning with Climate Factor
The belief in the past that impacts of climate and ocean conditions on fishery resources were less important than overfishing caused fisheries managers and policy-makers to ignore climate factors in fisheries management. The NSS herring and the Fraser sockeye case studies show that climate change has complex and uneven impacts on fish stocks.


154 See Glantz, M. H. (1991) op. cit., p. 12. The truth is that some of the less important lessons are elements of the basic lessons. For example, the fact that fishing capacity has reached a level which threatens stocks like NSS herring and Fraser sockeye and the need to accept efficient and timely fishery regulatory measures further support the reason why these state parties to the NSS herring and Pacific salmon regimes have decided to adopt a precautionary approach in managing the stocks.
These case studies reveal that different species respond in different ways to climate induced variations in the marine environment.\textsuperscript{155} For instance, increases in the temperature of Northeast Atlantic Ocean because of NAO led to an abundance of the NSS herring.\textsuperscript{156} On the other hand, increases in the temperature of the Northeast Pacific Ocean due to PDO led to declining Chinook and Coho salmon in the southern states of California, Oregon and Washington, while at the same time enhancing the productivity of Alaska pink salmon.\textsuperscript{157} The uneven effect of increasing sea temperatures on different fish species exacerbates the complexity of the situation and makes it more difficult for policy-makers and fisheries managers to decide which measures to apply.\textsuperscript{158} The socio-economic consequences that occur as a result of the contribution of climate variations to the deplorable state of the NSS herring and Fraser sockeye place new responsibility on the states involved in the exploitation of the stocks. This informed the commitments on the part of the states exploiting the stocks to take into consideration the impacts of fishing and climate-induced changes in oceans, estuary and freshwater in managing the stocks.

It is inevitable that in future changes in the biomass, productivity and availability of marine fishery resources will continue as a result of climate change.\textsuperscript{159} The management response must therefore consist of robust and flexible conservation and management measures that will enable different species to cope with or adapt to future climate change. Failure to apply such measures may result in the sort of management, legal and socioeconomic problems encountered by the states involved in the exploitation of the NSS herring and Fraser sockeye.


\textsuperscript{156} Sissener, E. H. and Bjørndal, T. \textit{op. cit.}, p. 303.


\textsuperscript{158} Miller, K. A. and Fluharty, D. L., \textit{op. cit.}, p. 82.

\textsuperscript{159} This is based on the fact even if GHGs were stabilised, the impacts of their emissions are projected to continue for hundred years. IPCC (2007) \textit{Climate Change 2007: The Physical Scientific Basis Summary for Policymakers}, Contribution of Working Group 1 to the Fourth Assessment Report of the IPCC, Geneva, IPCC Secretariat, pp. 12 and 13.
5.5.2 Lesson 2: Reckoning with Complexity and Non-equilibrium Paradigm

The second lesson from the NSS herring and the Fraser sockeye case studies is the need to apply an ecosystem approach in managing marine fishery resources. The 2008 Agreed Record and the 1999 Agreement do not specifically refer to the term “ecosystem approach”. Nevertheless, certain provisions of the 1999 Agreement and the adoption of an ecosystem approach to fisheries management by ICES strongly suggest that scientific advice which state parties to the 1999 Agreement and the 2008 Agreed Accord receive is influenced by the complexity and non-equilibrium nature of aquatic ecosystem, as well as the interaction between oceans, atmosphere and terrestrial ecosystems.

Even though the 1999 Agreement was primarily aimed at the regulation of North Pacific salmons, it allows the parties to go to the extent of adjusting the Fraser Panel Area in order to take into account the effect on other stocks and species harvested in the Area. Few other provisions under Chapter 4 Annex IV of the 1999 Agreement support the application of an ecosystem-based approach in managing Fraser sockeye. For example, the parties are obliged to take into account non-fishing factors that affect the optimum production of salmon and to financially support activities that will improve scientific understanding of factors affecting salmon production in freshwater and marine environments. Any construction of the phrases “non-fishing factors” or “factors affecting salmon production” should include the non-equilibrium nature of the freshwater and marine habitats as well as human-induced factors like climate change, all of which affect the health and productivity of salmon.

There is no doubt that the non-equilibrium nature of aquatic ecosystem and impacts of climate change have affected Canada’s ability to fulfil its obligation to forecast the Fraser

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161 Para 7 of Chapter 4 of Annex IV and Article VI (3), 1999 Agreement.

162 Para 3 of Attachment E, 1999 Agreement.

163 See para 3(a) of each section of Attachment C.

sockeye run size, migratory pattern and diversion rate, as required under the 1999 Agreement. As a matter of fact, the Wild Salmon Policy adopted by Canada in 2005 explicitly recognises the fact that global warming is taking place. The Wild Salmon Policy goes further to point out that changes in climate and ocean conditions affect survival of salmon during the stock ocean phase by a hundredfold and in some cases by a thousand fold. In order to address these problems the Wild Salmon Policy strategies and action step 3.1 requires that within two years an ecosystem monitoring and assessment approach will be developed and integrated with ongoing assessments and reporting on the status of salmon in freshwater. However, understanding salmon production requires integrating the freshwater monitoring programme with the effects of changes in climate and ocean conditions. While it is true that the Wild Salmon Policy cannot directly protect salmon from climate change, it seeks to maintain the genetic diversity of wild salmon and the integrity of their habitats and ecosystems in order to ensure viable stock populations in the future.

What then is an ecosystem approach to fisheries management and is it incorporated into IFL?

5.5.2.1 What is an Ecosystem Approach to Fisheries Management?

Tansley coined the term ecosystem in 1935, although the idea itself has a much longer history. While “ecosystem” and “ecosystem approach” are seldom defined in international fisheries agreements, publicists have ascribed them with numerous definitions. The FAO defines an ecosystem approach to fisheries management as striving:

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166 Wild Salmon Policy, p. 22.

167 Wild Salmon Policy, p. 23.

168 Ibid.

169 See marginal note on p. 23, Wild Salmon Policy.


172 For example, Murawski defines “ecosystem” and “ecosystem approach” as (i) Ecosystem: An ecosystem is a geographically specific system of organisms (including humans), the environment, and the process that control its dynamics. (ii) Ecosystem approach: An ecosystem approach to management (EAM) is one that provides a comprehensive framework for marine and coastal resource decision making. See generally Murawski, S. A. (2007) “Ten Myths Concerning Ecosystem Approaches to Marine Resources Management”,

Notwithstanding the nebulous nature of the ecosystem approach, Murawski has identified its basic characteristics.\footnote{See Article 194(5) under Part XII of the Convention. This part deals with the protection and preservation of the marine environment. See Article 145 (a) under Part XI of the Convention, which deals with the deep seabed mining. The basis for their contention is the requirement that conservation measures taken shall among other factors be designed to maintain or restore populations of harvested species at levels which can produce the} Apart from interaction, all ecosystems overlap and are interdependent. This supposition underpins the idea of the earth consisting of a single ecosystem (biosphere), and the need for marine fisheries managers and policy-makers to examine how ocean affects or is affected by land and atmosphere.

### 5.5.2.2 Ecosystem Approach in IFL

Historically, the idea of applying an ecosystem approach in solving environmental problems started at the Stockholm Conference on Human Environment.\footnote{See the Preamble and Principle 2 of the Stockholm Declaration. In fact, the Action Plan for the Human Environment adopted at the Stockholm Conference specifically underscores the relationship between fish and the environmental condition of estuaries, inter-tidal marshes, and other near or inshore environments. Recommendation 48 (a). Available at \url{http://www.oup.co.uk/pdf/bt/cassese/cases/part3/ch17/1204.pdf} (accessed April 3, 2004).} The 1980 Convention on the Conservation of Antarctic Marine Living Resources\footnote{Hereinafter referred to as CCAMLR. See Articles I(3) and II(c) of the CCAMLR. Available at \url{http://www.intfish.net/treaties/ccamlr.htm} (accessed January 30, 2008).} is the first international fisheries instrument to take into account the ecological relationships among species as part of conservation measures. The Convention does not specifically adopt an ecosystem approach in any of its provisions on conservation and management of fisheries resources. Only once in the Convention text does either of the terms ‘fragile ecosystem’ and ‘ecological balance’ appear. However, a number of scholars argue that certain provisions of Articles 61 and 119 of the Convention amount to either an obligation to apply an ecosystem approach in fisheries management or take into account the general issues of such an approach.\footnote{See Article 19(5) under Part XII of the Convention. This part deals with the protection and preservation of the marine environment.}
The proponents of these arguments seem to ignore the fact that an ecosystem approach is just one of the ways with which ecologists address environmental problems. Individual, population, species and community are the other ways.\textsuperscript{181} The ecosystem is a term more inclusive than others.\textsuperscript{182} It encompasses a community or series of communities (both fish and non-fish species) and the abiotic environment in which they interact. More distinctively, it includes human activities which have altered the interrelationship among other components of the ecosystem in unprecedented ways.\textsuperscript{183} But its hallmark lies in the interaction between aquatic, atmospheric and terrestrial ecosystems. Addressing fishing problems from a population context is the same thing as applying a single-species approach which focuses on specific species. At best, the combined effect of Articles 61(3) and (4) and 119(1)(a) and (b) is akin to a community approach of fisheries management. Since these provisions ignore the interaction between oceans, atmosphere, and terrestrial ecosystems and the effects of human activities on components of the ecosystem, the Convention cannot truly be said to have introduced an ecosystem approach in marine fisheries management.

The preamble of the FSA only emphasises the need to avoid the long-term or irreversible effects of fishing operations on marine biodiversity and ecosystems.\textsuperscript{184} By failing to recognise the effects of changes in the marine ecosystem on fishing operation as a factor to be considered in the management of SHMFS, the preamble’s provision of the FSA on ecosystem lacks the crucial element of “interaction between or among components of the ecosystem”. Article 5 of the FSA takes a different stand by asking states not just to assess the impacts of fishing, other human activities and environmental factors on target and non-

maximum sustainable yield, as qualified by relevant environmental and economic factors, the needs of coastal fishing communities, the special requirements of developing states and the interdependence of stocks. See Articles 61(3) and 119(1)(a), Convention. Proponents of this argument also rely on the requirement that conservation measures shall take into consideration the effects on species associated with or dependent upon harvested species with a view to maintaining or restoring populations of such associated or dependent species above levels at which their reproduction may become seriously threatened. See Articles 61(4) and 119(1)(b), Convention. Schiffman, H. S. (2009) “CCAMLR Fisheries: Challenges to Effective Conservation and Management”, \textit{Journal of International Wildlife Law \\& Policy}, Vol. 12, Issue 3, pp. 180-189 at p. 182 particularly footnote 15 on the same page. See also Belsky, M. H. (1989) “Marine Ecosystem Model: The Law of the Sea’s Mandate for Comprehensive Management” In: Alexander, L. M., Allen, S. and Hanson, L. C. (eds.) \textit{New Development in Marine Science and Technology: Economic, Legal and Political Aspects of Change}, Honolulu: Law of the Sea Institute, pp. 115-134 at pp. 119 and 120.

\textsuperscript{180} Morishita, J., \textit{op. cit.}, p. 20.
\textsuperscript{182} For instance, a population is a group of individuals of the same species living in a given place while a community comprises populations of a number of different species living together.
\textsuperscript{184} Morishita, J., \textit{op. cit.}, p. 20.
target species belonging to the same ecosystem, but also to take measures with a view to maintaining or restoring populations of such species above levels at which their reproduction may become seriously threatened.\textsuperscript{185} Article 5 also mandates states to protect biodiversity in the marine environment,\textsuperscript{186} as well as defining “non-target species” to include “non-fish species.”\textsuperscript{187} Despite the aforementioned provisions reflecting the basic elements of an ecosystem approach, they neither expand upon the nature of the concept by incorporating the interaction between oceans, atmospheric and terrestrial ecosystems nor do they provide the operational guidelines on practical issues relating to implementation of the concept.\textsuperscript{188}

5.5.2.3 Ecosystem Approach under the Code

The Code contains a plethora of provisions on the ecosystem approach.\textsuperscript{189} First, in setting out the general principles and standards of behaviour for responsible and sustainable fisheries, the Code integrates the ecosystem approach into fisheries management. The first general principle urges states and users of aquatic resources to conserve aquatic ecosystems. The word “aquatic”, which is used in several provisions of the Code, underscores the Code’s emphasis on the interconnection between freshwater and marine environments, and the holistic manner in which states should manage fishery resources. In order to achieve this, the Code elevated the protection and rehabilitation of all critical habitats in marine and freshwaters such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, which is usually regarded as a mere conservation and management measure, to the status of a principle.\textsuperscript{190} Indeed, a critical analysis of the general principles reveals that the ecosystem approach is inherent in almost all of them.\textsuperscript{191}

\textsuperscript{185} Article 5(d) and (e), FSA.
\textsuperscript{186} Article 5(g), FSA.
\textsuperscript{187} Article 5(f), FSA.
\textsuperscript{188} Kaye, S., \textit{op. cit.}, 283.
\textsuperscript{189} See Doulman, D. J., \textit{op. cit.}, pp. 213-214.
\textsuperscript{190} Articles 2(a), 6.8 and 7.6.10, the Code. In order to achieve this, states should ensure that policies, legal and institutional framework adopted by them to achieve sustainable and integrated use fish stocks take into account the fragility of coastal ecosystems. Article 10.1.1, the Code.
\textsuperscript{191} For instance, the Code directs that management measures should ensure conservation of targeted species and species belonging to the same ecosystem or associated with or dependent upon the target species (Article 6(2), Code). For this reason, fishers are required to minimise the catch of non-target species, both fish and non-fish species and, at the same time, develop and apply environmental and selective fishing gear and practices that will help them maintain biodiversity and conservation of the population structure and aquatic ecosystems (Articles 6(6) and 8.5.1, Code).
The Code does not entrench the ecosystem approach only in its general principles. Since the general principles encapsulate the other substantive provisions of the Code, elements of an ecosystem approach are also inherent in them. For example, the general principle of protecting and rehabilitating critical marine and freshwater habitats such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, is further strengthened in one of the fisheries management objectives which urges states, RFMOs or cooperative arrangements to adopt measures that provide inter alia for the conservation of biodiversity of aquatic habitats and ecosystems and the protection of endangered species. Furthermore, Article 7.2.3 unambiguously calls on states to assess environmental impacts on targeted and non-targeted species in the same ecosystem and interrelationships among the populations in the same ecosystem. States are required to undertake research and data collection which will improve scientific and technical knowledge of fisheries including their interaction within the ecosystem.

One unique feature of the Code is the holistic nature of its provisions on the ecosystem approach. It urges states to take measures against significant impacts resulting from human activities such as wasteful management of fishery resources that threaten the health and viability of those resources, unsustainable consumption, usage and trade in fish and fishery products. Importantly too, the Code prohibits emission of substances that deplete the ozone layer. It also prohibits emission of greenhouse gases although it uses the phrase “dangerous substances in exhaust gas emissions” instead. Finally, the Code directs that states should establish research capacity necessary to assess the effects of climate and other environmental change on fish stocks and aquatic ecosystems.

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192 The substantive provisions deal with fishing management, fishing operations, aquaculture development, integration of fisheries into coastal area management, post-harvest practices and trade and fisheries research. See generally Articles 7, 8, 9, 10, 11 and 12, Code and Doulman, D. J., op. cit., p. 194.
193 Articles 2(a), 6.8 and 7.6.10, Code. In order to achieve this, states should ensure that policies, and legal and institutional frameworks adopted by them to achieve sustainable and integrated use fish stocks take into account the fragility of coastal ecosystems. Article 10.1.1, Code.
194 Article 7.2.2(d), Code.
195 Article 6.4, Code. See generally Article 12 of the Code on states’ responsibility to ensure the availability of a sound scientific basis, which also takes into account traditional knowledge of the fisheries and their habitats.
196 The Code considers the term “waste” in a general (Articles 6.6 and 7.2.2 (g)) and specific manner including waste of fishery resources (Articles 6.7, 7.6.9, and 11.1.8.(a)) and waste from garbage (Article 8.7.2), oil waste and disposal (Articles 8.7.4 and 8.9.1 (c)), offal, sludge, dead and diseased fish, veterinary drugs and hazardous chemicals (Article 9.4.6) and waste data (Article 11.1.8 (a)).
197 The Code considers pollution in general terms (Articles 6.8, 7.2.2(g) and 12.5) and with specific reference to marine pollution (Articles 8.3.2, and 8.9.1(d)) and pollution from atmospheric sources (Article 8.8.1).
198 See generally Article 11, Code.
199 See generally Articles 8.8.2 – 8.8.5 of the Code dealing with protection of the atmosphere.
200 Article 8.8.1, Code.
201 Article 12.5, Code.
specifically taking into account the impacts of ecosystem changes and the effects of socio-economic and commercial factors on fishery resources, the Code identifies man as an integral part of the aquatic ecosystem.

Technically, the Code goes beyond the traditional single-species (population) and multi-species (community) fisheries management approaches entrenched in the Convention. It also takes into consideration human activities and the interaction between the aquatic, atmospheric and terrestrial ecosystems, which constitute the hallmark of an ecosystem approach. Unfortunately, the Code expatiates on the nature of the ecosystem approach but fails to provide operational guidelines on practical issues concerning implementation of the concept. The *EA Technical Guidelines* have elaborated not only the agreed principles and concepts relating to the ecosystem approach, but also the operational objectives, practical guidelines, indicators and performance measures for implementation of the ecosystem approach. A qualitative content analysis of recent works by Morishita, Murawski, Carden and Grafton and Kompas reveal a more comprehensive and explicit description of the principles and operational procedures of the ecosystem approach.

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202 Examples of reference to socio-economic factors are in Articles 7.4.2 and 7.4.5 of the Code under data gathering and management advice.

203 See generally Article 11, Code.

204 The truth is that human social systems and ecological systems have co-evolved. Dealing with problems in one system affects the other system hence the need to simultaneously deal with problems in both systems. Carden, K. (2006) “Bridging the Divide: The Role of Science in Species Conservation Law”, *Harvard Environmental Law Review*, Vol. 30, Issue 1, pp. 165-258 at p. 204; see particularly footnote 290.

205 See generally Articles 6.8 and 7.2.3 of the Code and the Abstract of the *EA Technical Guidelines*.

206 See the Background and Abstract of the *EA Technical Guidelines*. Murawski summarises the Technical Guidelines principles and operational directives as follows: (i) set high level policy goals, (ii) identify broad objectives, (iii) prioritise issues to be addressed in management, (iv) set operational objectives, (v) develop indicators and reference points (vi) develop decision rules for application of measures, and (vi) monitor and evaluate performance. Murawski, S. A., *op. cit.*, p. 685 and the pp. 16 and 17 of the *EA Technical Guidelines*.

207 Morishita, J., *op. cit.*

208 Murawski, S. A., *op. cit.*

209 Carden, K., *op. cit.*


211 This basis of identifying the principles or operational procedures in these texts are those words or phrases that point to factors that are hallmarks or essential for the successful implementation of ecosystem-based management to fisheries resources. For example Morishita uses the phrase “also relates to” in Para 5.3 on “Misperception” to refer to certain factors that must be in place for the implementation of an ecosystem approach to be effective. Again, in Para 6.1 on Good Science, the author uses the words “essential elements” to point out transparency and validity as crucial factors that must be in place for an ecosystem approach to succeed. See Morishita, J., *op. cit.* pp. 24 and 25 respectively. Among the numerous words and phrases used by Murawski are “implementation strategies include…” and “significant impediments to implementation of EAM”. With regard to the last phrase, common sense demands that a reader should know that solutions to the impediments are the factors which will lead to success of an ecosystem approach. Murawski, S. A., *op. cit.*, pp. 682 and 683. Finally, Carden uses phrases like “...it is likely to be successful unless ...” and “... key features of a successful...” to point to basic principles and operational procedures for successful ecosystem-based management. Carden, K., *op. cit.*, particularly at pp. 241 and 241.
Some of the principles and operational procedures common to the aforementioned literature include:

1. setting specific goals that are sustainable from the environmental and human perspectives;\textsuperscript{212}
2. identification of measures or tools required to achieve the set goals within a fixed time scale;
3. adoption of measures on a case-by-case basis because species characteristics and effects of measures on them are different;
4. flexibility and adaptability in the taking of measures;\textsuperscript{213}
5. ensuring availability of scientific and managerial resources and expertise required for implementation;
6. setting measurable criteria to review implementation progress;
7. assessment of success of the measures implemented based on measurable criteria;
8. review of measures based on new information acquired through the best scientific knowledge as it becomes available as scientific and traditional ecological knowledge are critical change agents;
9. basing scientific decisions on controversial issues on transparency and validity;\textsuperscript{214}
10. integrating information across disciplines and coordinating data collection; and
11. involvement of stakeholders in all the ecosystem processes and decisions, including the feedback loop.\textsuperscript{215}

On a more general note, the 1992 Convention on Biological Diversity (CBD) provides a legal basis for the application of the ecosystem approach in the conservation and

\textsuperscript{212} The human perspective is not limited to taking into account the socio-economic and political interest, but also resolving the competing interests (e.g. benefit and cost) of the different sectors, agencies and jurisdictions whether in a federation or at the international level. Murawski, S. A., op. cit., pp. 681 and 682.

\textsuperscript{213} Adaptability means modifying and improving on existing measures. It also implies review of existing statutes and international agreements containing obsolete measures. Carden further points out that for adaptive management of natural resources to succeed, a coordinated programme of research and monitoring is required. Carden, K., op. cit., p. 243.

\textsuperscript{214} Transparency means communicating and explaining goals and measures to be taken to all stakeholders and getting them involved (participation) in the decision making process. On the other hand, validity of goals and measures requires peer review and confirmation of measures by third parties. These are what give legitimacy to the goals and measures adopted. Murawski, S. A., op. cit., pp. 683 and 688.

\textsuperscript{215} Grafton, R. Q. and Kompas, T., op. cit., p. 475.
management of all natural resources, including fisheries. While it is true that the CBD originally contained no specific article demanding the application of the ecosystem approach in fisheries management, the Conference of Parties to the CBD addressed the omission in its Decisions II/10, IV/5 and V/6. More importantly, by encouraging its state parties to establish and/or strengthen, where appropriate, institutional, administrative, and legislative arrangements for the development of integrated management of marine and coastal ecosystem, the CBD extends the application of the ecosystem approach to coastal states internal waters and territorial seas which are not covered by the Convention or the FSA.

Decision V/6 gives a vivid description of the ecosystem approach and also identifies the principles and operational guidelines of the concept. Decision V/6 provides that the ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organisation encompassing the essential structure, processes, functions, and interaction among organisms and their environment. Finally, it stipulates that humans and their cultural diversity are an integral component of many ecosystems. The ecosystem approach has been integrated into many international fisheries and related soft laws, the most important being the Reykjavik Declaration and

216 Poplarly known as the Jakarta Mandate on the Conservation and Sustainable Use of Marine and Coastal Biological Diversity (Jakarta Mandate).

217 This policy decision on conservation and sustainable use of marine and coastal biological diversity including a programme of work adopted the ecosystem approach as one of the basic principles for the implementation of any activity pertaining to the programme of work. It contains specific operational objective including the identification of key variables or interactions, assessing and monitoring of components of biological diversity, the sustainable use of such components, and the ecosystem effects. See specifically Operational Objective 2.1 under Programme element 2. Marine and Coastal Living Resources.

218 See Para 3, Jakarta Mandate. COP 4 Decision IV/5.

219 The 12 ecosystem principles, otherwise known as The Malawi Principles, are: 1. Ecosystem management should be relative and based on societal choice. 2. Management should be decentralised to the lowest level. 3. Ecosystem effects from one ecosystem to an adjacent or other ecosystem should be considered. 4. Potential gains from management by understanding ecosystems in an economic context should be considered. 5. Conservation of an ecosystem’s structure and functions should be ensured. 6. Management of ecosystems should be within the limits of their functions. 7. The ecosystem approach should be undertaken at the appropriate spatial and temporal scales. 8. Objectives for the ecosystem should be based on long term planning. 9. It should be recognised that change is inevitable in ecosystem management. 10. An appropriate balance between conservation and use of resources should be achieved. 11. Consideration should be given to all forms of information, including scientific and indigenous and local knowledge, innovations and practices. 12. An ecosystem approach should involve all relevant sectors of the society and scientific disciplines.

220 Para 2 of Section A, Decision V/6.

221 FAO (2001) Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem, Rome: FAO. Available at http://www.fao.org/docrep/meeting/004/Y2211e.htm (accessed July 5, 2008). The follow-up of the Reykjavik Declaration was the convening of an Expert Consultation on Ecosystem-based Fisheries Management September 2002. This led to the adoption of the EA Technical Guidelines which supplement the Code. Although a few international fisheries instruments had earlier referred to an ecosystem approach, it was not until the adoption of the Reykjavik Declaration and the EA Technical Guidelines that serious progress was made to implement an ecosystem approach in fisheries management. Doulman, D. J., op. cit., p. 215.

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the 2002 World Summit on Sustainable Development Plan of Implementation. The latter encourages states to adopt the ecosystem approach in the conservation of fisheries resources by 2010.  

5.5.3 Lesson 3: Reckoning with Uncertainty

Another lesson from the NSS herring and the Fraser sockeye case studies arose from the large uncertainty associated with the stock management, which was exacerbated by climate change. The mere fact that uncertainty is a fundamental component of fish stocks assessment and other management measures debilitates the acceptability of the management system and the compliance behaviour of the states exploiting the stocks. In order to address the problem of uncertainty in the management of the NSS herring, the parties to the 2008 Agreed Record added the precautionary approach to the “catch limit” measure, which until 1999 was the only conservation and management measure used to manage the stock. One of the factors that contributed to the collapse of NSS herring in late 1960s was failure by the states exploiting the stock to set precautionary reference points for the stock. A precautionary reference point could have buffered the stock’s biomass against environmental variability and change.

The current measures taken by Canada and the U.S. under the 1999 Agreement to manage Fraser sockeye have encouraged the Panel to adopt a more precautionary approach in the use of mid-point forecast information until in-season updates of run size are available. Unfortunately, the 1999 Agreement does not set limit or target reference points for Fraser sockeye. This lapse has been taken care of in the Wild Salmon Policy adopted by Canada in 2005, and in fact, the bulk of the conservation and management measures which the Panel has applied in the management of Fraser sockeye have been initiated by Canada. The Wild Salmon Policy provisions on the precautionary approach are traceable to the FSA, the Rio Declaration, the Code, and the FAO Guidelines on the Precautionary Approach to

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224 Note that between 2003 and 2006 when the 1997 Five Parties Agreed Record collapsed, no internationally agreed conservation measure was applied in the management of the stock.

225 Field, J. C. and Francis, R. C., op. cit, p. 255.

226 Note that the Panel can only exercise this discretion on the advice of the Commission staff and the Fraser River Panel Technical Committee. Chapter 4 (13)(a), 1999 Agreement.
Capture Fisheries and Species Introduction. The application of precaution in the Wild Salmon Policy is also consistent with the guidelines provided to the Federal Departments by the Canada Privy Council Office. The said guidelines identify five guiding principles for the application of precaution and five principles for precautionary measures.

At this point it is necessary to examine the nature of the precautionary approach and the form in which it is incorporated into IFL. Since the provisions of the FSA on the precautionary approach are reminiscent of Articles 6(5) and 7.5 of the Code, it will be superfluous to also re-examine the precautionary approach as embodied in the Code. On that basis, this section provides adequate cross-references between the provisions of the FSA and the Code on the precautionary approach.

5.5.3.1 What is a Precautionary Approach?

A precautionary approach lacks an acceptable universally standard definition. There is also controversy as to whether precaution should be referred to as a “principle” or an “approach”. While each of these words is preferred in certain jurisdictions, it is not


229 (i) A legitimate and distinctive decision-making approach within risk management. (ii) Decision-making should be guided by society’s chosen level of protection. (iii) The scientific information base and responsibility for producing it may shift as knowledge evolves. (iv) The establishment of mechanisms for re-evaluating bases for decision-making and ensuring transparent process for further consideration. (v) Ensuring transparency, accountability and public participation. Ibid, pp. 6-10.

230 (i) Policies are subject to reconsideration based on new science, technology and society’s chosen level of protection. (ii) Measures taken should be proportional to the potential severity of the risk being addressed and to society’s chosen level of protection. (iii) They should be non-discriminatory and consistent with measures taken in similar circumstances. (iv) Measures taken should be cost-effective and aimed at (a) a net benefit for the society at least cost, and (b) achieving the greatest efficiency. (v) If more than one option meets these four characteristics, then the least trade-restrictive measures should be applied. Ibid, pp. 10-13.


232 Although the differences between “a principle” and “an approach” may not be decipherable from a policy perspective there is a wide disparity concerning their legal implication. A principle can be linked to the general principles or even customary international law, being sources of international law pursuant to Article 38 of the Statute of International Court of Justice. An approach does not encapsulate the same meaning for the purpose of interpreting international law, rendering it a consideration for national decision makers to use
uncommon to find both words being used by certain jurisdictions and scholars interchangeably. This study prefers the word “approach”, which is used in the FSA and the Code.

Under traditional environmental law where the “permissive principle” was applied, environmental activities were often not restricted or prohibited by legal rules until a causal link between the activity and a particular damage was established. The permissive principle was based on the “assimilative capacity approach” which supported the assumption that apart from science accurately determining the assimilative capacity of the environment, there was sufficient time to take preventive action even after damage may have occurred. The precautionary approach requires the policy-makers to ensure that errors are made on the side of excess environmental protection. It requires preventive action to be taken before scientific proof of harm. As a policy-making strategy, it addresses the manner in which policy-makers, for the purposes of protecting the environment, apply science, technology and economics.


234 See the 2004 Canada Wild Salmon Policy.


240 Barron N, and Couzens, Ed., op. cit., p. 21; see particularly footnote 11.
to the environment;\textsuperscript{241} and a shift in the burden of proof from those opposing environmental activity to those promoting such activity.\textsuperscript{242} Other assumptions impact assessments should be conducted prior to undertaking environmental activity;\textsuperscript{243} the conservation threshold for taking such action should be set;\textsuperscript{244} and a risk assessment including assessment of alternatives should be carried out.\textsuperscript{245} The above should take into account the social and economic well-being of present and future generations\textsuperscript{246} and an eco-centric approach should be applied to all environmental activities.\textsuperscript{247}

The genesis of the precautionary principle is traceable to the German environmental law principle of precautionary action or ‘\textit{Vorsorgeprinzip}’ that evolved during the 1970s and 1980s.\textsuperscript{248} In the past two decades the concept has been incorporated into many binding and non-binding international instruments on the environment, although its precise formulation is not identical.\textsuperscript{249} Notwithstanding variations in the several versions of the precautionary approach, they all share the normative assumption that when a government is balancing all interests, environmental protection should be given a paramount value.\textsuperscript{250} While the 1990 Bergen Ministerial Declaration on Sustainable Development in the ECE Region was the

\begin{itemize}
\item \textsuperscript{241} \textit{Ibid.}
\item \textsuperscript{244} Barron and Couzens note the common thresholds as “threats of serious or irreversible harm” contained in the Paragraph 15 of the Rio Declaration and “unacceptable impacts” adopted in the Para. 4 (a) of the UN General Assembly Resolution A/RES/44/225 of December 22, 1989. Barron, N. and Couzens, Ed., \textit{op. cit.}, p. 21; see particularly footnote 11.
\item \textsuperscript{246} Hilborn, R., \textit{op. cit.}, pp. 99-107.
\item \textsuperscript{249} For example, see Article 2 para. 2(a) of the Convention for the Protection of the Marine Environment of the North East Atlantic (This convention replaces both the 1972 Oslo Convention and the 1974 Convention when it came into force on February 9, 1999); Article 5(7) of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (1998); Article 3(17) of the Sebjerg Declaration of the Fourth International Conference on the Protection of the North Sea; Articles 10 and 11 of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Article 130r (2) (now Article 174) of the EC Treaty thereby making EC actions on environment to be based on precautionary approach. McAllister claims that more than ninety international agreements include precautionary principle in one form or the other. See McAllister, L. K. (2005) “Judging GMOs: Judicial Application of the Precautionary Principle in Brazil”, \textit{Ecology Law Quarterly}, Vol. 32, Issue 1, pp. 149- 174, at p. 154.
\end{itemize}
first international instrument to identify the precautionary approach as a condition for achieving sustainable development,\(^{251}\) its most authoritative formulation is in Principle 15 of the Rio Declaration.\(^{252}\) The primary factor that hinders implementation of the precautionary approach is failure by most international instruments to specify its operational details.\(^{253}\) Controversies exist as to under what circumstances should precautionary approach be taken, to what extent it should be driven by sound science, how extreme should precautionary measures be, and indeed what should be its status in international law? While these controversies still rage in other areas of environmental law, IFL has defined the threshold and the fundamental pre-determined courses of action, which should guide states in the application of the precautionary approach.\(^{254}\)

### 5.5.3.2 Precautionary Approach in IFL

The FSA makes it mandatory for states to apply the precautionary approach widely in the conservation and management of straddling and highly migratory fish stocks (SHMFS), with the aim of protecting marine living resources and preserving the marine environment. In order to achieve these aims, states shall be more cautious when information is uncertain, unreliable and inadequate. However, the absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.\(^{255}\) Incidentally, the FSA only addresses the element of scientific uncertainty. It is silent on the threats of serious or irreversible damage because once there is likelihood of such a threat, states are required to take emergency measures to avert the threat or ensure recovery of the fishery.\(^{256}\) Since an emergency situation suggests crisis, conservation and management measures applied by states are likely to be stricter and more decisive than mere precautionary measures or prudent foresight measures, which are applied when the stock is at least still healthy. In fisheries systems where changes are only slowly reversible, difficult to control, not well understood and subject to environmental changes and human

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\(^{252}\) Principle 15 provides that, “In order to protect the environment the precautionary approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradations.” See *Rio Declaration on Environment and Development*, June 14, 1992 Reprinted in 31 I.L.M. 874, 879 (1992).

\(^{253}\) McAllister L. K., *op. cit.*, p. 156.

\(^{254}\) Kaye, S., *op. cit.*, pp. 227 and 240.

\(^{255}\) Articles 5(c), 6(1) and (2) FSA. See also Articles 6(5) and 7.5, Code. The precautionary approach provision in the FSA and the Code reproduced Principle 15 of the Rio Declaration.

\(^{256}\) Article 6(7) FSA. See also Article 7.5.5, Code.
values, nothing short of taking emergency measures would be proper for a fishery that is seriously threatened or likely to collapse.

Article 6(3a-d) of the FSA stipulates the measures which states must take while implementing the precautionary approach. The measures are to:

a. improve decision making on fisheries management through obtaining and sharing the best scientific information and implementing improved techniques for dealing with risk and uncertainty;

b. apply the guidelines set out in Annex II and determine, on the basis of the best scientific information available, stock-specific reference points and action to be taken if they are exceeded;

c. take into account inter alia, uncertainty relating to the size and productivity of the stocks, reference point, stock condition in relation to such reference points, levels and distribution of fishing mortality, the impact of fishing activities on non-target species, and existing and predicted oceanic, environmental and socio-economic conditions;

d. develop data collection and research programmes for the assessment and taking into account of the impact of fishing on non-target species and their environments and to protect habitat of special concern.

Article 6(3)(b) ushers in a new revolution into fisheries management by jettisoning the reactive approach which merely encouraged implementation of conservation and management measures after a particular stock had collapsed or become depleted. The main objective of the application of a precautionary approach in fisheries management is to prevent excessive stocks exploitation and degradation of their environment, as well as help restore depleted stocks. In order to achieve this, states must determine stock reference points which must not be exceeded. Where reference points are exceeded, states must take appropriate action immediately to implement already pre-determined action that will

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257 This is how the FAO Guidelines for Precautionary Approach describes fisheries systems. See Paras. 20 and 19 of the guidelines.
258 For similar provision in the Code, see Article 7.5.2.
259 See Article 7.5.3(a), the Code contains the second arm of this measure.
260 Article 7.5.2, Code. Note that the words “existing and predicted oceanic” are not used in Article 7.5.2 of the Code.
261 Non-target species includes species that are associated or dependent on the targeted species.
restore the stocks.263 Where the status of target stocks or non-target species is in issue, states shall improve on monitoring the stock’s status and measures adopted for the management of the stock. The review of such measures must be regular and based on new information. Until there are sufficient data to allow assessment of the impact of fishing on the long-term sustainability of new and exploratory fisheries, states must adopt conservation and management measures that err on the side of caution, including catch and effort limits on such stocks.264 States shall adopt emergency measures on a temporary basis in order to ensure that fishing activities do not exacerbate the adverse impacts of a natural phenomenon on the status of SHMFS.265 Any emergency measures adopted must be temporary and based on the best scientific evidence available.266

A precautionary reference point is an estimated value derived through an agreed scientific procedure which corresponds to the state of the resource and of the fishery, and which can be used as a guide for fisheries management.267 The sense in which the words “resource” and “fishery” are used here underscores the need for policy-makers to take into account the biomass of fish stocks and socio-economic conditions of the fishers when deciding on which precautionary measures to implement. The two types of precautionary reference points recommended under Annex II are the conservation or limit reference points and the management or target reference points. The former set thresholds or boundaries with the aim of constraining harvesting within biological limits in which the stocks can produce MSY while the latter intends to meet management objectives.268 Both limits should be stock-specific and should take into account factors such as a stock’s reproductive capacity, resiliency of the stock, the characteristics of fisheries exploiting the stocks as well as other sources of mortality and any major sources of uncertainty.269 The phrase “characteristics of fisheries exploiting the stock” further buttresses the need to integrate socio-economic factors into decisions on precautionary measures. The phrase also allows for variation in policy implementation of the precautionary approach. For instance, policy-makers have to

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263 Article 6(4) FSA.
264 Such measures shall remain in force until available data allows for the assessment of the impact of fishing on the long-term sustainability of the stock, at which point conservation and management measures based on the assessment shall be implemented. The new measures shall, if appropriate, allow for the gradual development of the fisheries. Article 6(6) FSA. See also the Article 7.5.4, Code.
265 See generally Article 6 (7) FSA. See also Article 7.5.5, Code.
266 Ibid.
267 Para 1 Annex II, FSA. Note that Annex II sets out the guidelines for application of precautionary reference points in conservation and management of SHMFS.
268 Para 2 Annex II, FSA.
269 Para 3, Ibid.
consider whether the fishery includes artisanal or is overcapitalised before deciding on the types of precautionary measures to adopt.\textsuperscript{270}

Certain objective and operational procedures should guide decisions on the type of management strategies to adopt. Any strategy adopted should seek to maintain or restore populations of harvested stocks at levels consistent with previously agreed precautionary reference points.\textsuperscript{271} Secondly, the risk of exceeding limit reference points should be very low and target reference points should not be exceeded on average. Thirdly, where a stock falls below a limit reference point, or is at risk of falling below such a reference point, conservation and management action must be initiated to facilitate the stock’s recovery.\textsuperscript{272} Where information for determining the resources reference point is poor or not available, a provisional reference point shall be set by analogy to similar and better-known stocks.\textsuperscript{273} Since either poor or non-availability of information on SHMFS will increase uncertainty on the state of the stock, lessons from similar and better-known stocks serves as a useful heuristic device that could enhance policy-makers and other stakeholders’ understanding of how to manage the stock.\textsuperscript{274} In addition, the fishery must be monitored in order to ensure when available improved information requires revision of the provisional measures.\textsuperscript{275}

The fishing mortality rate, which generates a MSY, should be regarded as the minimum standard for fixing the limit reference point.\textsuperscript{276} For stocks that are not overfished any conservation and management strategy adopted must ensure that the mortality rate of the stocks does not exceed the level which corresponds to their MSY. Importantly too, the biomass of such stocks must not fall below a pre-defined threshold. With respect to stocks that are over-fished, the biomass that will enable the stocks to attain their MSY should be used as their rebuilding target.\textsuperscript{277} By requiring states to fix the limit reference points and stock mortality rate at the level that generates MSY the FSA seems to water down the potency of the precautionary approach as contained in Article 6(2) of the FSA. According to Kanehara, lack of objection to the precautionary approach during the drafting process of

\textsuperscript{270} Indeed, under the implementation guidelines provided for in the FAO Guidelines on Precautionary Approach apart from the general precautionary measures, specific precautionary measures are recommended for new and developing fisheries, over-utilised fisheries, fully-utilised fisheries and traditional as well as artisanal fisheries.

\textsuperscript{271} Para 4 of Annex II, FSA.

\textsuperscript{272} Para 5, Ibid.

\textsuperscript{273} Para 6, Ibid. With this provision, the FSA becomes the first international fisheries instrument to mandate states to adopt a historical analogy method in addressing the problem of lack of information.


\textsuperscript{275} Para 6, Annex II, FSA.

\textsuperscript{276} Para 7, Ibid.

\textsuperscript{277} Ibid.
the FSA was not so very different from the former concept of conservation, the essence of
which was to achieve MSY based upon available scientific evidence.\textsuperscript{278} Kanehara further
noted that the precautionary approach in the FSA is less restrictive in that it does not
provide for a switch of the burden of proof.\textsuperscript{279} With the burden of proof still on the
regulatory system, fishers are likely to hide facts that may be detrimental to long-term
sustainability of fishery resources.

Although, this subsection is not supposed to examine the provisions of the Code on the
precautionary approach, it is relevant to briefly mention that the \textit{FAO Guidelines on
Precautionary Approach} has elaborated on the implementation guidelines and the
operational procedures which will not only supplement the Code’s provisions on the
precautionary approach, but can be used by states in their implementation of the
precautionary approach under the FSA. In a nutshell, the implementation guidelines under
the \textit{FAO Guidelines on Precautionary Approach} list precautionary measures for four types
of fisheries\textsuperscript{280} and unambiguously warn that “access to fishery must always be controlled
as an open access fishery is not precautionary.”\textsuperscript{281} Recognising that changes in fisheries
systems are only slowly reversible, difficult to control, not well understood and subject to
changes in the environment and human values, the \textit{FAO Guidelines on Precautionary
Approach} requires:

i. reversal of the burden of proof,\textsuperscript{282} which does not mean no fishing until zero
risk is proved;\textsuperscript{283}

ii. management plans that clearly state their objectives;\textsuperscript{284}

iii. measurable operational targets and constraints;

iv. specific procedures to apply and adjust management measures;

v. evaluation;

vi. implementation, monitoring and enforcement; and

\textsuperscript{278} Kanehara, A. (1998) “A Critical Analysis of Changes and Recent Developments in the Concept of
Conservation of Fisheries Resources on the High Seas”, \textit{The Japanese Annual of International Law, Vol. 41, pp. 1-29 at p. 13.}

\textsuperscript{279} \textit{Ibid}, p. 12.

\textsuperscript{280} The four types of fisheries are new or developing fisheries, overutilised fisheries, fully utilised fisheries
and traditional or artisanal fisheries. See Section 3.5 consisting of paras. 45, and 47-50. Note further that
precautionary measures applied in one fishery could also be applied in another. For example see introductory
aspects of paras 47, 48, 49 and 50, \textit{FAO Guidelines on Precautionary Approach}.

\textsuperscript{281} Para. 47 (a), \textit{FAO Guidelines on Precautionary Approach}.

\textsuperscript{282} The requirement of the precautionary approach that human actions are assumed to be harmful unless
proven otherwise implies that all fishing activities are subject to prior review and authorisation. See Paras
6(f) and 7(a) and (c), \textit{FAO Guidelines on Precautionary Approach}. In this case, the standard of proof should
be commensurate with the potential risk to the resource, while taking into account the expected benefits of
the activities. Para. 7(d), \textit{FAO Guidelines on Precautionary Approach}.

\textsuperscript{283} Para. 7(b), \textit{FAO Guidelines on Precautionary Approach}.

\textsuperscript{284} Interim management measures should be applied to all fisheries until a management plan is put in place.
5.5.3.3 Precautionary Approach and Climate Change under the FSA

This subsection seeks to examine if states can integrate climate change into fisheries management through the provisions of the FSA on the precautionary approach.\textsuperscript{285} It is true that none of the provisions of the FSA on the precautionary approach specifically mandates states to take into account the impacts of climate change on SHMFS and their habitats when deciding which precautionary measures to adopt. Therefore, for fisheries managers and policy-makers to be able to address the problem associated with climate change, the relevant provisions of Article 6 and Annex II should be interpreted purposefully, bearing in mind the inherent eco-centric nature of the precautionary approach.

Under Article 6(1) of the FSA, states are obliged to apply the precautionary approach widely to conservation, management and exploitation of SHMFS, so as to protect marine living resources and preserve the marine environment. The use of the word “widely” in this provision should be seen as having “an agenda setting” intention not only within the harvest-focused context, but also taking into account other factors, including climate change, as they affect the sustainability of SHMFS. Indeed, the idea of preserving the marine environment should involve mitigating the impact of climate change on sea temperature, salinity or on ecosystems such coral reefs, etc. Article 6(2) of the FSA requires states to be more cautious when information needed for the purpose of managing SHMFS is uncertain. The FSA adopts a more specific approach by mentioning some of the areas in which uncertainty could exist. Among such areas are size and productivity of stocks and predicted oceanic and environmental conditions.\textsuperscript{286} Admittedly, part of the causes of uncertainty regarding information in fisheries management is the impact of natural and anthropogenic climate change on fish stocks. Articles 6(1) and (2) of the FSA

\textsuperscript{285} The argument put forward here applies to similar provisions entrenched in the Code. As an addendum to the discussion on how the precautionary approach requires states and other stakeholders to incorporate climate change impact into responsible fisheries management, it is important to note that the \textit{FAO Guidelines on the Precautionary Approach} refer to “climate change” only once under Part 6 dealing with Species Introduction. Paragraph 112 provides that “…Climate change may also have significant consequences that may modify the environment, making it more suitable for the introduction of either useful or harmful species.” On the other hand, paragraph 22 of the guidelines describes precautionary management as “explicit consideration of undesirable and potentially unacceptable outcomes, and provides contingency and other plans to avoid or mitigate such outcomes.” The phrase “undesirable and potentially unacceptable outcomes” is too vague and wide. Apart from overfishing, and its related factors, undesirable conditions can also arise when management fails to take action in the face of shifts in the external conditions affecting, for example, the productivity of the fish stocks. There is no doubt that the current global warming is the greatest external condition affecting aquatic ecosystems and productivity of fish stocks. From the above, it could rightly be argued that the \textit{FAO Guidelines on the Precautionary Approach} allow states or RFMOs to incorporate impacts of climate change into fisheries management.

\textsuperscript{286} Article 6(3)(d).
therefore provide the basis for states and RFMOs to apply measures that also take into account the impact of climate change on SHMFS and other marine living resources.

Secondly, states are required to revise regularly their conservation and management measures in the light of new information.\textsuperscript{287} Even though the precautionary approach provisions are harvest-centred, it will be absurd for contemporary fisheries managers and policy-makers to think that “new information” on fishing should be restricted to harvest-based factors when there is convincing evidence of the impacts of climate change on marine fish stocks and marine environments.\textsuperscript{288} In light of increasing global warming one doubts if there is any aspect of fisheries management where the phrase “in the light of new information” would be more useful than the correlation between climate change and fishery resources. Lastly, the fact that natural phenomena such as hurricane Katrina have been exacerbated by climate change calls for integration of climate change into marine fisheries management, particularly when such phenomena lead to more pressure on marine fishery resources.

Article 6 and Annex II, as they are, specifically and explicitly provide for the application of the precautionary approach in addressing harvest-based factors responsible for the current marine fish crisis. A broad and purposeful interpretation of Article 6 (1)(2)(5) and (7) will vest the FSA with the nature of a living instrument. On that basis, state parties will be obliged to integrate climate change into fisheries management. Interestingly, despite the adoption of the term “approach” in describing precaution in the FSA, the precautionary approach entails, as its essence, the precautionary principle because under Article 6 and Annex II of the FSA, strict measures and procedures could be applied since the FSA is binding on state parties.\textsuperscript{289}

\textbf{5.5.4 Lesson 4: Scientific Research}

Another important lesson from the NSS herring and the Fraser sockeye case studies is the decision of the states involved in the exploitation of the stocks to invest in research with the aim of understanding how environmental factors including climate change affect the stocks. About twenty five years ago, scientific understanding of how El Niño impacted on Fraser sockeye or how atmospheric circulation patterns determined changes in water

\textsuperscript{287} Article 6(5), FSA.
\textsuperscript{288} See earlier discussion on fisheries research in Chapter 4 pp. 163-165 of this thesis.
temperature in the Northeast Atlantic and NSS herring year class was fragmented and highly uncertain.\textsuperscript{290} The 2008 Agreed Record\textsuperscript{291} and the 1999 Agreement placed serious emphasis on scientific research.\textsuperscript{292} Although the complexity and non-equilibrium nature of aquatic ecosystems, as well as inherent human bias and value, still create uncertainty on how climate variations impact on NSS herring and Fraser sockeye, extensive and coordinated scientific research by the ICES (with regard to the NSS herring), the Pacific Salmon Commission and the Panel (with regard to the Fraser sockeye) is gradually narrowing the uncertainty gap.

One of the important outcomes of research conducted by the mentioned institutions is their ability to link the migration pattern of NSS herring and Fraser sockeye to oceanic conditions. Research by these institutions has established how ocean and freshwater temperature affect the spawning, running and mortality rate of the NSS herring and Fraser sockeye. The major benefits of investing in scientific research is that parties to the 2008 Agreed Record and the 1999 Agreement now have a more comprehensive database and better information on stock assessment,\textsuperscript{293} which has improved their basis for taking conservation and management decisions. Probably, this would not have been possible if these regimes did not provide for data sharing among state parties and participation of the relevant stakeholders in the stocks management.\textsuperscript{294}

5.5.5 Lesson 5: Cooperation and Compliance

During the life cycles of NSS herring and Fraser sockeye, both stocks migrate through the high seas, the exclusive economic zones, territorial seas and internal waters of different states. The complexity involved in ensuring the stocks sustainability as they traverse each state’s jurisdiction forced the states involved in their exploitation to strengthen their initial


\textsuperscript{291} Whilst the 2008 Agreed Record has not specifically placed a duty to conduct scientific research on its parties, such a duty can be inferred from the fact that the mortality rate of 0.125 set for the stock can be modified based on future scientific advice from ICES (para. 2 Annex II, 2008 Agreed Record). Moreover, if the Spawning Stock Biomass (SSB) falls below a reference point of 5, 000, 000 tonnes (Bpa) the fishing mortality rate has to be adopted in the light of scientific estimates that will ensure rapid recovery of the SSB to a level in excess of 5, 000,000tonnes. (para 3 Annex II, 2008 Agreed Record). The requirement for scientific advice and estimates presupposes the conduct of scientific research although in this case it is an independent third party (ICES) that performs this function.

\textsuperscript{292} See Article X (on research) of the 1999 Agreement and Para A of the MOU to the Pacific Salmon Agreement.

\textsuperscript{293} The truth is that including modelling of habitat-fisheries connection into stock assessment, as suggested by Armstrong and Falk-Peterson, can only be classified as “comprehensive” if the impacts of climate change on freshwater and marine ecosystem are taken into account. Armstrong, C. W., and Falk-Peterson, L. (2008) “Habitat-Fisheries Interactions: A Missing Link?” \textit{ICES Journal of Marine Science}, Vol. 65, No. 5, pp. 817-821. See particularly pp. 817 and 819.

\textsuperscript{294} See Para B of the MOU to the 1999 Agreement.
cooperative arrangements. The 2007 Agreed Record and the 1999 Agreement are evidence of such arrangements. These instruments were negotiated and adopted out of fear that if nothing was done to revive negotiations that had broken down under the 1997 Agreed Record and the 1985 Pacific Salmon Treaty, open access to exploitation of the NSS herring and Fraser sockeye would lead to their depletion and subsequent collapse.295

Unfortunately, while the states involved in fishing the NSS herring and Fraser sockeye have adopted robust and flexible conservation and management measures that will enable them to cope with climate change impacts on the stocks, they ignored the fact that reducing their emissions of GHGs, as stipulated in the Kyoto Protocol, is crucial for the sustainable development of the stocks. Tables 5.1 and 5.2 indicate that the majority of such states do not comply with the Kyoto Protocol.

Table 5.1 Kyoto Protocol: Compliance Status of States exploiting NSS Herring

<table>
<thead>
<tr>
<th>States Parties</th>
<th>GHGs Status</th>
<th>Based Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>Increased by 9% from 1990 – 2003</td>
<td>2003</td>
</tr>
<tr>
<td>Russia296</td>
<td>69.9 % below emissions in 1990</td>
<td>2004</td>
</tr>
<tr>
<td></td>
<td>EU – 15 Decreased by 2% (1990-2003)</td>
<td></td>
</tr>
<tr>
<td>Faroe Islands (Denmark)</td>
<td>Increased by 0.9% in 2000 above 1990 level</td>
<td>2000</td>
</tr>
<tr>
<td>Iceland</td>
<td>Increased by 8% in the period 1990-2003</td>
<td>2003</td>
</tr>
</tbody>
</table>

Source of Data Collation: UNFCCC297

295 This is the second reason given by Munro as prerequisite for cooperative arrangements establishing coordinated joint management programmes. The first reason is that the exploitation of the resource by one of the joint owners will influence significantly the economic benefits from the resources enjoyed by the other owners. Munro, G. R. (1986) “The Management of Shared Fishery Resources Under Extended Jurisdiction” Marine Resources Economics, Vol. 3, No. 4, pp. 271-296 at p. 274.

296 Russia’s low emission of GHGs is a result of low economic activities after the collapsed of Soviet Union. Now that Russia’s economy has started to pick up her emissions of GHG have also increased. For instance, in 2007 Russia emitted 2.192 billion metric tons of carbon dioxide equivalent which is 33.94 % below emissions in 1990. Doyle, A. “Russia Co2 emissions up in 2007: lag GDP Growth”, Reuters, April 16, 2009. Available at http://www.reuters.com/article/environmentNews/idUSTRE53F1HR20090416 (accessed June 4, 2009).

297 United Nations Framework Convention on Climate Change (UNFCCC), Annex 1 National Communications and Reports Demonstrating Progress under the Kyoto Protocol. Available at http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/3625.php (accessed last June 10, 2009). Note this data is extracted from the Fourth National Communications submitted by these countries to the UNFCCC.
Table 5.2 Kyoto Protocol: Compliance Status of States exploiting Fraser Sockeye

<table>
<thead>
<tr>
<th>States Parties</th>
<th>GHGs Emission Status</th>
<th>Based Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>26.6% above 1990 level</td>
<td>2004</td>
</tr>
<tr>
<td>United States</td>
<td>Increased by 15.8% from 1990 through 2004</td>
<td>2004</td>
</tr>
</tbody>
</table>

Source of Data Collation: UNFCCC\textsuperscript{298}

Since the effects of climate variations on these stocks will be exacerbated by climate change, either the principal regimes regulating the stocks or the secondary instruments such as the Wild Salmon Policy ought to have mandated the states concerned to comply with the climate change regime. The absence of interconnection between the compliance mechanisms of the 2008 Agreed Record and the 1999 Agreement, on the one hand, and the climate change regime, on the other, constitutes a major weakness in the regulation of the NSS herring and Fraser sockeye.

5.6 Conclusion: Implications of these Lessons for Fisheries Management

The conclusion that can be drawn from the NSS herring and Fraser Sockeye analogies is that the impact of climate change on already overexploited marine fisheries will constitute the most significant challenge to policy-makers and fisheries managers in the 21\textsuperscript{st} century. However, because of the interrelated nature of the problems they must be addressed simultaneously. Importantly too, lessons from the analogies confirm that decisions of states on which type of conservation and management measures to adopt in managing marine fishery resources will rarely, if ever, be based on complete data and information on all elements of aquatic ecosystems and the interactions between or among the elements. The non-equilibrium nature of aquatic ecosystems, the interactions among the various components of aquatic ecosystems and the inability by scientists to resolve the uncertainty surrounding anthropogenically induced climate change leave future policy-makers and fisheries managers with no option other than to apply the ecosystem and precautionary approaches in fisheries management. This could be achieved by allowing for flexibility in conservation and management measures, bearing in mind that climate change will certainly affect all stages of fish life.

Failure to jointly apply the two approaches, or apply precautionary measures without having adequate knowledge of the ecosystem implications, will constitute a serious impediment to sustainable development of marine fishery resources. This is exactly what happened in 1999 when the Canadian Fisheries Resource Conservation Council suggested

\textsuperscript{298} Ibid.
that the seal herds be reduced by up to 50% of their population levels for the purpose of conservation and recovery of the ground-fish cod in Northwest Atlantic.\textsuperscript{299} The only basis for such a precautionary measure was the claim by fishers that the burgeoning seal population was responsible for the continued low biomass of cod. Relying on a subsequent finding that the seal populations may, in fact, have a positive effect on cod stocks in the Gulf of St. Lawrence, Vanderzwaag \textit{et al} argue that the precautionary measure suggested by the Canadian Fisheries Resource Conservation Council did not take into account the complexities of the marine food web, nor did it adhere to an ecosystem approach.\textsuperscript{300}

The states involved in the exploitation of the NSS herring and Fraser sockeye have been able to improve their ability to conserve and manage the stocks by relying on scientific research. Nothing less is expected from other states as the threat of climate change on marine fishery resources increases. No doubt, the implementation of the ecosystem and precautionary approaches, as well as the development of a sound scientific research base in fisheries management, remains a slow and difficult process, particularly for developing countries. These countries are faced with numerous problems including lack of finance, inadequate data and technology for environmental assessment and ecosystem analysis, dearth of experts, as well as competition between different users of aquatic environment. One way of addressing this imbalance is for developed states to assist developing states in the areas of capacity building, science and technology, and finance. The truth remains that new forms of international cooperation that will shape the global response to global environmental challenges, including climate change impacts on marine fishery resources, will, according to Ville,\textsuperscript{301} involve significant expenditure and better focus transfer of aid and technology from developed to developing states.\textsuperscript{302}

The question that may interest legal scholars is the sort of obligation which states will have to comply with in order for the ecosystem and precautionary approaches in fisheries management to be applied. While previous works have expressed different views on the legal status of the ecosystem\textsuperscript{303} and precautionary\textsuperscript{304} approaches, this study only adds that

\textsuperscript{300} Ibid, p. 149.
\textsuperscript{302} Ibid, p. 180.
\textsuperscript{303} Molenaar argues that the status of the ecosystem approach is somewhat uncertain (Molenaar, E. J., \textit{op.cit.}, p. 47). Belsky argues that the ecosystem approach has become binding customary international law (Belsky, M. H., \textit{op. cit.}, pp. 115 and 119). Frid, Paramor and Scott argue that the incorporation of the ecosystem approach into the CBD and the FSA has shifted the term from being an option to becoming a legal necessity (Frid, C., Paramor, O., and Scott C. (2005) “Ecosystem-based Fisheries Management: Progress in the NE
the status of the approaches depends upon the nature of the instrument in which they are embedded, and how and where they are expressed in such instruments. While states’ practice of the ecosystem and precautionary approaches may be overwhelming, the majority of states may not intend to be bound to apply them. Moreover, it will be morally and legally unjustified to compel a developing state to apply the concepts when it has no financial and technological capability to apply them. The drive for all states to apply the ecosystem and precautionary approaches should be the urgent need to achieve sustainable development of marine fishery resources, especially now that the world is

Atlantic”, Marine Policy, Vol. 29, No. 5, pp. 461-469 at p. 461). Schiffman posits that the ecosystem approach is emerging as norm in conservation and management strategies. Schiffman, H. S., op. cit., p. 181. The description of the ecosystem approach as a management strategy in Decision V/6 by the COP to the CBD likens it to an environmental administrative tool rather than a legal principle in which case states can apply it at their discretion. The truth is, despite the ecosystem approach underpinning environmental law and policies and the fact that it is always interwoven with other environmental law principles, notably the precautionary principle, canvassed in environmental cases, its status has not been the subject matter of any known case.

Due to the wide spread application of the precautionary approach by states, Trouwborst, and McIntyre and Mosedale conclude that contemporary customary international law requires states to apply the precautionary approach. See Trouwborst, A. (2002) Evolution and Status of the Precautionary Principle in International Law, The Hague: Kluwer Law International, p. 286 and McIntyre, O. and Mosedale, T., op. cit., p. 241. On the other hand, Kunich doubts the possibility of the concept attaining the status of customary international law when it is couched in permissive language. He further notes that there is the problem of enforcement, because unless some transboundary damage is implicated, no state may raise a legal objection to the domestic environmental policies of any other state. See Kunich, J. C., op. cit., p. 49. Other works which share the view that precautionary approach has not attained the status of customary international law include Steward, T. P. and Johnson, D.S (2003) “A Nexus of Trade and the Environment: The Relationship Between the Cartagena Protocol on Biosafety and the SPS Agreement of the World Trade Organisation”, Colorado Journal of International Law and Politics, Vol. 14, Issue 1, pp. 1-52 at p. 43. According to Schiffman, the precautionary approach is only emerging as a norm in conservation and management strategies. Schiffman, H. S., op. cit., p. 181. The truth is while many domestic courts have made decisions on the legal status of the precautionary approach: the international courts have carefully avoided making specific pronouncement on the status of the concept. For example see Gabčekovo-Nagymaros Project (Hungary/Slovakia) ICIJ Reports 1997 particularly at paras 113 and 14 Available at http://www.icj-cij.org/docket/files/92/7375.pdf (accessed April 2, 2008) and Southern Bluefin Tuna Cases (New Zealand v. Japan; Australia v. Japan) paras 77 and 79, (1999) ITLOS, List of Cases Nos. 3 and 4. In EC Measure Concerning Meat and Meat Products (Hormones) (AB-1997-4 Report of the WTO Appellate Body 16 January 1998. Available at http://www.worldtradelaw.net/reports/woab/ec-hormones(ab).pdf (accessed April 2, 2008)) the WTO Appellate Body rejected the EC’s argument that its decision to invoke the precautionary principle as a ground for prohibiting import of beef produced in the United States and Canada with artificial hormones. While the EC’s opinion was that the principle is, or has become, a ‘general customary rule of international law’ or at least ‘a general principle of law (para. 121), the WTO Appellate Body held that outside the field of international environmental law, the precautionary principle still awaits authoritative formulations (para. 123).

For example, Article 5 of the 2004 Charter for the Environment incorporated into the French Constitution clearly describes the precaution as a principle.

For example a state may implement the ecosystem and precautionary approaches under its legislation but with the understanding that the obligation under the Articles 194 (5) and 145 of the Convention (with regards to ecosystem approach) and the Principle 15 of the Rio Declaration (with regards to precautionary approach) can only be performed in accordance with its capabilities. See Article 194(1), the Convention and Principle 15, Rio Declaration. In fact, the second caveat limiting states’ obligations under Article 194(5) of the Convention is that they can only use the best practicable means at their disposal. See Article 194(1), the Convention. Kunich, J. C., op. cit., p. 49 and Belsky, M. H., op. cit., p. 119.
faced with a food crisis and scientific data has proved that the speed and magnitude of climate change will be unprecedented in human experience.\textsuperscript{307}

While it is true that climate change will continue to affect all marine fishery resources, the impacts of climate change on shared, straddling and transboundary fish stocks will trigger the worst crises and conflicts between states. One valuable aspect of the lesson from the NSS herring and Fraser sockeye case studies is the decision by states exploiting the stocks to strengthen their cooperative arrangement through adopting measures that are resilient enough to allow the integration of the impact of climate change on the stocks whenever they occur. Regrettably, the 2008 Agreed Record and the 1999 Agreement failed to mandate their state parties to also comply with the climate change regime. Incidentally, the issue of state compliance with international law is one of theoretical construct, which deserves a separation examination.

CHAPTER 6

THE NEED FOR STATES TO APPLY A HOLISTIC APPROACH TO COMPLIANCE WITH INTERNATIONAL FISHERIES LAW

6.1 Introduction

Undoubtedly, one of the important lessons from the NSS herring and Fraser sockeye case studies is that despite the stringent conservation and management measures adopted by state parties to the 2008 Agreed Record and the 1999 Agreement, climate change still threatens the stocks by rendering the measures ineffective. This chapter is the upshot of the last lesson - cooperation and compliance - from the NSS herring and Fraser sockeye case studies. It aims at substantiating the second segment of this study’s argument that the most appropriate way to achieve long-term sustainability of marine fishery resources is for states to go beyond integrating climate change into the predominantly traditional harvest-based rules of fisheries management, such as the determination of maximum sustainable yield and total allowable catch for the stocks\(^1\) adopted by them. They must adopt a holistic approach to compliance which entails compliance with both international fisheries law (IFL) and other international agreements that are external to fishing but are capable of contributing to long-term sustainability of marine fisheries, particularly the climate change regime.\(^2\) States’ decisions to integrate the impact of climate change into marine fisheries management without accepting the concomitant obligation of reducing their greenhouse gas (GHG) emissions under the climate change regime is tantamount to adopting conservation and management measures that are valuable theoretically but are vitiated by failures to comply with the climate change regime.

The international law-making process and scholarly works on why states comply with international law have always adopted an issue-specific approach, such as international trade, arms control, ozone layer depletion, climate change and fisheries.\(^3\) On that basis, voluntary compliance by state parties to international fisheries agreements with the climate


\(^2\) This study is mindful of the fact that the effectiveness of international law on other issue-areas, for example, the World Trade Organisation (WTO) and biodiversity conservation has serious implications on efforts made nationally and globally to solve the marine fisheries crisis. The decision to elaborate only on climate change is based on the scope of this study.

change regime, in the absence of interconnection between their compliance mechanisms, may be difficult to achieve. Indeed, one must not lose sight of the fact that target groups will not simply accept the output (rules and procedures) generated during negotiations of international agreements as authoritative, particularly when such output is expressed in a non-binding instrument or its application has negative effects on the target groups’ interests. Therefore, it is important to think of the effectiveness of international agreements within the context of their compliance mechanisms, which is the third major component of a regime. Unfortunately, existing theories on state compliance with international law ignore the fact that the interconnection of environmental issues and, in some cases, the compliance mechanisms of the regimes regulating such issues provides a strong reason why states should adopt a holistic approach to compliance with such regimes.

With the exception of seminal works like Young’s *Compliance and Public Authority: A Theory with International Applications*, which treats compliance specifically at the levels of states and individuals, the majority of the works on compliance by international lawyers and international relations scholars focus on why states comply with international law. These works base their explanations for state compliance on rationalist or instrumental and normative or non-instrumental theories. With regard to why fishers comply with fishing laws and policies at the municipal level, although the existing literature is highly influenced by insights from economics, criminology, psychology and sociology, the theoretical foundation underlying fishers’ compliance or noncompliance behaviour is determined by instrumental and normative factors. Engaging in the compliance discourse enables this thesis to point out that a holistic approach to compliance with international agreements by states has emerged, but which is not integrated into the existing literature on marine fisheries.

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This chapter consists of seven parts. The part following the introduction defines compliance and its closely related but distinct concepts such as implementation and effectiveness. Part three reviews the different theoretical frameworks on the question of why states comply with international law. The fourth part examines some of the literature on effectiveness in order to identify the factors that enhance effectiveness of international environmental agreements (IEAs). Part five places IFL within the context of compliance and effectiveness discourses by identifying factors that enhance compliance and effectiveness, which have been integrated into IFL. The next part advocates the adoption of a holistic approach to compliance in solving the marine fisheries crisis. A defence is also put forward against the real and anticipated criticisms against the approach. The chapter concludes by reiterating that the sustainable development of marine fishery resources will only be possible if state parties to the various United Nations (UN) and the Food and Agricultural organisation (FAO) fisheries instruments also comply with the climate change regime.

6.2 Conceptual Definitions

The international law-making process does not only involve negotiation, adoption, ratification and entry into force of treaties, it also involves state compliance with the treaty obligations by way of implementation and enforcement of its terms and conditions. Lastly, the process involves ensuring the effectiveness of the treaty. Since the concepts of compliance, implementation and effectiveness lack precise meaning most discourse on compliance, including this study, commence by defining them.

6.2.1 Compliance

Compliance refers to whether state parties to an international agreement adhere to the obligations set forth in the agreement and to the implementing measures that they have instituted. Although the question of compliance involves implementation as well, in certain real life situations, compliance may occur without implementation. For instance, an international commitment may match current practice in a given state or it may permit

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and legitimise states’ existing plans of action.\textsuperscript{11} Compliance can also occur for reasons entirely exogenous to a state’s legal process. For example, the collapse of the economies of States in the former Soviet Union enabled them to comply with most environmental treaties.\textsuperscript{12} Thus the three dimensions of compliance identified in most of the literature are procedural compliance (e.g. the requirement to report), substantive compliance (e.g. obligation to cease or control an activity) and the spirit or broad norms, which are usually included in the preambles or initial provisions of treaties.\textsuperscript{13}

\subsection*{6.2.2 Implementation}

According to Jacobson and Weiss, implementation refers to the measures taken by the states to make international agreements effective in their domestic law.\textsuperscript{14} Whereas some agreements are self-executing others require domestication by the state parties. Most treaty obligations are cast as state obligations, but the real objective of treaties is not to affect state parties’ behaviour, but to regulate the behaviour of non-state actors within and outside state parties’ jurisdiction. In such cases, implementing legislation, followed by detailed administrative regulations, is required\textsuperscript{15} in order to reach the target groups or those who caused or can mitigate the problem, which the treaty aims at addressing.\textsuperscript{16} Implementation is, therefore, one major step in which compliance can be made possible.


\textsuperscript{13} Jacobson, H. K. and Weiss, E. B., op. cit., p. 4.


6.2.3 Effectiveness

Effectiveness is an elusive concept with multiple meanings. According to Young and Levy, regime effectiveness could mean the degree to which the problem that prompted its creation is eliminated or alleviated, the degree to which contractual obligations are met and whether it achieves the right outcome at the least cost. In their opinion, regime effectiveness also means whether it is fair or just and how behavioural changes by the targeted actors attributable to the operation of a regime are responsible for an improved environment. Notwithstanding this broad definition of effectiveness, Young and Levy are more concerned with the observable degree to which a rule or treaty induces desired changes in states’ behaviour that furthers the rule or treaty’s objective. Raustiala defines effectiveness in terms of the degree to which a given rule induces changes in behaviour that further the goal(s) of the rule, improves the state of the underlying problems and achieves its inherent policy objectives, but prefers to employ the term only in the first sense. Legal scholars, notably Mitchell and Joyner, are more interested in the problemsolving impacts or goal attainment of a treaty.

In any of these senses, state compliance with a treaty could be at variance with the effectiveness of such a treaty. For example, compliance by the former Soviet Union States with environmental treaties is high while the effectiveness of such treaties is zero. The implication of this as argued by Raustiala and Slaughter is that the mere existence of or lack of compliance may indicate little about the impact of international law on state behaviour.

The exacerbating effect of climate change on the already deplorable state of marine fishery resources makes it absurd to evaluate the effectiveness of IFL only from the perspective of

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19 Ibid.


its ability to induce a change in the behaviour of States insofar as it makes them stop overfishing. Meanwhile, state parties to the various international fisheries instruments cannot be compelled to reduce their greenhouse gases (GHGs) emissions within the framework of such fisheries instruments when such a rule is not specifically included or promoted in the instruments. In short, on what basis will state parties to the various international fisheries instruments be motivated because of the inextricable interrelationship between fisheries and climate change to reduce their GHGs when there is no causal relationship between IFL\textsuperscript{24} and the expected outcome in the form of changes in state parties’ behaviour by way of reducing emission of GHGs? For these reasons, this study defines effectiveness of IFL in terms of first, the extent to which it has solved or made significant steps towards solving the marine fish crisis that prompted its creation, and second, its inclusiveness, as shown in the interconnection of its compliance-eliciting methods and measures with interrelated treaties, particularly the climate change regime.\textsuperscript{25}

6.3 Why do States Comply with IFL?

The argument that IFL will not achieve its objective unless state parties to it also comply with the climate change regime requires careful consideration. To start with, there is a need to know why states comply with international law.\textsuperscript{26} Scholars such as Sands,\textsuperscript{27} Joyner\textsuperscript{28} and Weiss and Jacobson,\textsuperscript{29} address this question from a purely descriptive standpoint.\textsuperscript{30} Their

\textsuperscript{24} For Easton, the formal or authoritative output consists of binding decisions, laws, decrees, regulations, orders, and judicial decisions. Adopting more of a regime terminology, Underdal claims that formal output consists of the norms, principles and rules constituting the regime itself. See Easton, D. (1965) \textit{A Systems Analysis of Political Life}, New York: John Wiley & Sons, pp. 343-362 particularly at pp. 351-352 and Underdal, A., op. cit., p. 5.

\textsuperscript{25} By adopting this definition, this study agrees with Guruswamy on the “impact of a treaty” as the underlying issue when it comes to determining the effectiveness of a treaty. The arguable points of difference between this study’s definition of effectiveness and Guruswamy’s understanding of a treaty’s effectiveness is Guruswamy concurring with Raustiala on the treaty’s capacity for “changing State behaviour” and his decision to ignore the “interconnection or interdependency element”, which has emerged as a strong factor influencing treaty effectiveness. Guruswamy, L. (2007) “Judging Treaties”, In: \textit{The Future of International Law – Proceedings of the 101st Annual Meeting}, The American Society of International Law, March 28-30, 2007, Washington DC, pp. 175-181 at p. 177.

\textsuperscript{26} Note that the focus here is on treaties and not on judgments of international tribunal.

\textsuperscript{27} Sands identifies political, economic and social factors as reasons for non-compliance with international law. He went on to suggest that addressing compliance will require a comprehensive effort to develop rules and institutional arrangements at three levels: implementation, enforcement and dispute settlement. Sands, P. (2003) \textit{Principles of International Environmental Law} (2nd. Ed.) Cambridge: Cambridge University Press, pp. 171-228.


\textsuperscript{29} After comparing the performance of nine countries with respect to five treaties, Weiss and Jacobson concluded that factors such as the characteristics of the activity, the characteristics of the accord, the international environment and the social, cultural, political and economic characteristics of the countries
approach ignores the philosophical, political, economic and sociological foundations, which serve as the substratum of a state’s existence and provide the theoretical basis for explaining a state’s behaviour. Although theoretical knowledge is definitely not an end in itself, it is an excellent starting point for anyone wishing to have a deeper understanding of why states comply with international law. According to Kingsbury,

Compliance with law does not have, and cannot have any meaning except as a function of prior theories of the nature and operation of the law to which it pertains. Compliance is thus not a free-standing concept; but derives meaning and utility from theories, so that different theories lead to significantly different notions of what is meant by compliance. 31

On this basis, any investigation of why states comply with international law should adopt analytical or theoretical models because they help elucidate the primary reasons for states’ behaviour. 32 In line with most literature, 33 this study orders theories of state compliance into two broad categories, namely: rational or instrumental theories (consisting of realism, liberalism and regime theory or institutionalism) and normative or non-instrumental theories (consisting of constructivism, Franck’s legitimacy and fairness theory, the Chayesian managerial theory, Koh’s transnational legal process theory and Downs’ et al political economy or enforcement theory).

These are the primary theories explaining why states comply with international law. However, a review of other literature on compliance reveals other theories like reputational theory 34, positional theory 35, dynamic institutional theory 36, enmeshment theory 37, concerned influence a country’s implementation of and compliance with certain types of environmental accords. The authors finally framed a number of hypotheses on costs and benefits, democratic norms, epistemic communities, information, domestic processes, international momentum, leaders of a country, and administrative and bureaucratic capacity which they considered useful in addressing problems of non-compliance. See generally Jacobson, H. K. and Weiss, E. B., op. cit., pp. 6-12.

32 Very few works seem to combine the prescriptive account and the analytic models. See Goldsmith J. L. and Posner, E. A., (2005) The Limits of International Law, Oxford: Oxford University Press, pp. 11-14 where the authors also explain behaviour regularity associated with international law based on four models: coincidence of interest, coordination, cooperation and coercion.
organisational-cultural theory and personality theory. The captions of these theories make them appear as new and unique. However, a critical analysis of each of them shows that their basic element(s) or theoretical foundation is traceable to the primary theories given above. Their proponents, therefore, have only succeeded in applying, mixing, restating or adapting the primary theories in a bid to develop their own compliance theories. This contention is buttressed with two illustrations. First, reputation is defined as “others states’ beliefs about the likelihood that the state in question will comply with a treaty”. Guzman posits that reputation for compliance with international agreements is itself subject to a cost-benefit analysis by nations that choose long-term gains. Similarly, Goldsmith and Posner argue that reputation is consistent with rational choice premises. The rational dimension of reputation and the fact that it serves as a useful compliance mechanism for enforcement theory strips it of any novelty.

Secondly, the crux of Bradford’s argument in his article “In the Mind of Men: A Theory of Compliance with the Law of War” is that the ultimate determinant of international human rights law is to be found in the minds of individuals who must decide whether or not to comply. Basically, the personality theory regards the individual as not merely causally significant but, rather, as central to explanation and predictions of states’ behaviour towards international agreements. The individuals concerned could be from elites at the apex of state power or high intermediaries. Despite the political psychology foundation of personality theory, it could rightly be argued that it is built on liberal theory. Predicated on this, this study limits discourse on why states comply with international law

46 See Bradford explanation of liberalism on p. 1255 where he states that “liberalism shifts the inquiry from the systemic balance of power to the domestic level of analysis and posits that the key actors in international relations, and thus the primary independent variables in regard to compliance, are not States but rather individuals, institutions, organisations and other components of civil society”. See also the brief explanation of the theory of individual choice in Goldsmith, J. L. and Posner, E. A., op. cit., p. 4.
to the primary theories of compliance. The merits and demerits of primary theories of compliance is immaterial to this study because, before one canvasses for a holistic approach to compliance, it is only relevant to show that these theories do not consider the interconnectedness of issue areas and their regimes’ compliance mechanisms as a reason for state compliance.\(^\text{47}\)

Before examining the primary theories of compliance, it is worth mentioning that the classic positivists regard states as bound by only those commitments to which they consent.\(^\text{48}\) As far back as 1925, Corbett argued that the basis of international law as a system and of the rules of which it is composed is the consent of states.\(^\text{49}\) The Permanent Court International Justice (P.C.I.J.) applied this principle in *S.S. Lotus Case* when it held that “the rules binding upon States therefore emanate from their free will… Restriction upon the independence of States cannot therefore be presumed”\(^\text{50}\) Consent-based theory emerged from the understanding of the Westphalian sovereignty\(^\text{51}\) and it remains an axiom of the international political system.\(^\text{52}\) The implication of this theory is that once committed states are legally bound and should comply with the norms of the agreement.

Some commentators\(^\text{53}\) argue that consent cannot be the reason why states obey international law. Posner, for instance, posits that “an act of consent is not a sufficient condition for creating an obligation: A promise, which is an act of consent, is not a legal


\(^{50}\) 1927 P.C.I.J. (Ser. A) No. 10, p. 18.


obligation”. According to Hart, a promise could only give rise to an obligation if a rule already exists, which states that promises shall be binding. In other words, obligation with international law as a result of consent must rest on something other than consent. As far as Goldsmith and Posner are concerned, this rule is reflected both in the *pacta sunt servanda* principle and the *opinio juris* requirement for compliance with treaty and customary law respectively. Apart from noting that international law (both customary international law and treaties) has evolved to a point where it is binding on new states that have not consented to it, Goldsmith and Posner further argue that if consent were the basis of international law, a state could eliminate international obligations simply by withdrawing consent to them.

According to Posner, what is further necessary for an act of consent to create a legal obligation is the satisfaction of additional formalities, which themselves are not the creation of the parties. With regard to treaties, formalities such as ratification and domestication of treaty, which are themselves non-consensual rules, are provided externally by domestic or international law. Importantly too, the negotiation process in treaty formulation reflects the structure of the international system, in which the outcomes tilt in favour of the powerful states or, at times, the weaker states negotiating on a coalition platform. This very act means that treaty making is not purely consensual but a product of compromise. The real problem with consent is that it creates a binding obligation, but fails to explain what makes the obligation binding or why the behaviour of states is changed by international law.

54 Posner, E. A., *op. cit.*, p. 1909 Posner relied on the same line of argument in his claim that some commentators have made a mistake in claiming that customary international law rules are binding because states have consented to them.


56 Reus-Smit, C., *op. cit.*, 42.


6.3.1 Rational or Instrumental Theories

6.3.1.1 Realist Theory

Realism comes in many forms, but they all share the views of Thomas Hobbes and Niccolo Machiavelli on the inherent risk of war in the state of nature and the need for a common coercive power exercised by the sovereign. In the realists’ opinion, states are unitary actors with interests that are exogenous and fixed. Because the international system is ‘anarchic’, states sometimes follow international law, but only when it serves their self-interest to do so. Reference to anarchy does not imply that the international system is characterised by chaos or disorder, rather it implies the absence of any central government or ultimate arbiter that stands above states. Under the anarchic system states have no alternative than to engage in what Reus-Smit describes as a continuous struggle with each other to maximise their relative material power. Interest, which is the key element in the realists’ power calculus, is objectively determined based on material consideration or capabilities.

The costs and benefit analysis influences states’ decisions on whether or not to comply with international law. Goldsmith and Posner put it more succinctly thus:

States comply with international law when it is in their interest to do so, and international law emerges from States acting rationally to maximise their interests, given the perception of the interests of other states and the distribution of State power.

Law only influences state behaviour, if at all, when relatively unimportant non-security issues are at stake. Protection of sovereignty, territorial integrity and political

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64 Supporting a Prince’s use of all means to advance the interests of his state, Machiavelli warned concerning whether princes should honour their word “that a prudent ruler cannot, and must not, honour his word when it places him at a disadvantage and when the reasons for which he made his promise no longer exist” See Machiavelli, N. (2003) The Prince, Translated with Notes by George Bull Introduction by Anthony Grafton, London: Penguin Books. See particularly Chapter XVIII pp. 56-58 at p. 57.
66 Ibid. and Burgstaller, M., op. cit., p. 96.
71 Mitchell, R. B., op. cit., p. 4.
independence of a state stand above all other interests. Hence, compliance will vary base upon the extent to which a state’s security and integrity are potentially at risk. 72 Uncertainty by one state of the intentions of others leads to its desire to control and shape its external environment, and hence the decision whether or not to comply with international law.

From the realists’ perspective, international norms are likely to be enforced or enforceable by a hegemon73 either through specific reciprocity74 or through the use of a combination of carrots and sticks to ensure compliance from the periphery. The carrots and sticks may be in the form of economic incentives, or trade and other forms of sanction. The extent to which the behaviour of a state conforms to international norms, or the level at which a state cooperates at the international level concerning a certain issue, depends on the state’s political and economic power vis-à-vis its neighbours, not mainly on norms.75 Even though states will naturally cooperate when it advances their interest, the interests of powerful states set the terms of cooperation.76 Therefore, to understand why a state complies with international law in some cases, and fails in other cases, one should examine its relative capabilities and its external environment.77

6.3.1.2 Liberal Theory
Slaughter78 and Moravcsik79 are the leading contemporary advocates of this theory. This theory hypothesises that states are not the key actor that influence compliance, instead it is the domestic-level actors such as individuals, institutions, organisations and other components of civil society, and the variations among states in these internal attributes.80 From the liberal perspective, state preferences, which are determined as aggregation and

74 Keohane, R. (1992) “Compliance with International Commitments: Politics within a Framework of Law,” The American Society of International Law”, The American Society of International Law. Proceedings of the 86th Annual Meetings, pp. 176-180 at p. 177 However, specific reciprocity is only an effective weapon for a powerful State and can hardly be used successfully by a weak State against a powerful State. Ibid.
75 Burgstaller, M., op. cit., 96.
77 Burgstaller, M., op. cit., pp. 96 and 97.
intermediation of the preferences of individual and privately constituted groups, influence the outcome of what constitutes a state’s interests and its interaction with other states. Once a state’s interests are determined, its government pursue them in a rational unitary manner. Slaughter agrees with Doyle that liberal states are generally democratic, have constitutional protection for civil and political rights and a market economy based on property rights. Another common feature of all liberal societies is a functioning judicial system dedicated to the rule of law. These intrinsic features of a liberal state determine the interaction between the state, individuals and group actors in the domestic scene.

With respect to environmental cooperation, Raustiala and Victor argue that liberal states appear more likely than illiberal states to create and participate in structures for regularised monitoring and implementation review that enhance compliance. There is also the contention that international agreements concluded among liberal states are likely to be concluded in an atmosphere of mutual trust, a precondition that will facilitate compliance. Slaughter concludes that liberal states are far less likely to go to war with one another than they are to go to war with non-liberal states; a situation she termed as “liberal or democratic peace.” While it is true that democracy does not in all cases lead to state compliance with international regimes and supranational judicial decisions, the problem may not necessarily be with the whole political system. Rather, within the context of a particular issue area, reconciling conflicting political interests with economic or socio-cultural subsystems may not be politically advantageous. Indeed, even where compliance with international law is slow or lacking, because immediate sources of power lie with the state, the forces of democracy are likely to trigger a bottom-up change in state behaviour towards compliance.

86 Slaughter, A. (1995) op. cit., p. 509. Slaughter agrees that there exist strong objections to this claim. According to Slaughter other scholars argue that other factors such as a high level of development, a high level of economic interdependence, a particular cultural tradition, or simply the presence of a common threat also contribute to the so termed “liberal peace”.
88 Raustiala K. and Slaughter, A. op. cit., p. 548 support their argument with the US limited willingness to comply with rulings of the International Court of Justice.
5.3.1.3 Regime and Institutionalism Theories

Regime has been defined as a set of implicit or explicit principles, norms, rules and decisions making procedures around which actor expectations converge in a given issue-area. Regime theorists believe that not all relations among states can be explained on the basis of power and interest calculations. They argue that sets of rules and procedures developed by and between states acquire a life of their own, controlling or at least qualifying the application of power by states. In short, regimes govern the behaviour of a particular group of actors concerning a given issue area. The focus of regime theorists was on multilateral treaties and international organisations, although some of them also recognised that informal rules and procedures, which fulfil only supplemental roles of strengthening and rendering the formal institutions more efficient, may develop around treaties and international organisations.

The regime theory was developed in the late 1970s, but by the 1980s it had been subsumed into institutionalism, which Keohane refers to as ‘neoliberal institutionalism’. International institutions are “persistent and connected sets of rules (formal and informal) that prescribe behavioural roles, constrain activities, and shape expectations.” Keohane divides institutions into three groups (formal intergovernmental or cross-national nongovernmental organisations, international regimes and conventions) on the basis of their differing degrees of organisation or formality. Institutionalism is more comprehensive than regime theory as it tends to blend assumptions of both realism and


96 Ibid, pp. 3-4.
liberalism. Apart from regarding states as the primary actors in the international system and assuming that the international system was anarchic, institutionalists opine that non-state actors also play important roles both as target of regulations and as participants in the effort to elicit compliance.

According to Burgstaller, international institutions enhance compliance with international agreements in a variety of ways, which include reducing incentives to cheat, enhancement of reputational value, establishment of legitimate standard of behaviour for states to follow and facilitating monitoring, which creates “the basis for decentralised enforcement founded on the principle of reciprocity.” Institutions lengthen the “shadow of the future”, which means that future iterations may be affected by gains derived from present unilateral defections. Such a situation creates an incentive for compliance and cooperative solution. This probably explains why international institutions and cooperation are not collapsing in an anarchic world and in the face of declining US hegemony.

The normative power of treaty rules is derived from a dialogic process of interpretation and application, which operates through the activities of interpretative communities. The constraint of subjective interpretations and imposition of reputational costs on violators of norms by the interpretative communities, which function mainly through international institutions like the World Trade Organisation (WTO) and European Union, promote habitual compliance. According to Mitchell and Hensel, reputational cost for noncompliance may be particularly acute when important regional or global institutions are

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involved in the dispute resolution process. By linking issues to one another, institutions raise reputation costs for reneging on commitments. In addition, institutional enmeshment, which occurs when domestic decision making with respect to an international commitment is affected by the institutional arrangement established in the course of making or maintaining the commitment, motivates states into compliance with international law. Finally, institutionalists argue that the nature of the issue area covered by the regime and how the institution is designed to perform its functions are likely to induce cooperation and compliance. The numerous roles of institutions encourage state parties and, at times, third parties to comply with international law.

6.3.2 Normative or Non-instrumental Theories

6.3.2.1 Constructivism

Constructivism, also known as ‘the new idealism’, commences with the claim that international actors, especially states and non-state actors, do not perceive the world objectively. Constructivists argue that actors’ (whether individuals, interest groups or the state) interests are socially constructed through social processes that generate shared or intersubjective understandings. Constructivism proposes two basic assumptions on the nature of international system. First, the structure of an international system is a “social structure” consisting of both material and non-material elements.

Constructivists believe that material elements such as weapons, oceans and other common resources have no inherent meaning except the ones given to them as states interact and establish relationships. The non-material elements consist of a variety of norms, including legal norms, laws, international agreements, international institutions and other attributes of the global system created by states and other international actors. They are regarded as social structures because their impact comes to the fore when actors actually interact. Second, there exist a “mutually-constitutive” relationship between actors and structure. The international dynamics between the actors and the structure is due to the interactive

105 Keohane, R. O. (1989b), Ibid.
107 Haas, P. M., op. cit., p. 53. The author recognises the number of parties to the regime, mode of monitoring and verification, horizontal linkages, nesting and the role given to third parties in the monitoring and verification process as the few aspects of institutional design that promote compliance. Ibid.
processes that reciprocally allow the actors to create the structure which, in turn, constitute them by shaping their identities and interests, rather than just their behaviour. On that basis, constructivism downplays the methodological individualism of rational choice theories, which focus on the behaviour of particular actors or agents.

Despite the constitutive power of structures, they exist because of the routine practices of knowledgeable social agents, which make them human artefacts amenable to transformation. For this reason, the meanings of concepts such as state, sovereignty and national interest are not fixed but contingent. Indeed, Steinberg and Zasloff likened actors’ interests and identities to plastic that may be redefined depending on the nature of the actors’ interactions.

Understanding the behaviour of states and other actors requires examining how their social identities condition their interests and actions. The condition of anarchy in the international system does not compel a certain state to behave in a certain fashion. Rather, its conduct stems from the way in which people perceive the outside world. Compliance is not just based on national interests, but in applying socially generated convictions and understanding about how national interests are likely to be achieved in any particular policy domain. The fact that international law is seen as a broad social phenomenon deeply embedded in the practices, beliefs and traditions of societies, and shaped by interaction among states, gives it normative authority which can persuade public and

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110 Wendt, A. (1995) “Constructing International Politics,” *International Security*, Vol. 20, No. 1, pp. 71-81 at pp. 71-72. Reus-Smit puts it more succinctly when he says social structures shape how the actors see themselves and regulate their behaviour. Reus-Smit, C., *op. cit.*, p. 21. To say that X social structure constitutes an agent, is to say that the properties of the agent are made possible by, and would not exist in the absence of, the structure by which they are constituted. A constitutive relationship establishes a conceptually necessary or logically connection between the structure and the agent, in contrast to the contingent connection between independently existing entities that is established by causal relationship. ‘Constitutive’ has a special meaning that cannot be captured by related terms like “comprise,” “consist of,” or “cause”. Wendt, A. (1995) *op. cit.*, p. 72.

111 Abbott, K. W. (2008) *op. cit.*, p. 10. Downplaying methodological individualism means that actors have less freedom to calculate (like in realism, institutionalism and liberalism). Instead they respond to situations based on their perceptions of social expectations, their identities, internalised values, legitimacy, norms and similar subjective considerations. Indeed, actors can only deploy instrumental strategies based on invoking existing social understanding or constructing new ones. *Ibid*, p. 13.


113 Steinberg, R. H. and Zasloff, J. M., *op. cit.* p. 82. The reason for the lack of definite meanings for these notions is because international actors operate within a social milieu of shared subjective understandings and interpretations which vary according to their historical and political contexts.

114 Reus-Smit, C., *op. cit.*, p. 22


private actors to change their interests and thereby promote compliance. Since treaties are artefacts of political choice and social existence, there is always a convergent interest both at the national and international levels, which helps not just in the norm development process but also induces states compliance.

6.3.2.2 Legitimacy and Fairness Theory of Compliance

The genesis of legitimacy theory is Franck’s answer to the question: “Why do powerful nations obey powerless rules?” According to Franck, states comply with international law because they perceive the rule and its institutional penumbra to have a high degree of legitimacy. Franck argues that legitimacy is the capacity of a rule to pull those to whom it is addressed towards consensual compliance. For a rule or a rule process to command legitimacy, it has to possess four characteristics, namely: determinacy, symbolic validation, coherence and adherence. Determinacy refers to the textual clarity and transparency of the commitment itself or the meaning of the rule. The better the rule can communicate its intent, the easier it is to know what conduct is expected and thus, the stronger is its perceived legitimacy. Symbolic validation is the communication of authority through ritual or pedigree. Ritual is a specialised form of symbolic validation marked by ceremonies like the swearing in of a new President. Pedigree pulls towards rule compliance using signals as cues to emphasis the deep rootedness of the rule, or rule making process or institution.

Coherence refers to the internal consistency and lateral connection of a rule to the principles underlying other rules. Adherence means vertical nexus between a primary rule of obligation, which is the system’s workhorse, and a hierarchy of secondary rules identifying the sources of rules and establishing normative standards that define how rules are to be made, interpreted and applied. The primary rules consist of rules and duties

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119 Ibid, p. 25.
121 Of these, determinacy seems to be the most important. It is the quality of a norm to generate an ascertainable understanding of what it permits and what it prohibits (permissible and impermissible). A rule having an unascertainable meaning allows states to defer opportunities for self-gratification thus leading to evaporation of the rule’s compliance pull. Franck, T. M. (2006) op. cit., p. 93.
123 Franck, T. M., op. cit., pp. 93-94 Example of pedigree occurred when the UN recognised the new State of Israel in 1949.
124 In other words, the rule must be in accordance with the general purpose set forth, correspond with rules applied hitherto for the solution of similar problems and it has to be embedded in a “lattice of principles in use to resolve different problems.” Franck, T. M. op. cit., p. 148.
enumerated in treaties or specified by the pedigree of customary usage. Franck’s secondary rules of process consist of rule-making institutions in the international system. These four properties determine the right process, which creates the perception of legitimacy that in turn determines the compliance pull of a rule. To the extent that a rule, or rule process, exhibits these properties, it will exert a strong pull on states to comply. To the extent that these properties are not present, the rule will be easier to ignore or avoid by a state tempted to pursue its short-term interests.

Franck published another book with the objective of expanding on his theory of compliance with international law. According to Franck, fairness in international law is determined by the degree to which the rules satisfy the participants’ expectations of justifiable distribution of cost and benefits and by the extent to which the rules are made and applied in accordance with what the participants perceive as the right process. He argues further that just as legitimacy encourages compliance, the perception that a rule or system is distributively fair shapes a state’s behaviour towards compliance. While legitimacy remains a key factor that shapes behaviour of states towards compliance, the requirement of fairness means that the consequential effects of the law, or its distributive justice, must be taken into consideration. A law will be taken to be unfair if it distributes burden unfairly. Such laws are likely not to be complied with even by some states that benefit from them. Franck’s concept of distributive justice is rooted not on grounds of securing greater compliance but in moral values - because most people think it is right to act justly.

125 Example of such institutions are the Security Council, the UN General Assembly, the International Law Commission, international courts of all sorts, active networks of quasi-judicial committees and commissions and arbitral tribunals. Ibid. pp. 184 – 185.
126 Raustiala, K. and Slaughter, A., op. cit., p. 541.
127 Franck, T. M., op. cit., pp. 41-42.
129 Ibid 7. The two aspects of fairness – the substantive (distributive justice) and the procedural (right process) may not always pull in the same direction, because the former favours change and the latter stability and order. The tension between the two, if not managed, can distort the system. Fairness is the rubric under which this tension is discursively managed. Ibid.
131 Ibid.
132 Burgstaller, M. op. cit, p. 123.
6.3.2.3 Managerial theory of compliance: Chayes and Chayes commence their exposition of the managerial theory by conceding to the realist assumption of states’ compliance with treaties as a norm. According to the Chayeses, non-compliance may be intentional but it may also reflect inadvertence - the result of ambiguity and indeterminacy in a treaty’s language; lack of administrative, informational, financial or regulatory capacity by the parties to carry out their undertakings; inherent uncertainty in chosen policy instruments due to what they termed as ‘the temporal dimension’ which comprises unforeseen changes in social, economic and political conditions due to avoidable and unavoidable time lag between a state’s undertaking and its performance. Chayes, Chayes and Mitchell agree that both the enforcement and the managerial models may be used to address the problem of non-compliance. After examining different enforcement measures, such as military and economic sanctions, as well as unilateral sanctions, they concluded that coercive sanctions are not only ineffective but are also inherently unsuitable. Citing the UN Charter and the Organisation of American States Charter as exceptions, they argue that authorised use of concerted military or economic sanctions is rare. Even when a sanction is granted, it is rarely used and likely to be ineffective when it is used.


135 Chayes, A., Chayes, A. H., and Mitchell, R. B., op. cit., p. 40. See also The New Sovereignty, pp. 9 – 17. To an ordinary person, these factors are seen as causes of noncompliance, but from the Chayes’ position they are defences. If successfully pleaded the conduct is not a deliberate violation of the treaty provisions but extenuates a prima facie case of breach. See The New Sovereignty, p. 10.

136 Chayes, A., Chayes, A. H., and Mitchell, R. B., op. cit., p. 41. In The New Sovereignty, the Chayeses argue that the deficiencies of military and economic sanctions are related to their cost and legitimacy. The costs of military sanctions are measured in lives. The cost of economic sanctions are high both for the sanctioning and sanctioned states. When economic sanctions are used they tend to be leaky and results are slow and not conducive to changing behaviour. The most important cost, which is less obvious, is the serious political investment required to mobilise and maintain a concreted military or economic sanction over time in an international system where there is no hierarchically superior authority. See particularly pp 2-3. To substantiate their position, the Chayeses argue that unilateral sanction can be imposed only by the major powers and retaliation may result in a long echo of alternating retaliations which may risk the breakdown of current or future cooperation.


As far as the Chayes, Chayes and Mitchell are concerned, threat of punishment cannot guarantee compliance. Rather it is the iterative processes of justification, discourse, persuasion and argument among all actors in which their efforts are tailored towards re-establishing, within the context of a particular dispute, the balances of advantage that brought the agreement into existence that do so.\(^{139}\) The ensuing discourse, at the negotiation level, progressively elaborates the meaning of relevant obligations\(^{140}\) and enables the norms of the states to be incorporated into treaties. A discursive process, which does not aim at identifying wrongful behaviour but at the collective improvement of performance, is bound to shape a state’s behaviour towards compliance. Norms\(^ {141}\) serve as the foundation of compliance. Reaching a voluntary normative consensus motivates initial compliance rather than the treaty compliance mechanisms.\(^ {142}\) The concept of “new sovereignty” in the managerial theory emphasises not just the interdependence of the community of states, but also their participation in making international regimes.\(^ {143}\) The desire by States to be connected to the rest of the world and the political ability to be an actor are more tangible reasons for states’ compliance with international law.\(^ {144}\)

Chayes, Chayes and Mitchell elaborate on the requirements of a transparent information system and managerial strategy of response as elements that induce compliance. The elements of a transparent information system include transparency, assembling the database, self-reporting, independent reporting and verification as well as analysis, evaluation and dissemination. On the other hand, the managerial strategy of response consists of review and assessment, determining acceptable compliance levels, capacity building, dispute resolution and interpretation, adaptation and revision.\(^ {145}\) Notwithstanding the non-coercive nature of these elements, their persuasiveness exerts strong pressure on States to comply with their obligations. Managerial theory de-emphasises formal


\(^{141}\) The authors’ defined norm as prescriptions for action in situations of choice, carrying a sense of obligation, a sense that the treaty ought to be followed. Chayes, A., Chayes, A. H., and Mitchell, R. B., *op. cit.*, p. 42. In the *New Sovereignty*, the Chayes are more explicit on the fact that their construction of norm is in the generic sense, which includes, principles, standards, and so on – both procedural and substantive. *Ibid*, p. 113.


\(^{143}\) *The New Sovereignty*, p. 27. In other words, under the ‘new sovereignty’ acquired by states, sovereignty no longer means freedom from external interference, but freedom to engage in international relations as members of international regimes. *Ibid*, p. 123.

\(^{144}\) *The New Sovereignty*, p. 27. According to Burgstaller, the managerial model is the institutionalist part of the Chayeses approach. Hence their theory could be categorised under the institutionalist “label” as well. Burgstaller, M. *op. cit.*, footnote 179 at p. 141.

enforcement measures and coercive informal sanctions except in egregious cases. Instead, the theory encourages assistance to be given to deviant states to put in place the necessary management elements that will enhance their compliance with international law.

### 6.3.2.4 Transnational Legal Process theory

What motivated the development of this theory is Koh’s belief that other theories, in particular those expounded in Chayeses’ and Franck’s works do not explain by what process norm-internalisation occurs and how occasional or grudging compliance with global norms can be transformed into habitual obedience. According to Koh, any investigation on why states comply with international law must go beyond the issue of interest, identity, international society and the horizontal focus of traditional process theories to studying the vertical complex process of institutional interaction whereby international norms are not just debated and interpreted, but ultimately internalised into domestic legal systems.

In Koh’s opinion, this process has three phases:

One or more transnational actors provoke an interaction (or series of interaction) with another, which forces an interpretation or enunciation of the global norm applicable to the situation. By so doing, the moving party seeks not simply to coerce the other party, but to internalise the new interpretation of the international norm into the other party’s internal normative system. The aim is to “bind” that other party to obey the interpretation as part of its internal value set. Such a transnational legal process is normative, dynamic, and constitutive. The transaction generates a legal rule which will guide future transnational interactions between the parties: future transaction will further internalise those norms; and eventually, repeated participation in the process will help to reconstitute the interests and even the identities of the participants in the process.

The internalisation of international norms into domestic rule enables international law to acquire its “stickiness”. This motivates states to obey international law rather than merely conforming their behaviour to it when it is convenient. The “transmission belt”

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149 ibid, p. 2603.
150 ibid, p. 2647.
152 For Setear’s support of Koh’s opinion concerning the effect of repeated participation of States in Treaty making process on compliance see Setear J. K. (1996) “An Iterative Perspective on Treaties: A Synthesis of
(the extent to which international norms are successfully internalised into domestic rule) becomes the future determinant of why nations obey international law.\textsuperscript{153} Compliance is traceable from coincidence to conformity to compliance and to internalised or habitual obedience.\textsuperscript{154} In order to maintain the repeated interaction, which underpins the theory, Koh advocates that more actors be empowered to participate, existing fora be strengthened and new ones established both outside and within the framework of the regime involved.\textsuperscript{155} Finally, he identifies the key agents on which the success of internationalisation depends.\textsuperscript{156}

\textbf{6.3.2.5 The Political Economy or Enforcement theory of compliance:}

This theory, which is also known as the ‘new institutions’ theory of compliance, achieved its popularity from Downs, Rocke and Barsoom’s\textsuperscript{157} response to critiques of managerial theory.\textsuperscript{158} According to Downs, enforcement refers to the overall strategy that a state or a multinational adopts to establish expectations in the minds of state leaders and bureaucrats about the nature of the negative consequences that will follow noncompliance.\textsuperscript{159} Enforcement, therefore, is not limited to penalties or measures expressly stated in an agreement or the opprobrium directed through public opinion at the party that defects from an international norm.\textsuperscript{160} It includes extra-legal measures such as ad hoc economic

\textsuperscript{153} Koh, H. H. (1997) \textit{op. cit.}, p. 2651 and Raustiala, K and Slaughter, A., \textit{op. cit.}, p. 544. On the forms which internationalisation takes Koh identifies social, political and legal internalisation. According to Koh, social internalisation occurs when a norm acquires so much public legitimacy that there is widespread general adherence to it. Political internalisation occurs when the political elites accept an international norm and advocate its adoption as a matter of government policy. Legal internalisation occurs when an international norm is incorporated into the domestic legal system and becomes domestic law through executive action, legislative action, judicial interpretation, or some combination of the three. Executive directives, policy statements, fiats, guidelines, standards are some of the ways which internalisation of international norm occurs. Legislative internalisation occurs when international norms become embedded into domestic legislation or even constitutional law thereby forming part of the domestic legal fabric. Judicial internalisation occurs when litigation in domestic courts provokes judicial incorporation of international law norms into domestic law, statutes, or constitutional norms. Koh, H.H., (1998) \textit{op. cit.} pp. 642-645.


\textsuperscript{155} Ibid, pp. 677-8. Other suggestions by Koh include developing techniques that will provoke legal norm-internalisation and self-conscious participation by the relevant agents in the transnational legal process. Ibid, p. 678.


\textsuperscript{159} Downs, G. W., (1998) \textit{op. cit.}, p. 320.

\textsuperscript{160} Ibid, p. 321. Downs claims that many international lawyers think primarily of penalties in this perspective
sanctions, withdrawing of diplomatic missions, halting negotiations on unrelated issues and withholding of promised positive incentives that are not embodied in either international instruments or operate through public opinion.\textsuperscript{161} Downs distinguishes between blanket types of economic or general sanctions against a state and “smart” or targeted sanctions, which are aimed at those responsible for unacceptable behaviour of a state.\textsuperscript{162} Apart from enforcement being a deterrence strategy, it operates to offset the net benefits that a potential violator could gain from noncompliance.\textsuperscript{163}

Two principles underpin the enforcement theory. The first principle is the necessity for and feasibility of enforcement which varies with the nature of the underlying game.\textsuperscript{164} Enforcement is not relevant in a coordination game because none of the parties can gain by unilaterally defecting from cooperative outcomes. Rather, enforcement is relevant in the repeated prisoners dilemma, or mixed-motive games, where states profit from collective cooperation, yet each state individually has an incentive to defect from the cooperative arrangement.\textsuperscript{165} Second, there is a positive correlation between enforcement and the nature of regime commitments - ‘depth of cooperation.’ The depth of cooperation is an estimate of either the amount of behavioural change that an agreement requires of signatories or the magnitude of the behavioural change that an agreement has actually brought about among signatories.\textsuperscript{166} Analysis of some agreements by Downs, Rocke, and Barsoom revealed that as regimes deepen and demand greater changes from the status quo, the benefits from cooperation grow. At the same time the incentive to behave opportunistically or to defect grows. Essentially, this leads to a corresponding demand for harsher punishment to deter non-compliance and sustain cooperation.\textsuperscript{167}


\textsuperscript{163} Ibid., p. 321.

\textsuperscript{164} Ibid., p. 322.

\textsuperscript{165} Ibid.

\textsuperscript{166} See generally Downs, G. W., Rocke, D. M., and Barsoom, P. N., \textit{op. cit.}, p. 383. The authors express their doubt over the possibility of estimating depth of cooperation when the required change in behaviour is qualitative in nature. They suggest describing such change in quantitative terms as a way of overcoming the problem. Note the less technical definition of depth of cooperation by Downs, Rocke, and Barsoom as thus: the extent to which a treaty requires states to depart from what they would have done in its absence. Downs, G. W., Rocke, D. M., and Barsoom, P. N., \textit{op. cit.}, p. 383.

\textsuperscript{167} The only criterion is that whatever punishment is imposed the state involved should know that if it defects it will suffer enough from the punishment and its the net benefit will not be positive. \textit{Ibid}, pp. 385 & 386.
6.3.3 Does Compliance Guarantee the Effectiveness of IFL?

The consensus among IR and IL scholars is that even though compliance is the first step towards achieving effectiveness of IEAs, it does not necessarily guarantee the effectiveness of IEAs. Joyner puts it more succinctly that “compliance is not effectiveness” as the latter concept “involves the extent to which goals of a fishery treaty are attained”. Under normal circumstances, ascertaining the goals which the fishery should strive to achieve requires first, understanding the problem(s) of the fishery. Unfortunately, Joyner’s conception of effectiveness falls short of specific consideration of the ecological interconnection between fisheries and other issue-areas, particularly climate change. More precisely, states could comply with harvest-based conservation and management measures that ordinarily should enable them to achieve the sustainable development of marine fishery resources, yet external or non-fishing factors like climate change will force the deplorable state of marine fishery resources to persist. The crucial nature of effectiveness in the environmental management discourse has motivated some scholars to conduct an investigation on the factors that enhance it. While an examination of such works is outside the scope of this study, a brief examination of the factors that enhance effectiveness of IEAs is necessary.

6.4 Factors that Contribute to the Effectiveness of IEAs

*The Implementation and Effectiveness of International Environmental Commitments: Theory and Practice* edited by Victor, Raustiala and Skolnikoff examines eight areas of international environmental regulation with the aim of ascertaining the extent to which the influence of IEAs on states behaviour leads to environmental improvement. Despite accepting that the effectiveness of IEAs is influenced by many factors interacting in a complex way, the authors concluded that the process of implementation is a central

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170 The areas include pollution in the North Sea, Baltic seas, acid rain in Europe, the Montreal Protocol, The London Convention, Whale regulation, trade in hazardous chemicals, and conservation of flora and fauna.

171 Other factors identified by Victor, Raustiala and Skolnikoff are the nature of the problem (e.g. ratio of cost to benefit, distribution of cost and benefit among the states, possibility of free rider, whether the problem requires coordination or cooperation solution), configurations of power (e.g. presence of hegemonic stability), institutions (e.g. shapes expectations and reduces cost of collective action), nature of commitments (e.g. scope, clarity and application), linkages with other issues and objectives (e.g. down scaling), exogenous factors (e.g. political and economic changes), public concern. See generally Victor, D. G., Raustiala, K. and Skolnikoff, E. B., op. cit., pp. 9-14.
factor that determines the effectiveness and operation of IEAs. The authors examine implementation from two perspectives: (i) how international institutions and procedures to monitor and review implementation, as well as handle problems of poor implementation influence the behaviour of actors and contribute to a regime’s effectiveness, and (ii) how international commitments are implemented at the national level in some developed countries.

The operation of rules and procedures of specific international institutions is what Victor, Raustiala and Skolnikoff term the systems for implementation review (SIRs). System for implementation review consists of rules and procedures by which state parties to an international agreement and other relevant stakeholders collect and exchange data, share information on implementation, monitor activities, assess the adequacy of existing commitments, fund capacity building, handle problems of poor implementation and adjust existing treaty commitments in the light of new information and experience. Although system for implementation review often consists of decentralised and informal procedures, there are instances where treaties establish it as a centralised and formal procedure. The understanding of how system for implementation review and participation work requires some detailed discussion.

The Montreal Protocol functions through a data reporting procedure which requires state parties to submit to the Ozone Secretariat the statistics of their production, imports and exports of substances controlled by the Protocol for the relevant baseline year and for each year thereafter. This data is then analysed and used by the various institutional bodies of the Protocol and the Global Environmental Facility. The Montreal Protocol also functions through the Implementation Committee which was established to manage the protocol

\[174\] Ibid, p. 16.
\[175\] Ibid, p. 20. The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) provides a good example of the existence of both procedures. The protocol Non-Compliance Procedure and the Implementation Committee established to manage the Non-Compliance Procedure constitute the formal and dedicated system for implementation review under the Montreal Protocol. On the other hand, the informal and non-dedicated system of implementation review consists of institutions, mechanisms and actors such as the Technology and Economic Assessment Panel, the Multilateral Fund, the EU, the Global Environmental Facility, which is an external institution to the Montreal Protocol, and nongovernmental organisations and their implementing agencies. These bodies are involved in collection, exchange and review of information on implementation of and compliance with the Montreal Protocol even though they have not been officially assigned to such tasks. See generally, Green, O. (1998) “The System for Implementation Review in the Ozone Regime”, In: Victor, D. G., Raustiala, K. and Skolnikoff, E. B., (eds.) op. cit., pp. 89-136.
\[176\] Article 7, Montreal Protocol.
Non-Compliance Procedure.\textsuperscript{177} Even though the Protocol’s system for implementation review operates primarily by managing implementation, it has a modicum of enforcement element. The Non-Compliance Procedure includes an “Indicative list of Measures that Might be Taken by a Meeting of the Parties in Respect of Non-compliance with the Protocol.”\textsuperscript{178} The Multilateral Fund could withhold funds from developing countries that were not serious about their funded projects. Similarly, the Global Environmental Facility withheld additional funding to countries with failed ozone-related projects or that failed to comply with the protocol commitments until the Implementation Committee approved their compliance plans. It is not surprising therefore that the first phase of implementation of the Montreal Protocol, which involved compliance by developed countries, was very effective.\textsuperscript{179}

The second perspective of implementation which Victor, Raustiala and Skolnikoff examined is participation and factors that influence participation such as rules of access, actors’ interests and ability of actors to participate. The authors focused on participation within the implementation process in the Western European liberal democracies and in the East European countries undergoing political and economic transition from central planning to a liberal market-based system.\textsuperscript{180} The cases focus on target groups, environmental non-governmental organisations, scientists (experts), government agencies with the aim of investigating how they influence the quality of decision and the process

\textsuperscript{177} How the two interlocking components of the Non-Compliance Procedure (a regular and ad hoc components managed by the Implementation Committee) operate to ensure the effectiveness of the Montreal Protocol have been examined Victor, D. G. (1998) “The Operation and Effectiveness of the Montreal Protocol’s Non-Compliance Procedure”, In: Victor, D. G., Raustiala, K. and Skolnikoff, E. B., (eds.) \textit{op. cit.}, pp. 137-176. Basically, the Implementation Committee identifies possible causes of non-compliance and makes appropriate recommendations to the Meeting of Parties (Parties). The Parties decide upon the recommendations and call for steps to bring about full compliance with the Protocol including measures that will assist the parties to comply with the Protocol and also make non-compliance by state parties with the Protocol to be transparent. Paras. 1, 2, 7(d) and 9, Non-compliance Procedure (1998). See Ozone Secretariat UNEP (2006) \textit{Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer, (7\textsuperscript{th} ed.)} Kenya: Ozone Secretariat, UNEP, Available at http://ozone.unep.org/Publications/MP_Handbook/ (accessed December 2, 2007).

\textsuperscript{178} See Ozone Secretariat UNEP, \textit{Ibid}. Three measures listed are appropriate assistance, caution and suspension of certain rights and privileges.


and extent of implementation. For instance, in the North Sea pollution regime, the change from lower level of governmental participation to ministerial participation made the adoption of stringent international commitments, including applying the precautionary principle and polluter pays principle, possible.

In the first chapter of *The Effectiveness of International environmental Regime: Causal connections and Behavioral Mechanisms*, Young and Levy examine six causal pathways through which regimes influence states and individuals’ behaviour and ultimately address the environmental problem, which led to their creation. First, since actors are self-interested utility maximisers whose behaviour is based on the calculation of costs and benefits stemming from their actions, the regimes’ effectiveness depends on how its specific rules and activities influence the actors’ costs and benefits calculations. Second, regimes affect the behaviour of rational actors through enhancing cooperation. Most international environmental problems are collective problems, which have transboundary effects, hence require collective-action solutions. Regimes emerge as mechanisms for mitigating the problems through ensuring transparency, reduction of transaction costs, sanctions, lengthening the shadow of the future on the issues involved, etc.

Third, regimes also affect behaviour of states by bestowing them with authority. Regimes achieve this by creating rules seen as legitimate or authoritative. The normative quality of the regime influences behaviour of actors in a way that addresses the environmental problem without them engaging in detailed calculations of the costs and benefits.

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188 *Ibid*, p. 23.
implication of the regime. Fourth, by facilitating learning about the nature of the problem or about how best to address the problem, regimes have been able to improve factual information, prevailing discourses as well as values and, in the process, alter actors’ behaviour. Although the actual processes through which learning occurs are yet to be fully understood, individual leaders, groups of experts and epistemic communities play crucial roles in the process.

Fifth, as role definers, regimes operate at the constitutive level shaping the identities and interest of actors and, in the process, influence the way actors behave as occupants of the role to which they are assigned. Lastly, regimes act as agents of internal realignments. States and collective entities like environmental organisations are composed of a number of groups seeking to promote their own concerns and, in the case of states, their national interests. In order to affect the behaviour of such states and collective entities, regimes consider their internal dynamics before creating new constituencies or shifting the balance among factions or subgroups vying for influence within individual States or among other actors.

One of the most developed works on why some IEAs are effective while others are ineffective is authored by Underdal. In summary, Underdal argues that aside sheer luck, the effectiveness of IEAs lies in the character of the problems which they are established to solve and their problem-solving capacity. Environmental problems can either be benign or malign in character. The basic assumption is that some problems are intellectually more complicated or politically more malign than others and hence more difficult to solve. Intellectual malignancy of the problem refers to the descriptive and theoretical uncertainty in knowledge about the seriousness and causes of the problem. Political malignancy of the problem is primarily a function of the configuration of actors’ interests and preferences.

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189 With regard to individuals their behaviour is influenced through socialisation, while for collective entities their behaviour is influenced by the process involving internalisation or routinisation as well as by socialisation. Young O. R. and Levy, M. A., op. cit., p. 24.
190 Ibid, p. 25.
195 Underdal, A., op. cit., pp. 15 and 469.
that it generates.\textsuperscript{196} The core element of problem malignancy is congruity,\textsuperscript{197} or the extent to which rational action on the part of individual states produces a suboptimal outcome for all states.\textsuperscript{198}

The second presumption, which focuses on the problem-solving character of IEAs, is that some systems have at their disposal more powerful institutional tools and can mobilise more skill and energy to tackle the problems they encounter.\textsuperscript{199} Problem-solving capacity is a function of institutional setting, distribution of power among the actors, and skill and energy.\textsuperscript{200} In summary, the key element of the institutional setting is capacity. Regimes that address malign problems with high levels of institutional capacity are more likely to be effective, and vice versa. The impact of problem-solving capacity tends to be greater for moderately malign than for strongly malign problems.\textsuperscript{201} According to Underdal, one of the limitations of his work is that each regime is considered as a stand-alone arrangement, which is quite contrary to the real world context where the effectiveness of regimes is influenced by the fact that they are embedded, nested, or in some other ways linked to other institutions.\textsuperscript{202}

Few important conclusions can be deduced from the literature so far reviewed on compliance and effectiveness. In practice, the line between the reasons why States comply

\textsuperscript{196} Logically a perfectly benign problem is characterised by identical preferences. As a matter of fact, uncertainty in knowledge and political malignancy could interact to increase the intractability of the problem, but sometimes with the benign consequence of facilitating cooperation or solution to the problem. \textit{Ibid}, pp. 15 and 16.

\textsuperscript{197} While incongruity is caused by externalities (externalities denotes external leaks – those effects of an actor’s behaviour that hit others and therefore disappear from the actor’s own cost-benefit calculations.) or competition (where one actor’s welfare depends on how well he performs compared to others). It could also be characterised by asymmetry (a situation where the parties are coupled in such a way that their values are incompatible or their interests negatively correlated) or cumulative cleavages (a situation where parties find themselves in the same dimensions or issues, so that those who stand to win (or lose) on one dimension also come out as winners (or losers) on the other dimensions as well. All things being equal, competitive and asymmetrical problems are more malign hence it is difficult to find a solution that will be acceptable to all the parties. \textit{Ibid}, pp. 18-20.


\textsuperscript{199} \textit{Ibid}, pp. 3 and 23. Underdal’s primary focus is on capacity to deal with the political rather than the intellectual aspect of a problem and the interplay between those two dimensions. \textit{Ibid.}, p. 23.

\textsuperscript{200} \textit{Ibid}, p. 23.

\textsuperscript{201} Underdal, A., \textit{op. cit.}, p. 27. The rationale for this is that the more malign the substantive issues to be dealt with by a particular institution, the more difficult it will be to reach agreement about the shape of that institution and the weaker and more constrained it is likely to be. \textit{Ibid}, p. 28.

\textsuperscript{202} \textit{Ibid}, p. 36.
with international law and the factors that influence effectiveness of a treaty is blurred. For instance, Young and Levy’s consideration of regimes as utility modifiers and enhancers of cooperation is a mere reiteration of the ideas of realism and neoliberal institutionalism. The role of a regime as bestower of authority is similar to Franck’s idea of legitimacy. Also, regimes role as role definers is not different from the constructivists’ international dynamics between actors and the structure, which allows actors to create structures, which, in turn, affect the actors and regulate their behaviour. The truth therefore as observed by Bodansky is that individual works on compliance and effectiveness is unsystematic and conjectural. Unfortunately, the situation is likely to continue insofar as the methodological foundation of the majority of the works in this area is based upon intuitive perceptions, expert analysis and case studies.

More importantly, the literature on compliance theories and effectiveness models so far examined adopt a specific-issue approach, when in reality environmental issues are interconnected and interdependent. The scientific bases for the interconnection of environmental issues are systems theory and reductionist theory. Al Gore’s popular book and documentary film, both entitled “an inconvenient truth,” use visual texts to capture the interconnection between global warming and other extreme weather events. The intertextuality between Al Gore’s photographs and motion pictures with data from other sources, including the U.S. Navy, Hadley Centre, National Geographic magazine and the United Nations, strengthens his claim on the interconnection between climate change and

205 Chambers, W. B., op. cit., p. 519.
206 Issue-areas are a set of issues that are in fact dealt with in a common negotiation and by the same and closely coordinated bureaucracies. Keohane R. O., (1984) op. cit., p. 61.
207 The system theory is about anything that is alive whether an organism or an engineering mechanism while it is working. According to this theory, the Earth is seen as a single complex system consisting of interrelated and functional subsystems. The reductionist theory is all about the cause and effect of humans’ action. See Lovelock, J. (2006) The Revenge of Gaia; Why the Earth is Fighting Back – and How We can still Save Humanity, London: Penguin Group, p. 17.
209 Al Gore presents comparative pictures of so many extreme weather events. Some of the ones that are important in fisheries discourse are melting of the ice cap in the Arctic (pp. 127-9) and Antarctica (pp. 180-5) effects of sea level rise on low-lying Pacific Islands (pp. 186-7) coral bleaching in Kiribati (p. 163) and Marshall Islands (pp. 16-7), and the drying of Lake Chad (p. 116). Gore, A. (2006) op. cit.
extreme weather events. Visualising some of these pictures led Jonathan Patz to comment, in *Too Hot Not To Handle*, that “when one looks outside around his (sic) surroundings, one realises how connected everything is.” Similarly, while expressing his concern on the impact of climate change on the United Kingdom, in *Climate Change: Britain under Threat*, Professor Peter Cox said, “we are so connected now across the globe that we would (sic) be affected by environmental change wherever it occurs”. The understanding of interconnection between climate change and other earth subsystems and the fear of dangerous negative consequences of climate change, which Lovelock describes as the revenge of Gaia, have contributed positively to the desire by many states to replace the 1997 Kyoto Protocol with a new agreement.

Unfortunately, natural interconnection of environmental issues can only have a legal effect if states integrate it into the compliance mechanisms of IEAs. Interestingly, states are beginning to realise that there are situations when the content, operation or consequences of one issue or regime are significantly affected by another. Apart from establishing interconnection between different regimes, because issues regulated by them are naturally connected, states do establish interconnections between issues or regimes for strategic reasons, with the hope of getting over the problems inherent in a specific-issue approach to treaty making. The strategic interconnection of issues and regimes by States is well established between environment and trade. Many States have established an interconnection between the environment and human rights and have even gone to the extent of entrenching environmental provisions into their constitutions. The World Bank

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214 Lovelock, J., *op.cit.*
216 Article 22 of the Convention on Biological Diversity provides that parties shall implement the convention with respect to the marine environment consistently with the rights and obligations of states under the law of the sea. See also the preamble to the Agreement for the Establishment of the Indian Tuna Commission which specifically calls on parties to take into consideration Articles 56, 64 and 116-119, Convention.
218 Presently, more than 130 Countries have environmental provisions in their constitution. Although most of them are not enforceable, the mere inclusion of environmental provisions in such constitutions symbolises...
and other international financial institutions have long established an interconnection between the environment and project financing. In 2007, the UN Security Council held a session to debate the consequences of climate change on global peace and security. At the regional level, the Sydney Declaration states more succinctly that economic growth, energy security, and climate change are fundamental and interlinked challenges.

A number of scholars have taken a more definite stand on how interconnections between issue-areas and treaties influence state compliance with treaties and the effectiveness of such treaties. Haas identifies the interconnection of issues and regimes as one of the three ways states learn to comply with international instruments. In his opinion:

States can learn as well about the connection between issues thus change compliance patterns over time due to the acceptance of new ‘policy maps’, which identify goals that must be achieved in order to promote national goals.

Similarly, Chambers identifies treaty interlinkage as one of the elements leading towards a new understanding of legal effectiveness of environmental treaties. Despite expressing

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223 Ibid, p. 63.
fear about the possibility of conflict arising from such linkages, Chambers goes on to extol the positive side of linkages thus:

Treaties are created quite independently with little regard to how they inter-relate. In other treaty types, this is not as big of a concern as the treaties do not share as much connectivity, but in environmental treaty-making, which normally concern ecosystems, everything is connected. So environmental treaties have a strong potential through collaboration to strengthen themselves. Creating synergies in terms of institutions, finance, implementation, and compliance can improve effectiveness of treaty in accomplishing its goals.  

Recently, Ward has argued, “owing to ecological interconnectedness, regimes can have both positive and negative side-effects on environmental issues that they do not explicitly deal with.” In his view, when nations participate in particular regimes, they also become part of a wider network. This network creates linkage between states and individual regimes. The network or web of interdependencies created between states by membership of treaties and intergovernmental organisations embodies social capital that facilitates collective action and improves the chances of environmentally sustainable practices within communities. Therefore, the idea whereby the interconnection of regimes is jettisoned for an issue-specific approach may be one of the reasons for the slow pace of solving most global environmental problems.

6.5 Placing IFL within the Context of Compliance and Effectiveness Discourse

From the foregoing, the effectiveness of IFL depends on whether it has incorporated the factors identified in the literature on state compliance and effectiveness of IEAs. Ascertaining such facts requires placing IFL within the compliance and effectiveness discourses. This thesis does not have the space to cover all the factors that promote

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224 Chambers W. B., op. cit., p. 528 and Victor, D. G., Raustiala, K. and Skolnikoff, E. B., op. cit., p. 12 where the authors posit that commitments and accords can also be effective in changing behaviour if they create linkages with other issues and objectives.

225 Ibid., pp. 528-529.

226 Ibid., pp. 528-529.


228 Linkages or nesting of regimes occur because they often share institutional architecture, deal with different aspects of the same problem, frame issues using similar legal and policy principles, are subject to attempts to coordinate across issues by groups of nations, NGOs and international agencies. Also private corporations through interaction build networks to coordinate issues like trade, the environment and development. Epistemic community or scientific networks interconnect issue-areas. Ward, H., op. cit., pp. 149 and 150 Young gives a clearer picture of different types of linkages: (i) Horizontal linkages: this is the connection between regimes or institutions at the international level. It could give rise to (a) nested regimes i.e interconnection between regional fisheries agreement and the Convention; (b) clustered regimes i.e interconnection between different components of the Antarctic Treaty; (c) embedded regimes i.e the WTO Agreement embodying larger principles of the neoliberal economic order. (ii) Vertical linkages: this refers to connection between international regime and institutional arrangements operating at the local levels of social organisation. See Governance in World Affairs, pp. 121-123.

228 Ward, H., op. cit., pp. 149 -151.

229 Ibid.
compliance and effectiveness of IFL; rather, the focus is on the major themes drawn from the compliance and effectiveness discourse.

### 6.5.1 National Interest/Normative Authority

The Convention promotes state compliance by reflecting the interests of all States and ensuring that its basic rules are embedded in the practices of States. One major problem encountered by the Third UN Conference on the Law of the Sea (1973 – 1982) (UNCLOS III) was how to address the multiplicity of states’ interests brought to the fore during the 10 years’ negotiations. The creation of EEZ satisfied the interests of costal states while access to the coastal states surplus catch enabled land-locked states, geographically disadvantaged states and distant water fishing nations (DWFNs) to continue fishing in the newly created EEZs, but with the terms and modalities of such participation established by the coastal states. Similarly, Article 66 of the Convention protects the interests of states such as the US and Canada in whose rivers anadromous stocks like salmon spawns. The compatibility measures introduced in the FSA and the comprehensive method of settling disagreement on such measures provide an extra protection of the interests of coastal states and DWFNs.

The normative authority of IFL stems from the fact that its core principles are a codification of long established customary laws,\(^\text{230}\) while the 12 nautical miles territorial sea and the 200 nautical miles EEZ became crystallised as custom during the UNCLOS III. The UNCLOS III was established to deal with the establishment of an equitable international regime on a number of issues including fishing. By deciding that the rights of coastal states should take priority over about 40 percent (%) of the ocean space, and that all states should have equal rights in the remaining 60%, the UNCLOS III introduced a new equity in the relationship among states with respect to exploitation of marine fishery resources.

### 6.5.2 Enforcement/Management Strategies

The IFL adopted the enforcement and managerial strategies for the purpose of ensuring compliance by states and its effectiveness. The idea underscoring the enforcement approach is that state compliance with or implementation of an inconvenient regime becomes a question of opportunism without the adoption of centralised coercion.\(^\text{231}\) With respect to managerial strategy, mechanisms such as reporting, publishing of a list of

\(^{230}\) The core principles are freedom of fishing on the high seas, coastal States’ exclusive right to fishery resources in its territorial sea, and exclusive jurisdiction of flag States over ships flying its flag.

violating states, access to information and participation of NGOs in on-site monitoring, control and surveillance (MCS) processes, which rely on a reputation factor to induce compliance and enhance the treaty’s effectiveness, have been integrated into IFL.\textsuperscript{232} In addition, states are required to contribute and exchange scientific information, statistics of catches and fishing efforts (e.g. fishing gear and fishing vessels) and other relevant conservation data.\textsuperscript{233} These mechanisms, for example reporting play utilitarian and non-utilitarian roles by driving up the cost of non-compliance and reassuring individual parties that others are living up to their respective commitments.\textsuperscript{234} In that process, they enhance state compliance with IFL, as well as the effectiveness of IFL.

The incorporation of managerial strategies into the various international fisheries instruments points to the fact that their negotiators were aware that some states lack the capacity to implement the prescribed conservation and management measures.\textsuperscript{235} As far as such states are concerned it is not so much coercion by a superior power but good management and institutionalised incentive mechanisms that will lead to a satisfactory level of compliance with IFL and its effectiveness.\textsuperscript{236} In order to enhance state compliance with and the effectiveness of IFL, transparency is encouraged in decision-making processes, particularly with regard to adoption of conservation and management measures.\textsuperscript{237} There are provisions for financial and technical assistance, transfer of technology, and capacity building through education and training.\textsuperscript{238} These strategies are directed mostly towards assisting developing states in order to enable them participate effectively and to meet their obligations under the various international fisheries instruments.\textsuperscript{239}

Lack of an effective enforcement mechanism under the Convention to tackle the increasing rate of illegal, unreported and unregulated (IUU) fishing on the high seas led to the strengthening of enforcement powers of flag states, coastal states, port states, and RFMOs under the FSA and the Code.\textsuperscript{240} Sanctions adopted ranged from boarding, inspection, arrest

\textsuperscript{232} Article IV, Compliance Agreement.
\textsuperscript{233} Article 61(5) and 119(2), the LOSC, Article 14, Fish Stocks Agreement and Articles IV and VI, Compliance Agreement.
\textsuperscript{234} Breitmeier, H., Young, O. R. and Zürn, M., op. cit., p. 151.
\textsuperscript{235} Chayes et al., p. 40. See also The New Sovereignty, pp. 9 -17.
\textsuperscript{237} Article 12, FSA and Article 7.1 9, Code.
\textsuperscript{238} Articles 24 and 25, FSA , Article 8.3, Code and Article VII, Compliance Agreement.
\textsuperscript{239} See generally Article 61(3) and 119(1)(a) Convention; Article 24 , 25, and 26 FSA; Article VII, Compliance Agreement and Article 5, Code.
\textsuperscript{240} Article 8.1.8.3, Code, Articles 8(4), 13, and 17–23 FSA and Article III, Compliance Agreement.
and judicial proceedings against fishing vessels that violate conservation and management measures in the EEZs and on the high seas. States can now apply severe sanctions, such as refusal, withdrawal or suspension of authorisations to serve as masters or officers of fishing vessels, which are expected to be effective in securing compliance.\textsuperscript{241} At the extreme, a RFMO may exclude states that refuse to apply the conservation and management measures adopted by it from fishing in its high seas zone.\textsuperscript{242} The use of both positive and negative incentives to induce states is considered to be essential for the effectiveness of FSA because IFL recognises the fact that the global environmental system ignores political boundaries; hence, states whose activities impact on marine fishery resources cannot be allowed to remain outside IFL and defeat its objectives.\textsuperscript{243}

6.5.3 Targets for Ensuring Compliance and Effectiveness

Because international fisheries problems have domestic roots, IFL has now shifted its target from states and RFMOs to non-states actors on the issues of compliance and enforcement. Whilst states still remain the primary level actors and focus, non-states actors, including all persons concerned with the conservation, management and utilisation of fisheries resources and trade in fish, are now targets and must be involved.\textsuperscript{244} This strategy makes it possible for IFL to engage all domestic actors by strengthening, backstopping and compelling them to act, thereby enhancing its effectiveness.\textsuperscript{245}

6.5.4 Robustness

IFL can be likened to a living organism insofar as it evolves to deal with the global developments in the fishing industry globally. Analysis of recent developments in the fishing industry shows that the pace of change is accelerating. In 1982, when the Convention was adopted, issues like driftnet and longline fishing, IUU fishing, deep-sea trawling and biodiversity did not constitute serious problems. In order to avoid the Convention becoming obsolete in the face of these new challenges, the UN and the FAO have responded principally by adoption of the FSA, the Compliance Agreement, the Code and its associated instruments, including the International Plan of Actions (IPOAs). Expanding the commitments of coastal states, flag states, port states and RFMOs, and to

\textsuperscript{241} Article 19(2) FSA. See also Article III(8) Compliance Agreement.
\textsuperscript{242} Article 8(4) FSA.
\textsuperscript{244} See Articles 4.1, 6.13 and 7.7.2 Code, Articles III(8), VI(1)(d) and VI(2)(a) Compliance Agreement and Article 19(2) FSA. The non-state actors include fishers, fishworkers, international organisations, both governmental and non-governmental, masters and officers of fishing vessels, owners, operators, and managers of fishing vessels, those engaged in processing and marketing of fish and fishery products, all offenders and other interested organisations.
\textsuperscript{245} Slaughter, A. and Burke-White, W. \textit{op. cit.}, at pp. 328, 334-346.
some extent taking compelling action against third states, have positively influenced states compliance with IFL and promoted its effectiveness. This development probably would not have been possible without the framework nature of the Convention and the review mechanism incorporated into it.\(^{246}\)

One of the most interesting aspects of the evolving nature of IFL is the market strategy it has adopted to address the clandestine nature of IUU fishing. Since monitoring and controlling of fishing vessels are difficult in the more remote and dangerous parts of the high seas, and occasionally within the outermost part of the EEZs (where IUU fishing takes place), IFL now focuses on ensuring that IUU caught fish do not get to their final destination, that is the consumers. The identification of the origin of fish and fishery products ensures that international and domestic trade in fish and fishery product accord with sound conservation and management measures.\(^{247}\) Although certification of fish and fishery products by states is primarily aimed at ensuring health and quality standard,\(^{248}\) this strategy is another effective way of ensuring that sources of fish and fishery products are not linked to IUU fishers. The evolving nature of IFL is one of the important characteristics that will enhance its effectiveness.\(^{249}\)

### 6.5.5 Exogenous Factors

The FSA and the Code take into account situations where external factors, for example, a natural phenomenon render ineffective conservation and management measures. In the event of such an occurrence, states are required to take temporary emergency measures based on the best available scientific evidence. The magnitude of the damage that was done to fishery resources, the lives of fishers as well as properties in the fishing communities from Southeast Asia to the coast of East Africa, as a result of the December 2004 tsunami illustrates how external factors can render treaties ineffective.\(^{250}\) Since public opinion is one of the most potent exogenous factors that influence the effectiveness of a treaty, the FSA and the Code emphasise stakeholders’ and public participation in the formulation and implementation of fisheries policies.

\(^{246}\) Article 45, FSA and Article XIII, Compliance Agreement.

\(^{247}\) Article 11.1.12, Code.

\(^{248}\) Article 11.1.4, Code.

\(^{249}\) Chambers, W. B., op. cit. p. 526.

6.5.6 Interconnection between IFL and other Regimes/Institutions

The FSA established interconnection between fisheries and biodiversity conservation by specifically mandating its state parties to protect biodiversity in the marine environment. The performance of this obligation by any state party to the FSA will be tantamount to compliance with the Convention on Biological Diversity, even where such a State is not a party to the Convention on Biological Diversity. Earlier discussion in Chapter 4 showed how the Code expressly and implicitly establishes strong link with a number of interrelated international agreements. By establishing interconnection with related issue-areas, the negotiators of the FSA and the Code came to terms with the reality of ecological interconnectedness. This implies that the effectiveness of IFL cannot be based solely on the effectiveness of harvest-based measures, such as an aggregate outcome like an annual harvest. Proper evaluation of the effectiveness of IFL must take into account how effective are the regimes regulating related issue-areas. Unfortunately, apart from the Code which has established interconnection of fishery issues with climate change, albeit indirectly, IFL as a whole has failed to specifically establish synergy of issues and compliance mechanisms with the climate change regime.

Since interconnection of issues and compliance mechanisms of the regimes regulating such issues can be a two-way process, it is necessary to ascertain whether or not international agreements regulating climate change have established such interconnections with IFL.

6.5.6.1 The Climate Change Regime

The failure of the United Nations Climate Change Conference of the Parties to adopt a legally binding agreement at the Copenhagen Conference, which was held from 7-18 December 2009, leaves the UNFCCC and the Kyoto Protocol as the major agreements regulating the emission of greenhouse gases (GHGs) that are responsible for the warming of the earth. The ultimate objective of the UNFCCC and any other related legal instruments that the Conference of the Parties may adopt is to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic

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251 Article 5(g), Fish Stock Agreement.
253 According to Christiana Figueres, Executive Secretary for the UNFCCC, the Copenhagen Accord was not adopted but rather it was ‘taken note of’. It is not considered as an agreement of the Conference of the Parties and will have to be treated as political direction and political guidance that goes into the current negotiation tract which are the Kyoto Protocol and the long-term cooperative action. Video text of Christiana Figueres delivered on March 22, 2010 (09.52-10.14 of 15.11 minutes) when she was Candidate for the Position of Executive Secretary for UNFCCC. Available at www.youtube.com/watch?v=6whK-cJxJpkg (accessed October 6, 2010). For the Text of the Copenhagen Accord see Draft Decision -CP.15 on the Copenhagen Accord available at http://unfccc.int/resource/docs/2009/cop15/eng/lo7.pdf, (accessed January 9, 2010).
interference with the climate system.\textsuperscript{254} The UNFCCC directs that “such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”\textsuperscript{255} It establishes the general principles,\textsuperscript{256} commitments,\textsuperscript{257} institutions\textsuperscript{258} and the processes through which governments meet regularly.

The general principles include sustainable development,\textsuperscript{259} common but differentiated responsibilities and respective capacities,\textsuperscript{260} specific needs and special circumstances of developing countries,\textsuperscript{261} precautionary measures,\textsuperscript{262} international cooperation,\textsuperscript{263} avoiding arbitrary or unjustifiable discrimination or disguised restriction on international trade.\textsuperscript{264} The general principles are meant to guide states in performing their commitments. More succinctly, the general principles and the discourse processes through regular meeting of governments and their representatives at the various fora are all designed to attract even sceptical countries and provide the needed legitimacy for the UNFCCC.

With regard to commitments, the UNFCCC classified state parties into Annex 1 and Annex 11 countries based on their development status and levels of GHGs emission. However, all parties to the UNFCCC are required to develop national inventories of anthropogenic emissions by sources and removals by sinks.\textsuperscript{265} They are also required to produce a report on the programmes containing measures they have implemented to mitigate and facilitate

\footnotesize{\textsuperscript{254} Article 2, UNFCCC. Note also that the Copenhagen Accord has improved on the vague nature of the obligation of stabilising GHGs concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The international community now recognises the scientific view that the increase in global temperature should be kept below 2 degree Celsius. See Paras 1 and 2, Copenhagen Accord.\textsuperscript{255} \textit{Ibid}.\textsuperscript{256} Article 3, UNFCCC.\textsuperscript{257} Article 4, UNFCCC.\textsuperscript{258} Institutional wise, the UNFCCC’s supreme organ is the Conference of the Parties (COP). It meets annually to review the implementation of the UNFCCC. The UNFCCC has an administrative organ called the Secretariat and two subsidiary bodies for (i) Scientific and Technology Advice, and (ii) Implementation. See Articles 7-10, UNFCCC.\textsuperscript{259} Article 3(1) and (4), UNFCCC.\textsuperscript{260} Article 3(1), UNFCCC.\textsuperscript{261} Article 3(2), UNFCCC. Under Article 4(1), UNFCCC, the State parties to the UNFCCC shall also take into account their specific national and regional development priorities, objectives and circumstances while performing the commitments under the UNFCCC.\textsuperscript{262} Article 3(3), UNFCCC.\textsuperscript{263} Article 3(5), UNFCCC.\textsuperscript{264} \textit{Ibid}. With this Article, the UNFCCC established interconnection with the WTO Treaty. See Articles XI and XX of the WTO Treaty.\textsuperscript{265} Articles 4 (1)(a) and 12, UNFCCC.}
adequate adaptation to the impacts of climate change.\textsuperscript{266} All state parties to the UNFCCC must take into account the implications of climate change, to the extent feasible, in their relevant social, economic and environmental policies and actions. In doing so, they should employ appropriate measures to mitigate and adapt to climate change with a view to minimising the adverse effects of climate change on the economy, public health and the quality of the environment.\textsuperscript{267} Articles 4(8)(h) and 4(10) mandate parties to the UNFCCC to take into consideration the adverse effects of implementation of measures to response to climate change on countries whose economies are highly dependent on income generated from fossil fuel. A non-binding goal was set whereby the industrialised countries listed in Annex I would try to return by the year 2000 to the GHG emission levels they had in 1990.\textsuperscript{268} A financial mechanism funded by industrialised countries listed in Annex II provides financial resources to developing countries in order to enable them fulfil their obligations under the UNFCCC.\textsuperscript{269}

The Protocol reaffirms almost all the general principles, commitments, institutions and the process through which governments meet regularly under the UNFCCC.\textsuperscript{270} The first significant change is that Annex I Parties shall reduce their GHG emissions by at least 5% below 1990 levels in the first commitment period, 2008-2012.\textsuperscript{271} The Protocol requires parties to consider commitments for subsequent periods beginning in 2005.\textsuperscript{272} The second significant change is the introduction of three flexible mechanisms that will enable the Annex I Parties to meet part of their emission reduction commitments in a more cost effective manner. The emission trading mechanism is like a commodity exchange between only States in Annex B or their companies. The commodity - assigned amount units - is created as a result of investment in clean technology and improved energy efficiency

\textsuperscript{266} Articles 4(1)(b) and 12, UNFCCC. The mitigation measures should address human-induced emissions by sources and removals by sinks of all GHGs. In practice, the national inventory and the measures to mitigate and facilitate adaptation to climate change were prepared as one document called “National Communication”.

\textsuperscript{267} Examples of such measures are impact assessment, sustainable management of sinks and reservoirs of GHGs including oceans, coastal and marine ecosystems and integrated coastal zone management, Article 4(1)(d)(e) and (f), UNFCCC. Furthermore, UNFCCC calls on all States to cooperate in the areas of scientific research and data development, exchange of relevant scientific, technical, socio-economic and legal information and education, training and public awareness on climate change. (Article 4(1)(g-i) and 6, UNFCCC.

\textsuperscript{268} See generally Article 4(2)(a-b).

\textsuperscript{269} Articles 4 (3) and 11, UNFCCC. The fund (under which Special Climate Change Fund and Least Developed Country Fund have been established) is under the management of Global Environmental Facility.

\textsuperscript{270} With the exception of the Adaptation Fund, which is managed by the Adaptation Fund Board established under the Kyoto Protocol, all the institutions of the UNFCCC also serve as the Protocol’s institutions.

\textsuperscript{271} Article 3(1), Kyoto Protocol. Annex B of the Protocol stipulates the specific emission reduction and limitation commitments for the Annex I Parties.

\textsuperscript{272} Article 3(9), Kyoto Protocol.
leading to the parties or companies in Annex I going beyond their emission reduction limits.273

Joint implementation is another market mechanism based on no-carbon projects set up by Annex I Parties within each other’s territories. The emission reduction units resulting from such projects can be used by the investing Annex I State to offset its GHG reduction commitment at home or sell in the carbon market to other Annex I countries.274 Finally, the clean development mechanism initially allowed only Annex I Parties to invest in cleaner and more energy efficient projects in developing countries.275 The demand by developing countries to participate in clean development mechanism projects got approval in the Marrakesh Accord thereby making it possible for all parties to the Protocol to participate in a clean development mechanism project.276 Unilateral clean development mechanism enables a developing country (or entity within it) to undertake a clean development mechanism project without an Annex I partner. States that have invested in clean development mechanism projects are issued with certified emission reduction, which they can use against their emission limitation commitments or sell in the carbon market as in the case with developing countries.

The Marrakesh Accord contains a decision on determination of the appropriate procedure and mechanism for addressing cases of non-compliance as required by Article 18 of the Protocol. The Compliance Decision277 adopted at Marrakesh utilises both soft enforcement measures, such as persuasion and capacity building, and coercive measures including exclusion from the flexibility mechanism and penalties to induce compliance. The Compliance Committee, which is the Compliance Decision’s primary institutional mechanism, consists of a Facilitative Branch and the Enforcement Branch. The Facilitative Branch mandate includes providing advice to parties and facilitating technical and financial assistance. The Enforcement Branch determines questions of compliance by Annex I States with their GHG emission reduction commitments. The Enforcement Branch

273 Article 17, UNFCCC. Note that parties in Annex B and Annex I of the UNFCCC are the same. While Annex I is a list of developed countries and states with economies in transition that are expected to reduce their GHGs emission, Annex B quantifies the emission limitation or reduction commitment (percentage base year or period) of parties in Annex I. The concern regarding excessive reliance on the flexible mechanisms by states while avoiding taking mitigation measures at home was addressed with a requirement that the use of the flexible mechanisms by states must be supplemental to their domestic actions. Ibid.
274 Article 6, UNFCCC.
275 Article 12, UNFCCC.
277 Decision 24/CP.7: “Procedures and Mechanism Relating to Compliance under the Kyoto Protocol” (the “Compliance Decision”).
can suspend the eligibility of defaulting states participating in the flexible mechanism or in the case of failure to meet the assigned emission levels commitments, direct the state involved to make up for the shortfall plus a 30% penalty in the next commitment period, as well as suspend from eligibility to sell assigned amount units. Although the Kyoto Protocol compliance mechanism is regarded as the most comprehensive and rigorous system of compliance for a multilateral environmental agreement, it does not establish an interconnection with the compliance mechanism of any other agreement. 278

The objective of international fisheries law has evolved from optimum sustainable yield of fisheries resources to securing a maximum supply of food to achieving a long-term conservation and sustainable use of fisheries resources. The motive underpinning the objective of IFL is to ensure the availability of fish food for nearly half of the world’s population that depends on fish as its main source of protein. 279 Literally, the word “food” as used in Article 2 of the UNFCCC includes fish food. In that sense, the UNFCCC establishes interconnection of issue between climate change and fish. The argument that the UNFCCC establishes interconnection of issue with IFL is further strengthened by the words “environmental policy and actions” in Article 4(f), which ordinarily construed will include policies and actions on fisheries. Similarly, a purposeful interpretation of the words “quality of the environment” in the same subsection will include sea temperature, acidification levels of the ocean and other changes in the aquatic environment caused by climate change that are capable of affecting fish stocks. Unfortunately, neither the UNFCCC nor the Kyoto Protocol directs its state parties to comply with IFL.

Interconnection between the compliance mechanism of IFL and climate change regime may not necessarily be a two-way affair. However, in a situation where, for instance, two interconnected issue-areas are separately regulated by a weak and strong regime, 280 it is reasonable for state parties to the weak regime to also comply with and ensure the effectiveness of the strong regime. Regrettably, IFL has failed in that respect. Yet, the correspondence between the domain of IFL, determined by the construction of issues and

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280 The terms “weak regime” and “strong regime” are used as a way of categorising between related issue-areas where one has the ability to have a strong impact of the other. In the context of climate change and fisheries correlation, it is climate change that impacts on fisheries. On that basis, climate change regime is categorised as strong regime while IFL is the weak regime. Achieving the objective of fisheries regime (weak regime) does not depends only on its effectiveness, but very importantly on the effectiveness of climate change regime (strong regime).
best estimate of what would be required to ensure sustainable development of marine fishery resources, has critical significance for the effectiveness of IFL. This is why from the problem-solving and inclusiveness perspectives none of the UN or FAO fisheries instruments can be regarded as effective.

6.6 Applying a Holistic Approach to Compliance in Solving the Marine Fisheries Crisis

There is a need to apply a holistic approach to compliance in solving the marine fish crisis. This requires the understanding of state parties to the United Nations and FAO fisheries instruments that it will be difficult, if not impossible, to achieve a long-term sustainability of marine fishery resources when related regimes on climate change, WTO, international trade on endangered species, etc are ineffective. The situation becomes complex when climate change is taken into account. Optimists of climate change may argue that the 2007 IPCC Report and other scientific literature have rightly noted that there is an observed increase in abundance of zooplankton and fish traceable to an increase in sea temperature. Those who are optimistic about the IPCC and Beaugrand et al findings on the positive effects of climate change on fisheries must not forget the negative side of the findings. Beaugrand et al also observed that an increase in sea temperature has led to a decrease in the diversity of cold-temperate, sub-Arctic and Arctic species of zooplankton. As stated earlier, fish by nature are temperature conformers. Therefore, as global warming increases most fish and the associated and dependent species may become extinct because of exposure to unsuitable temperatures that exceed their thermal limits.

Establishing interconnection of issues between fisheries and climate change by the regimes regulating both issues is not sufficient to address the exacerbating effect of climate change on already overexploited marine fishery resources. The first step in the right direction is to integrate climate change into marine fisheries management through the application of the precautionary and ecosystem approaches. In addition, in order to avoid the inescapable dangerous consequences of climate change impacts on marine fishery resources state parties to the United Nations and FAO fisheries instruments should also comply with the

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283 Rosenzweig, G., et al., op. cit.
climate change regime by reducing their GHGs emissions.\textsuperscript{284} They have to embrace the new global spirit that anchored the 2007 Live Earth pledge, which places the responsibility for solving the climate crisis on collective action by all countries.\textsuperscript{285}

There is no doubt that the developed states listed in Annex 1 of the Kyoto Protocol are primarily responsible for the present global warming, but the truth is that all countries have, one way or the other, contributed to the menace. This proposition underscores Turnbull’s address during the \textit{High-Level Meeting on Forests and Climate Change} where he said:

\begin{quote}
A tonne of carbon dioxide has the same impact on our climate, whether it is emitted in Stockholm, Sydney, or Shanghai. A global challenge demands a global response: just as climate change threatens the whole world, only the whole world, working together effectively can meet it.\textsuperscript{286}
\end{quote}

Unfortunately, none of the developing coastal or fishing states has a specific obligation under the Kyoto Protocol to cut its GHGs emission. Carbon emission by most of them is presently low, but this will increase substantially in the future as their populations grow and they continue to develop their economies using a carbon business as usual approach. Also, many multinational companies are relocating from developed to developing countries where they enjoy low production cost and less stringent environmental regulations. The projection that very soon carbon dioxide (CO$_2$) emissions from developing states like China, India, Brazil, Indonesia and South Africa may be higher than CO$_2$ emissions of some developed countries has started to become manifest in the case of China, which has overtaken the US as the top emitter of CO$_2$.

Incidentally, some of the developing coastal states that emit large amount of CO$_2$ also have strong fishing interest. For example, China is indisputably the leading fishing country in the world,\textsuperscript{287} but its CO$_2$ emissions are increasing at an astronomical rate. South Africa is

\textsuperscript{284} Okon, E. E. (2008) “State Compliance with International Fisheries law: Applying a Holistic Approach to Compliance in solving Fisheries Crisis in Nigeria”, \textit{Conference Proceedings 1\textsuperscript{st} Post graduate Researcher’s Conference on Meeting the Environmental Challenges in the Coastal Region of Nigeria}, University of Abertay Dundee, Scotland, United Kingdom, 29\textsuperscript{th}-30 September 2008, pp. 156-185, at p. 156.
ranked 11th among countries with the highest emissions of CO₂ yet it has some of the most comprehensive legislation on fisheries in Africa and its recreational fishing industry which is worth R2 billion is an important sector of its economy. Nigeria is the second highest gas flaring country in the world. In 2004, the World Bank ranked Nigeria as the 38th in the list of countries with the highest emissions of CO₂. Although, the emission of GHGs in Nigeria is generally low based on per capita energy and other resources consumption, this is expected to rise in the future as a result of the high population growth rate, and corresponding increase in per capita energy and other resource consumption. Meanwhile, the importance of fish and fish products to the Nigerian economy cannot be underestimated.

Most developed coastal states and DWFNs have shown serious concern on how to address the deplorable state of marine fishery resources. Despite the US not ratifying the Convention, its efforts to protect and preserve marine living resources dates back to the 1893 Bering Sea Fur Seals Arbitration. Recently, it has revolutionised shrimp and tuna fishing with the introduction of Turtle Excluder Devices (TEDs). New Zealand and Australia’s commitment to conservation and management of marine fishery resources led to their involvement in the Southern Bluefin Tuna (New Zealand v. Japan; Australia v. Japan) case. Apart from the EU’s commitment to conservation and management of marine fishery resources, which has started to yield minimal successes, it is the world’s largest market for processed fish products. In 1998, its whole fishing sector – from fishing

290 According to the Nigerian National Petroleum Company (NNPC) “2006 Annual Statistic Bulletin” NNPC Monthly Performance Highlights, a total volume of 2,182.43 Billion Standard Cubic Feet (BSCF) of natural gas was produced in 2006 out of which 799.99 (36.66%) was flared. See particularly p. 5. Available at http://www.nnpcgroup.com/performance/index.php (accessed last March 12, 2008).
291 Bacon, R. W. and Bhattacharya, S. op. cit.
to marketing – was worth over £20 billion, or 0.28 per cent of its gross domestic product. The last two cases before the International Tribunal on the Law of the Sea (ITLOS) initiated by Russia evidenced its commitment to conservation and management of fishery resources within and beyond its jurisdiction.

It is disappointing that the US has still not ratified the Kyoto Protocol. Regrettably, too, other developed coastal states and DWFNs that have ratified the Protocol have failed to cut their GHGs emissions to the targets set in the Protocol. The puzzling question is: of what use are the conservation and management measures put in place by these countries when it is clear that climate change will render those measures ineffective or unworkable? The oceans are integral components of the climate system and they respond to changes that occur because of the global warming which Lovelock likens to the earth having a serious fever. The revenge of Gaia or the disastrous consequences of the Earth regulating itself will have serious effects on the biological productivity of aquatic ecosystems. Already, the balance of the aquatic ecosystems has greatly changed in almost every country and region. Apart from the NSS herring and the Fraser sockeye cases examined in Chapter 5, changes ranging from north and south poleward migration of some fish species to drying up of large freshwater habitats like Lake Chad are capable of rendering even the best conservation and management measures ineffective. Therefore, achieving a long-term sustainability of marine fisheries resources in the face of the current global heating is, to say the least, an illusory idea.

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296 The reasons for this proposition are (i) Russia’s effectiveness in monitoring, control and surveillance of its exclusive economic zone, (ii) the element of severity of sanction integrated into Russian law in calculating illegal caught fish, (iii) the change in Russia status from “violator” in the Volga Case (see ITLOS list of cases No.11) to “prosecutor” in the Hoshinmary and Tomimaru Cases (see ITLOS list of cases No. 14 and 15 respectively).

297 Lovelock’s metaphor of the living earth sick of fever (global heating) because of humans emitting excessive GHGs into the atmosphere is gradually creeping into almost every discourse or literature on climate change. See Nobel Price Acceptance Speech by Al Gore on the Acceptance of the Nobel Peace Prize December 10, 2007, Oslo, Norway, Available at http://blog.algore.com/2007/12/nobel_prize_acceptance_speech.html (accessed last December 19, 2007)

298 Ibid.

The reasonable thing for all coastal states and DWFNs to do is to look beyond the few positive signs (recovery of a number of species) brought about as a result of compliance with IFL by some of them. They have to take into consideration the short, mid and long-term effects of climate change on marine fishery resources. They have to understand that governance mechanisms for global environmental problems do not frequently coincide with the realities of physical, socio-economic and ecological systems.\(^{300}\) If the marine fish crisis is linked with climate change, so too must be its solution.\(^{301}\) This is what a holistic approach to compliance entails. It addresses global environmental problems in a way that simultaneously promotes sustainable development.\(^{302}\) It is premised on the fact that environmental regimes regulating inextricably interconnected issue-areas can effectively solve the problems that prompted their creation if they are all effective.

### 6.6.1 Defence of a Holistic Approach to Compliance

Critics of the holistic approach to compliance, and indeed the interconnection of regimes compliance mechanisms, are worried mainly over how the inherent or likely conflict between the regimes is addressed. Actually, this fear arose after the WTO Panel and Appellate Body decisions on the US Shrimps cases I and II.\(^ {303}\) Some scholars are concerned with the implication of the interpretative hurdles imposed on the US that makes it virtually impossible for a WTO member to impose trade measures to protect the environment or natural resource.\(^ {304}\) Another group of scholars is concerned with the dominant position of WTO dispute settlement mechanisms when there is conflict between trade and multilateral environmental agreements.\(^ {305}\) Chambers specifically argues that

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where conflict arises because of interlinkages of regimes, it can diminish effectiveness by causing uncertainty, and thus lead to difficulties in treaty negotiation, renegotiation, ratification, and even in the achievement of the treaty goals.\textsuperscript{306} Weiss supports this view with examples of the operational inefficiency and cumbersome process that were involved in ensuring obligation consistency in the management of forests provisions during the negotiations for the UNFCCC, Biodiversity Convention and the Forest Principles.\textsuperscript{307}

While the foregoing concerns appear reasonable, they cannot overshadow the merits of a holistic approach to compliance with IEAs. Firstly, there is absolutely no basis for fear if legal certainty is maintained between the potentially conflicting treaties.\textsuperscript{308} Importantly too, the mutual reinforcement of the interconnected regimes tilts the weight against whatever criticisms that may be raised. Scholars who are worried about the interconnection between WTO and the environment seem to ignore the fact that in the US Shrimp Case I, the WTO Panel findings and WTO Appellate Body decisions only emphasised the need for the conservative spirit of Section 609 of US Public Law 101 – 162 to be compatible with the preconditions for interconnection established between environment and trade in the Chapeau of Article XX.\textsuperscript{309} As soon as the US fulfilled those conditions, as evidenced in the facts and submissions of the parties in the US Shrimps Case II, the WTO Panel and the Appellate Body had no other option but to uphold the US trade ban. The success of the US Shrimp cases has led many countries, intending to penetrate the lucrative US shrimps market, to use Turtle Excluder Devices (TEDs) or similar measures in catching shrimps. Today, almost all the countries that were complainants or reserved their rights as third parties in the US Shrimp Cases are using TEDs to catch shrimps. For example, Nigeria introduced the use of TEDs by Nigerian trawlers and went further to enact the Use of Turtle Excluder Devices (TEDs) and other Bycatch Reduction Devices (BRDs) on Shrimp Trawl Nets Regulation, which came into force on August 22, 2006.

Another criticism of this approach may likely arise from the conclusions reached by Breitmeier, Young and Zürn who in their analysis of the International Regime Database between WTO and the Marrakesh Accords, \textit{International Environmental Agreement: Politics, Law and Economics}, Vol. 4, No. 4, pp. 339-357 at p. 340.

\textsuperscript{306} Chambers, W. B., \textit{op. cit.}, p. 529.
\textsuperscript{308} Chambers, W. B., \textit{op. cit.}, p. 528.
\textsuperscript{309} It was on this same basis that a GATT Panel held that the US Marine Mammal Protection Act which banned the import of yellowfin tuna harvested with nets that harm dolphins constituted a disguised barrier to trade in violation of the GATT. Panel Report, United States-Restriction on Import of Tuna, GATT B.I.S.D, 398/155 (Sept 3, 1991) (not adopted) hereinafter (Tuna 1).
(IRD) revealed that 20.6% of the cases lacking compliance mechanisms still resulted in a considerable improvement towards problem solving.\textsuperscript{310} The tendency, therefore, is for anyone to argue that mere interconnection of issue (food) between the Code and the UNFCCC does not provide sufficient reason why parties to the various UN and FAO fisheries instruments should comply with the climate change regime by reducing their emissions of GHGs. It is true that the spectrum of commitment to ensure the effectiveness of interconnected regimes ranges from undertakings by state parties to a particular agreement to study the issues or objectives of related agreement(s) to complying with the provisions of related agreement(s), and backing up their commitments with sanctions and incentives. It is also true, as argued by social practice theorists, that engaging actors in more or less complex social networks can produce positive results, quite apart from the development of compliance mechanisms.\textsuperscript{311} These arguments notwithstanding, where interconnected regimes deal with highly competitive and sensitive issues, and as the same time collective action to address such issues conflicts fundamentally with states’ national interests, then it is advisable for parties to the agreements to specifically provide some level of formal compliance mechanism for themselves. With respect to the Code, its non-binding nature supports the contention for a specific provision urging member states to comply with the climate change regime or reduce their GHG emissions.

Presently, it is difficult for anyone to argue that a holistic approach to compliance dominates or trumps all other concerns which states take into consideration in deciding whether or not to comply with international treaties. Indeed, there is consensus in the literature that every reason or concern which a state considers operates at the margin.\textsuperscript{312} A holistic approach to compliance is no different. However, due to the ecological

interconnectedness of environmental problems and the increasing manner in which states, regional and international organisations are linking environmental and non-environmental issues and regimes, the need to apply a holistic approach to compliance in solving not just environmental problems, but all inextricable problems, may in future place the approach in a dominant position over other concerns.

6.7 Conclusion: Interconnection, Effectiveness and IFL Design

The questions “why do states comply with international law?” and “why some efforts at developing and implementing joint solution to international problem succeed while others fail?” are relevant for the purpose of providing critical policy guidelines for the design of new international agreements.313 Certainly, at the national level, the answers to these questions could help negotiators of international agreements identify states’ intentions for complying with IFL and the requisite capacity states need to make IFL effective. Incidentally, the issue-specific approach, which most regimes and scholars apply in answering the foregoing questions, ignores the fact that in the real world interconnection of regimes enhances compliance and effectiveness.314 The design or characteristics of IEAs matters because they provide the reasons why states comply with IEAs and also ensure the effectiveness of the IEAs.315 Placing IFL within the context of the compliance and effectiveness discourse reveals that it embodies most of the attributes identified as contributing to ‘compliance’ and ‘effectiveness’ of other regimes. This has contributed to the effectiveness of IFL, at least, when it comes to harvest-based measures yielding some levels of success.

The fundamental flaw of IFL is that despite the conclusive evidence that global warming has exacerbated the deplorable state of marine fisheries globally it only establishes an interconnection of issues between fisheries and the climate change regime without mandating coastal and fishing states to comply with the climate change regime. Unfortunately, today’s crisis in marine fisheries is very different from the one which the international community knew and experienced in the early 20th century, and by the time our knowledge has caught up with the new reality the crisis is likely to be more drastically different in ways that today may seem unthinkable.316 It is a good idea for states to comply with conservation and management measures designed to curb overfishing. Regrettably,
those measures will be ineffective, and in some cases unworkable, in the face of current global warming. The only way to achieve the sustainable development of marine fishery resources at all levels is for coastal states and fishing states that have predominant interests in marine fisheries to comply with both IFL and the climate change agreements.
CHAPTER 7

CLIMATE CHANGE: THE NEW CHALLENGE FOR SUSTAINABLE DEVELOPMENT OF ALREADY OVEREXPLOITED MARINE FISHERY RESOURCES IN NIGERIA

7.1 Introduction

The preliminary discussion in Chapter 2 revealed, among other things, the parlous state of marine fishery resources in Nigeria, which is caused primarily by overfishing. However, the most dangerous aspect of the revelation, which existing literature does not address, is the fact that from 1990 to 2007 the annual and the mean monthly temperature in the Atlantic Ocean at Victoria Island was higher than the tolerant level of some commercially important marine fishery resources in Nigeria, particularly *Pseudotolithus senegalensis*, *Sardinella maderensis* and *Penaeus notialis*. It is clear that the problems of overexploitation of marine fishery resources, and the exacerbating effect of climate change on already overexploited marine fishery resources, are global in nature. However, the factors identified as the causes of the deplorable state of marine fishery resources in Nigeria reinforce the argument that the problem has a domestic root. Therefore, the effectiveness of international fisheries law (IFL) depends on how states, in this case Nigeria and its domestic institutions, respond to the problem.

Nigeria, being a sovereign coastal state, has discretion within its national jurisdiction on how to comply with international fisheries instruments adopted by the United Nations (UN) and its Food and Agriculture Organisation (FAO). Likewise, the general obligations

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3 The international fisheries instruments in question are the 1982 United Nations (UN) Convention of the Law of the Sea (Convention), 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (FSA) and the 1995 Food and Agriculture Organisation Code of Conduct for Responsible Fisheries (Code). The reason for this legislative scope has already been explained in Chapter 3 at pp. 98-99. Note that these and other relevant international fisheries instruments are referred to as international fisheries law (IFL).

4 This assertion is based upon the combined effect of the provisions of Article 297(3)(a) and (b) of the Convention, the customary international law of permanent sovereignty over natural resources by States and
under Articles 2, 4(1)(a) and (b) and 12 of the United Nations Framework Convention on Climate Change (UNFCCC) do not require Nigeria to reduce its emissions of greenhouse gases (GHGs) to meet any specific target. Meanwhile, past lessons from the Norwegian spring-spawning herring (NSS herring) and the Fraser River sockeye *Oncorhynchus nerka* (Fraser sockeye) case studies examined in Chapter 5 confirm that Nigeria can only achieve a long-term sustainability of its marine fishery resources if it adopts conservation and management measures that can address the threats of overfishing and climate change on the stocks. Since environmental regimes regulating inextricably interconnected issue-areas can effectively solve the problems that prompted their creation only if they are all effective, Chapter 6 argues that coastal states and fishing states should adopt a holistic approach to compliance. This approach involves compliance by states with both IFL and the climate change regime. The aim of this Chapter, among others, is to ascertain the extent to which the regulation of marine fisheries in Nigeria has addressed the problem of overfishing and the impact of climate change on marine fish stocks.

Firstly, this chapter critically analyses the conservation and management measures adopted in the Sea Fisheries Act Cap S4 Laws of the Federation of Nigeria (LFN) 2004, its supplementary regulations and other relevant Nigerian legislation. This analysis aims at ascertaining whether or not the problems of overfishing and climate change are adequately addressed. Secondly, the chapter focuses on the extent to which Nigeria has complied with IFL, the reasons for its compliance with IFL, why industrial trawler owners or operators (industrial fishermen) comply with fisheries law in Nigeria and how, if any, Nigeria’s interests in fisheries influences its compliance with the UNFCCC. Lastly, this chapter

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5 Nigeria ratified the UNFCCC on 29/08/94 and acceded to the Kyoto Protocol on 10/03/05. For detailed discussion of the obligations and commitments of Nigeria under the UNFCCC see pp. 281-285 in Chapter 6

6 Hereinafter referred to as SFA.

7 The regulations are: the Sea Fisheries (Licensing) Regulation, 1992 (Licensing Regulation); the Sea Fisheries (Fishing) Regulation, 1992 (Fishing Regulation); the Sea Fisheries (Fish Inspection and Quality Assurance) Regulation, 1995 (Quality Assurance Regulation); and the Use of Turtle Excluder Devices (TEDs) and other By-Catch Reduction Devices (BRDs) on Shrimp Trawl Nets Regulations, 2006 (TED/BRD Regulation).

8 The phrase “other relevant Nigerian legislation” means legislation which contains measures that complement conservation and management measures prescribed in the SFA and its supplementary regulations. The legislation includes the Inland Fisheries Act Cap 110 LFN 2004 (Refer to hereinafter as IFL); Environmental Impact Assessment Act Cap E12 LFN 2004 (Refer to hereinafter as EIA Act); National Environmental Standards and Regulations Enforcement Agency (Establishment) Act No. 25 of 2007 (NESREA Act); Live Fish (Control of Importation) Act Cap L14 LFN 2004 (Live Fish Act); Nigerian Urban and Regional Planning Act Cap N138 LFN 2004 (Planning Act); The Coastal and Inland Shipping (Cabotage) Act No. 5 of 2003 (Cabotage Act); Nigerian Maritime Administration and Safety Agency Act No. 17, 2007 (NIMASA Act); and Merchant Shipping Act No. 27 2007 (MSA Act).
presents and discusses the views and perceptions of the stakeholders in the marine fisheries sector on the main issues investigated in this study. The major findings from the interview analysis are also identified. The order of the aforementioned discussion constitutes the structure of this chapter. It is preceded by a brief examination of the characteristics of Nigeria’s marine fishery resources and the chapter concludes by identifying the major indicators supporting the contention that Nigerian fisheries law is not effective.

7.2 Characteristics of Nigeria’s Marine Fishery Resources

The Nigerian marine environment is classified into the inshore waters extending up to a depth of 0-50 metres, and the offshore waters which extend from 50 metres in depth up to the end of Nigeria’s exclusive economic zone (EEZ). Marine fishery is both multispecies and heterogeneous. Most of the commercially important species in Nigeria are common in other parts of the Gulf of Guinea. Tobor identified 71 families of about 157 species of finfish and shellfish. A more recent study by Isebor reveals an increase in the number of the families, genera and species of teleost, rajiform and squaliform fish. The finfish families that constitute the major target of industrial fisheries in the inshore waters include Sciaenidae, Haemulidae, Cynoglossoidae, Serranidae, Sphyraeidae, Lutjanidae, Ariidae, Scombridae, Carangidae, Polynemidae, Drepanidae, Sparidae, Carcharhinidae, and Rajidae. These species are genetically small varying in size from 25-50cm. The shrimp species which industrial fishermen target in the inshore waters include Penaeus notialis.

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14 Ibid.
Parapenaeopsis atlantica, Penaeus kerathurus, Parapenaeus longirostus and Penaeus monodon.\textsuperscript{15} The latter appeared in trawler catches for the first time in the late 1990s.\textsuperscript{16}

Tuna and tuna-like species dominate offshore pelagic species. The major targeted species are Katsuwonus pelamis, Thunnus albacores, Thunnus obesus, Euthynnus alletteratus, Sarda sarda and Elagatis bipinnulata.\textsuperscript{17} Offshore demersal species include fish families such as Priacanthidae, Sparidae, Aromidae, and Pentheroscion mbizi, and also shrimps and red crab. Despite the rich variety of marine fish species in Nigerian waters, Sciaenidae (croakers), which consists of Pseudotolithus typus, P. senegalensis, P. elongates, P. brachynathus, account for over 80 percent (%) of landings by industrial fisheries.\textsuperscript{18} Harvesting of finfish and shellfish is all year round, even though certain months are associated with higher catch rates.\textsuperscript{19}

7.3 Conservation and Management Measures for Marine Fishery Resources

The 1999 Constitution of the Federal Republic of Nigeria (1999 Constitution) vests in the Federal Government of Nigeria jurisdiction over marine fishing and fisheries in the territorial waters and the EEZ.\textsuperscript{20} Although both soft and hard laws regulate conservation and management of marine fishery resources in Nigeria, this section only adumbrates the former while detailed attention is given to the latter.

\textsuperscript{16} Isebor, C. E., \textit{op. cit.}, p. 59.
\textsuperscript{19} Amire noted that the peak periods for marine shrimping occur during the rains from May to September. The low catch rates occur between August and September as well as February and March when the juvenile shrimps are in the creeks and lagoons. Amire, A. V., \textit{op. cit.}, p. 146. On the other hand, Ogbonna is of the view that highest catch rates occur in June and December. Ogbonna, J. C., \textit{op. cit.}, p. 193.
\textsuperscript{20} See section 4(2) and (3) as well as item 29 on the Second Schedule, Part 1 of the 1999 Constitution. This constitutional power underpins the Territorial Waters Act Cap T5 LFN 2004 (Territorial Waters Act) and the Exclusive Economic Zone Act Cap E17 LFN 2004 (EEZ Act). The Territorial Waters Act gives effect to the concept of territorial sea by delimiting Nigeria’s territorial waters at 12 nautical miles, and also vesting in the Federal Government of Nigeria all powers with respect to any matter concerning the territorial waters. See section 1(1), (2) and (3a) of the Territorial Waters Act. The EEZ Act gives effect to the concept of EEZ by delimiting Nigeria’s EEZ at 200 nautical miles, and also vests the sovereign and exclusive right to exploit marine living resources in Nigeria. See sections 1(1) and 2(1) of the EEZ Act. See generally \textit{Attorney-General of the Federation v. Attorney-General of Abia State & 33 Ors}, Federation Weekly Law Reports, (2002) Part 102, pp 1-310 particularly Ogwuegbu JSC at pp. 242-244.
7.3.1 The Legal Framework: Soft Law

By virtue of the wide powers given to the Agency established under the NESREA Act to protect, develop and enforce compliance with policies, regulations etc. on environmental matters including sustainable development of Nigeria’s natural resources, municipal soft law instruments on the environment, particularly the 1999 Revised National Policy on Environment and Nigeria’s National Agenda 21, can no longer be taken for granted. The fact is, just as in international law, municipal soft law instruments can become enforceable laws when they are incorporated into statute and expressed in enforceable terms. Unfortunately, the 1999 Revised National Policy on Environment and National Agenda 21 do not specifically prescribe measures for conservation and management of marine fishery resources. However, the 1999 Revised National Policy on Environment’s cardinal goals and its provisions on biological diversity, natural resources conservation, as well as marine and coastal area resources, can enhance the sustainable development of marine fishery resources, if properly implemented. The same argument goes for the National Agenda 21, which contains provisions that are designed to address the problems of coastal resources and biodiversity conservation.

7.3.2 The Legal Framework: Hard Law

The SFA and its supplementary regulations are the primary laws regulating fishing in the territorial waters and the EEZ of Nigeria. The other relevant Nigerian laws already mentioned have provisions that complement conservation and management measures adopted in the SFA and its supplementary regulations. A thematic analysis of conservation and management measures is preferred, instead of examining the laws individually.

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21 Sections 1(2) and 7(a), NESREA Act.
24 Para 4.4 on Biological Diversity.
25 Para 4.5 on Natural Resources Conservation.
26 Para 4. 10 on Marine and Coastal Area Resources.
7.3.2.1 Conservation and Management Measures: SFA and its Supplementary Regulations

7.3.2.1.1 Registration and Licensing of Motor Fishing Boat

Section 1(1) of the SFA provides that the owner of a motor fishing boat used for the purpose of either fishing or shrimping, or reefer vessel used for discharging frozen fish within the territorial waters of Nigeria or its EEZ, must obtain a licence in respect of that vessel and ensure its registration before operating it.\(^{27}\) Although these measures create an income avenue for the Federal Government of Nigeria, their primary aims are to check excessive fishing capacity within the maritime waters of Nigeria\(^{28}\) and in foreign waters,\(^{29}\) as well as to ensure that the Federal Department of Fisheries (FDF) keeps a proper record of vessels granted licences to fish by Nigeria as required by IFL.

Section 1(1) of the Licensing Regulation makes it mandatory for a prospective owner of a fishing vessel intended for fishing or shrimping in Nigeria’s territorial waters to first obtain a Letter of Pre-purchase Assurance from the Minister of Agriculture, who is the Licensing Officer, stating that the proposed vessel would be granted a licence if procured.\(^{30}\) While this section makes reference to only Nigeria’s territorial waters, in practice, the FDF also enforces it on prospective owners of fishing vessels intended for fishing or shrimping in Nigeria’s EEZ. The primary aim of this measure is to avoid wasteful investment by the applicant which may lead to unnecessary pressure on the Licensing Officer for a vessel to be licensed, even where the sector is over-capitalised. The SFA further buttresses this position by providing that the Licensing Officer may not license a motor fishing boat if its operation is prejudicial to the interests of the sea fishing industry.\(^{31}\)

Another way in which the licensing requirement can enhance conservation and management of marine fishery resources is the wide discretionary power given to the Licensing Officer to decide what conditions may be attached to the licence.\(^{32}\) This implies that a motor fishing boat licensed to fish could be restricted to certain specie(s), method of

\(^{27}\) Although section 1(1) of the SFA does not use the word shrimping, the fact that the licence can only be issued for either fishing or shrimping and not for both can be deduced from the wording of section 3(1)(a) of the SFA and Para 1(1) of the Licensing Regulation. For the form, duration and expiration of the licence see sections 4(2), and 4(3)(a) and (b), SFA.

\(^{28}\) Sections 1(1) and 3(1)(a), SFA.

\(^{29}\) Section 3(1)(c), SFA.

\(^{30}\) Section 15 of the SFA permits the Minister of Agriculture (Minister) who is charged with responsibilities for fisheries to appoint any person(s) to carry out any of the provisions of the Act. Presently, the Director of the Fisheries, FDF acts on behalf of the Minister.

\(^{31}\) Section 4(1)(d), SFA. Example of operation of a fishing vessel prejudicing the interest of the fishing industry may arise when the biomass of the fish stock is low or the industry is overcapitalised.

\(^{32}\) Section 4(2), SFA.
fishing, fishing period/season and area of the sea. In addition, the Licensing Officer may without assigning any reason cancel a licence or suspend a licence for such period as he deems fit.\textsuperscript{33} In that case, any person aggrieved by the decision of the Licensing Officer may appeal to the Minister, who may take any decision he deems fit. The decision of the Minister on any appeal shall be final.\textsuperscript{34} The conditions for licensing of motor fishing boats shall also apply in relation to renewal of the fishing license,\textsuperscript{35} except that the Licensing Officer may vary any of the conditions.\textsuperscript{36}

7.3.2.1.2 Single Purpose Licence

Section 3(1)(a) of the SFA provides that application to the licensing officer in respect of a motor fishing boat shall be for either trawling for fish or shrimp.\textsuperscript{37} The idea of restricting trawlers to “single purpose” exploitation is to reduce the likelihood of trawlers using small mesh shrimp nets to harvest fish. The effectiveness of this measure is doubtful because recent study has revealed that owners of vessels licensed for shrimps have the “dual purpose” of shrimping and, at the same time, using small cod-end mesh size allowed for shrimping to intentionally target demersal finfish.\textsuperscript{38}

7.3.2.1.3 Restriction on the Size of fishing Gear/Net Size

Section 2 of the Fishing Regulations provides that trawlers shall not use a cod-end with stretch mesh size of less than 76 mm (3 inches) when trawling for fish in the inshore waters or less than 44 mm (1\(\frac{3}{4}\) inches) when trawling for shrimps in areas approved for shrimp trawling. In order to further strengthen this provision the Fishing Regulation provides that no opening on each mesh in any part of a trawl net shall be obstructed or diminished.\textsuperscript{39} This provision shall be adhered to even where a topside charter is used to reduce wear and tear of the mesh.\textsuperscript{40} These measures are designed to facilitate the escape of juvenile finfish and shrimps thereby increasing their rate of recruitment into the fishery. Unfortunately, industrial fishermen do not strictly comply with these measures. There is documentary evidence which shows that the crews of fishing vessels go to the extent of

\textsuperscript{33} Section 4(5)(a) and (b), SFA.
\textsuperscript{34} Section 7(1-3), SFA.
\textsuperscript{35} Section 6, SFA.
\textsuperscript{36} Section 4(1)(c) SFA and section 11(2), Licensing Regulation.
\textsuperscript{37} See also section 3 of the Fishing Regulation, which prohibits using a vessel for fishing and shrimping.
\textsuperscript{39} Section 13(1), Fishing Regulation.
\textsuperscript{40} See generally section 13, Fishing Regulation.
making arrangements with artisanal fishermen to bring them mosquito size nets while at sea which they then use in fishing.\textsuperscript{41}

7.3.2.1.4 Prohibited Methods of Fishing

The SFA prohibits any person from taking or destroying or making any attempt to take or destroy any fish within the Nigerian maritime waters by using any explosive substances or any noxious or poisonous matter.\textsuperscript{42} This measure aims at avoiding health hazards for people who may consume poisoned fish and the negative consequences of such methods of fishing on the aquatic ecosystem. The main problem with this measure is the difficulty of enforcing it in very shallow waters and the hundreds of creeks and lagoons, which serve as the breeding and nursery grounds for most marine fish stocks. It is quite difficult for enforcement officers to have access to such terrains. More so, under the Inland Fisheries Act, the littoral states in Nigeria are vested with most of the powers as far as fishing activities in these areas are concerned. Unfortunately, they are either not interested or have no capacity to enforce the conservation and management measures prescribed in the Inland Fisheries Act.\textsuperscript{43}

7.3.2.1.5 Regulation of Minimum Size of Catchable Fish Species

Section 12 of the Fishing Regulation provides that the minimum catchable size for lobster and crab shall be 7 cm and 6 cm in length measured from the tip of the beak to the end of the flap of the tail when spread as flat as possible. With regard to finfish, the Fishing Regulation provides that the Nigerian Institute for Oceanography and Marine Research (NIOMR)\textsuperscript{44} may determine, before the 31\textsuperscript{st} January of every year, the minimum total length of fish catchable during the year, for each of the commercial species, taking into

\textsuperscript{41} The Minutes of the Industrial Fisheries Stakeholders Meeting involving FDF, NITO A, Nigerian Navy and the Marine Police Held on the 23\textsuperscript{rd} November, 2004 at FDF Conference Room, Lagos, p. 3 and comments by the Deputy Director of Fisheries (MCS) in the Minutes of the Meeting Between the Federal Department of Fisheries (FDF) and Members of the Nigerian Trawlers Owners’ Association (NITO A) Held at the Conference Room of the FDF, Victoria Island, Lagos on the 5\textsuperscript{th} of May, 2004 at p. 3. Earlier study by the FAO reveals that there was prevalent use of smaller meshed nets ranging from 32-40 mm, which increases the percentage of smaller sized shrimps in catches in Nigerian waters. FAO (1986) Report of the CECAF Ad hoc Working Group on the Demersal and Shrimp Resources of the Central Gulf of Guinea Division (34.3.5) CECAF/ECAF Series 86/36.

\textsuperscript{42} See particularly section 6(1)(a-c) of the IFA which prohibits the use of explosive substances or any noxious or poisonous matter or electricity to fish in inland waters. ‘Littoral state’ is a term which the Supreme Court of Nigeria used to describe the eight states (Akwa Ibom, Bayelsa, Cross River, Delta, Lagos, Ogun, Ondo, Rivers) of the federation that bound the Atlantic Ocean. See generally Attorney-General of the Federation v. Attorney-General of Abia State & 35 Ors, Federation Weekly Law Reports, (2002) Part 102, PP 1-310.

consideration the 5% retention length of the legal cod-end mesh.\textsuperscript{45} The other factors which NIOMR has to take into consideration are the demand and supply situation, as well as the health of fish species.\textsuperscript{46} This measure aims at discouraging catches of undersize fish and the use of illegal mesh size in the cod-end.\textsuperscript{47} However, it does not apply to catches made on behalf of the Federal Government of Nigeria by approved research cruises.\textsuperscript{48} Unfortunately, NIOMR has never implemented this measure, probably as a result of the discretionary manner in which section 14(1) is couched.

The increasing rate at which juvenile fish were being landed led the Meeting of Industrial Fisheries Stakeholders (MIFS) to set up a Committee on the standardisation of the fishing sorting system. The recommendation of the Committee was finally adopted as a government policy in a Circular titled \textit{Standard Sorting System for Fishes Caught in Nigeria’s Marine Waters}, FDM/C/L/24/S.4/I/193 of February 27, 2006.\textsuperscript{49} Paragraph 1 of the circular lists the agreed sizes for the grading of marine fish in Nigeria and the weight specification given to related species other than the \textit{Pseudotolithus} (Croakers). Although the main objective of the policy is to ensure equity in the packaging of finfish by fishing companies, it allows for the landing of small size finfish, particularly the croakers of 14 cm. This size is far below what was contemplated with mesh size of not less than 76 mm and 44 mm, when trawling for fish and shrimps respectively. If the prescribed mesh size is strictly adhered to, the minimum size of the \textit{Pseudotolithus typus} that can be caught at 25% selectivity is 24 cm, and at 50% selectivity is 26 cm.\textsuperscript{50}

\textbf{7.3.2.1.6 Restriction on the Size of Vessels}

The Licensing Regulation provides that no fishing vessel intended to be used for fishing or shrimp trawling shall exceed, in the case of a fishing vessel, 25.3 metres in dimension and 150 gross tonnage and, a shrimp trawler, 23.2 metres in dimension and 130 gross tonnage.\textsuperscript{51} However, for inshore fishing fleets that were in existence before the enactment of SFA the size restriction does not apply during their life span.\textsuperscript{52} In order to ensure compliance with this measure, the SFA mandates that a fishing vessel must be surveyed

\begin{itemize}
  \item \textsuperscript{45} Section 14(1)(a), Fishing Regulation.
  \item \textsuperscript{46} Section 14(1)(b) and (c), Fishing Regulation.
  \item \textsuperscript{48} Section 14(3), Fishing Regulation.
  \item \textsuperscript{49} The policy took effect from May 1, 2006.
  \item \textsuperscript{51} Section 8, (a and b), Licensing Regulation.
  \item \textsuperscript{52} Section 14, Licensing Regulation.
\end{itemize}
and its tonnage measured. By limiting the size of fishing and shrimp vessels, the Licensing Regulation adopts a sort of precautionary measure by reducing the harvesting capacity of each vessel and its capacity to destroy rare and fragile habitats like coral reefs and seamounts, as it trawls on the ocean floor. The recent introduction of pair trawling into the marine fisheries completely negates this precautionary measure.

Unfortunately, Amire, the Director of Fisheries, (Monitoring Control and Surveillance (MCS)), supports pair trawling by arguing that it is constitutional, permitted under the SFA and that it is the size of the mesh which determines the size of the fish to be caught. Amire seems to forget the dangers for coral reefs and on other epibenthic and infauna organisms of trawling on the seabed. Indeed, these dangers can be expected from pair trawling especially in a sector where over 80% of trawlers are involved in shrimping.

7.3.2.1.7 Prohibition of Dumping and Transshipment

The Fishing Regulation provides that fishing vessels licensed to fish either in the territorial waters, or the EEZ of Nigeria must not dump edible and marketable sea products at sea. This measure aims at promoting optimum utilisation of marine fish stocks. The word “dump” means, “to discard.” Ordinarily, it could be argued that this measure permits discard of fish and shrimps that are spoiled or contaminated. In order to avoid dumping of edible and marketable sea products on such grounds the Quality Assurance Regulation requires industrial fishermen to adhere strictly to guidelines and standards on fishing vessel certification, fish handling, storage, preservation, processing, transportation and marketing, including export and import. As a way of further strengthening the provisions of the Quality Assurance Regulation, the Licensing Officer shall issue a fishing licence only after he is satisfied that the fishing vessel is constructed and equipped to the standard that is fit for fishing. Despite all these regulations, there are still complaints of fish spoilage arising from prolonged periods of towing.

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53 The report of the survey and tonnage measurement, which must be sent to the Minister, is to ensure that only suitable and permissible vessels are used for fishing and shrimping. See generally sections 4(1) and (2) SFA. See also section 7(3) of the Licensing Regulation, which provides that an application for license must be accompanied by a concise statement as to the tonnage of the vessel, horse power and year of construction.
54 News Agency of Nigeria, “FG Orders Fishing Trawlers to Install VMS Monitors”, May 18, 2009. Available at [http://allafrica.com/stories/200905181285.html](http://allafrica.com/stories/200905181285.html). Note that the MCS unit is one the units of Federal Department of Fisheries (FDF), Lagos.
55 See Table 2.4 on percentage of registered fishing and shrimping vessels on p. 52 of Chapter 2 of this thesis.
56 Section 4, Fishing Regulation.
57 *Minutes of Meeting Held with Pair Trawlers Operators at Fisheries Conference Room on the 22*nd *April 2008*, pp. 1 and 3.
The full intent of the phrase “dump edible and marketable sea product” becomes clearer if read in conjunction with sections 11, 19 and 20 of the Fishing Regulation. Section 11 of the Fishing Regulation provides that it is an offence to catch, land, retain, sell expose or offer for sale or be in possession for the purpose of sale of sea fish of any description that is smaller in size than prescribed. On the other hand, section 19 provides that no person shall keep on board either dead or alive or offer for sale any lobster or crab less than 7 cm or 6 cm respectively. Finally, section 20 provides that any egg carrying crab or lobster caught by whatever means shall be returned to the waters. From the foregoing three provisions, the phrase edible and marketable must be construed as fish, lobster or crab that is not undersized. The phrase also excludes berried crab and lobster. The whole essence of these provisions is to protect juvenile fish and berried crab and lobster for the purposes of maintaining sustainable stock recruitment.

Unfortunately, a new occupation - a lucrative sea market for trash fish including sometimes priced fish (known in the Nigerian fishing industry as “yamayama”) between crew of fishing vessels and artisanal fishermen has emerged. This market is driven by the eroding resource base,\(^{58}\) high demand for yamayama by aquaculturists, who rely on it as the cheapest and most readily available source of food for farmed fish, and poverty-stricken Nigerians who see it as a cheap source of animal protein. Regrettably, in the face of global criticism against using wild fish to feed farmed fish, Amire still believes that “yamayama can be used as raw material for animal/fish feed”.\(^{59}\) Legally, failure by NIOMR to implement section 14(1)(a) of the Fishing Regulation also contributes to the problem.

Concerning the prohibition on transshipment of fish, section 6 of the Fishing Regulation provides that all fish caught by motor fishing vessels in Nigeria’s territorial waters and EEZ must be landed at a Nigerian port, and no part of it may be exported or shipped away from Nigeria at sea. Ordinarily, this measure should help the FDF to collate accurate data on fish production and other relevant fish data. Also, this measure is directed at promoting fish food security, especially when local fish supply is grossly inadequate to meet the national demand. Lastly, by prohibiting transshipment, the Monitoring, Control and Surveillance Unit of the FDF can easily detect during jetties inspection of fishing vessel, whether or not the crew of fishing vessels complied with prescribed conservation and management measures. Unfortunately, the good intention of the law has been defeated, as

\(^{58}\) Davies, R. W. D., et al., p. 661.
\(^{59}\) Minutes of the Industrial Fisheries stakeholders Meeting Involving FDF, NITO, Nigeria Navy and the Marine Policy Held on the 23\(^{rd}\) November, 2004 at FDF Conference Room, Lagos, p. 4.
the *yamayama* business has successfully introduced a local dimension of transshipment of fish. The consequences of this are lack of transparency in the catch data reporting system and paucity of data on fish stocks, which contribute to poor marine fisheries management.

### 7.3.2.1.8 Prohibiting Fishing in Certain Areas

The Fishing Regulation prohibits any motor fishing boat from fishing within the first five nautical miles of the waters of Nigeria’s continental shelf. Furthermore, trawling or pair trawling within this zone is prohibited. Practically, these measures create a non-trawling zone within the area of territorial waters of Nigeria, where the breeding and nursery grounds for juvenile fish and shrimp are located. While the non-trawling zone helps juvenile fish to recruit into the main stock, it is not a “no-take” zone because it gives exclusive fishing rights in the zone to the artisanal fishermen. The rationale of adopting this measure is to create a balance between economic factors and social sustainability, on the one hand, and biological and ecological sustainability, on the other hand. Second, this measure aims at reducing conflict between artisanal fishermen and trawler operators.

Section 10(b) of the Fishing Regulation prohibits trawlers that are less than 20 gross tonnages from trawling for shrimps within Nigerian inshore waters. This measure prevents smaller vessels from trawling for shrimps in shallow inshore waters that may lie outside the non-trawling zones, but still serve as breeding and nursery grounds for juvenile fish and shrimps. In order to further strengthen this measure, Section 10(c) of the Fishing Regulation prohibits any motor fishing boat from shrimping in waters shallower than 18 meters. As an output measure, prohibition of shrimping in shallower waters reduces the catch of juvenile fish by shrimp trawlers that concentrate their target on brown shrimps in shallow waters. Pramod and Pitcher rightly noted that these measures exist only on paper since the FDF fails to enforce them.

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61 Section 1 Fishing Regulation.

62 Section 10(a), Fishing Regulation.

63 Section 10(c), Fishing Regulation.


7.3.2.1.9 Bycatch Reduction

Gillett puts the ratio of bycatch of shrimp trawlers in Nigeria at 1:5 – 1:15,\(^6\) while Solarin et al put it at a ratio of 1:8 to 1:19.\(^6\) Two decades ago, almost all the bycatch fish and non-fish were discarded. That trend has changed now. Kelleher claims that in Nigeria, because of the growing market for yamayama, there is high collection at sea, thus reducing its discard rate to 1.4% which is among the lowest in the world.\(^6\) Unfortunately, Kelleher’s data ignores discards at ports, which according to Pramod and Pitcher can be as high as 60% of trash fish landed during some seasons.\(^6\) In order to reduce the rate at which commercially-important juvenile finfish are caught as bycatch by smaller cod-end mesh used by shrimp trawlers, section 5 of the Fishing Regulation provides that fish landed by shrimp trawler shall not be less than 75% by weight of the total landings, including the head on weight of shrimp landed. Tobor criticises this provision for encouraging rather than discouraging the landing of under-sized fishes. It seems that the problem with the provision lies in the construction of the word “fish”, which in this case should be interpreted as shellfish.\(^7\)

With regard to minimising the number of sea turtles that are caught as bycatch by shrimp trawlers (a problem which led the United States to ban import of Nigerian shrimps into its market) section 1 of the TED/BRD Regulation makes it mandatory for operators of shrimp trawlers within Nigeria’s territorial waters to attach both TED and BRD to the cod-end of the trawl. The TED/BRD Regulation not only enhances the escape of sea turtle from shrimp trawl nets, it also prevents very large fish from entering such nets. This has led to an appeal by members of the Nigerian Trawlers Owners’ Association (NITOA) to the Government for some form of subsidy since they are losing quality fish and shrimp by

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\(^{6}\) Gillett, R., op. cit., p. 251.


\(^{6}\) Ibid.

\(^{7}\) Unfortunately, the earlier distinction made between fish and shrimp in the regulation creates ambiguity in terms of the meaning of the word ‘fish’ in Section 5. The interpretation problem here is: does the word ‘fish’ refer to ‘finfish’ or ‘shellfish’? Resolving this ambiguity requires reference to the margin note of the section and the application of the mischief rule of interpretation (Heydon’s Case [1584] 3 CO REP 7a). The marginal notes of the section simply states ‘landing of shrimps’, while the mischief or defect that the Sea Fisheries Act Cap 404 did not properly address was a high incidence of bycatch of juvenile fish in shrimp trawling nets. Since the aim of Section 5 is to reduce incident of bycatch of juvenile fish in the shrimp trawling nets, the word “fish” in this section ought to have been shrimp and therefore should be construed as “shrimp”.

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using TED and BRD. However, because there is no monitoring, control and surveillance of fishing vessel activities at sea, the data on detection of violation of the TED/BRD Regulation by fishing companies between 2004 and November 2009 (Table 7.1) may not represent the actual level of compliance or non-compliance with the TED/BRD Regulation by industrial fishermen.

Table 7.1: Detection of Violation of Fisheries Law

<table>
<thead>
<tr>
<th>Year</th>
<th>No of Cases</th>
<th>Nature of Violation</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>1</td>
<td>Fishing with expired licence by a Nigerian registered vessel Not Using TED</td>
<td>Detained: new licence issued and fine paid Seizure of Net</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Not Using TED</td>
<td>Seizure of Net</td>
</tr>
<tr>
<td>2005</td>
<td>1</td>
<td>Not Using TED</td>
<td>Fine and confiscation of net</td>
</tr>
<tr>
<td>2006</td>
<td>2</td>
<td>Not using TED</td>
<td>Fine and confiscation of net</td>
</tr>
<tr>
<td>2007</td>
<td>3</td>
<td>Not using TED</td>
<td>Fine and confiscation of net Request made to Cameroon for sanction</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Using undersize net</td>
<td>Fine and confiscation of net</td>
</tr>
<tr>
<td>2008</td>
<td>1</td>
<td>Not using TED</td>
<td>Fine and confiscation of net</td>
</tr>
<tr>
<td>2009</td>
<td>1</td>
<td>Not using TED</td>
<td>Fine and confiscation of net</td>
</tr>
</tbody>
</table>

Source of Data collation: MCS Files, FDF, Lagos

7.3.2.2 Weakness of Conservation and Management under the SFA System

The discussion here takes into consideration the critical approach adopted to analyse each of the conservation and management measures and the fact that other Nigerian laws have addressed some of the issues that could have been considered as weaknesses under the SFA system. The climate change problem is examined separately. The SFA and its supplementary regulations do not adopt output control measures such as total allowable catch, quota systems, days at sea and marine protected areas, which are recommended in the Convention and are widely used in other jurisdictions. Existing conservation and management measures are also devoid of demand-side measures such as catch certification, catch documentation, banning trade in endangered and threatened fish species etc. Finally, apart from registration and licensing requirements, industrial fishermen have

71 See the comments by Mrs M. Orakwusi, 1st Vice President of NITOA in the minutes of Trawl Fisheries Stakeholders’ Meeting Held on 3rd August, 2006 at the Conference Room of Nigerian Institute for Oceanography and Marine Research, p. 4.
72 Article 62(4)(band C) Convention.
open access to fish all year round. This hinders the recruitment of juvenile fish into the main stocks.

7.4 Conservation and Management Measures: other Nigerian legislation

7.4.1 Objective of Marine Fisheries Management

One important issue, which the SFA and its supplementary Regulations ignore, is the need to clearly state the objectives of marine fisheries management. The NESREA Act identifies, among its objectives, the sustainable development of Nigeria’s natural resources. The overarching effect of NESREA Act on all aspects of the environment invariably makes sustainable development the primary objective of marine fisheries management.

7.4.2 Protection of Critical Aquatic Habitats and Integrated Coastal Area Management

The Planning Act and the EIA Act provide for the protection of habitats that are sensitive and critical for marine fish breeding and nursery, such as estuaries, creeks, lagoons, mangrove swamps and wetlands. First, the Planning Act makes it mandatory for a developer to obtain approval for any land development from the Planning Commission or Board or Authority. Second, the Planning Act and the EIA Act prescribe mandatory environmental impact assessment for most projects located in the aforementioned habitats. The EIA Act extends the mandatory environmental impact assessment requirement to projects located in the immediate marine environment. Third, both laws promote integrated coastal area management. Section 7 of the EIA Act provides that before the Federal Environmental Protection Agency (now Federal Ministry of Environment, Housing and Urban Development (FMEHUD)) takes any decision on the environmental impact assessment of a project, opportunity must be given to government agencies, members of

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73 Sections 28, 30 and 33 of the Planning Act. Of course, technically, land will include wetlands and mangrove swamps.

74 For example, mandatory environmental impact assessment is required for coastal reclamation covering an area of 50 hectares or more; construction of fishing harbours, harbour expansion involving an increases of 50 percent or more in landing capacity per annum; construction of port or port expansion involving more than 50% of the capacity; conversion of mangrove swamps for development use covering an area of 50 hectares or more; clearing of mangrove swamps on islands adjacent to national marine parks; and construction of offshore pipelines of more than 50 kilometres in length. See generally the Schedule to the EIA Act which lists all the Mandatory Study Activities.

75 This ministry was initially established as the Federal Ministry of Environment. See Presidential Directive Ref No. SGF 6/S.22/1 of October 12, 1999. In a recent shuffling of federal ministries, the portfolio of Federal Ministry of Environment was expanded to include Housing and Urban Development. Before the establishment of the Federal Ministry of Environment, the FPEA, a parastatal under the Federal Ministry of Works and Housing, was responsible for all environmental matters. FPEA was scrapped in 1999 when the Federal Government of Nigeria decided to establish the Federal Ministry of Environment.
the public, experts in the relevant disciplines and interested groups to comment on the environmental impact assessment of the project. Likewise, the Planning Act provides that for the purposes of integration, consistency and coherence within and between all levels of physical development plans in Nigeria (Plan), the Nigerian Urban and Regional Planning Commission (the Planning Commission) must call for submission of input towards the preparation of the plan from all relevant government organisations, non-governmental organisations (NGOs) and interested members of the public. Unfortunately, as a small and often economically and politically less important sector, fisheries as a whole is the least considered interest among the competing and conflicting interests in the coastal zone of Nigeria.

7.4.3 Ecosystem Approach, Biodiversity Conservation and Precautionary Approach

The basic elements of environmental impact assessment include conducting an impact assessment prior to undertaking activity that may affect the environment, and risk assessment, including assessment of alternatives. Since these elements constitute part of the assumptions which the precautionary approach is based upon, it could rightly be argued that the environmental impact assessment requirement introduces a minimal precautionary approach into marine fisheries management. The NESREA Act identifies biodiversity conservation as one of its objectives. In addition, it vests in the Agency the power to enforce compliance with laws on sustainable management of ecosystems and biodiversity conservation. On that basis, the Agency must apply the ecosystem approach in setting standards and regulations that will prevent, reduce or eliminate all forms of environmental degradation in seas and oceanic area, as well as restore and enhance marine resources.

The Live Fish Act promotes biodiversity conservation and application of the ecosystem approach in marine fisheries management by ensuring that the importation of invasive species and their introduction into the aquatic environment is strictly controlled.

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76 See generally Section 13(1) Planning Act. The same provision exists in the States Urban and Regional Planning Board Law. For example see section 11(1) of Lagos State Urban and Regional Planning Board Law Cap L52.
79 Section 7(e) NESREA Act.
80 Section 8(o) NESREA Act.
81 See also section 8 of the IFA.
7.4.4 Addressing Employment Rights

Part XI of the MSA 2007 contains elaborate provisions on employment of seamen covering sensitive labour issues such as engagement, wages, leave entitlement, discharge, termination of employment, welfare and prevention of accidents to seamen. The Nigerian Maritime Administration and Safety Agency is vested with the power to register and maintain a pool of dockworkers and seafarers as well as supplying them for crew of vessels within the Cabotage Act.\textsuperscript{82} The Nigerian Maritime Administration and Safety Agency is also vested with the power to investigate matters relating to maritime labour at Nigerian jetties including ensuring that dock workers and seafarer employers comply with requirements regarding crewing, wages, safety, welfare and training of dockworkers and seafarers.\textsuperscript{83} Even though poor working conditions and job insecurity are among the factors responsible for crew of fishing vessels becoming involved in illegal fishing activities,\textsuperscript{84} the protection of seafarers’ employment rights under the MSA 2007 is not mentioned in any of the MIIFS.

7.5 Do Conservation and Management Measures integrate Climate Change into Marine Fisheries Management?

In 2003 Nigeria submitted its First National Communication under the United Nations Framework Convention on Climate Change\textsuperscript{85} which, among other things, examines the impact of climate change on fisheries and identifies the adaptation measures that should be applied to address the problem. Besides \textit{Nigeria’s National Communication}, the \textit{Environmental Impact Assessment Sectoral Guidelines: Agriculture and Rural Development}\textsuperscript{86} (\textit{EIA Sectoral Guidelines}) recognises the fact that global environmental changes, such as the greenhouse effect may affect the biological productivity of the oceans and seas.\textsuperscript{87} Unfortunately, apart from the above general statement of problem, the \textit{EIA Sectoral Guidelines} do not specifically examine how climate change affects marine fish or make clear the implications of climate change for marine fisheries management in Nigeria.

\textsuperscript{82} Section 27(1)(a) NIMASA Act. Note Nigerian Maritime Administration and Safety Agency was created by merging of Nigerian Maritime Authority and Joint Maritime Labour Council on August 1, 2006.
\textsuperscript{83} Section 27(1)(c) NIMASA Act.
\textsuperscript{84} Minutes of the Industrial Fisheries Stakeholders Meetings Involving FDF, NITOA, Nigerian Navy, Marine Police and Fish Sellers Association Held on the 16\textsuperscript{th} of June, 2005 at FDF Conference Room, Victoria Island, Lagos, p. 3.
\textsuperscript{87} See particularly the 10\textsuperscript{th} paragraph in the introduction to Chapter 6 at p. 37.
Likewise, neither the SFA nor any of its supplementary regulations address the impact of climate change on marine fishery resources. In fact, none of the Nigerian fisheries laws provides for the integration of environmental factors into marine fisheries management, which would enable policy-makers and fisheries managers to take climate change into consideration.

The Agency has power to enforce laws on sustainable management of ecosystems, biodiversity conservation and the development of Nigeria’s natural resources including the seas and oceans.\textsuperscript{88} It is also vested with powers to regulate air quality and atmospheric pollution originating from energy sources in a way that protects marine health\textsuperscript{89} and to enforce compliance with international agreements on climate change.\textsuperscript{90} All these support the argument that the NESREA Act provides the needed assurance that climate change will be integrated into marine fisheries management. Unfortunately, the major weakness of the NESREA Act is the lack of jurisdiction by the Agency on all matters relating to the oil and gas sector.\textsuperscript{91}

From the foregoing, only Nigeria’s National Communication specifically identifies and provides ways of addressing climate change impacts on fisheries. The possible impacts identified are:

i. Changes in upwelling along the Gulf of Guinea due to increase in ocean temperature;

ii. Change in characteristics of ocean water which will adversely affect fish habitat in the coastal zone;

iii. 10-25% decrease in precipitation since the beginning of the 21\textsuperscript{st} century; and

iv. An increase in deep sea fishing towards the coast due to rising seas level.\textsuperscript{92}

According to Nigeria’s National Communication, specifics of the changes to the ecosystems as a result of climate change are yet to be properly analysed. More importantly,

\begin{itemize}
\item [\textsuperscript{88}] Section 7(e) and (b) NESREA Act.
\item [\textsuperscript{89}] Section 20(1)(d) NESREA Act. Note that this mandate of the Agency is wide enough to embrace its other mandate on the regulation of GHGs which implied in section 20(1)(b) as to control the concentration of substances in the air which separately or in combination are likely to damage or deteriorate marine health. See also section 8(o) NESREA Act.
\item [\textsuperscript{90}] Section 7(c) NESREA Act.
\item [\textsuperscript{91}] There are numerous provisions of the NESREA Act, which restrict the powers of the Agency on matters relating to oil and gas. For example see sections 8(g)(k) and (m); 24(3); 29; and 30(1)(a)(4) NESREA Act
\item [\textsuperscript{92}] See pp. 8, 72 and 75.
\end{itemize}
Nigeria’s National Communication notes that the severity of climate change impacts on Nigerian ecosystems (fish inclusive) depends to a large extent on their status. However, with regard to climate change impacts on fisheries, Nigeria’s National Communication suggests the following adaptation measures:

i. Changes in harvest technology;
ii. Stocking marine water with salt tolerant or hardier fishes;
iii. Expansion of aquaculture production systems;
iv. Improvement of processing and storage facilities; and
v. Enforcement of legislation on appropriate and acceptable fishing practices.

Regrettably, Nigeria’s National Communication fails to incorporate basic adaptation measures such as monitoring of ocean temperatures, migration patterns of fish, changes in size and productivity of habitats, and distribution of fish. No specific effort has been made to ascertain or estimate the quantity of GHGs which the marine fisheries sector emits, and what measures should be taken to reduce it. This seems to suggest that the Climate Change Unit of the FMEHUD, which is responsible for preparing Nigeria’s National Communication was either not serious in its examination of the impact of climate change on marine fishery resources or it did not consult the relevant stakeholders in the marine fisheries sector.

Incidentally, the problem of non-integration of climate change factors into marine fisheries management in Nigeria is not a failure of law or the FMEHUD alone. The greatest concern is that neither the FDF nor the MIFS has acknowledged that climate change constitutes a threat to marine fishery resources. Everyone seems to remain silent over a problem that is one of the most publicised in recent human history.

7.6 Enforcement of Conservation and Management Measures under SFA and TED/BRD Regulation

Analysis of the SFA and the TED/BRD Regulation reveals that the SFA employs management and enforcement or deterrent strategies to ensure compliance with its provisions while the TED/BRD Regulation adopts only the deterrent strategy.

7.6.1 Management Strategies

The management strategies adopted in the SFA are periodical returns of operation, inspection of catch, fishing vessel identification, exhibition of licence, fishing gear and

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93 Nigeria’s National Communication, p. 72.
catch, as well as search and examination of fishing vessels and gear.\textsuperscript{94} Other statutory management strategies adopted in the SFA include maintaining a national record of authorised fishing vessels and marking of the vessels in accordance with the FAO Standard Specifications for the Marking and Identification of Fishing vessels.\textsuperscript{95} The impromptu and instant application of the search, examination and inspection of fishing vessels without warrant or summons or other processes should encourage compliance with the SFA and its supplementary regulations if there were enforcement of the laws at sea.\textsuperscript{96} Unfortunately, the inspection and search of fishing vessels, as well as the examination of fishing nets and catches are done at the jetties by staff of the FDF when fishing vessels are landing. This makes it extremely difficult for them to ascertain whether or not the crewmembers complied strictly with the prescribed conservation and management measures while at sea.

The FDF uses two non-statutory management strategies, i.e. participation of corporate stakeholders in marine fisheries management and capacity building targeted at the FDF staff, vessel captains and fish workers. The MIFS is a forum where the stakeholders in the Nigerian marine industrial fisheries discuss the problems associated with the sector and proffer solutions to them.\textsuperscript{97} The FDF also uses the forum to get members of the NITOA actively involved in the decision-making process on certain issues affecting marine fisheries. The comments by the Deputy Director of Fisheries (MCS) that “fisheries management has become a stakeholder affair”\textsuperscript{98} and the understanding of the Committee on Standard Sorting System for Fishes Caught in Nigeria’s Marine Waters that “the new approach to resources management is that stakeholders must be involved in the management of the resources,”\textsuperscript{99} confirm the fact that participation underpins the management of marine fishery resources in Nigeria. The FDF in collaboration with NITOA, NIOMR, FAO, United Nations Environment Programme and Global Environmental Facility have organised a series of workshops and training sessions for the purpose of educating and training industrial fishermen and enforcement agents on TED, vessel system monitoring (VSM) and bycatch utilisation in Nigeria.

\textsuperscript{94} Sections 8(a) and (b) and 9(1)(a-c), FSA and generally section 17, Fishing Regulation.
\textsuperscript{95} Section 9, Fishing Regulation and the reference to the FDF directive on the international Standard for the Marking of Fishing Vessels in the Minutes of the Industrial Fisheries Stakeholders Meeting Involving FDF, NITOA, Nigerian Navy and the Marine Police Held on the 23\textsuperscript{rd} of November, 2004 at FDF Conference Room, Lagos, p. 4.
\textsuperscript{96} Section 9(2), SFA.
\textsuperscript{97} The stakeholders refer to here are the FDF, members of NITOA, Nigerian Navy, Marine Police, Fish Sellers Association and NIOMR.
\textsuperscript{98} The Minutes of the Industrial Fisheries Stakeholders Meeting Involving FDF, NITOA, Nigerian Navy and the Marine Police Held on the 23\textsuperscript{rd} of November, 2004 at FDF Conference Room, Lagos, p. 5.
\textsuperscript{99} Minutes of the Committee on the Standardisation of Fish Sorting System within Nigerian Industrial Fisheries Subsector Held on 21\textsuperscript{st} December, 2004 at the FDF Conference Room, p. 1.
7.6.2 Deterrent/Enforcement Strategy

The enforcement strategies commence with the arrest and detention of any vessel or person who violates the SFA or any of its supplementary regulations. Paragraph 17(e) of the Fishing Regulation provides that a person duly authorised by the Minister to enforce the regulation shall:

Arrest the vessel, its Master or Chief Engineer and order the vessel to proceed to the nearest port where the law enforcement agencies shall report to the FDF to effect prosecution. 100

These functions may be exercised without warrant, summons or other process. In addition, section 9(3) of the SFA provides that any motor fishing boat or apparatus taken from the offender may be detained or kept pending the trial of the alleged offender, and the catch may be sold and the proceeds of the sale detained or kept pending such trial. Where the offender is prosecuted and convicted by the court, the following punishments are available:

7.6.2.1 Imprisonment Fine, Forfeiture and Confiscation

The offence of fishing or shrimping without licence attracts imprisonment of five years or a fine of ₦250,000 or both. Using explosive substances or any noxious or poisonous matter when fishing attracts imprisonment of two years or a fine of ₦50,000. A person convicted for operating a fishing vessel with an expired licence shall be fined ₦50,000 and his catch forfeited. 101 All other specific and general offences in the SFA, the Fishing Regulation and Licensing Regulation attract only ₦50,000 fines. The TED/BRD Regulation prescribes a fine of ₦100,000 and confiscation of nets where a shrimp trawl is operated within Nigeria’s territorial waters without a TED and a BRD attached to its cod-end. 102 Where a shrimp trawl operates with an improperly rigged TED as specified under the regulation, the fine shall be ₦50,000 and the net used confiscated. 103 Any shrimp vessel used twice to contravene section 1 of the Regulation more than once shall have its licence withdrawn for the remaining part of the year for which the licence was issued. 104 The administrative approach of punishing violators of the TED/BRD Regulation instead of prosecuting them enables the FDF to avoid the perennial problem of delay in civil and criminal trials. 105

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100 For other powers of the person duly authorised by the Minister to enforce the Fishing Regulation see Para 17(a-d), Fishing Regulation.
101 Section 4(5), SFA.
102 See Sections 1 and 8(a), TED/BRD Regulation.
103 Section 8(d), TED/BRD Regulation.
104 Section 8(c ), TED/BRD Regulation.
105 The reasons for delay have been attributed to the Bench, the existing court procedures and the attitude of some lawyers who intentionally wish to delay the Court. See Nigerian Bar Association (NBA) (2007)
7.6.2.2  **Blacklisting of First Officer under the TED/BRD Regulation**

The TED/BRD Regulation provides that the First Officer (the Captain) of any shrimp vessel found contravening section 1 of the Regulation more than once shall be blacklisted, and shall not be allowed on board any fishing vessel in Nigeria for a period of five years.106 This sanction aims at targeting the vessel Captains or Masters who are the real perpetrators of fishing crimes. Its effectiveness relies on the fact that a First Officer is a professional who may not find it easy to change profession or get employment in another fishing company during the period he is blacklisted.

7.6.2.3  **Forfeiture, Cancellation and Suspension Powers of the Court**

Notwithstanding the foregoing penalties, the court may order forfeiture to the Federal Government of Nigeria of any fishing boat, fishing gear or catch employed in the commission of or derived from any act in respect of which that person is so convicted.107 The court has powers to cancel or suspend the licence of such a motor fishing boat for such time as it deems fit.108 So far, there have been only three cases of prosecution of foreign vessels for fishing illegally in Nigeria’s maritime waters.109 While fines or imprisonment were ordered in all the cases, it was only in *Attorney-General of the Federation v. Fishing, Shipping and Construction Co. Ltd. & 15 ors*110 that Justice Jinadu, G.A. also ordered that the vessel *MV Ocean’s VIII* and the net used in the illegal fishing be forfeited to the Federal Government of Nigeria.

7.6.3  **Weakness of Enforcement under the SFA System**

The most important weakness of the enforcement strategies is failure by the government to recognise that violation of conservation and management takes places mostly at sea. The FDF has no patrol boats or the necessary personnel to conduct monitoring, control and

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106  Section 8(b), TED/BRD Regulation.
107  Section 13(a) SFA.
108  Section 13(b) SFA.
109  In *Attorney-General of the Federation v. Constandinos Oikonomon & 16 ors*, Suit No. FHC/L/10c/90, each accused person was given an option of N500.00 fine or 6 months imprisonment and in *Attorney-General of the Federation v. Panagondis Nifiatis & 17 ors* Suit No. FHC/L/99/90 each of the accused was given an option of N1000.00 fine or one year imprisonment on the first count and N200.00 or 6 months imprisonment for the second count (the fine were accumulative while the terms of imprisonment were concurrent).
110  Suit No./FHC/L/37/91.
surveillance of fishing vessels activities at sea. This relaxes the compliance pull exerted by the legitimacy of the FDF and rules made by it as a result of participation in the law or decision-making processes by industrial fishers. The fact is, if the claim by the FDF that the crew of a fishing vessel can realise up to ₦1.5 million each trip by selling yamayama at sea is true, then fishermen will not be deterred by a paltry fine of ₦50,000 or ₦100,000. As the law stands, the slight increase in fines to ₦100,000 under the TED/BRD Regulation affects only industrial fishermen involved in shrimping.

The long delays in civil and criminal trial discourage the government from prosecuting violators of fisheries laws. On the other hand, the administrative approach limits the full deterrent effect of the law because it does not adequately replace the psychological stress or stigma resulting from media reports of offenders being convicted by the Courts and gazette of cases by the Federal Government. The demerit of vesting enforcement and judicial functions in the FDF is that most fishermen may see the FDF as inherently biased and unfair. Indeed, such an arrangement can reduce the level of legitimacy which industrial fishermen accord to the FDF and rules emanating from it, thus weakening their compliance behaviour and also increase management costs for the FDF.

7.6.4 Enforcement of Fisheries laws: Other Nigerian Legislation

The Agency has powers to conduct public investigation into the degradation of natural resources and to adopt standards and regulations that will prevent, reduce and eliminate any form of degradation in the nation’s oceans and seas, as well as restore and enhance their natural resources. More importantly, the Agency is empowered, subject to the provisions of the 1999 Constitution, and in collaboration with relevant judicial authorities, to establish mobile courts that will expeditiously dispense environmental cases. This

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112 Sutinen, J. G., Rieser, A., and Gauvin, J. R. (1990) “Measuring and Explaining Non-compliance in Federally Managed Fisheries,” Ocean Development & International Law, Vol. 21, No. 3, pp. 335-372, p. 342. See also p. 357 where it is stated that the goal of an effective penalty schedule is to make the penalty such that the economic gains from illegal activity as the infraction becomes more egregious are not worth the risk of incurring the penalty.
113 Sutinen, Rieser, and Gauvin discovered in their study that the greater the time between detection of a violation and conviction and sanction the lower the perceived cost of the violation at the time of a person’s compliance or noncompliance decision. The less time there is to conviction and sanction, the higher the perceived cost. Sutinen, J. G., Rieser, A., and Gauvin, J. R., op. cit., pp. 339 and 350-360.
115 Section 8 (g) and (o) NESREA Act respectively.
116 Section 8 (f) of the NESREA Act.
groundbreaking provision is expected to address the perennial problem of delay in the justice system, which has hindered enforcement of environmental law in the past.

The NIMASA Act vests the Nigerian Maritime Administration and Safety Agency with responsibility to implement the following fisheries related functions:\footnote{117}{See generally sections 22(1)(a-q) and 23(5)(b) of the NIMASA Act.}

i. Flag and port state control duties;

ii. Carry out air and coastal surveillance;

iii. Board, inspect and search any vessel (which includes fishing vessels) within Nigeria’s maritime zone;

iv. Deal with any unauthorised fishing activities;

v. Exercise right of hot pursuit; and

vi. Examine and seize fish because of offences committed under the NIMASA Act as well as dispose of any fish concerned in such offence.\footnote{118}{For example, section 23(9) of NIMASA Act states that act prejudicial to the safety and security of Nigeria’s maritime domain as (c) any unauthorised fishing activities.}

\section*{7.6.5 Weakness of Enforcement under other Nigerian Legislation}

The argument against vesting enforcement and judicial functions in one institution is also applicable to the Agency. The Agency may find it difficult to find and employ qualified persons who are experts in fisheries. Already, at the state level, news of corruption of mobile environmental court officials is fast spreading.\footnote{119}{Bello, U. A. and Abubakar, A. A., Hawkers Allege Extortion by Environmental Officials, \textit{Daily Trust}, 25 September 2009, available at \url{http://allafrica.com/stories/200909250148.html} (accessed September 29, 2009).} Unfortunately, there are no records that the Nigerian Maritime Administration and Safety Agency ever performed responsibilities itemised ii, iii, vi, and v with regard to marine fisheries. Since the early 1990s, the Nigerian Maritime Administration and Safety Agency has been performing port duties on behalf of Nigeria but has limited itself to marine pollution and safety and security of ships in line with the various International Maritime Organisations Conventions. The Nigerian Maritime Administration and Safety Agency’s performance of flag state administration and vessel inspection with regard to fisheries is restricted to only survey and tonnage measurements of fishing vessels.

\section*{7.7 Institutional Framework for Regulations of Marine Fishery Resources}

From a national perspective, institutions are rights, rules, responsibilities of organisations and individuals as well as the regulative structures, activities and processes that shape
individual behaviour. The major policy concern for understanding the institutional framework of any fisheries management is to determine if and how laws and regulations, as well as other structures affect resource users; and also to know if all the structures are performing their assigned roles.

The institutional framework for marine fisheries management in Nigeria consists of six structures. The first is the rule-making bodies. This category includes the National Assembly (NA), which is vested with the power to make law on marine fisheries as well as other related areas. It also includes the Minister who is given wide powers under section 14(2)(a-h) of the SFA to make regulations on all matters relating to conservation and protection of marine fisheries. The second institutional structure consists of primary legislation on marine fisheries i.e. SFA, on the one hand, and regulations and policies made by the Minister, which constitute the secondary or supplementary legislation to the SFA on the other. Other legislation related to marine fisheries will fall under either of these two categories depending on their enactment authority.

The third institutional structure consists of the owners of fishing vessels who operate under the umbrella of NITOA, and the First Officers whose behaviour is specifically regulated by the TED/BRD Regulation. The fourth institutional structure comprises two review bodies. The first review body is NIMOR. Research conducted by its fisheries and marine biologists on stock estimates and the marine environment form the basis upon which most decisions are made by the rule-making bodies. The second review body is the MIFS. As already noted, this is a non-statutory body of corporate stakeholders in the industry. It was created by the FDF primarily to encourage the participation of resources users in marine fisheries management. The MIFS is a forum where corporate stakeholders engage in consultations and make suggestions on how best to address problems facing the sector. The fifth

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123 See section 4(2) of the 1999 Constitution and Item 29, Part 1 of the Second Schedule to the Constitution. This does not include fishing and fisheries in rivers, lakes, waterways and other inland waters within Nigeria.

124 Hønneland, G., *op. cit.,* p. 710.
institutional structure consists of the Minister, any person authorised in writing by the Minister and other agencies authorised under section 9(6)(b-e) of the SFA to monitor, control and enforce compliance with the rules and regulations on fisheries and related legislation.\textsuperscript{125}

The sixth structure consists of government agencies authorised to prosecute, judge and sanction industrial fishermen who violate fisheries laws. The Attorney-General of the Federation being the Chief Law Officer of the Federation\textsuperscript{126} has the power to prosecute any person who violates any Act of the National Assembly before any court of law in Nigeria. The Attorney-General of the Federation can exercise his power in person or through officers of his Ministry.\textsuperscript{127} Previously only the Federal High Court had original jurisdiction over matters concerning marine fisheries.\textsuperscript{128} That has now changed by virtue of section 8(f) of the NESREA Act.\textsuperscript{129}

### 7.7.1 Weakness of the Institutional Framework

The point that needs to be emphasised here is that decisions concerning which conservation and management measures are appropriate, or the implementation and enforcement of such measures are made through institutional arrangements. The yardsticks for evaluation of an institution’s success are participation, transparency and accountability. Participation means the inclusion of the stakeholders in policy-making and implementation. Transparency or openness has to do with public access to information. Accountability pertains to defining roles and responsibilities in a manner whereby responsibility rests with those with the power to make decisions.\textsuperscript{130} As far as participation is concerned, the establishment of MIFS allows for institutionalised collaboration between limited key actors – government agencies and NITOA. The latter is only consulted and even where its members get involved in law or decision-making processes, the ultimate decision lies with the Minister. Consumers, environmentalists, NGOs and the public are not among the key stakeholders. Management is only partially open hence crucial information may be restricted to key stakeholders who may not readily share it with the

\textsuperscript{125} See also the enforcement and investigation powers of the Agency under sections 7(h) and 8(g) of the NESREA Act.
\textsuperscript{126} Section 150(1), 1999 Constitution.
\textsuperscript{127} Section 174, 1999 Constitution.
\textsuperscript{128} See section 7(1)(a) of the Federal High Court Act and section 251(1)(a) and (g), 1999 Constitution. The appellate power of the Minister in cases of cancellation or suspension of license has already been discussed. See p. 301 of this chapter.
\textsuperscript{129} As noted earlier this section empowers the Agency to establish Mobile Courts to expeditiously dispense with environmental cases.
\textsuperscript{130} Mikalsen, K. H. and Jentoft, S., \textit{op. cit.}, pp. 170-172.
public. Although roles and responsibilities are clearly defined in the SFA, the final decision lies with the Minister. In that sense, other stakeholders such as NITOA and the Nigerian Navy are left with no responsibility for the outcome. A situation where the Minister is saddled with so many other responsibilities, and the FDF and other enforcement agencies lack the capabilities to perform their assigned functions, makes efficiency and accountability in terms of enforcement of conservation and management measures unsatisfactory.

Secondly, other Nigerian laws that are relevant to marine fisheries have institutional structures akin to the ones under SFA system, which have also failed to perform their functions effectively. For example, the Nigerian Maritime Administration and Safety Agency has failed to perform Nigeria’s port and flag state’s duties with regard to fisheries. However, the major institutional problem is lack of cooperation and coordination of roles between government agencies.\textsuperscript{131} Representatives of the agencies, commissions and boards that are responsible for the implementation of other Nigerian laws which are relevant to marine fisheries management do not participate in the MIFS. Similarly, there is no indication that the FDF is represented in such institutions.

\section{7.8 Compliance with IFL by Nigeria}

Despite Nigeria having the final say on how to conserve and manage marine fishery resources within its EEZ,\textsuperscript{132} international law requires it to act in good faith in relation to fisheries obligations it has assumed under all international fisheries instruments\textsuperscript{133} and to avoid actions which would defeat the object and purpose of such instruments, which it has signed but which are yet to be ratified.\textsuperscript{134} Likewise, the Code unambiguously states that the right to fish and the obligation to ensure effective conservation and management of fishery resources goes hand in hand.\textsuperscript{135} In line with the aforementioned international law, the EEZ Act provides that the sovereign and exclusive rights of Nigeria with respect to the exploration and exploitation of the living resources of its EEZ are subject to the provisions

\textsuperscript{131} This problem is apparent between (i) FDF and Nigerian Maritime Administration and Safety Agency (ii) FDF and the Environmental Impact Assessment Department in the FMEHUD; (iii) FDF and Commission established under the Planning Act); (iv) FDF and the Nigerian Navy; (v) FDF and the various ministries in charge of fisheries at the state levels; and (vi) FDF and the various state Police Command of the littoral states.

\textsuperscript{132} Article 297(3)(a) and (b) of the Convention and Article 32, of the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (the FSA), which states that Article 297(3) of the Convention also applies to the FSA.

\textsuperscript{133} Article 26, Vienna Convention on the Law of Treaties, 1969. Referred to hereinafter as the “Vienna Convention”. See also Article 300, Convention and Article 34, FSA.

\textsuperscript{134} Article 18(a), Vienna Convention.

\textsuperscript{135} Article 6.1, the Code.
of any treaty to which Nigeria is a party. Thus, the crux of the matter is the extent to which Nigeria has complied with IFL.

In order not to repeat earlier discussion on conservation and management measures adopted under IFL and Nigerian fisheries law, this sub-section only lists the major conservation and management measures together with the enforcement strategies prescribed under IFL. It then goes on to examine whether or not Nigeria has implemented and enforced them. It is important to note that the measures listed are based on each international fisheries instrument. However, from the perspective of IFL as a whole, the lists are continuous and inseparable. Therefore, any measure that is already listed in a previous instrument is not repeated under the subsequent instrument except where there is significant improvement on it. Finally, implementation of IFL is not restricted to only domestication or changes in legislation that reflect the commitments of Nigeria under IFL. In a country where review and update of laws are not common, changes in government policies and practices constitute a good source of determining the degree of government decision to implement IFL.

7.8.1 Conservation and Management Measures

7.8.1.1 Nigeria and the Convention

The Convention prescribes in mandatory terms certain conservation and management measures which Nigeria still has discretion to adopt in its EEZ considering its status as a coastal state. The measures are to:

1. determine allowable catch;
2. apply the best scientific evidence available;
3. maintain or restore targeted stocks to a level at which they can produce maximum sustainable yield (MSY);
4. take into account environmental factors e.g. interdependence of stocks;
5. take into account economic factors e.g. economic needs of coastal community;
6. ensure target stocks are not endangered by overfishing;
7. ensure reproduction of non-target species is not threatened;
8. contribute to and exchange scientific information, catch and fishing effort statistic relevant to conservation of fish through international organisations;

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136 Section 2(2), EEZ Act.
137 See generally Chapters 3, 4 and sub-section 7.4 of this Chapter.
138 Measures 1-8 are prescribed under Article 61 of the Convention while measures 9-11 are prescribed under Article 62 (1-3) of the Convention.
9. ensure optimum utilisation of fish;
10. determine harvesting capacity; and
11. give other states access to surplus allowable catch.

In addition, Nigeria may adopt conservation and management measures such as licensing of fishing vessels, fixing the age and size of catchable stocks and non-target species, fixing the types and size of gear and vessels, quotas, closed seasons or areas.\textsuperscript{139} The core management measure which Nigeria should adopt is to cooperate with competent international organisations with the aim of ensuring that overfishing does not endanger fish stocks in the EEZ.\textsuperscript{140} The Convention directs Nigeria to apply also the foregoing conservation and management measures (particularly numbers 1-8) when negotiating with other states for the conservation and management of fishery resources in the high seas, as well as when vessels registered and authorised by Nigeria fish in area(s) of the high seas not regulated by regional fishery agreement.\textsuperscript{141}

The SFA and its supplementary regulations do not specify allowable catch, quotas, closed season, marine reserve, MSY and determination of harvesting capacity as measures for the conservation and management of marine fishery resources. By directing that NIOMR may publish, before 31\textsuperscript{st} January of each year, the minimum total length of commercial fish catchable during the year,\textsuperscript{142} the Fishing Regulation promotes the proper conduct of scientific research by Nigeria as well as integrates the requirement of best scientific evidence available into marine fisheries management. The implementation of the TED/BRD Regulation, which aims to exclude sea turtles and other bycatches from the cod-end of shrimp trawl, is concrete evidence that Nigeria has incorporated environmental factors, particularly avoiding threats to non-target species and the interdependence of stocks, into marine fisheries management. The non-trawling zone of five nautical miles, which is reserved for local artisanal fishermen, takes into consideration environmental and economic factors. It takes into consideration environmental factors in the sense that the area, which serves as breeding grounds for juvenile fish and shrimps, is protected from the fishing activities of trawlers. Economically, fishing activities of local artisanal and subsistence fishers are concentrated in the non-trawling zone. Therefore, prohibition of

\textsuperscript{139} Article 62(4)(b-d) Convention.
\textsuperscript{140} Article 61(2), Convention.
\textsuperscript{141} Articles 118 and 119(1 and 2), Convention.
\textsuperscript{142} Section 10(1)(a) and (b), SFA. Note the weakness of these provisions as earlier discussed in this Chapter on p. 302.
trawlers from fishing in the zone protects the source of sustenance for local artisanal and subsistence fishers.143

The rigorous process of acquiring a fishing or shrimping licence, and the restriction in mesh and vessel sizes, are all input control measures prescribed in the Convention which Nigeria has implemented. The prohibition of dumping of edible and marketable sea product at sea is evidence of the determination of Nigeria to implement measures geared toward ensuring optimum utilisation of marine fish by Nigerians. Finally, the active participation of Nigeria in RFMOs,144 particularly with regard to Sub-Regional Cooperation in Marine Fisheries Monitoring, Control and Surveillance in the Southern Gulf of Guinea on the Harmonisation of Fisheries Laws and Regulations of the Region (SCMFMCSSG),145 shows its compliance with the obligation on coastal and fishing states to cooperate for the purpose of contributing and exchanging scientific information, catch and fishing effort statistics, and other relevant data for the conservation of marine fish stocks.146 Actually, there was no functional RFMO in the Southern Gulf of Guinea until Nigeria, in collaboration with Cameroon, formed the SCMFMCSGG.

While the extent to which Nigeria has contributed and exchanged scientific information with state parties to these organisations is not readily known, the FAO’s website holds fisheries data on Nigeria indicating its compliance with Article 61(5) of the Convention. However, as far as participation of Nigeria in RFMOs is concerned, the most serious problem is failure by all the RFMOs to adopt contemporary environmental principles, such as the ecosystem approach and the precautionary approach. A critical analysis of the instruments establishing the RFMOs, and the proposed Agreement for Cooperation in Fisheries Monitoring Control and Surveillance in the Gulf of Guinea,147 reveals that they do not integrate climate change into marine fisheries management. They also do not contain strong environmental provisions that states can rely on in future to integrate climate change into marine fisheries management.

143 For argument on poor enforcement of the TED/BRD Regulation and persistent violation of the non-trawling zone by industrial fishermen see pp. 308 and 317 of this chapter.
144 The agreements include International Convention for the Conservation and Management of Atlantic Tunas (ICCAT), Fishery Community for the Eastern Central Atlantic (CECAF), Regional Convention on Fishery Cooperation among African States Bordering the Atlantic Ocean and Convention for the Establishment of the Fishery Committee for the West Central Gulf of Guinea (FCWC).
145 In fact, the Secretariat of the initiative is domiciled in Nigeria.
146 Article 61(5), Convention.
Generally, the discussion in sub-section 7.3.2.1 of this thesis points to the fact that Nigeria has implemented most of the non-mandatory conservation and management measures prescribed in the Convention.¹⁴⁸

### 7.8.1.2 Nigeria and the FSA¹⁴⁹

Although the FSA is applicable beyond areas of national jurisdiction, it requires Nigeria to ensure that measures adopted by it for the conservation and management of straddling fish stocks and highly migratory fish stocks (SHMFS) within its EEZ are designed to achieve long-term conservation and sustainable use of the stocks. The FSA is very specific on the type of measures as well as the general principles which Nigeria must adopt. The measures are:

1. precautionary approach; and
2. compatibility of conservation and management measures;

The requirement of compatibility of conservation and management measures established for the high seas and those adopted in the EEZ, together with the adoption of the ecosystem approach in the FSA, means that Nigeria must implement in its EEZ the other conservation and management measures adopted in the FSA.¹⁵⁰ The core measures which are expressed as general principles in Article 5 of the FSA are:

1. adoption of the ecosystem approach;
2. protection of biodiversity;
3. take into account the impact of fishing and other human activities on target and non-target species;
4. minimising pollution, waste, discard, ghost fishing, catch of target and non-target species through the use of selective, environmentally safe and cost-effective fishing gear and techniques; and

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¹⁴⁸ The measures include registration and licensing of fishing vessels, charging fees for fishing license, prohibition of transshipment of fish caught in Nigeria’s maritime waters and fixing the size of fishing vessels, mesh cod, fish, lobster and crab.

¹⁴⁹ The expectation that Nigeria will soon ratify the FSA (Personal communication with Mrs Grace Ekanem, the Assistant Director, Department of International Law, Federal Ministry of Justice, Abuja reveals that the process is only awaiting the necessary approval) coupled with its obligation not to take any action that would deflect the object and purpose of the FSA are the reasons for examining whether Nigeria has complied with the FSA.

¹⁵⁰ It has already been argued in Chapter 3 that the adoption of the ecosystem approach in the management of SHMFS in the FSA obligates coastal states to apply the conservation and management measures adopted in the FSA to all fish species in their EEZ.
The FSA requires Nigeria to implement additional conservation and management measures concerning vessels flying its flag, and which are registered to fish on the high seas. The measures include licensing of fishing vessels, authorisation to fish, establishment of national records of fishing vessels and gear, marking of fishing vessels and gear in accordance with the FAO specification standards and regulation of transshipment on the high seas.\textsuperscript{151}

None of the Nigerian legislation on marine fisheries specifically adopts sustainable development, the ecosystem approach or precautionary approach. However, these measures underpin the primary objective of the 1999 Revised National Policy on Environment, Nigeria’s National Agenda 21, the EIA Act and the Planning Act, which can now be enforced by virtue of the NESREA Act. Unfortunately, with regard to the EIA Act, although fisheries are included among the mandatory projects for which environmental impact assessments are required,\textsuperscript{153} the FMEHUD limits the application of the \textit{EIA Sectoral Guidelines} to only aquaculture.\textsuperscript{154}

Nigeria has implemented the use of selective and environmental friendly gear by mandating all shrimp vessels to install TED and BRD to the cod-end of their nets. Ordinarily, this measure should enable industrial fishers to minimise waste, discard, as well as prevent bycatch of target and non-target species as required under the FSA. However, the incontrovertible fact is that these devices do not stop shrimp nets, which are sometimes pulled by two trawlers, from destroying the marine ecosystem. Such fishing practices neither protect biodiversity nor promote the ecosystem approach. They also fail to take into account the impact of fishing and other human activities on target and non-target species belonging to the same ecosystem. The restriction on mesh and harvestable size of certain fish species, as well as the establishment of the non-trawling zone, are far from leading to the establishment of stock-specific conservation and target reference points, which underpin the concept of the precautionary approach.\textsuperscript{155}

\textsuperscript{151} The other core measures which have already been examined under the Convention include adopting conservation and management measures based on “the best scientific advice available”, maximum sustainable yield, environmental factors and other measures set forth in Article 5 (b)(d)(e)(i)(j) and (k), FSA.
\textsuperscript{152} See generally Article 18(3), FSA.
\textsuperscript{153} Section 13, EIA Act.
\textsuperscript{155} See generally Annex 11 of the FSA. These reference points are also adopted in Article 7.5.3(a) and (b), Code.
Even though science underpins fisheries management in the Gulf of Guinea, the existing RFMOs and other fishery arrangements in the area are guided by different objectives and basic principles.\textsuperscript{156} There is no doubt that the lack of compatibility in the fisheries laws of states that bound the Gulf of Guinea informed the objective of harmonisation of legislation and regulations among contracting parties of the FCWC,\textsuperscript{157} SCMFMCSGG and the Regional Convention on Fishery Cooperation among African States bordering the Atlantic Ocean.\textsuperscript{158} Although, Nigeria may have initiated the idea of harmonisation of fisheries laws among the Southern Gulf of Guinea States, the implementation of the necessary change in its fisheries law, which is the most crucial aspect of harmonisation process, is lacking.

In order to minimise pollution of the marine environment the SFA prohibits dynamiting, poisoning and other similarly destructive fishing practices.\textsuperscript{159} The International Convention for the Prevention of Pollution from Ships MARPOL 73/78 as amended, and most other anti-marine pollution Conventions, have been ratified and domesticated by reference in the MSA 2007.\textsuperscript{160} Unfortunately, the Nigerian Maritime Administration and Safety Agency is yet to adopt guidelines and Regulations, which will make MARPOL 73/78 applicable to all vessels, including fishing vessels. Presently, neither the SFA nor any of its supplementary regulations mandates fishing or shrimp trawlers to minimise catch by abandoned gear. Also, Nigeria is yet to implement any serious measure that will reduce its excess fishing capacity.\textsuperscript{161}

Again, considering earlier discussions in sub-section 7.4.2.1.1, Nigeria has implemented some of the management measures applicable to Nigerian flagged vessels fishing on the high seas, including establishing a national record of authorised fishing vessels, marking of


\textsuperscript{157} Article 5(2)(c) FCWC.

\textsuperscript{158} Articles 2(d), 3(4) and 13 Regional Convention on Fishery Cooperation among African States Bordering the Atlantic Ocean.

\textsuperscript{159} Section 10(1) SFA. The FSA does not specifically address this source of pollution but Article 8.4.2 of the Code prohibits dynamiting, poisoning and other comparative destructive fishing practices.

\textsuperscript{160} See Section 335 MSA 2007. Note that violation of any of these international convention or guideline and regulation made to implement them is an offence punishable with 500,000.00 fine or two years imprisonment. Section 335(6) MSA 2007.

\textsuperscript{161} See footnote 89 on p. 52 of Chapter 2 of this thesis and table 2.3 on the same chapter.
the vessels in accordance with the FAO Standard Specifications for the Marking and Identification of Fishing vessels\textsuperscript{162} and VMS. On the other hand, Nigeria has not implemented management measures such as regulation of transshipment on the high seas.

\textbf{7.8.1.3 Nigeria and the Code}

Most of the conservation and management measures adopted in the Convention and FSA have been incorporated into the Code.\textsuperscript{163} Since Nigeria has accepted the Code as the normative reference for its fisheries decisions,\textsuperscript{164} it could rightly be argued that the Code provides an additional legal basis for Nigeria to comply with conservation and management measures as prescribed in the FSA. In any case, since the Code is not limited by species, and taking into consideration its ecosystem approach to fisheries management, those measures should be applied to all fish species. This sub-section examines whether or not Nigeria has implemented the unique conservation and management measures adopted in the Code.

The measures are as follows:

1. To integrate traditional or indigenous knowledge of the resource and habitat into fisheries management.
2. To protect and rehabilitate critical fisheries habitats i.e. wetland, mangrove, lagoon and reef.
3. To integrate marine fisheries management into coastal area management.
4. To diversify income and diet through aquaculture.
5. To integrate the effects of climate into fisheries management.
6. To address external issues like:
   i. international trade in fish and fishery products;
   ii. quality assurance of fish and fishery products;
   iii. oil and waste disposal;

\textsuperscript{162} See the \textit{Minutes of the Industrial Fisheries Stakeholders Meeting Involving FDF, NITOA, Nigerian Navy and the Marine Police} Held on the 23\textsuperscript{rd} of November, 2004 at FDF Conference Room, Lagos, p. 4; Article 18(3)(d) FSA; Article 8.2.3, Code; and Article III(6) Compliance Agreement.

\textsuperscript{163} Because of the soft law nature of the Code, non-conventional rule such as contained in Articles 8(4) and 17(1) and (2), FSA.

\textsuperscript{164} Para 6 of the Preamble to 2007 Convention for the Establishment of the Fishery Committee for the West Central Gulf of Guinea (FCWC), of which Nigeria is a party, states that the contracting parties recognise the Code “as the appropriate normative reference to deal with a number of critical issues with which the States of the West Central Gulf of Guinea are faced in the management and development of their fisheries, such as over-fishing and overcapacity in fisheries, prevention, deterrence and elimination of illegal, unreported and unregulated fishing, development of sustainable aquaculture ..., improvement of the livelihood of small scale fishers and processors”. Available at \url{ftp://ftp.fao.org/FI/DOCUMENT/FCWC/convention_e.pdf} (accessed June 4, 2009).
iv. protection of rights of fishers and fish workers; and

v. energy optimisation through efficient use of energy (i.e. wood and water) in harvesting and post-harvesting activities

Concerning the integration of traditional knowledge and technologies into marine fisheries management, the Code provides that such traditional knowledge and technologies should have been investigated, documented and assessed in order to ensure that their application would lead to sustainability of marine fisheries. Regrettably, neither the SFA nor the Research Institute Establishment, etc Order of November 1975 that established the NIOMR incorporates traditional knowledge and technologies into marine fisheries management. The *EIA Sectoral Guidelines* encourages the incorporation of sustainable traditional fishery practices to the extent possible into marine fisheries management systems as one of the mitigation measures for overfishing and long-term degradation of the marine resource base. Failure of the SFA to implement the provision of the Code on traditional knowledge and technologies, or develop along the *EIA Sectoral Guidelines*, means ignoring critical information which can improve management of marine fish stocks and rebuild marine ecosystems.

As noted earlier, the Planning Act and the EIA Act contain provisions which require the relevant government agencies to take into consideration the interests of marine fisheries by ensuring that representatives of the marine fisheries sector and the public are consulted in the development of coastal zones of Nigeria. In practice, this has not been the case as poor planning and lack of government control over coastal development constitute the major causes of destruction and degradation of sensitive and critical habitats that serve as breeding and nursery areas for marine fish stocks. Part of the reason for diversification of income and diet through aquaculture is to take off pressure from marine fisheries. Under the Presidential Initiative on Fisheries, which aims at ensuring food security in Nigeria, the sums of ₦16,640,000, ₦550,000,000 and ₦250,390,995 were budgeted in 2007, 2008 and 2009 respectively for aquaculture development and related activities. Besides this, in

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167 See pp. 309 and 310 of this chapter and Article 10.1.3, Code.

2009, the Federal Government of Nigeria budgeted the sum of ₦9.2 billion for the construction and rehabilitation of dams in order to provide among other things enough space for stocking of fingerlings. All these measures confirm the commitment of Nigeria to implement the provisions of the Code on aquaculture. Regrettably, none of the fisheries legislation or related legislation integrates climate change into marine fisheries management.

The Quality Assurance Regulation implements the provisions of the Code on post-harvest practices and trade, especially those on minimum standards for safety and quality assurance, as well as reduction of post-harvest losses and waste. The Quality Assurance Regulation also ensures that export and import of fish and fishery products meets the World Trade Organisation’s (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures, as elaborated in the Code. The SFA and its supplementary regulations are silent on the issues of oil and waste disposal from fishing vessels. The Cabotage Act deals with the problem by providing that the Minister of Transport must be satisfied that fishing vessels possess all certificates and documentation on safety and pollution requirements imposed by Nigerian law and any international convention in force before it is registered. As mentioned earlier, the Nigerian Maritime Administration and Safety Agency is yet to adopt guidelines and regulations on oil pollution by fishing vessels.

The SFA and its supplementary regulations do not have provisions that are directed at protection of the rights of fishers and fish workers. As noted earlier, the MSA 2007 and the NIMASA Act contain elaborate provisions which protect and enhance seamen and seafarers’ working conditions and rights. However, the poor working conditions including poor remuneration, inadequate crew welfare, job insecurity and permanent casual
appointments of crewmembers suggest that fishing companies are either not aware of the relevant provisions of the MSA 2007 and the NIMASA Act or are yet to implement them. In fact, during one of the MIFS, the Deputy Director (MCS) exhibited lack of awareness of the relevant provisions of the MSA 2007 and the NIMASA Act on the rights of seamen and seafarers by only referring members of the MIFS to the Code’s requirement on the need for vessel owners to ensure safety of vessel crew and insurance of both vessels and crewmembers. Finally, neither the SFA nor other Nigerian legislation so far examined directed fishing companies to optimise their energy utilisation or fix energy optimisation devices to their vessels.

7.8.2 Strategies for Enforcement of Conservation and Management Measures

The provisions of the SFA on boarding, inspection, arrest and use of judicial procedure complies with Articles 73(1) of the Convention. However, Nigeria has not implemented on-board placement of observers and trainees as provided for in Article 62(4)(g) of the Convention. The inability of Nigeria to implement these strategies at sea is primarily linked to the crisis in the Niger Delta and its immediate marine environment. This has caused the Federal Government of Nigeria to focus its attention on the security of oil and gas installations in the immediate marine environment of the Niger Delta. Importantly too, the FDF cannot cope with the human and financial costs of placing observers onboard all fishing vessels.

An examination of the few cases involving prosecution of persons and vessels of foreign nationals for the crime of fishing illegally in the maritime zone of Nigeria reveals that the Federal High Court ordered the accused to pay fines or go to prison. Meanwhile, there is no agreement referred to in Article 73(3) of the Convention between Nigeria and any other state. As far as foreign nationals are concerned, the sanction of imprisonment prescribed in sections 1(2) and 9 – 13 of the SFA confirms that Nigeria does not comply with Article 73(3) of the Convention.

175 Ibid, p. 7.
176 See generally sections 1(2) and 9 - 13, SFA.
177 See generally footnote 29 on p. 103 of Chapter 3 of this thesis. This assertion is also applicable to observers and inspections schemes adopted in the FSA.
178 The Minutes of the Industrial Fisheries Stakeholders Meeting Involving FDF, NITOA, Nigerian Navy and Marine Police Held on the 23rd of November 2004 at FDF Conference Room, Lagos, p. 3.
179 See footnote 109, supra.
180 The only pre-condition to prosecute a foreign national who has committed fishing offence in the territorial waters and the EEZ of Nigeria is that the trial must be approved to by the Attorney-General of the Federation or at his instant. Section 3(1), Territorial Waters Act and Section 4(3), EEZ Act.
The FSA mandates Nigeria to apply numerous enforcement measures already examined under the flag state, coastal state and port state responsibilities.\textsuperscript{181} It has earlier been pointed out that the Nigerian Maritime Administration and Safety Agency, which is vested with the power to perform flag and port states responsibilities for Nigeria, does not focus on conservation and management of marine fishery resources.\textsuperscript{182} There is no evidence that the Nigerian Maritime Administration and Safety Agency ever consulted the FDF in the course of performing its flag and port state responsibilities.\textsuperscript{183} In any case, the Nigerian Navy cannot share its scarce resources between two Federal Government agencies (FDF and the Nigerian Maritime Administration and Safety Agency) that have common responsibilities. Finally, the Nigerian Custom Services cannot cooperate with the Nigerian Maritime Administration and Safety Agency to enforce port state measures on fisheries when the import prohibition list permits the importation of almost all the collapsed and depleted fish stocks so long as import duties are paid on them.\textsuperscript{184}

Nevertheless, Nigeria has made attempts at the implementation of some enforcement strategies prescribed in the FSA.\textsuperscript{185} The strategies are:

i. Monitoring, control and surveillance of fishing vessels.

ii. The carrying out of judicial proceedings of any violation expeditiously.

iii. Severity of non-compliance penalties to include, inter alia, refusal, withdrawal or suspension of authorisations to serve as masters or officers on fishing vessels.

Recently, the Federal Government of Nigeria directed all fishing vessels to install VSM by the end of 2009.\textsuperscript{186} This shows the determination of Nigeria to effectively place surveillance on fishing vessels flying its flag whether they are within the Nigerian maritime waters or on the high seas. The implementation of VMS will also enable the FDF to collect the necessary vessel, catch and effort data including vessel position required under the FSA. With such data available, Nigeria can give them to investigating state in

\textsuperscript{181} See pp. 129-135 of Chapter 3 of this thesis.
\textsuperscript{183} This goes to prove an earlier claim make in this study that there is problem of lack of cooperation and coordination among government agencies.
\textsuperscript{185} See generally Articles 18 and 19, FSA.
\textsuperscript{186} News Agency of Nigeria “FG Orders Trawlers Owners to Install Monitors” This Day, May 12, 2009.
good time, whenever a request is made. Unfortunately, the Federal Government of Nigeria seems to be unaware that the FDF and other enforcement agencies need functioning radars, a good number of sea going patrol boats and uninterrupted supply of electricity. Without these facilities, VSM alone cannot be effective when it comes to quick rescue response and expeditious apprehension and investigation of violators of applicable conservation and management measures, particularly foreign vessels which are likely to leave the maritime waters of Nigeria immediately after their IUU fishing activities.

With regard to ensuring that judicial proceedings are carried out expeditiously, the TED/BRD Regulation addresses this problem by adopting an administrative enforcement approach, while the NESREA Act empowers the Agency to establish mobile courts that will expeditiously adjudicate on environmental cases. With regard to sanctions imposed by Nigeria on violators of conservation and management measures being adequately severe, and the fact that sanctions must target Masters and other officers of fishing vessels, the TED/BRD Regulation prescribes blacklisting of First Officers who violate the provision of section 1 of the TED/BRD Regulation more than once. Regrettably, in spite of an increase in the fine prescribed under the TED/BRD Regulation, it is still paltry.

Besides adopting most of the conventional enforcement measures entrenched in the FSA, the Code has introduced two novel management strategies which Nigeria has implemented. The strategies are:

i. Participation of the stakeholders in marine fisheries management; and

ii. Promotion of awareness of responsible fisheries through education and training.

7.8.3 Why does Nigeria comply with IFL Law?
A combination of analytic and critical approaches to discourse adopted in Chapters 3 and 4 enabled this thesis to point out some of the reasons, albeit generally, why states, particularly developing ones, have not been able to comply with IFL. In Sections 7.3 – 7.7

187 It was only in 2007 that the Federal Government made budgetary allocation of N25,000,000.00 for Fisheries Monitoring, Control and Surveillance Project (Purchase of Fishery Patrol Boats, Training of Enforcement Officers and Workshops for Stakeholders etc). See 2007 Budget Classification No. 02500030170000. Available at http://www.budgetoffice.gov.ng/PDF/2007budget.pdf (accessed last January 12, 2009). As at July 31, 2009 the FDF neither purchased nor was it given any patrol boat.
188 Article 19(2), FSA.
189 Section 8 (f) of the NESREA Act.
190 Article 19(2), FSA.
191 Articles 4.4, 6.13, 10.2.1 and 11.3.2, Code.
192 Articles 6.16 and 10.2.1, Code.
of this Chapter some factors have been identified as the reasons for the non-compliance behaviour of Nigeria and industrial fishers with IFL and the SFA and its supplementary regulations respectively. In order to avoid unnecessary repetition, this subsection focuses on why Nigeria and its industrial fishers comply with IFL and Nigerian fisheries law respectively. This notwithstanding, the analytical tools used in this study enable the researcher to separate the documentary and semi-structured interviews’ data into constituent parts – compliance and non-compliance – in order to understand the parts and the reasons for their manifestations.

The reasons why Nigeria complies with IFL are entrenched in section 19 of the Constitution, which enumerates the foreign policy objectives of Nigeria. Reliance on the 1999 Constitution as a source of identifying the reasons why Nigeria complies or not with IFL is further strengthened by the opinion of liberals like Slaughter,\(^\text{193}\) who emphasise the importance of domestic constitutional law as a determinant of international behaviour. Indeed, the limitation which a constitution places on the government sets the boundaries of the government’s ability to encumber or foster international law.\(^\text{194}\)

These notwithstanding, since explanatory or “why-questions” cannot be answered purely with legal arguments, this section also relies on non-legal documents to ascertain why Nigeria complies with IFL.\(^\text{195}\) Besides the problem of answering “why questions”, the mere fact that section 19 of the 1999 Constitution, by itself, is not enforceable means that the 1999 Constitution cannot alone be a conclusive source with regard to why Nigeria complies with IFL. While it is not practicable to ascertain the reasons why Nigeria implements all the core conservation and management measures, as well as the enforcement strategies prescribed under IFL, effort has been made to identify the reasons why Nigeria complies with some of the crucial measures and strategies.

It is important to reiterate that compliance with IFL involves two parallel paths.\(^\text{196}\) First, Nigeria is obliged to implement and enforce international fisheries instruments, which it has ratified or accepted. Second, since industrial fishermen and other resources users are


\(^{194}\) Ibid, p. 228.


the main cause of the deplorable state of marine fishery resources, the effectiveness of IFL, as well as of policies and legislation domesticating IFL in Nigeria, largely depends on their compliance behaviour.\footnote{Clover agrees that non-compliance by fishermen with conservation and management measures remains one of the biggest problems facing the world’s oceans. See Clover, C., In: Murray, A. R., (2009) \textit{The End of the Line}, London: The Fish Film Company, 0:35:50 - 0:35:55.} Therefore, unless care is taken to also understand the factors that influence the compliance behaviour of industrial fishermen in Nigeria, the placement of the state at the centre of the analysis will limit the ability of this thesis to proffer solutions that are holistic enough to ensure the sustainable development of marine fishery resources. Therefore, without necessarily delving into theoretical discourse on compliance by individuals, this sub-section briefly identifies reasons for the compliance behaviour of industrial fishermen that are common in fisheries literature in other jurisdictions.

7.8.3.1 Constitutional Factors
The relevant provisions of section 19 of the 1999 Constitution states that the foreign policy objective of Nigeria shall be:

(a) promotion and protection of the national interest;

(c) promotion of international co-operation for the consolidation of universal peace and mutual respect among all nations and elimination of discrimination in all its ramifications; and

(d) respect for international law and treaty obligation as well as seeking settlement of international disputes by negotiation, mediation, conciliation, arbitration and adjudication.

The implication of the foregoing provisions is that the decision of Nigeria to comply with any treaty largely depends on whether or not the treaty promotes or guarantees the achievement of its foreign objectives. In other words, before the National Assembly enacts any treaty or aspects of it into law, it should first decide whether the rights and obligations entrenched in the treaty enhance or promote the foreign policy objectives of Nigeria. Indeed, by itemising the foreign policy objectives, the 1999 Constitution invariably prescribes the order of importance in which the National Assembly should accord the objectives.
Within the context of IFL, a deeper reflection on the foregoing provisions of section 19 of 1999 Constitution brings to fore issues of national interest, international cooperation and respect for international law and treaty obligations as the core foreign policies. This does not mean that the need to ensure universal peace, peaceful settlement of disputes and a just world economic order do not influence Nigeria’s compliance behaviour with IFL, or that they should be treated with levity. Indeed, Nigeria’s decision to enact the EEZ Act is partly based on the fact that the fisheries provisions of the Convention are designed to promote a just world economic order. The effort made by Nigeria to ensure the harmonisation of the fisheries law of neighbouring states in the Southern Gulf of Guinea is to avoid fisheries conflicts that could threaten the peace and security in the region.

A critical analysis of the identified core foreign policy objectives shows that they could be broadly categorised under the instrumental or rational theories and non-instrumental or normative theories. Section 19(a) of the 1999 Constitution is clearly worded after the realist theory. It uses the word “national” to identify Nigeria as the primary actor in international law. Interestingly, the Supreme Court of Nigeria (SCN) also viewed Nigeria in the same manner in Attorney-General of the Federation v. Attorney-General of Abia State & 35 Ors. Judging from the hierarchy of the foreign policy objectives, national interest appears to be the foremost reason why Nigeria decides to either comply or not with IFL. The enactment of the Territorial Waters Act and EEZ Act, though aimed at bringing Nigeria’s claim with regard to territorial waters and EEZ in conformity with the Convention, was primarily aimed at protecting the sovereign rights of Nigeria to exploit, conserve and manage natural resources, including fish, in the zones. Similarly, the decision of the Federal High Court in Attorney-General of the Federation v. Constandinos Oikonomon & 16 ors and Attorney-General of the Federation v. Panagondis Nifiatis & 17 ors to prescribe fines or imprisonment of the accused, who were foreign nationals, must have been influenced by the fact that Nigerian courts will not comply with a rule of IFL which conflicts with the national interest of the country.

198 [2002] Federation Weekly Law Reports, Part 102, pp. 1-310. Ogundare JSC at pp. 92-93 and 96. The summary of Ogundare’s judgment is that Nigeria as a sovereign state is a member of the international community and not any of the littoral states or other political component unit either individually or collectively. In exercise of its sovereignty, Nigeria enters into treaties – both bilateral and multilateral. The power to conduct such affairs is therefore in the Government of the Federation.
199 Suit No. FHC/L/10c/90.
200 Suit No. FHC/L/99/90.
There is no doubt that the effectiveness of the US ban on the import of shrimps from Nigeria exemplifies a case where a state with less economic power is coerced into compliance with IFL by hegemony. The truth is that the primary reason why the Minister formulated the TED/BRD Regulation was to protect Nigeria’s national interest. Dr. A. Ayinla amply noted the precarious position of Nigeria as follows:

The belief by some people that there was no sea turtle in Nigeria’s marine waters should not be entertained now, but to work together as a team to ensure success during the visit...

Indeed, the whole scenario was one of Nigeria’s acting rationally to maximise its national interest by avoiding further loss of foreign exchange earnings from not exporting of its shrimps to the US.

Section 19(c) of the 1999 Constitution lists international co-operation as a factor that may shape the foreign policy of Nigeria. The concept of international co-operation underscores the institutional theory of compliance. Apart from institutions providing the forum for states to come together to interact more successfully, it enables states to reduce their management costs and to achieve more socially optimal outcomes than they would by acting independently. This proposition was noted in the Prospectus of the Workshop on Turtle Excluder Device (TED) Implementation, Vessel Monitoring Systems (VMS) and Bycatch Utilisation in Nigeria on Project EP/GLO/201/GEF that was held in Lagos from 6th – 12th March 2006 thus:

At sea enforcement of fisheries legislation is so large that an effective control in Nigeria and many other African countries is not economically possible.

Incidentally, the signing of the Protocol for membership of the International Commission for the Conservation of the Atlantic Tuna by Nigeria has geometrically increased the area of surveillance for government agencies involved in conservation and management of

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202 The US demand that Nigerian vessels involved in shrimping should use TED aims at curbing unselective and non-environmentally safe ways of shrimp harvesting, which is one of the conservation measures prescribed in the FSA, the Code and Section 609 of US Public Law 101-102. See also Article 5(f), FSA and Articles 6.6, 7.2.2(g), 7.6.9 and 8.5 Code.

203 See Minutes of Trawl Fisheries Stakeholders’ Meeting Held on 3rd August, 2006 at the Conference Room of Nigerian Institute for Oceanography and Marine Research, p. 3.


205 The basis of this proposition lies in the general theory of crime and punishment, in particular the seminal work of Becker which established that (a) with costly enforcement, it will not be optimal to ensure complete compliance; and (b) in such a situation, one can expect illegal activity to occur on the basis of marginal returns to individual decision makers responding to a set of regulation and enforcement levels. See generally Becker, G. S. (1968) “Crime and Punishment: An Economic Approach,” Journal of Political Economy, Vol. 76, Issue 2, pp. 169-212 and Charles, A. T., Mazany, R. L., and Cross, M. L. (1999) “The Economics of Illegal Fishing: A Behavioral Model,” Marine Resource Economics, Vol. 14, pp. 95-110 at p. 96.
marine fisheries, especially the MCS Division of the FDF.\textsuperscript{206} The need to effectively address this problem led Nigeria to collaborate with Cameroon to form the SCMFMCSGG. It is, therefore, not a surprise that during the second meeting of the SCMFMCSGG delegates noted the dire need to collaborate within the sub-region for the purpose of deriving maximum benefits from their marine fishery resources. On that basis, decisions taken during the meeting to address the problem included:

1. Establishment of a sub-regional MCS incorporating a VMS, which the FAO supported through the EP/GLO/201/GEF project.\textsuperscript{207}

2. Any vessel banned in any of the member States due to illegal fishing activities shall consequently be banned in all the cooperating States.\textsuperscript{208}

Influenced by huge benefits from the establishment of the SCMFMCSGG, especially the reduction in cost of MCS within the maritime zones of Nigeria, and the adjacent high seas, and producing and sharing of unbiased data on vessel movements and activities in the sub-region, the Federal Government of Nigeria directed fishing and shrimp trawlers to install VMS in their vessels before the end of 2009. The request by the FDF to its Cameroonian counterpart for the prosecution of Mid-Atlantic 1 vessel, which relocated in 2007 to Cameroon after involvement in illegal fishing activities in Nigeria,\textsuperscript{209} shows how a cooperative arrangement has positively influenced Nigeria to comply with IFL.

The 1999 Constitution adopts a weak precommitment device by expressly stating in section 19(d) that Nigeria shall have respect for international law and treaty obligation. The phrase “a weak precommitment” is used here because precommitments are self-binding acts which constrain choices to be made at a later time.\textsuperscript{210} Unfortunately, besides the unjusticiable nature of the foreign objectives, section 19(d) specifically provides that Nigeria “shall have respect for” and not “shall comply with”, which is more forceful and demanding on government. Doctrinally, the entrenchment in the constitution of this non-instrumental reason for compliance with international law is traceable to international law

\textsuperscript{206} See the Preamble of the \textit{Stakeholder Workshop on Implementation of the Vessel Monitoring System (VMS) in Nigeria} held in Lagos from 27\textsuperscript{th} – 28\textsuperscript{th} September, 2007, p. 1.
\textsuperscript{207} See Para 14 of the Annex 4 to the Communiqué Issued at the End of the 2\textsuperscript{nd} Meeting of the \textit{Sub-regional Cooperation in Marine Fisheries Monitoring, Control and Surveillance in the Southern Gulf of Guinea on the Harmonisation of Fisheries Laws and Regulations of the Region}. Held in Lagos Nigeria From 22 – 23 March 2007.
\textsuperscript{208} See Para 10 \textit{Ibid}.
\textsuperscript{209} See the comments by the Assistant Director of Fisheries (MCS) in the \textit{Minutes of Meeting Held Between FDF and the Pair Trawlers Operators at Fisheries Conference Room on the 22 April, 2008}, p. 4.
rules of *opinio juris* and *pacta sunt servanda*. The truth is, however these rules are expressed, the underlying idea is that Nigeria is drawn towards compliance with IFL because compliance is either morally right or a legitimate thing to do.\(^\text{211}\) Indeed, having them entrenched in the constitution promotes a strong belief among the country’s leadership that Nigeria is under a legal obligation not to violate international obligations binding upon it. Indeed, such a belief constitutes one of the reasons why Nigeria unequivocally subjected its delimitation of the EEZ and sovereign right to explore and exploit the zone to the provisions of any treaty with respect to the exploitation of the living resources of the EEZ.

### 7.8.3.2 Other factors

Besides the constitutional factors influencing why Nigeria complies with IFL, the series of workshops and training sessions on reduction of environmental impacts from tropical shrimp trawling, through the introduction of bycatch reduction technologies and change of management, made it possible to educate and inculcate the necessary knowledge on the proper fabrication, installation and usage of TED particularly among the law enforcement agencies and trawler Captains. As matter of fact, TED was introduced to the marine fisheries sector 10 years before the said workshops and training sessions were organised.\(^\text{212}\) The general belief in the sector was that using TED caused unacceptable shrimp and fish loss for the industry of up to 50%.\(^\text{213}\) TED legislation alone could not work because apart from the inability of the FDF to conduct MCS at sea, the department had no moral justification to enforce the use of TED by shrimp trawlers when the TED directive was seen as harsh, unfair and extremely detrimental to the interests of industrial fishermen. The main problem was really to educate the sector that lacked the knowledge of how to use TED without much shrimp loss.\(^\text{214}\) The workshops and training sessions on bycatch reduction technologies and change of management helped to achieve this and went further.

\(^{212}\) Minutes of *Trawl Fisheries Stakeholders’ Meeting* Held on 3\(^{\text{rd}}\) August, 2006 at the Conference Room of Nigerian Institute for Oceanography & Marine Research, p. 5.  
\(^{214}\) Ibid. See also the Report of the Joint Monitoring Team on TED presented during the MITS in the *Minutes of the Industrial Fisheries Stakeholders Meeting Involving FDF, NITO, Nigerian Navy, Marine Policy and Fish Sellers Association* Held on the 16\(^{\text{th}}\) of June, 2005 at FDF Conference Room, Victoria Island, Lagos, pp. 6-7.
to facilitate cooperation between fishers, fisheries scientists, and law enforcement agencies.\textsuperscript{215} The general convictions and understanding among the stakeholders on the effectiveness of TED after successful conduct of sea trials provided the basis for the Minister to make the TED/BRD Regulation which inevitably promotes compliance by Nigeria with IFL.

Another reason for compliance by Nigeria with IFL is the active participation of top FG functionaries such as the Minister and the Director of Fisheries in the law-making processes on fisheries of the FAO, RFMOs and other cooperative arrangements. In so doing, the said Nigerian representatives are convinced that IFL has been made through the right process. Besides, the iterative discourse process, which allows for justification and persuasion during negotiations, does not only enable Nigerian representatives to incorporate expected norms by Nigeria into IFL but also to personally internalise international rules on fisheries emanating from the organisations and arrangements. These factors provide the basis for an internal sense of legal obligation, which has motivated the aforementioned government functionaries to positively influence Nigeria’s compliance with IFL. For example, concerning the recent decision by the Federal Government of Nigeria to implement the VMS in Nigeria, Amire A.V., the Director of Fisheries, told the News Agency of Nigeria that:

\begin{quote}
The decision was taken by the coastal states in the West Africa sub-region to implement VMS before the end of 2009. Nigeria is definitely in line to actualise the decision.
\end{quote}

Logically, such candid comments and statements could not have been made if Amire, as a person, had not internalised the rule and also desire that Nigeria should comply with it. This is exactly what led Nigeria to implement the decision of SCMFMCSGG to establish a sub-regional MCS incorporating a VMS within the sub-region even though a formal agreement establishing the SCMFMCSGG has not been adopted.

The inclusion of a report mechanism in the design of the Code means that Nigeria must give an account of its level of compliance with the Code.\textsuperscript{216} The need for Nigeria to have a positive report on its compliance with the Code is further strengthened by FAO’s engagement in promotional field activities in Nigeria through the bycatch reduction

\textsuperscript{215} Ibid.

\textsuperscript{216} Report mechanism is one of the features of system for implementation review See pp. 268 of Chapter 6. Even though Victor, Raustiala and Skolnikoff argue that system for implementation review enhances effectiveness of international agreement, it could also be used to support state compliance with international agreement.
technologies and change of management project. The first phase of the bycatch reduction technologies and change of management’s project addressed the core implementation problems, i.e. lack of finance, poor capacity building in the marine fisheries sector and illegitimacy of the code, due to non-participation in its adoption process by non-state stakeholders in the marine fisheries sector. The truth is the FAO, Global Environmental Facility and United Nations Environmental Programme, which jointly sponsored the bycatch reduction technologies and change of management project, would not have given Nigeria approval for the second phase of the project if its report to the FAO Secretariat had not shown that the first phase of the project was successful. For this reason, Nigeria had to comply with international conservation and management measures such as the use of selective and environmental friendly gear, marking of fishing vessels, VMS, participation of stakeholders in marine fisheries management and participation in RFMOs and cooperative arrangements.

7.8.4 Why do Industrial Fishermen Comply with Fisheries Law?

In an attempt to measure and explain non-compliance in federally managed U.S fisheries, Sutinen, Rieser and Gauvin\(^\text{217}\) identified certain factors, which literature referring to other jurisdictions has also confirmed, that affect compliance behaviour of individual fishermen.\(^\text{218}\) The factors include utility maximisation, enforcement, regulation, economic and biological conditions, inducement and social pressure. Other factors are self-interest, obligation to comply with fisheries law that does not rest on explicit calculations of costs and benefits, habit and behaviour of others. More recent literature argues that broader stakeholder participation and transparency are core values of fisheries management.\(^\text{219}\) Lastly, Nielsen and Mathiesen identify the significant role played by institutions in coordinating various interests and reducing high transaction costs in fisheries management.\(^\text{220}\) These factors also shape fishers’ compliance behaviour. It is expected that how industrial fishermen in Nigeria, like fishermen from other jurisdictions, respond to these factors will determine how they comply with fisheries law. The truth, as rightly noted


by Mikalsen and Jentoft is that managing fisheries poses some unique and common problems. Indeed, whatever the context of the fisheries fishermen will be motivated by profit maximisation and normative factors, although to different degrees, because of their individual personalities and circumstances of the fisheries.

The remaining part of this sub-section analyses the various minutes of MIFS, minutes of communities of the MIFS, communiqués and minutes of workshops and conferences, with the aim of identifying reasons that shape the compliance behaviour of industrial fishermen in Nigeria. In doing so, care is taken to ascertain if there is convergence of views between the regulators and the industrial fishermen on the reasons for compliance or non-compliance, as this could foster cooperation and provide the basis for effective management strategies. Although almost all the aforementioned factors could easily be inferred as influencing the compliance or non-compliance behaviour of industrial fishermen in Nigeria, this sub-section considers only those factors that are expressly established in the aforementioned documents.

### 7.8.4.1 Enforcement

Enforcement is the explicit attempt by public authorities to manipulate the perceived gains and losses of non-compliance, while enforcement programmes consist of resources and institutions dedicated to the detection, prosecution and sanction of violators of fishing law. The majority of the comments made in the MIFS confirmed the lack of enforcement of conservation and management measures by government agencies on industrial fishermen as the main reason for the latter’s non-compliance behaviour. For instance, while defending the inability of the Marine Police to address the problem of illegal sales of yamayama, the Representative of the Marine Police in the MIFS said, “the police had no sea going vessel, as such, a joint patrol might not be possible.” Similarly, the representative of the Nigerian Navy said, “Federal Government pays more attention to the security of oil pipes and wells by providing the Navy with patrol vessels but no vessels are provided to patrol the sea and the non-trawling zone where yamayama business

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223 For example, based on the role of MIFS, one could rightly argue that the establishment of institutions shapes the compliance behaviour of industrial trawler operators. Meanwhile, such an opinion was not expressed by the stakeholders in any of the minutes, reports and communiqués.


The complete lack of presence of the Marine Policy, Nigerian Navy and the FDF at sea explains why the crew of a fishing vessel could take up to three hours to offload fish into a canoe at sea without worrying about being caught. This also explains why there are still cases of failure of shrimp vessel operators to attach TED and BRD to the cod-end of their trawls.

The investigation of the activities of pair trawler operators in 2007 proves that enforcement of conservation measures by the FDF can enhance compliance with conservation measures by industrial fishermen. The investigation conducted by the FDF revealed that the operators of Mid-Atlantic 1 were using nets with prohibited cod-end mesh sizes. Unfortunately they relocated to Cameroon before they could be apprehended. During the meeting between the MCS Unit of the FDF and pair trawler operators, the Assistant Director of Fisheries (MCS) informed the pair trawler operators that a report had been made against operators of Mid-Atlantic 1 with the Cameroon authorities, and that action against them was about to commence. The decision of the FDF to take action against operators of Mid-Atlantic 1 increased the perceived probability of other pair trawler operators that violation of conservation and management measures by them would be detected and sanctioned. This prompted them to instruct their Captains, even before meeting with the MCS Unit of the FDF, to use the cod-end with approved mesh sizes.

7.8.4.2 Profit or Utility Maximisation

There were a number of comments made during the MIFS which substantiate the fact that industrial fishermen, being rational decision makers, will exhibit non-compliance behaviour when the expected utility from doing so exceeds the utility from engaging in lawful activities. This is the case with vessel Captains and fish workers who prefer to

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227 Minutes of Trawl Fisheries Stakeholders’ Meeting Held on 3rd August, 2006 at the Conference Room of Nigerian Institute for Oceanography and Marine Research, p. 6 and Pramod, G. and Pitcher, T.J., op. cit., p. 17.
228 See Table 7.1 at p. 308 of this chapter.
229 Minutes of Meeting Held with Pair Trawlers Operators at Fisheries Conference Room on the 22nd April 2008, pp. 2 and 4.
make huge sums of money from the sale of *yamayama* caught using illegal nets instead of relying on poor remuneration, inhuman working conditions and insecure jobs.\(^{232}\) In a poor working environment where Captains are arbitrarily changed\(^{233}\) and negligence by the management of fishing companies has resulted in the deaths of some crew members from accidents at sea,\(^{234}\) it is not unusual to have the sort of report such as that presented by Dr. Adetayo describing how the crew of a fishing trawler ‘name withheld’ took about three hours to off-load bags of fish into a canoe tied alongside at sea.\(^ {235}\) Such a poor working environment also explains why for each fishing trip the crews of fishing vessels use mosquito nets to catch fish which they sell in bags without any company logo for as much as ₦1.5 million.\(^ {236}\)

### 7.8.4.3 Participation

The SFA vests in the Minister the ultimate authority to manage marine fisheries in Nigeria. As mentioned earlier, the establishment of the MIFS creates a forum where industrial fishermen are consulted on issues affecting the sector. This causes them to perceive the procedures taken to reach such decisions and the regulations emanating from such procedures as fair and legitimate.\(^ {237}\) In addition, the mere fact that industrial fishermen are involved in making decisions that they will put into practice creates an incentive for them to implement the decisions.\(^ {238}\) This is exactly what happened when the need to mark vessels flying Nigeria’s flag, in accordance with uniform and internationally recognised vessel marking systems, was discussed in the MIFS of May 5, 2004.\(^ {239}\) No sooner had the decision been taken, than the Deputy Director of Fisheries (MCS) noted that the “fishing companies largely complied with the directive.”\(^ {240}\) Similarly, fishing companies have

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\(^{233}\) *Ibid.*


\(^{235}\) See footnote 227, p. 343 *supra.*


\(^{239}\) *Minutes of the Meeting Between the Federal Department of Fisheries (FDF) and Members of the Nigerian Trawler Owners’ Association (NITOA)* Held at the Conference Room of the FDF, Victoria Island, Lagos on the 5\(^{th}\) May, 2004, pp. 3-4. See also Article 18(3)(d) FSA, Article 8.2.3, Code and Article III(6) Compliance Agreement.

voluntarily complied with the Standard Sorting System for Fishes Caught in the Marine Waters of Nigeria because they were involved right from the committee level in all the processes and decisions concerning the issue.\textsuperscript{241}

7.8.4.4 Education and Training

One factor that influences the compliance behaviour of fishers is their ability to understand the meaningfulness and efficacy of the law.\textsuperscript{242} This factor was echoed by the President of NITOA when he re-iterated his members’ readiness to comply with the TED/BRD Regulation but suggested,

The FDF should let the penalty be applied to members only if they are fully knowledgeable on TED but failed to comply.\textsuperscript{243}

Logically, what the President of NIOTA meant was that members of his association were willing to comply with the TED/BRD Regulation but they did not know how to use TED. This is exactly the position of Dr. Solarin of NIOMR who attributed non-compliance with the TED/BRD Regulation to “employing Captains that were not conversant with TEDs”.\textsuperscript{244} The Deputy Director of Fisheries (MCS) further laboured the point when he appealed to members of NIOTA not (to) give vessels to Captains who had no knowledge of TED installation and fabrication.\textsuperscript{245} Indeed, the series of workshops and interactive training sessions which the FDF, in collaboration with NIOMR and a number of international organizations, organised to educate vessel Captains on how to use TEDs without much shrimp loss made the current level of compliance with TED/BRD Regulation by the industrial fishermen possible.

7.8.4.5 Habit

Habit acquired by frequent repetition of a particular act has a great influence on the compliance behaviour of industrial fishermen.\textsuperscript{246} Long inaction by the FDF in stopping industrial fishermen from using mosquito nets to catch juvenile fish, which they sell as “yamayama”, led most vessel crews to see it as an established norm of non-compliance

\textsuperscript{241} The MIFS appointed a Committee consisting of fishing companies and staff of FDF and NIOMR. It was based on the report of the Committee that the MIFS made its final recommendations on the issue to the Minister for approval.

\textsuperscript{242} Nielsen, J. R. and Mathiesen, C., op. cit., p. 412.

\textsuperscript{243} Minutes of Trawl Fisheries Stakeholders’ Meeting Held on 3\textsuperscript{rd} August 2006 at the Conference Room of Nigerian Institute for Oceanography & Marine Research, p. 4.

\textsuperscript{244} Ibid.

\textsuperscript{245} Ibid, p. 3.

\textsuperscript{246} Young, O. R. (1979) op. cit., pp. 24-25.
behaviour in the fishery.\(^{247}\) Despite such an illegal activity being as old as the industry, it was only after the continuous exchanges of large sums of money between vessel crews and artisanal fishermen led to pirates being attracted to the vessels, that the FDF and trawler owners decided to address the problem. The difficulty of breaking the norm must have led some of the major stakeholders in the marine fisheries sector to think that sale of *yamayama* is impossible to eradicate.\(^{248}\)

### 7.8.4.6 Behaviour of Others
The compliance behaviour of industrial fishermen is also influenced by the behaviour of their colleagues. In a real life situation there is a pervasiveness of interdependencies among those making compliance decisions simultaneously. This means that a fisherman will typically have a well-developed interest in contemplating the probable behaviour of relevant others as he decides whether or not to comply with a certain rule.\(^{249}\) In order to ensure the successful implementation of the TED and recertification of Nigeria a few fishing companies\(^{250}\) agreed to bear the costs of hosting workshops on TED while Atlantic Shrimpers Limited procured 125 Angle Locators required for the proper installation of TED by other fishing companies.\(^{251}\) The benevolence of a few fishing companies to other fishing companies acted as a sort of motivation, and a subtle pressure, on such companies to comply with the TED Regulation. In the case of using mosquito nets to fish juvenile fish for sale as *yamayama*, the mere fact that the chronic violators are not detected and sanctioned has created an incentive for other industrial fishermen to follow their example.\(^{252}\)

From the foregoing analysis, it can rightly be concluded that compliance by Nigeria and industrial fishermen cannot be explained by one factor alone.


\(^{248}\) Minutes of the Industrial Fisheries Stakeholders Meeting Involving FDF, NITOA, Nigeria Navy, Marine Police and Fish Sellers Association Held on the 16\(^{th}\) of June, 2005 at FDF Conference Room, Victoria Island, Lagos. See the comment by the representative of the President of NITOA and the Marine Police, as well as the response of the Deputy Director (MCS) at pp. 3 and 4.


\(^{250}\) The companies are Atlantic Shrimpers, Banarly Nig Ltd., Ocean Fisheries Ltd and Dolphine Fisheries Ltd

\(^{251}\) Minutes of the Meeting Between the Federal Department of Fisheries (FDF) and Members of the Nigerian Trawlers Owners Association (NITOA) Held at the Conference Room of the FDF, Victoria Island, Lagos on the 5\(^{th}\) May 2005. p. 5.

7.9 Does Nigeria’s interests in Marine Fisheries influence its decision to comply with the Climate Change Regime?

The fundamental issue here in considering the interconnection between marine fisheries and climate change is whether the impact of climate change on marine fisheries is among the factors that influence Nigeria’s compliance with the UNFCCC. In other words, within these two issue areas has Nigeria adopted a holistic approach to compliance?

It is true that apart from the general obligation of Nigeria to refrain from acts which would defeat the object and purpose of the UNFCCC, Nigeria is only required under Article 4(1)(a) of the UNFCCC to develop, publish and make available to the Conference of the Parties to the UNFCCC, through its Secretariat, its National inventories of anthropogenic emissions by sources and removals by sinks. Nigeria’s National Communication reports that the gross carbon emission from energy, land use change, industry, solvent use agriculture and waste management in 1994 was 52.5 Tg-CO$_2$-C, while the net uptake, principally from land use change, was 10.4 Tg-CO$_2$-C. This gives a net carbon emission of 42.1 Tg-CO$_2$-C.

According to the report, the concentration of carbon dioxide (CO$_2$), methane CH$_4$ and nitrous oxide (N$_2$O), which are the major GHGs in Nigeria, will increase in future because of the high population growth rate and the concomitant rise in energy consumption. For instance, total CO$_2$ emissions in the energy sector, which stood at 108 Tg CO$_2$ in 1995, are expected to rise to 232 Tg CO$_2$ by the year 2030 in the baseline scenario at the minimum. This means that by the year 2030 Nigeria will not be able to stabilise the concentration of its major GHGs in the atmosphere at a level that will contribute to global efforts to prevent dangerous anthropogenic interference with the climate system.

Notwithstanding Nigeria’s burden of triple vulnerabilities, many reasons have been put forward to support the argument that Nigeria should adopt adequate adaptive and mitigation measures to address the problem of climate change. The obvious effect of gas flaring, and the fact that the Federal Government of Nigeria, the communities where gas is

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253 See Articles 2 and 4 (1)(a) and 12, UNFCCC. See also Article 18 of the Vienna Convention on the Law of Treaties.
254 Nigeria’s National Communication, pp. 3-4. This rate of GHG emission is low because of Nigeria’s low per capita energy and other resources consumption. Ibid, p. 5.
256 Ibid, p. 41.
257 This refers to Nigeria’s vulnerability in terms of land based effect (desert encroachment in the North and low lying ocean coastline in the south), the economic effect on its major sources of earning, crude oil and natural gas production , and the vulnerability of its 147.7 million people, majority of who are living far below the poverty line.
flared and environmentalists have openly stated their reasons why gas flares should be stopped, makes it the ideal subject of analysis for any meaningful answer to the question posed in this subsection. Gas flaring contributes 58.1 million tonnes or 54.4% of gross emissions of 115 Tg CO$_2$ from the energy sector.\textsuperscript{258} In order to address this problem, the Federal Government of Nigeria has adopted a number of policies and legislation, including the 2009 Gas Flaring (Prohibition and Punishment) Bill

Besides the Federal Government of Nigeria conceding to changes in the deadlines to end gas flaring by the oil companies, its decision to restrict the enforcement powers of the Agency established under the NESREA Act on matters relating to oil and gas is clear proof that its major concern is to protect the oil and gas sector because of the economic importance of the sector to the economy of Nigeria. Between 2004 and 2008, out of the total revenue accruing to the Federal Government of Nigeria, revenue from oil accounted for 84%, 85%, 87%, 78%, and 83% respectively.\textsuperscript{259} Meanwhile, the sector’s contribution to the gross domestic products of Nigeria between 2003 and 2007 was 26.53%, 25.72%, 24.26%, 21.85%, and 19.58% respectively.\textsuperscript{260} The decision of the Federal Government of Nigeria to grant an amnesty to insurgents of the Niger Delta, and to establish a special security task force in the area and its immediate marine environment, reaffirms the determination of the Federal Government of Nigeria to promote and protect the economic interest of the country over and above individual or group interests.

The regulation of gas flaring in Nigeria by the Federal Government of Nigeria is also influenced by the need to avoid environmental and health hazards, as well as to minimise economic wastage associated with gas flaring. According to Senator Osita Izunaso, Chairman of Senate Committee on Gas:

Gas flaring has an adverse effect on the health of our people. Today, it is estimated that Nigeria flares up to 2.5 billion cubic feet, and the effect of this gas flaring can best be imagined than experienced. Our environment is increasingly becoming a time bomb due to gas flaring.\textsuperscript{261}

\textsuperscript{258} Gas flaring also contributes 25% of the 17. 05 Tg carbon monoxide (CO) emissions in the country. \textit{Nigeria’s National Communication}, pp. 30 and 31.
Actually, environmentalists and the general public have relied upon these normative and instrumental factors in their campaign to force the Federal Government of Nigeria and oil companies to stop gas flaring in Nigeria. More specifically, *Nigeria’s National Communication* and other literature on gas flare in Nigeria are very specific in identifying global warming, low crop yield, noise pollution, contamination of water and streams, and acid rain as the environmental problems caused by gas flaring.\(^\text{262}\) A qualitative content analysis of some online Nigerian mass media reports on the Gas Flaring (Prohibition and Punishment) Bill reveals that the impact of global warming on marine fisheries is not mentioned as one of the reasons why gas flaring should be stopped.\(^\text{263}\)

Certainly, the Federal Government of Nigeria budgetary allocation to boost inland and aquaculture fisheries is evidence of the government’s recognition of the importance of fish to the country’s economy. However, taking into account the meagre contribution of fisheries to the gross domestic products of Nigeria\(^\text{264}\) and failure by the government and the public to mention the interconnection between marine fisheries and climate change as one of the reasons why flaring of gas should stop in Nigeria, it is reasonable to conclude that Nigeria has not adopted a holistic approach to compliance concerning the marine fish crisis and climate change.

### 7.10 The Views and Perceptions of Stakeholders on the Major Issues of Investigation

This subsection presents and discusses the analysis of the semi-structured interviews under seven major themes namely state of marine fishery resources, conservation and management measures, compliance, lessons from NSS Herring and Fraser Sockeye, interconnection between fisheries and climate change, effectiveness of Nigerian fisheries law and policy, and legislative review. The themes are developed from the major issues of investigation as reflected in research questions (i – v). This presentation provides objective insights into the views of the stakeholders on these themes as well as triangulating data derived from documentary sources.


\(^{263}\) *Ibid.*

\(^{264}\) See Central Bank of Nigeria data on fisheries contribution to Nigeria’s gross domestic products at p. 40 of Chapter 2 of this thesis.
7.10.1 State of Marine Fishery Resources

The opinions of the interviewees on the state of marine fishery resources varied. A very small number were of the view that both finfish and shellfish were in a healthy state.\(^{265}\) A representative view of this group stated that:

... at the moment fishing activities only takes place along the West coast of Nigeria. The militant groups and increased in the number of pirate attack do not allow fishing activities to extend to the Niger Delta, Calabar and Ikot Abasi areas, which have an abundance of fish species. No commercial vessels go not go beyond 50 metres depth. The inshore resources are still not fully exploited.\(^{266}\)

The majority of the interviewees were of the opposite view that stocks and landings of individual vessels have declined. One of the interviewees in this group encapsulated the indices which his department (FDF) uses to determine that the stocks are declining as follows:

Before fishing companies would take 30 days to land the same quantities which they now take 60 days to do. Yet, 70 percent of the landing will be small size fish and shrimps compared to what they used to land 15 years ago. We use these two parameters to draw our conclusion.\(^{267}\)

According to him, he was referring to inshore stocks. With regard to offshore stocks, he said,

We do not have accurate data. There is no operation in that sector. No investor has been licensed to operate in that area but that doesn’t mean that the stocks there are healthy because we have received so many reports from local trawlers citing foreign fishing vessels in our waters.\(^{268}\)

When asked to comment on the claim by other interviewees that the stocks are still healthy, another interviewee, who is a director in one of the fishing companies said,

The people who say that the resources are still in good health are being deceived by the fact that the Niger-Delta crisis has become a blessing in disguise to the fishing industry. Because of the crisis and increasing activities of pirates in their waters fishing has stopped there for years now. That area has become a sort of marine reserve area for breeding of fish. If the crisis is solved tomorrow and industrial fishing starts there, the resources will collapse in less than 5 years...

Look, 3-4 years ago, we had 43 fishing companies. Now that number has reduced

\(^{265}\) Interviewees 2, 5 and 15.
\(^{266}\) Interviewee 2.
\(^{267}\) Interviewee 1.
\(^{268}\) Ibid. The interviewee actually acknowledged that one investor applied for registration in 2006 but the application was not approved. He did not disclose the reason why the application was refused when the Federal Government is seriously considering diversification of capacity from inshore fisheries to offshore fisheries.
to 10-11 fishing companies. Yes, the fact that the number of vessels have died off means that the intensity of fishing pressure on the resources naturally reduces and we can still have fish to catch. That gives a false impression to many people that the resources are in a healthy state.\footnote{Interviewee 11.}

On the question of what factors are responsible for the current state of marine finfish and shellfish, almost all the interviewees identified lack of enforcement of conservation and management measures at sea, too many vessels fishing or shrimping all year round and pirates as the major problems. One interviewee tried to sum up the factors as follows:

... lack of reliable scientific data because the FDF and the scientists in NIOMR depend on fishing companies for data and fish samples, failure by scientists to communicate research outcomes to fishermen, high rate of catch of juvenile fish by vessels fishing shrimps, use of illegal undersize nets, poor funding of the FDF by the Federal Government, pollution of marine and freshwater environments and illegal fishing in Nigeria’s EEZ by developed countries fishing vessels. Generally, socio-economic problems such as high operational costs, especially Ago (diesel) and naturally induced changes in the aquatic habitat.\footnote{Interviewee 12.}

When asked what he meant by ‘naturally induced changes’ he said, “Ocean water has washed off some of the spawning grounds.”\footnote{Interviewee 12.}

A few other unique factors were also identified. For example, one interviewee said,

I think the problems are uninformed leadership, incompetent government advisers who lack expertise on practical issues involved in fishing and the problem of managing species that are found in Nigerian and other countries’ waters.\footnote{Interviewee 1.}

Other unique factors identified by other interviewees include pair trawling,\footnote{Interviewees 9 and 14.} locating of oil platforms in good fishing grounds,\footnote{Interviewee 4.} pollution of the marine environment by nylon bags (mostly pure water bags) and the belief held by some that fishery resources will never collapse.\footnote{Interviewee 8.}

Surprisingly, only one interviewee linked climate change to the depletion of marine fishery resources. He said,

\begin{footnotes}
\item[269] Interviewee 11.
\item[270] Interviewee 12. While the seriousness of the effect of pollution on the state of marine fisheries resources was noted by the majority of the interviewees, very few of them noted that (i) “for quite a while we have not noticed oil pollution” (Interviewee 5) and (ii) “but this does not affect us since we fish in deeper waters. Oil spillage is not that much”. (Interviewee 4).
\item[271] Interviewee 12.
\item[272] Interviewee 1.
\item[273] Interviewees 9 and 14.
\item[274] Interviewee 4.
\item[275] Interviewee 8.
\end{footnotes}
Along the coastal areas, rain and flooding have increased tremendously in the past few years as a result of changes in the climate. Because of flooding, the rate of vector borne diseases, especially malaria has increased. The fishermen who live in the coastal areas are also affected. One of the ways in which they can solve their health problems is to fish beyond the prescribed target in order to earn extra income. The fishermen have families. That means fishing more in order to earn enough money to maintain their families. I am sure that that extra pressure from a good percentage of the fishermen will lead to the depletion of fish stocks.²⁷⁶

However, when other interviewees were asked if climate change has any impact on marine fishery resources, a good number of the interviewees unequivocally said they “had no idea.”²⁷⁷ A very small number of the interviewees, mostly Captains, said that they had no scientific knowledge of how climate change affects individual fish, but from their long years of experience as fishermen they have come to understand how changes in rainfall patterns affect their landings and where to fish.²⁷⁸ A representative view of this opinion said, “When the rain starts late our catch of shrimps and fish decline”.²⁷⁹ Another Captain described his personal knowledge of the correlation between rainfall and pelagic fish species thus:

During the raining season, which is between March and October, one can feel that the ocean is relatively cold, windy and stormy most of the time. We do not sail too far into the ocean to fish because the fish move closer to the shore and they swim more on the surface layer. It is our boom period. But between December and February, when we have dry season and the current and waves are low, the fishing ground is located far away from the shore and surface water fish move deeper into the ocean. We have to sail very far into the ocean to fish. During this period our catch drops drastically. In the last seven years or so rainy session has been starting late and that can affect how our stocks breed.²⁸⁰

It was common to find among the marine biologists interviewed that they were not aware of any conclusive empirical work where the focus is on the impact climate change on a particular Nigerian fish species. The representative view was that

We do not have data on the life pattern of our fish stocks and sea temperature that is long enough (I mean number of years) to enable us to simulate any useful modelling on the past and future effect of climate change on our fish stocks.²⁸¹

One of the marine biologists who were interviewed went further to explain his personal observation at sea as follows:

²⁷⁶ Interviewee 3.
²⁷⁷ Interviewees 5, 10, 14, 17 and 18.
²⁷⁸ Interviewees 4, 7 and 8.
²⁷⁹ Interviewee 7.
²⁸⁰ Interviewee 8.
²⁸¹ Interviewee 2.
Fish and other aquatic organisms are changing their distribution. Some pelagic fish species are now found in the middle of the sea. Two reasons may be responsible for this. The sea surface may be too warm, which causes plankton to drift down to the depths of the sea. Fish tend to move into deeper waters in search of their main food.  

7.10.2 Conservation and Management Measures

Almost all the interviewees were confident in identifying the measures adopted for the conservation and management marine fishery resources. This was reflected in the interviewees’ acuity in mentioning the measures as follows:

TED/BRD, landing of catch in a Nigerian port, trawlers can only be involved in fishing or shrimping, restricted area where trawlers are not permitted to fish, mesh size of not less than 76 mm for fishing vessels and 44 mm for vessels licensed for shrimping, size of vessels.  

However, it was apparent from their responses that they were not conversant with how other Nigerian laws complement conservation and management measures prescribed in the SFA and its supplementary regulations. For example, while identifying the factors that are responsible for the parlous state of marine fishery resources, one of the interviewees said,

Most of our good fishing grounds have been turned into oil platforms which makes them restricted areas for fishing. There was no consultation with us.

When asked if any Nigerian law requires the government to consult with NITOA or the FDF before locating a platform in Nigerian waters, the interviewee said, “I don’t know.”

Another interviewee was specifically asked if the EIA Act has implications on the management of marine fishery resources. His response was, “I am yet to see or read the impact assessment law.”

The majority of the interviewees identified the use of TEDs and BRD as conservation measures prescribed under IFL. A few other interviewees also mentioned the Code of Conduct for Responsible Fisheries, the vessel monitoring system (VMS), standard identification marks on vessels, hazard analysis critical control points (HACCP), quota allocation and the ecosystem approach to fisheries management as measures prescribed

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282 Interviewee 13.
283 Interviewees 4, 5, 7, 8, 10 and 11.
284 Interviewee 4.
285 Ibid.
286 Ibid.
287 Interviewee 1.
288 Examples are Interviewees 1, 2, 4, 6, 10, 11 12 and 16.
under IFL.\textsuperscript{288} The inability of a few interviewees to distinguish between the Code and the conservation and management contained therein is an indication of their poor knowledge of IFL.

### 7.10.3 Compliance

When asked whether or not Nigeria has complied with conservation and management measures prescribed by IFL, the general perception of interviewees was that Nigeria has complied with the use of TED and BRD and the application of the ecosystem approach. Almost all the interviewees said that Nigeria did not comply with TAC, quota and VMS measures.\textsuperscript{289} Although expressed in different forms, the reasons put forward by a good number of the interviewees on why Nigeria complies or fails to comply with IFL can be categorised as instrumental and or normative. The view of one interviewee was comprehensive enough to reflect the scanty opinions expressed by other interviewees. He said,

Nigeria complied with IFL because of the US ban on Nigeria’s shrimps, and the Federal Government did not want to lose more income from shrimps. Nigeria complies with the Code of Conduct for Responsible Fisheries because it has signed it. Another factor is the support from international organisations such as the FAO in terms training and the design of TED and BRD.\textsuperscript{290}

Another interviewee also identified a unique reason why Nigeria complies with IFL thus:

Nigeria cannot assume a leadership position in addressing the problems with marine fisheries in the Southern Gulf of Guinea without complying with IFL.\textsuperscript{291}

With regard to non-compliance by Nigeria with IFL, the previously mentioned interviewee was of the opinion that poor understanding of conservation measures even by staff of the FDF and lack of technology in Nigeria are the factors responsible for non-compliance by Nigeria with IFL. She recalled that lack of technology to design a locally made TED and poor understanding of how to use TED were the reasons why Nigerian failed to comply with the US TED requirement.\textsuperscript{292}

A common perception among the interviewees, particularly captains and management staff of fishing companies is that sanctions such as withdrawal of fishing or shrimping licence,

\textsuperscript{288} Interviewees 1, 11, 12, and 15. Note that as at the time of writing up this thesis the response of the interviewees may be different on the issue of VMS because, recently, the Federal Government of Nigeria has ordered all trawlers to install it before December 31, 2009.

\textsuperscript{289} Examples are Interviewees 1, 4, 5, 6, 7, 8, 9 and 12.

\textsuperscript{290} Interviewee 6.

\textsuperscript{291} Interviewee 1.

\textsuperscript{292} Interviewee 6.
payment of fines and confiscation of their nets/catch by the FDF deterred those who might otherwise not comply with the law. The paltriness of fines and the decision of the FDF to jettison court prosecutions for administrative enforcement did not render sanctions totally ineffective.\textsuperscript{293} There was convergence of this perception when one interviewee who works with one of the enforcement agencies said:

Even though the fines are small, getting the detained vessel off the hook is very cumbersome. It involves the Nigerian Navy and the FDF. To get approval for the release of a detained vessel from the Navy Headquarters and the Minister is not easy. The bureaucracy involved is not pleasant at all. The real problem is do we have the means to go to the sea to inspect them.\textsuperscript{294}

A good number of other interviewees expressed the view that consultations between the FDF and industrial fishermen on the problems affecting the sector promote compliance by the latter with fisheries law. A representative view had it that:

The participatory approach where we are carried along in the decisions taken on how to solve the problems in the sector makes us comply with the law.\textsuperscript{295}

This assumption was further supported by a small number of interviewees who believed that discursive measures adopted by the FDF positively influenced the compliance behaviour of industrial fishermen.\textsuperscript{296} This view was well articulated by one of the interviewees thus:

... We have stakeholders’ meetings where we try to educate the fishermen on the need to comply with conservation and management measures because it is all for their own good. We also organise workshops and seminars on how to construct and install the TED and BRD. During the seminars and workshops we also talk to them on the need to comply with conservation measures. In addition, during inspection visits to fishing companies we adopt a face to face approach in explaining to the Captains and their managers the implications of non-compliance with conservation measures in the long run on the survival of their business, and the cost implication of spending more days at sea because of poor state of stocks and sustainability of the resources.\textsuperscript{297}

Another factor implicit in the above expression, which was noted by another interviewee, is the fact that sufficient understanding of how to implement conservation and management measures by industrial fishermen promotes their compliance with fisheries law.\textsuperscript{298} Lastly, a

\begin{footnotes}
\item[293] Examples are Interviewees 4, 5, 7, 8, 10 and 11.
\item[294] Interviewee 1.
\item[295] Interviewee 16.
\item[296] Interviewees 1, 7, 8, and 10.
\item[297] Interviewee 1.
\item[298] Interviewee 6. In fact, more than a half of the interviewees believe that insufficient understanding that prescribed conservation and management measures are ultimately in the interest of the fishing industry was what delayed compliance with the TED when it was first introduced.
\end{footnotes}
few interviewees shared the view that their companies complied with fisheries law because violation means “harm to others and our companies. No fish in future means our companies will not be in business again.”

There was unanimity among the interviewees that non-compliance behaviour still witnessed among the industrial fishermen was due to lack of monitoring of fishing activities at sea by the FDF and the Nigerian Navy.

A representative view of a very small number of the interviewees said:

Non-compliance is as a result of the selfish short-term interests of some people to make profit under the prevailing harsh economy.

7.10.4 Lessons from NSS Herring and Fraser Sockeye

When asked whether conservation and management measures adopted by Nigeria simultaneously address the problems of overfishing and climate change, a common response from the interviewees was “no”. A representative view said “the conservation and management measures adopted in Nigeria only address overfishing and not climate change”. A small number of interviewees were of the view that “the Sea Fisheries law is too old to deal with the climate change problem.” The perception among industrial fishermen is that current research by NIOMR does not address the problem of climate change. On the other hand, a representative view of interviewees in the FDF and NIOMR was:

Theoretical work on the impact of climate change on marine fisheries was done by staff of NIOMR in the early 1990s. Unfortunately, lack of funds did not allow NIOMR to start recording temperature(s) of the Atlantic Ocean until recently. Also, the US ban on our shrimps and the need to know the impact of shrimp trawling on the aquatic environment caused NIOMR to redirect its focus of research. I am pretty sure that the focus of the marine biology department will turn to climate change now that the 2007 IPCC Report is out.

The precautionary approach was defined differently by the majority of the interviewees. One of the interviewees said “the term suggests caution and care in the midst of

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299 Interviewees 8, 10 and 11.
300 This view is reflected in almost all the participants responses.
301 Interviewee 9.
302 Interviewees 1, 2, 4, 7, 8, 9, 12, 13, 16.
303 Interviewee 16.
304 Interviewees 1, 2, and 9.
305 Interviewees 4, 7, 8 and 11.
306 Interviewee 2.
Another interviewee put it thus “precautionary approach refers to not delaying in taking conservation and management measures pending the outcome of research results”. Simple as these definitions may be, they reflect the basic elements of the precautionary approach – positioning fisheries management in the face of uncertainty, and assessing the probability of the risk and the degree of harm. When asked if there was any evidence indicating that management of marine fisheries in Nigeria is based upon the precautionary approach, a representative opinion of majority of the interviewees was:

Yes, to some extent, there is adoption of the precautionary approach in the industrial fisheries sector. Don’t forget that TED was implemented even when no scientific research proved that sea turtle were present in shrimping grounds in Nigeria.

A contrary view was expressed by a few interviewees. In their opinion, “The management of marine fishery resources was not based on the precautionary approach because it is not among the measures prescribed in the sea fisheries law.”

Almost all the participants had a fair understanding of the ecosystem approach. One of the interviewees sums it up thus:

An ecosystem approach is that which takes into consideration the entire components of the ecosystem in fisheries management. That is the biotic, abiotic and socio-economic factors receive equal attention.

There was consensus among the majority of the interviewees that an ecosystem approach has been integrated into marine fisheries management. One interviewee, whose view reflected the majority perception on the issue said:

We do apply the ecosystem approach in managing our marine fishery resources. Recently, Ted and BRD were introduced as part of the conservation measures. Nigeria is also involved in the Guinea Current Large Marine Ecosystem Project, whose primary aims include harmonisation of fishing policies and conservation measures among member states.

When asked what factors hinder the application of precautionary and ecosystem approaches in marine fisheries management, the majority of the interviewees identified inadequate funding of research by the government, failure to amend the SFA in line with contemporary developments in the sector, inadequate education and training of staff in the

307 Interviewee 9.
308 Interviewee 16.
309 Ibid.
310 Interviewees 6 and 7.
311 Interviewee 7.
312 Interview 2.
regulating agencies and fishing companies and lack of the technology needed to apply the approaches.\textsuperscript{313} A few interviewees also identified a number of unique factors, which hindered the application of precautionary and ecosystem approaches in marine fisheries management. These factors include failure of scientists to disseminate their research findings to industrial fishermen, lack of cooperation between institutions and agencies in charge of fisheries and other sectors such as the universities where fisheries are taught,\textsuperscript{314} and the tendency of countries in the Gulf of Guinea to pay more attention to national rather than regional issues and uninformed leadership.\textsuperscript{315} Very few of the interviewees said they had no idea of what precautionary and ecosystem approaches entail.\textsuperscript{316}

When asked how well does fisheries cooperation among the Gulf of Guinea States address the problems of overfishing and climate change, the majority of the interviewees said either they had no idea or were not in the best position to answer the question. A few of the interviewees were knowledgeable on the issue. One of them said:

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Cooperation among the Gulf of Guinea states has been well-established in recent times. Currently, the issue of harmonising the fisheries laws and regulations, and establishment of fish data bank are in progress....\textsuperscript{317}
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Expressing his view on the issue, another interviewee puts it thus:

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Member states are in the process of adopting a common Agreement moderated by FAO to address fishing problems in the subregion.\textsuperscript{318}
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Asked what the title of the Agreement is and if it has specifically integrated climate change into marine fisheries management, the interviewee said:

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No. Climate change is still a new issue. Our main focus during the last four meetings was to address the problem of overfishing, which is caused by excessive fishing fleet, illegal fishing in the EEZs of member states, mostly by foreign vessels, and harmonisation of fisheries laws of member states. The title of the Agreement is the Agreement for Cooperation in Fisheries Monitoring Control and Surveillance in the Gulf of Guinea.\textsuperscript{319}
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\textbf{7.10.5 Interconnection between Fisheries and UNFCCC}

The response of almost half the interviewees to the question of whether or not the interest of Nigeria in marine fisheries influenced its decision to comply with the UNFCCC was that

\textsuperscript{313} Interviewees 1, 2, 4, 6, 7, 8, 9, 12, and 16.
\textsuperscript{314} Interviewees 6 and 12.
\textsuperscript{315} Interviewees 1 and 9.
\textsuperscript{316} Interviewees 14, 17 and 18.
\textsuperscript{317} Interviewee 6.
\textsuperscript{318} Interviewee 9.
\textsuperscript{319} Interviewee 9.
they had no idea.\textsuperscript{320} A good proportion of the interviewees said that compliance by Nigeria with the UNFCCC was as a result of its being a signatory to the UNFCCC.\textsuperscript{321} Very few of the interviewees were of the view that the government does not accord a high level of economic importance to fisheries, thereby suggesting the sustainability of fisheries could not have positively influenced Nigeria’s decision to comply with the UNFCCC.\textsuperscript{322} A representative of this view was so frank as to remark:

As far as I am concerned, Nigeria has more compelling reasons than effects of climate change on fisheries to comply with the UNFCCC. One of such reasons is the poor health of the people living in the communities where gas is flared.\textsuperscript{323}

In the same vein, one concerned interviewee remarked “Government cannot sacrifice oil for fish or other resources”.\textsuperscript{324} The most authoritative view on the issue was expressed by one interviewee who was involved as a consultant in the preparation of \textit{Nigeria’s National Communication}. He said:

The marine environment was not considered as a major issue during the preparation of \textit{Nigeria’s National Communication} but it was mentioned as an indication of the area that needed further studies.\textsuperscript{325}

\section*{7.10.6 Effectiveness}

Almost all the interviewees were of the opinion that Nigerian fisheries law was not effective. Their evaluation was based mostly on the decreasing size of all fish species and catch landings by individual vessel, despite crews spending more days at sea. One interviewee lamented:

How can the law be effective when the government is doing nothing to stop pirates or provides us with AGO (diesel) to buy at a subsidised rate? But come to think of it, how can the law be effective when the FDF has no patrol boats to enforce conservation measures at sea.\textsuperscript{326}

Lastly, it was a common belief among a few interviewees that existing conservation and management are not effective because they do not address climate change impacts on marine fish stocks.\textsuperscript{327}

\begin{footnotes}
\item[320] Interviewees 4, 5, 10, 14, 17 and 18.
\item[321] Interviewees 2, 3, 9 and 16.
\item[322] Interviewees 4, 8 and 11.
\item[323] Interviewee 4.
\item[324] Interviewee 11.
\item[325] Interviewee 3.
\item[326] Interviewee 6.
\item[327] Interviewees 1, 4, 6, 7, 9, 12 and 13.
\end{footnotes}
7.10.7 Proposal for Policy and Legislative Review

When asked which policy and legislative review would enhance the sustainable development of marine fishery resources in Nigeria, the interviewees suggested a number of measures. The best way to ensure that the views of all interviewees are represented is to itemise the measures suggested under the themes below. Where a conflicting opinion was expressed on any of the suggested measures, further explanation is given in the footnote.

7.10.7.1 Enhancement of Conservation and Management Measures

i. Closed season or fishing holiday.\(^{328}\)

ii. Reduction in size of industrial fleet.

iii. 60 mm mesh size for both finfish and shellfish.

iv. Stock assessment to determine MSY.

v. Redistribute fishing capacity to offshore fisheries.

vi. Ban pair trawling.

vii. Rotate marine reserve area between Western and Southeast marine zones.\(^{329}\)

viii. Promote awareness of the dangers of non-compliance with conservation and management measures.

7.10.7.2 Strengthening of Enforcement Mechanism

i. At sea monitoring, control and surveillance of fishing activities.

ii. Increase fines under the SFA and the TED/BRD Regulation.

iii. Government should provide AGO (diesel) at a subsidised rate to industrial fishermen as incentive for compliance.

vi. Government should procure patrol boats, and communication and monitoring equipments for the FDF.

v. Provision of common jetties or harbours with shared facilities for all fishing companies.\(^{330}\)

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\(^{328}\) This suggestion was common among the interviewees. However, one of them argued that the measure will not work unless Nigeria gets the other countries in the Southern Gulf of Guinea to implement the same measure in their countries. In his words, “Government should declare and enforce at least two months fishing ‘holiday’ where no fishing vessels from Nigeria or any part of the world can fish in our waters. But if the same measure is not enforced in other countries in the Southern Gulf of Guinea our fish will move there for them to fish. Mind you fish don’t stay in one place”. Interviewee 11.

\(^{329}\) One interviewee opposed the view of creating a marine reserve area. She expressed her position thus, “the federal government does not allow fishing close to offshore platforms and pipelines. We have so many offshore platforms and pipelines in our waters. When you add together the total area of restriction from fishing as a result of oil exploration it is quite a big area. I am sure if government had adopted a marine reserve area or closed area conservation measure such a large area would not have been covered. Don’t forget restriction in these areas is permanent so long as the oil installations are still there” Interviewee 2.

\(^{330}\) Interviewee 10 noted that having a common terminal or jetty with shared facilities will reduce energy consumption and GHGs from the sector.
vi. The FDF should place observers on each vessel.

vii. Life insurance for those involved in MCS at sea and on-board observers.

viii. Capacity building for staff of the FDF and other agencies especially on species identification and stock assessment.

ix. Government should stop pirate activities by addressing the Niger Delta problem.

7.10.7.3 Strengthening Institutional Framework

i. MIFS should be held more frequently.

ii. The FDF should collaborate with States Commissioners for Fisheries or Agriculture as the case may be to ensure enforcement of conservation and management measures prescribed in the Inland Fisheries Act, particularly the licensing of craft and registration of gear used by artisanal fishermen.

iii. Government should increase the budgetary allocation of the FDF and other agencies involved in MCS.

iv. Government should allocate more funds to NIOMR for fisheries research i.e. equipment, vessels and capacity building.

v. The FDF should work more closely with the Nigerian Maritime Administration and Safety Agency and other government agencies.

7.10.7.4 Climate Change

i. A holistic approach should be applied to address climate change impacts on marine fisheries taking into account other sectors and socio-economic factors.

ii. Scientists should work with industrial fishermen to determine the percentage of change in the physiology and ecology of marine fisheries resources that is caused by climate change and the percentage that is attributed to other factors.

iii. Scientists should disseminate information from research on climate change impacts on marine fisheries to industrial fishermen.

iv. NIOMR should commence research on the interrelationship between climate change and marine fishery resources. The immediate focus should be on commercially important species. Industrial fishermen should be allowed to participate in the research.
7.10.8 Major Findings from the Views and Perceptions of Stakeholders on Issues Investigated

i. Pelagic and demersal inshore fishery resources are in a poor state. The situation may be at its worst with offshore fisheries where IUU fishing has been going on totally unhindered for years. The state of inshore fisheries could have been worse but for the protective zones around oil installations and pipelines, as well as the increasing pirate activities in the Niger Delta, which have stopped fishing in almost 90% of the fishable waters in the southeast of Nigeria thus creating a marine reserve area. The paradox of a marine reserve area being created as a result of oil installations and pipelines is the marine environment there suffered from oil pollution although the open ocean seems to be relatively less affected.

ii. Although so many factors have contributed to the parlous state of marine fishery resources, the major factors are overfishing and non-compliance with conservation and management measures, due mostly to the complete absence of MCS of fishing vessel activities at sea.

iii. The traditional knowledge of industrial fishermen on the distribution and migratory patterns of fish based on changes in rainfall patterns gives a more convincing generalised claim than scientific theoretical claims, that climate change is likely to have a serious impact on marine fishery resources in Nigeria. However, there is no proof that the said traditional knowledge has been investigated, documented and assessed in order to ensure that its applications will lead to sustainable development of marine fishery resources.

iv. Conservation and management measures and recent research conducted by NIOMR are predominantly harvest-based. Climate change has not been mainstreamed into marine fisheries management and no measure has been adopted to determine the level of GHGs emission from the sector and how to reduce it.

331 See the views of Interviewees 7 and 8 on p. 352 as well as the convergence of views between Interviewees 8 and 13 on pp. 352 and 353 respectively.
v. The crucial element of the precautionary approach, which is stock-specific limit reference points, and the hallmark of the ecosystem approach, which lies in the interaction between aquatic, atmosphere and terrestrial ecosystems are not integrated into marine fisheries management.

vi. The major reasons hindering the proper application of the precautionary and ecosystem approaches in the management of marine fishery resources are the failure to incorporate them into Nigerian fisheries law, lack of technology and finance, and poor awareness of what the approaches entail by staff of FDF and industrial fishermen.

vii. There is consultative participation of selected key stakeholders in marine fisheries management with the Minister having the power of ultimate decision-making. However, there is a lack of cooperation and coordination between the FDF and other government agencies, which further compounds the problem of conflicting roles between them.

vii. Cooperative arrangements between Nigeria and other Gulf of Guinea states have been established at government level. Industrial fishermen are not participating in the process. Worse still, the instruments establishing such cooperative arrangements completely ignore the problem of climate change.

viii. The first major encounter of the stakeholders in Nigeria’s marine fisheries sector with IFL was when the United States banned imports of shrimps from Nigeria into its market. Emphasis on the Code during the post-shrimps ban workshops, conferences and training sessions has created a little awareness of the Code in this sector. However, the majority of the stakeholders in the sector still lack knowledge of other international fisheries instruments.

ix. Nigeria’s interest in marine fisheries does not influence its decision to comply with climate change regime.

x. Nigerian fisheries law is not effective because of its inability to adequately address the problems of overfishing of marine fishery resources and the likely effects of climate change on the resources. There is a need for review of Nigerian fisheries law. The low degree of awareness in the sector
concerning other Nigerian laws that are relevant to marine fisheries management did not allow for their evaluation.

7.11 Conclusion: The Way Forward

The whole essence of this Chapter is to ascertain the extent to which Nigeria has complied with IFL and whether or not Nigerian fisheries law has effectively addressed the problems of overfishing and the possible impact of climate change on marine fishery resources. A critical analysis of the conservation and management measures adopted in the SFA and its supplementary regulations, as well as the views of the stakeholders in the marine fisheries sector, revealed that Nigeria has not specifically implemented conservation and management measures such as sustainable development, the ecosystem and precautionary approaches and biodiversity conservation prescribed by IFL. It is true that these measures have been incorporated into the NESREA Act, but their implementation and enforcement by the Agency has not been extended to the marine fisheries sector. Importantly too, the input measures adopted by Nigeria for the conservation and management of marine fishery resources are poorly implemented and enforced due to lack of an adequate regulatory and institutional framework.

The views of the stakeholders in the marine fisheries sector triangulated the documentary data on the inability of Nigerian fisheries law to address the problems of overfishing and the likely impact of climate change on marine fishery resources. Concerning overfishing, how bad the situation is can only be imagined when one takes into account that the policy on Standard Sorting System for Fishes Caught in Nigeria’s Marine Waters allows fishing companies to sell finfish as small as 14 cm. The size of fish is not the only indicator to prove that industrial fishermen are almost fishing to the end of the line. The population abundance of the most commercially important finfish e.g. croakers in fish landings decreased from 30-40% of the catch in 1965 to 6.2% in 2004.332 This proves how ineffective is the regulation of marine fishery resources.

The traditional knowledge of industrial fishermen on the effect of changing rainfall pattern on marine fish distribution and abundance triangulated the documentary data presented in Chapter 2, which revealed that climate change is likely to lead to changing rain patterns and that these will affect fish in permanent ways such as distribution, abundance and

migratory pattern. Unfortunately, with the exception of the few vague and non-specific adaptation measures recommended in Nigeria’s National Communication, climate change has not been mainstreamed into the conservation and management measures adopted in the SFA and its supplementary regulations. Small as the emission of GHGs from the industrial fisheries sector might be, the fact is that global actions to address climate change must start from individuals. This means the sector ought not to have been ignored in Nigeria’s National Communication. Failure to ascertain the amount of GHGs emitted from the sector and how to reduce it further proves the ineffectiveness of the regulation of marine fishery resources.

The uniqueness of Nigeria’s marine fisheries sector means that the way forward to achieve sustainable development of marine fishery resources lies in the ability of policy-makers and fisheries managers to synthesise past lessons from NSS herring and Fraser sockeye case studies with the measures suggested by stakeholders in a bid to address the parlous state of marine fishery resources.
CHAPTER 8
Conclusion and Recommendations

8.1 Introduction
This thesis is an attempt to fill the noticeable gap in the existing legal literature on how to address the parlous state of marine fishery resources.¹ Three main issues were settled from the outset. First, the objective of this thesis was to determine the best way to achieve a sustainable development of marine fishery resources globally, but particularly in Nigeria. Secondly, the fact that the factors responsible for the current crisis in marine fisheries have domestic root and the impact of climate change on Nigeria’s marine fishery resources is little understood by the majority of the stakeholders meant the core methodological designs of the research were restricted to case study and historical analogy. For reasons stated earlier, Nigeria’s marine fisheries sector was chosen as the unit of analysis while historical analogies were drawn from the Norwegian spring-spawning herring (NSS herring) and the Fraser River sockeye Oncorhynchus nerka (Fraser sockeye) cases. The third issue concerns the originality of this work which was discussed in detailed in Chapters 1 and 2 of this thesis.² In order to achieve the intended objective and also to determine what research methodology should be adopted, a number of research questions (i-v) were formulated. Whether or not those questions have been answered successfully, determines if the objective has been achieved, and if not, why not.

8.2 Meeting the Objectives of the Thesis
Research Question 1
A combination of archival search and empirical methods of research was used to establish the effect of overfishing on marine fishery resources globally and in Nigeria. The views of the stakeholders in Nigeria’s marine fisheries sector were used to triangulate the opinions and comments in textbooks, peer reviewed journal articles, and minutes of the meetings of industrial fisheries stakeholders (MIFS) that overfishing has led to the decline in quantity and size of fish landed by fishing vessels. Concerning the impact of climate change on marine fishery resources, this thesis was able to establish that climate change may be having a serious impact on marine fishery resources in Nigeria. These conclusions were based on the analysis of the scientific literature on the causes of coastal erosion and changes in rainfall patterns in Nigeria, as well as the knowledge acquired over the years by some Captains on how changes in rainfall patterns affect the distribution of marine fish and

¹ See pp 5-7 of Chapter 1 and pp. 88-97 of Chapter 2.
² See pp. 7-8 of Chapter 1 and pp. 91-97 of Chapter 2.
their catch landings. It was also established that commercially important fish species like *Pseudotolithus senegalensis* may have been affected by climate change because the lowest Atlantic Ocean temperature at Victoria Island, Lagos, during its spawning months, is above its preferred temperature range.³

The cautionary approach adopted in drawing these conclusions is based on the fact that there is a lack of scientific evidence on what percentage of changes in the physiology and ecosystem of any individual marine fish species has been caused by climate change and how such species have responded to it. On the other hand, a review of scientific work from other jurisdictions including the 2007 IPCC Report clearly link the sudden and abnormal changes in the growth rates, recruitment, abundance, distribution and migration patterns, predator-prey relationships, availability and catchability of certain marine fish species to rising ocean temperatures caused by climate change.

In answer to research question 1, this thesis has achieved the followings:

i. established that overfishing and climate change have contributed to the deplorable state of marine fishery resources.

ii. substantiated its contention that climate change has introduced a new dimension into the marine fish crisis. As far as the legal literature on the parlous states of Nigeria’s marine fisheries is concerned, this is an entirely original argument.

**Research Question 2**

Concerning how well international and Nigerian fisheries laws address the problems of overfishing and climate change, the doctrinal method was used in chapters three and four to establish that international fisheries law requires all states, coastal states, flag states, port states, and regional fisheries management organisations (RFMOs) to comply with a number of input and output measures which are designed to deal with the problem of overfishing. The 1995 Fish Stock Agreement (FSA) and 1995 Food and Agriculture Organisation Code of Conduct for Responsible Fisheries (Code) introduced sustainable development, and the precautionary and ecosystem approaches into marine fisheries management. Using the same method, it was also established that only the Code contains indirect provisions on climate change. On the other hand, the 1982 United Nations Convention on the Law of the Sea (Convention), the Code, and the FSA contain broad environmental provisions, which the Courts can interpret purposefully in order to allow for the integration of climate change into marine fisheries management.

³ See pp. 61-63 of Chapter 2.
This thesis has used a combination of doctrinal and empirical methods to establish the fact that Nigerian fisheries law does not specifically adopt the core conservation and management measures prescribed by international fisheries law (IFL).\(^4\) Using the same methods, it was established that the few input measures prescribed by IFL which Nigerian fisheries law has adopted are not enforced at sea due to lack of finance, patrol boats and communication equipment by the Federal Department of Fisheries (FDF). There is also a lack of cooperation and coordination between the relevant government agencies. The views expressed by the stakeholders in the marine fisheries sector were used to triangulate documentary evidence from Nigerian fisheries law, MIFS, and the annual reports of the Nigerian Institute of Oceanography and Marine Research (NIOMR) establishing that climate change has not been mainstreamed into the marine fisheries management.

Thus, in answer to research question 2 this thesis has:

i. established the fact that the inability of IFL to address the problem of overfishing is due to inadequate legal and institutional frameworks on implementation and enforcement on the part of states like Nigeria.

ii. established the fact that international and Nigerian fisheries laws do not specifically integrate climate change into marine fisheries management.

iii. introduced a new line of argument into marine fisheries discourse, which is that that unless the problem of overfishing and climate change are simultaneously addressed, it will be difficult, if not impossible, to achieve the sustainable development of marine fishery resources.

**Research Question 3**

The question on how best one can address a novel problem like the impact of climate change on already overexploited marine fishery resources in Nigeria arose out of the concerns at the fact that the majority of the fisheries managers and policy-makers have no knowledge of the science of climate change. Moreover, there may still be a few scientists who do not believe that the current global warming is anthropogenically induced. Under such circumstances, to implement the recommendations put forward here may prove to be a challenge. In order to address this problem, a historical analogy method was adopted. Other reasons for adopting this method have already been given in the Chapter 1,\(^5\) while Chapter 5 showed its practical use in deploying the NSS herring and Fraser sockeye crises.

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\(^4\) The core conservation and management measures refer to here are total allowable catch, determining harvesting capacity of Nigeria, sustainable development, precautionary approach and ecosystem approach.

\(^5\) See p. 19 of Chapter 1.
as case studies. The five lessons learned from these case studies show that the states exploiting the stocks have:

i. addressed the problems of overfishing and climate change simultaneously.

ii. adopted robust and flexible conservation and management measures based on sound science and, in the case of NSS herring, the advice of an independent third party.

iii. applied an ecosystem approach as a major conservation measure.

iv. applied a precautionary approach as a major conservation measure.

v. established a cooperative arrangement to manage the stocks.

However, they failed to establish interconnection between the compliance mechanisms of the international agreements regulating the stocks and climate change; increases in the emission of greenhouse gases by the states concerned hinder the sustainable development of the stocks.

These lessons were placed within the unique context of Nigeria’s marine fisheries sector by seeking the views and perceptions of the stakeholders in the sector on whether or not the lessons are being applied as conservation and management measures in the management of Nigeria’s marine fisheries. The views expressed by the said stakeholders helped the researcher to triangulate the data from the documents that he used and to reconfirm earlier findings that Nigerian fisheries law tries to address the problem of overfishing but not climate change. In addition, Nigerian fisheries law does not adopt the precautionary and ecosystem approaches or contain robust and flexible conservation and management measures based on sound science. Lastly, the same data sources and methods enable the present work to conclude that Nigeria has cooperative arrangements with some of its neighbouring states in the Gulf of Guinea. However, agreements regulating such cooperation do not address climate change nor establish an interconnection between their compliance mechanisms and the climate change regime.

The achievements of this thesis from answering research question 3 are as follows:

i. It is the first work to draw out a comprehensive set of lessons from the NSS herring and Fraser sockeye case studies, which will aid fisheries managers

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6 The lessons were examined in detail in Chapter 5 pp. 215-239.

7 See Tables 5.1 and 5.2 on pp. 238 and 239 of Chapter 5 respectively. See footnote 296 on p. 238 which explains Russia low emissions of GHGs.
and policy-makers in Nigeria to address climate change impacts on marine fisheries.

ii. It substantiates the argument that it is difficult to achieve sustainable development of marine fishery resources when states only integrate the climate change factor into fisheries management without complying with the climate change regime.

Research Question 4
The main reason for understanding why Nigeria complies with international law is to design an effective international agreement on fisheries. However, since compliance with IFL by Nigeria rests partly on the actions of its industrial fishermen it was necessary to know also why they comply with Nigerian fisheries law. The inextricable interrelationship between fisheries and climate change warranted the investigation on whether Nigeria’s interest in fisheries influences its compliance with the UNFCCC. Chapter 6 provides the theoretical basis for answering these ‘why’ questions and situates IFL within the compliance and effectiveness discourse. That sequence of the discourse enables this work to identify a failure of the IFL to establish an interconnection of issues (with the exception of the Code) and compliance mechanism with climate change regimes as one of its greatest weaknesses, especially when viewed from the context of global warming. In order to address the problem of governance mechanisms for marine fisheries not coinciding with ecological systems, this thesis advocates the application of a holistic approach to compliance by coastal and fishing states.

It is clear from the archival, doctrinal and empirical research carried out, particularly concerning why Nigeria complies with IFL, that a mixture of instrumental and normative factors shapes the country’s compliance behaviour. Likewise, enforcement and normative factors were identified as influencing the compliance behaviour of industrial fishermen. Ordinarily, one would expect that once these factors are taken into account in any law, compliance with such a law by the actors (be it a state or individual) should be almost perfect. The compliance behaviour of Nigeria and its industrial trawlers operators contradicts such an expectation. The views expressed by stakeholders in the marine fisheries sector enabled the researcher to triangulate available documentary evidence showing that failure to enforce conservation and management measures at sea was the major reason for non-compliance with fisheries law by industrial fishermen. Documents and semi-structured interviews as data sources were used to show that the lack of finance
and technology necessary for the implementation of most conservation and management measures prescribed by IFL are the main reasons for Nigeria’s non-compliance behaviour.

Finally, by analysing the content of some Nigerian and international Newspapers published online, and also relying on the views expressed by some of the stakeholders in the marine fisheries sector, the researcher was able to establish that Nigeria’s interest in marine fisheries does not influence its compliance with the UNFCCC. On that basis, it could be concluded that Nigeria does not apply a holistic approach to compliance, at least, when it comes to dealing with the problems of the deplorable state of marine fishery resources and climate change.

In attempt to answer research question 4, the achievements of this thesis are the following:

i. It has identified the major reasons for compliance and non-compliance behaviour of Nigeria and its industrial fishermen.

ii. It has established that Nigeria’s interest in marine fisheries does not influence its compliance with IFL.

iii. It has introduced a novel factor into the compliance discourse by advocating that states should adopt a holistic approach to compliance when dealing with interconnected issue-areas like fisheries and climate change.8

**Research Question 5**

The policy, legislative and institutional reforms which should be made in order to ensure the sustainable development of marine fishery resources in Nigeria can be deduced from the lessons drawn from the NSS herring and the Fraser sockeye case studies, and the suggestions and comments made by the stakeholders in the sector in the various documents referred to in this thesis and during the semi-structured interviews. What is required at this stage is to synthesise and adopt those lessons and major suggestions as the recommendations of this thesis.

**8.3 Recommendations:**

i. Policy-makers and fisheries managers in Nigeria should adopt the lessons learned from the NSS herring and Fraser sockeye case studies as the basic principles that should guide marine fisheries management. The truth is that a critical analysis of the

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measures suggested by the stakeholders in the sector reveals that the measures are easy to implement if the ecosystem and precautionary approaches are adopted to underpin the management of marine fisheries. On that basis, there is no need for the present work to specifically recommend measures such as closed seasons, banning of pair trawling, reducing of fleet size and redistribution of fishing capacity, banning of fishing in the estuaries, allocating numbers of days at sea, rotation of marine reserve area between western and south-eastern coastal zones.

ii. Nigeria should adopt specific measures to ensure that industrial fishermen’s perceived probability of detection and conviction for non-compliance with conservation and management measures while at sea is extremely high. The measures should include: collaboration between the FDF and other enforcement agencies for the purpose of monitoring, controlling and carrying out sea and air surveillance of fishing vessels activities; an increase in fines with the minimum fixed at an amount that is severe enough to discourage non-compliance with conservation and management measures by corporate entities and individuals; limiting administrative sanctions to first time offenders while flagrant and frequent offenders are expeditiously prosecuted; undercover operations; at sea boarding; and promotion of awareness of relevant non-fisheries law and the danger of non-compliance with conservation and management measures by the stakeholders.

iii. Existing mechanisms for participation in marine fisheries management i.e. the MIFS should be broadened to include representatives of Nigerian Maritime Administration and Safety Agency, Agency, Planning Commission, Nigerian Air Force, Nigerian Custom Service, Federal Ministry of Justice, ministries responsible for fisheries and urban and regional planning in the eight littoral states of the Federation, fish workers, environmentalists, consumers, and the press. MIFS should be held more frequently. Sharing of and access to information should be encouraged.

iv. Flag and port responsibilities on fisheries should be transferred from the Nigerian Maritime Administration and Safety Agency to the FDF and the budget allocation of the FDF should be increased to enable it to acquire patrol boats and vessel monitoring equipment, and also to employ and train more staff.

v. Nigeria should encourage marine fisheries management that is based on sound science, incorporating traditional knowledge and technology and focusing on harvest-
based measures, climate change and other environmental factors. NIOMR and the Federal School of Fisheries should be properly funded.

vi. Fisheries research should focus on determining to what extent changes in the physiologies and ecosystems of commercially important fish species are caused by climate change and how the species have responded to climate change.

vii. Fisheries research should also focus on establishing the quantity of greenhouse gases emitted from the marine fisheries sector, and how to reduce it.

viii. Basic adaptation measures against climate change impacts on marine fisheries should ensure that all commercially important fish species are in a healthy state and they should establish a reliable maximum sustainable yield for them. Such measures would involve understanding their life cycles, distribution and migratory patterns, spawning behaviours, feeding preferences and prey-predator relationships.

ix. Basic mitigation measures to reduce GHGs from the marine fisheries sector may include implementation of a lights-off policy by the fishing companies, encouragement of their staff to use public transportation, scrapping of old fishing vessels, ensuring fuel efficiency of fishing vessels' engines, and implementation of the proposed Lagos mega jetty with shared facilities for all fishing companies.

x. Nigeria should strengthen the cooperative arrangements it has with other states in the Southern Gulf of Guinea by ensuring that special funds are established for sub-regional MCS and research programmes for fish stocks assessment and also the interconnection between climate change and fishery resources.

xi. There should be serious and vigorous sensitisation of stakeholders in the marine fisheries sector to the fact that healthy fish stocks will cope better with climate change than depleted or collapsed stocks. Importantly too, fish droppings help the ocean absorb CO$_2$ which means that a larger global biomass of marine fishery resources will help reduce global warming.$^9$

xii. It is impossible to implement these recommendations under the existing governance mechanism. Therefore Nigerian fisheries law should be reviewed with the aim of

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specifically incorporating the above recommended measures especially those concerning the adoption of the precautionary and ecosystem approaches. The new fisheries law should be flexible and robust as well as providing strong incentives for conservation as fish stocks respond to climate change. Similar measures are recommended at the regional level.

On a general note, there is a need to implement at the international level the recommendations on how to strengthen the effectiveness of IFL, which are presented in the form of arguments in chapters 3 and 4.\textsuperscript{10}

The above recommendations are not a panacea for addressing the parlous state of marine fishery resources in Nigeria. The problem is complex and not well understood, hence it requires a holistic and multidisciplinary solution. Other fisheries problems like pollution and habitat destruction and degradation must also be addressed. Teamwork is required whereby lawyers, scientists, economists, politicians, professionals and experts from other disciplines work together to strike a balance in solving the problem.\textsuperscript{11} In addition, when reviewing the SFA, it is reasonable to refer to other countries whose fisheries laws have attained a sophisticated level. Examples of such fisheries law can be drawn from Canada, the EU directive on common fisheries policy and South Africa.

In all, apart from the originality of the main argument presented here, which represents a new contribution to the knowledge in this subject area, many of the embedded issues addressed or mentioned will perform a similar role.

Examples of such embedded issues are:

- ascertaining the status of sustainable development within the context of international and Nigerian fisheries law;
- taking a comprehensive approach to draw out the lessons from NSS herring and Fraser sockeye case studies;
- ascertaining whether there are new theories of state compliance;

\textsuperscript{10} For example, it was argued that there is congestion of international soft law on fisheries, hence the Code should be updated and integrated with the salient provisions of other international soft law on fisheries as well as specific adaptation and mitigation measures to address climate change fishery resources. It was also argued that there is need for the Courts to interpret purposefully the vague environmental provisions in the Convention, the FSA and the Code. Another important point to note is the concentration of fisheries research in the high latitude regions. This imbalance in addressing problems in the world fisheries negates the ecosystem approach. The United Nations and the FAO should, as a matter of urgency, make funds available for more fisheries research in tropical waters, particularly the southern Gulf of Guinea.

- placing IFL within the context of compliance and effectiveness discourse;
- ascertaining the factors that influence the compliance behaviour of Nigeria and its industrial fishermen;
- bringing to fore the problem of climate change and fisheries conflict in the Gulf of Guinea; and
- adopting a convergence strategy which synthesises the views of the resources users and the regulators in proffering solutions to the deplorable state of marine fisheries in Nigeria.

Importantly too, the systematic method, structure, sequence of presentation of the arguments, and a combination of problem solving and the bringing to the fore of anticipated problems, as developed in this work, will signify a considerable contribution to knowledge in the subject area. It is hoped that the analyses of the subject of this thesis and recommendations put forward will evidence the ability of the researcher to relate the result of his work to the general body of knowledge in his research area.

8.4 The 16th Conference of Party to the UNFCCC at Cancun (16th COP) to be held 29 November to 10 December 2010

It is very important to stress once again that the objective of this thesis has been to determine the best way to achieve the sustainable development of marine fishery resources. The brief examination of the climate change regime and its compliance mechanism in Chapter 6 was included to establish whether or not there is an interconnection of issue and compliance mechanism between IFL and the climate change regime. Therefore, whatever the nature of the outcome from the Cancun Conference it cannot weaken the substratum of the main argument of this thesis. In the first place, the experience with the Convention and the 1997 Kyoto Protocol to the UNFCCC has shown that even where states reach a binding agreement on emission cuts at Cancun, the harder task of the domestic implementation and enforcement may take years to achieve. More importantly, regardless of the success or failure of the Cancun Conference at curbing climate change, major changes in fish communities can be expected over the next 50 years with a concomitant need to adapt their management strategies accordingly. The uncertainty concerning the outcome from Cancun Conference does not permit this thesis to take into account the pre-Cancun Conference documents.

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12 The achievement of this thesis as problem solving and bringing of anticipated problems to fore is well articulated under the significance of the thesis on pp. 33-35 of Chapter 1.
8.5 Limitations of the Thesis

In the process of examining the impact of climate change on marine fishery resources, the focus has been mainly on temperature, which is the most common parameter used in measuring climate change. Ignoring other climatic parameters makes the real past and future effects of climate change on marine fishery resources highly tentative and uncertain. The findings from the semi-structured interviews may be constrained by sample bias due to failure to interview the 3% industrial trawler companies based outside Lagos. At the initial stage of this thesis, the multi-case (comparative) design of a case study method was adopted with Nigeria and South Africa’s marine fisheries as the units of analysis. However, due to insufficient funds available to the researcher, a single case design with Nigeria’s marine fisheries sector as the unit of analysis was therefore used. The adoption of the single-case design means that the findings of this thesis are constrained, and cannot be considered to be as robust and compelling as would be desirable.\(^\text{14}\)

8.6 Future Research

In order to achieve the sustainable development of marine fishery resources one needs to address the geographical spread of the problems of overfishing and climate change. Nationally, this will require in future stepping beyond the unit of analysis of this thesis and examining whether the Inland Fisheries Act as well as the various state laws on fisheries adequately deals with the problems of overfishing and climate change impact on inland fisheries and aquaculture. Thus the issue of sustainable management of freshwater resources is also an important issue for research.

Internationally, the situation will be akin to the law of osmosis. If the recommendations suggested in this thesis are adequately implemented, Nigerian fisheries law should be effective, with depleted or collapsed fishery resources starting to recover and to build up. However, if Nigeria’s neighbouring coastal states do not also strengthen their fishery laws, their fishery resources will become depleted or collapse. Their fishermen will have no alternative but to shift their fishing grounds to Nigeria. Presently, the poor state of marine fishery resources in Nigeria has caused Nigerian industrial fishermen to shift their fishing activities to waters of other countries bordering the Gulf of Guinea. Therefore, future research will require working as a team with lawyers, professionals and experts from other countries in the Gulf of Guinea to ensure the effectiveness of their fisheries laws as well as existing and future regional fisheries agreements in the Gulf of Guinea.

Lastly, there is an urgent need to enrich the literature on the link between fishery resources and climate change. Scientists Graham and Harrod,\textsuperscript{15} and many others, focus their research mainly on the physiological and ecological consequences of climate change on certain fish species. They do not examine whether the municipal laws and regional fisheries agreements regulating harvesting of fish species are able to address the emerging legal problems. This is another fascinating area for future research.

\textsuperscript{15} Graham, C. T., and Harrod, C., \textit{op. cit.}