

Faculty of Bioscience, Fisheries and Economics

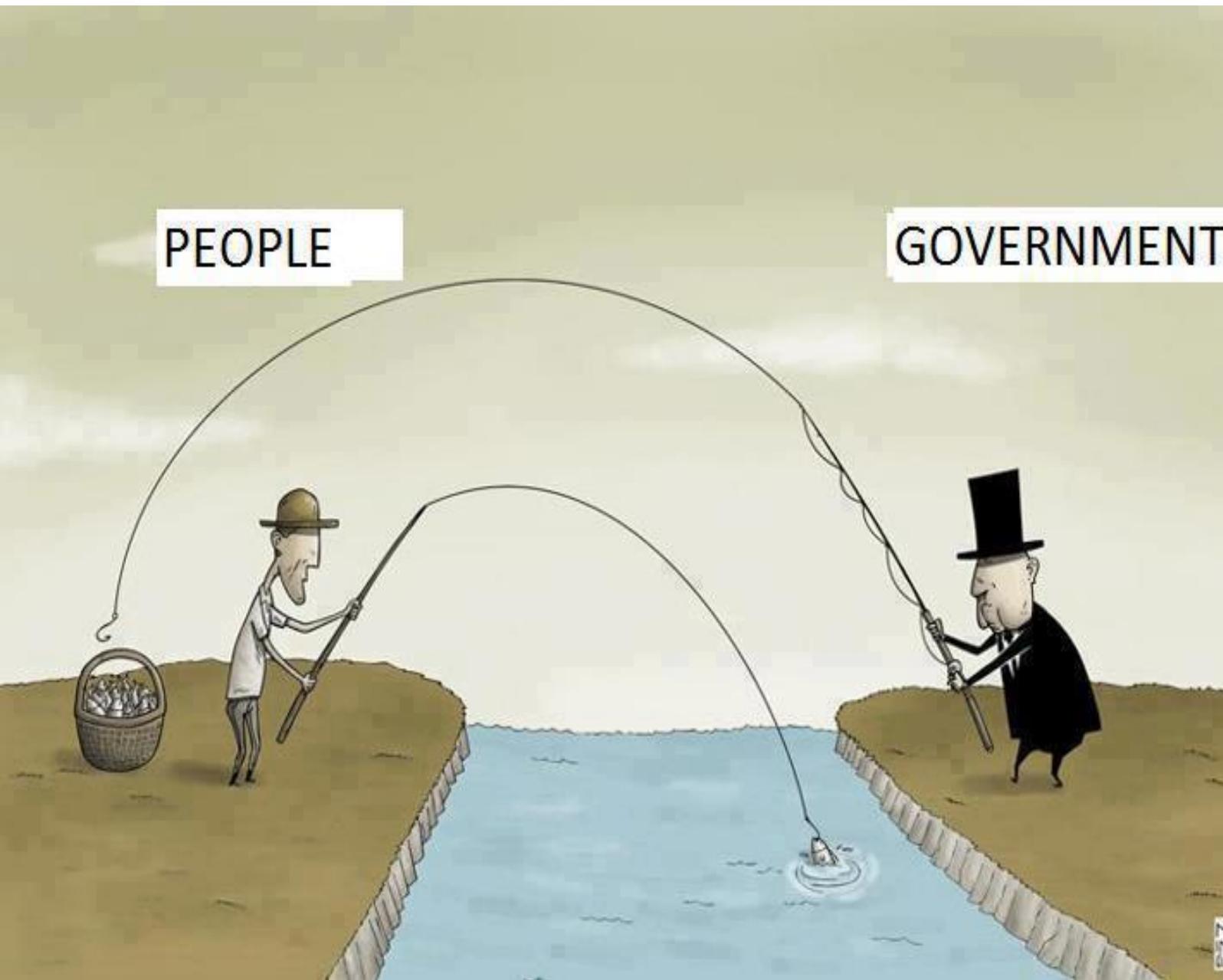
# **Implementation of the Ecosystem Approach to Fisheries; an institutional solution in fisheries management**

*The case of the ground-fisheries IFMP, Canada*

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*Master's Thesis in International Fisheries Management*

*June 2015*



## **Declaration**

I hereby declare that this thesis is the result of my own original research and no part of it has been submitted anywhere. All references have been duly acknowledged and I therefore bear the sole responsibility for any shortcomings.

**Menyoli Emmanuel Molua**

I hereby certify that this thesis was supervised in accordance with the procedures laid down by the Arctic University of Norway, Faculty of Biosciences, Fisheries and Economics.

**Professor Jahn Petter Johnsen**  
**Supervisor**

## **Dedication**

Hard work, endurance and tenacity comes from the contents of our DNA and are influenced by those very close to us. This book, is dedicated to the members of my family and especially to those I will never see, my father **MENYOLI SAMUEL M.** and my aunt **ENJEMA HANNAH.** May their souls, rest in perfect peace.

*Let the heavens rejoice, let the earth be glad;  
Let the seas resound, and all that is in it.  
Psalm 96:11*

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Knowledge is empowering, those who give you an opportunity to achieve it must be gratified. Sincere word of thanks to the government of Norway and all the staffs of UIT, for offering me a tuition free and quality education. Coming from a developing country, that act of benevolence is deeply dignifying.

To my supervisor, Professor Jahn Petter I am grateful for your spontaneous, though-provoking, witty and insightful comments. This paper, would never have been any better without them.

Irrespective of the topic, a Master's thesis is a short and direct summary of a student's study. This study, cuts-across everything I learnt in the college. To this end, I extend a word of thanks to all the lecturers and visiting lectures of the college who painstakingly, took us through the program. You might not have directly contributed to the writing of this paper, but in one way or the other your knowledge, comments and reflections are articulated in this study. Special thanks to that respect go to Professors Bjorn, Jentoft, Eide, Santos and Dr. Melania.

A cordial and friendly environment is conducive for learning. My regards, to all my colleagues. Sometimes, studies was challenging and we were rivals. But more often, we were friends and will remain a family.

Studying abroad, and away from family is always challenging. Ane Marie, where will I start? In short, thank you very much. May the Good God, continue to give you the strength and energy you need to help those coming after us, they will need you.

My gratitude to Dr. Bjorn (My ophthalmologist) for the help throughout the writing of this paper and also, to all those who helped me in proofreading this thesis. With that in mind, my appreciation to Dr. Melenia, and Dr. Peter (senior brother).

Finally, big thanks to all those whose company I keep. Writing is stressful and often, changes people's character and attitude. Thank you for keeping me as your friend, regardless.

## Abstract

Fisheries management institutions, call the shots in fisheries management. Coming at a time when, global fish stocks are experiencing decline at an ever increasing rate, sectorial single species approaches cannot be looked upon solely to provide sustainable fisheries. This is foremost because studies have revealed that, the problems associated with the management of stocks are manmade and have a sporadic effect on the entire aquatic ecosystem, thus management must be holistic, and comprehensive enough in light of those challenges.

Global entities such as, the Food and Agricultural Organisation (FAO) and Multi-lateral Agreements have adopted an Ecosystem Approach to Fisheries (EAF) to sustainably manage fisheries. The FAO, charged with the development of guidelines and frameworks for fisheries management worldwide, has developed an EAF implementation roadmap to facilitate its implementation by States and Regional Organizations. The Convention of Biodiversity and the Code of Conduct for Responsible Fisheries represents a move towards the EAF. That move, is within the framework of the Law of the Sea Convention. The duty, to implement an EAF is facultative and depends largely on States sovereign will. Be that as it may, member States of UNCLOS and other global policies such as Canada are committed and have successfully adopt an EAF in their national policies and management plans.

The Integrated Fisheries Management Plan (IFMP), was developed to manage the ground-fisheries in the Pacific region of Canada due to decline of stocks and habitat degradation witnessed in the fishery. The IFMP, is consistent with the FAO implementation roadmap, global policy recommendation and has successfully achieved its objectives. Its worthy of note that, the success of the IFMP goes beyond Canada's political will to adhere to global policies and guidelines.

This study, explores the institutional and policy framework which underpin an EAF from a global perspective and how the EAF is implemented in the IFMP. This study focuses solely, on the implementation of the EAF from a human dimension.

*Keywords:* Ecosystem Approach to Fisheries; Integrated Fisheries Management Plan; United Nations Law of the Sea Convention; Fisheries management institutions.

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## **List of abbreviations**

<b>CBD</b>	Convention of Biodiversity
<b>CCAMLR</b>	Convention of Antarctic Marine Living Resources
<b>CCRF</b>	Code of Conduct for Responsible Fisheries
<b>CFMA</b>	Conventional Fisheries Management Approach
<b>CIL</b>	Customary International Law
<b>CPR</b>	Common Pool Resources
<b>EA</b>	Ecosystem Approach
<b>EAf</b>	Ecosystem Approach to Fisheries
<b>EBFM</b>	Ecosystem Based Fisheries Management
<b>EEZ</b>	Exclusive Economic Zone
<b>FAO</b>	Food and Agricultural Organization
<b>FSA</b>	Fish Stocks Agreements
<b>ICJ</b>	International Court of Justice
<b>IM</b>	Integrated Management
<b>IUCN</b>	International Union for the Conservation of Nature
<b>UNCLOS</b>	United Nations Law of the Sea Convention
<b>WTO</b>	World Trade Organization
<b>IFMP</b>	Integrated Fisheries Management Plan
<b>TAC</b>	Total Allowable Catch
<b>MSY</b>	Maximum Sustainable Yield

<b>MPA</b>	Marine Protected Area
<b>CCG</b>	Canadian Coast Guard
<b>B.C</b>	British Colombia
<b>VSM</b>	Vessel Monitoring System
<b>LME</b>	Large Marine Ecosystem
<b>FSC</b>	Food, Social and Culture
<b>ITQ</b>	Individual Transferable Quota
<b>IOTC</b>	Indian Ocean Tuna Commission
<b>SIFAR</b>	Support Unit for International Fisheries and Aquatic Research
<b>ATTC</b>	American Tropical Tuna Commission
<b>FSA</b>	Fish Stocks Agreement
<b>CSAP</b>	Centre for Science Advice Pacific
<b>C.S</b>	Continental Shelf
<b>FIM</b>	Aquaculture Management Division
<b>FIF</b>	Fisheries and Aquaculture, Economic and Policy Division
<b>COFI</b>	Committee of Fisheries
<b>UNEP</b>	United Nations Environment Program
<b>CGRCS</b>	Ground-fish Resource and Conservation Society

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## CHAPTER 1: General Introduction

### 1.1 Research rationale

Contemporary fisheries management requires a holistic, multi-species and cross-sectorial Ecosystem Approach to Fisheries (EAF) (Tanaka 2010). To this end, knowledge about the implementation of the EAF is crucial in today's fisheries management. As our analysis will show, human activities on the aquatic ecosystem has an impact on the resources (Fig. 1) and the aquatic ecosystem in general. Studies have revealed that, marine pollution, climate change and fishing have an adverse effect on the aquatic ecosystem which necessitates a new and comprehensive approach in the way fisheries are managed.

Aquatic ecosystems have varied uses for mankind. Ecosystems and ecosystem services will be looked at in greater details in chapter two. However, aquatic ecosystem, including rivers, lakes and estuaries sustain the production of fisheries and are the largest sources of wild protein in the world, with yields of 120 million tons of fish a year and provides, livelihood to about 140 million people (FAO 2014). Humans therefore depend on fish for subsistence, economic returns and development (FAO 2005-2015a).

Human activities, on the aquatic ecosystem have caused utterances to the aquatic ecosystem (UN 2002), due to man's lack of complete understanding of the structure and functioning of the ecosystem (Garcia *et al.* 2003). There is a lack of knowledge (Garcia *et al.* 2003) about the total impact of human activity on the aquatic ecosystem, however, it has been recorded (estimated) that 41% of the ocean, has been impacted by human development and abuses (Halpen *et al.* 2008).

Areas of the aquatic ecosystem habited and occupied by man, are recipients of pollution produced due to human settlements and industrial activities both in inland and in coastal areas (FAO 2005-2015b). The North Pacific Ocean for instance, that use to be a flourishing ocean ecosystem is now in the blink of collapse due to dumping at sea (National Geographic 1996-2015).

Climate change, caused by human actions has led to temperature rise which has both ecological and economic effects on the marine ecosystem. Rise in temperature, has caused predators to be separated from prey due to ecological disturbances due to, climate change (NOAA FISHERIES 2004). In the same vein, fish populations have become less productive based on their movements out of the fisherman's range (NOAA FISHERIES 2014). Furthermore, oceans absorb one-half of the CO<sub>2</sub>

emitted leading to acidification. Ocean acidification, has an impact on fisheries that build shells out of Calcium Carbonate such as Corals and shell fish (NOAA FISHERIES 2014).

Undesirable fishing practices such as, destructive methods and overfishing have serious effects on the ecosystem (FAO 2005-2015a), and contributes to species extinction (Gianni 2004; Rogers et al. 2011). Over-fishing for instance contributes to destruction of trophic levels, flow of biomass, and destruction of bottom topography (Garcia et al. 2003; Science daily 2015). Repeated bottom trawling and dredging literally flattens diversity in benthic habitat, radically changing the associated communities (Watling 2005). About 85% of global fish stocks are over exploited, depleted, fully exploited or in recovery from exploitation (Vince 2012). Species such as Cod are near extinction (Vince 2012) while, all of West African fisheries are now over exploited (FAO 2013-2015). As a result of stock depletion, the world's fishing fleets incur annual losses of USD 50 million (World Bank and FAO 2008).

The Chair of the International Union for the Conservation of Nature (IUCN) world Commission for Protected Areas alludes that, the world leading experts on oceans are surprised by the rate and magnitude of the change we are seeing. He further adds that, the challenges for the future of the ocean are vast, but unlike previous generation, we know what now needs to happen. The time to protect the blue heart of our planet is now, today and urgent (Rogers *et al.* 2011). Similarly, in the World Summit for Sustainable Development, Johannesburg 2002 it was agreed that maintaining and restoring depleted stocks was urgent (UN 2002).

To restore, and maintain stocks that contributes to sustainable development requires a holistic and diverse approach that takes into account all the human and natural influences of fish dynamics (UN 2002; FAO and UNEP 2009; University of Liverpool 2006). Single species or traditional approach often, did not result in optimizing the economic and social benefits of the fishery as a whole (Staples et al. 2009; Wang 2004), as they were focused on managing particular species(s) which provide food to consumers, income and livelihood to the fishers (FAO 2003b) and did not take into consideration the management of the entire ecosystem network.

The widespread degradation, of the ocean resources and continued human pressure on coastal and ocean environment necessitates ecosystem-based approaches to the management of marine resources (Rosenberg et al. 2005; King 2007; Wang 2004; Garcia et al. 2003).

## **1.2 Objective and scope of this study**

Implementation of the EAF, is a human pursuit that takes place in the context of societal goals and aspirations, the human forces at play must fully be understood (FAO 2009). The human and societal forces concern with the implementation of the EAF takes the form of policies, social structures, cultural values, institutional processes and other forms of human behaviour (Fig.2) (FAO 2009). The main objective, of this study is to provide a descriptive account of the implementation of the EAF from a human dimension by looking at the global institutions, policies and national institutions which have recommended and adopted an EAF to sustainably manage fisheries.

The reasons, for the objective of this study is to enhance knowledge by illustrating using the existing literature, the key global institutions and policies involved in the implementation of the EAF and how the approach is implemented in Canada. In more details, we will enhance knowledge of the concept by providing deeper analysis of the key issues of the subject matter. Foremost because institutions, have always been blamed for the poor management of fisheries based on their approach and practices employed to manage fisheries (Canada history 2013; World Bank and FAO 2009). In that regard, we seek to provide the alternative approach adopted by institutions to restore stocks at sustainable levels to help improve on the understanding of managers and scholars who aspire to, learn about the implementation of the EAF concept. Besides, the EAF will fail just as conventional management often failed if attention is not paid to the human aspect of the implementation of the EAF (FAO 2009). Also, the legal framework that details how the EAF should be implemented in practise is not well understood (FAO 2009). Furthermore, not much of scholastic literature exist about the Integrated Fisheries Management Plan (IFMP) developed by the government of Canada to manage the ground-fisheries in the Pacific region which is the case study used in this study.

This study shall therefore address the following issues;

- Provide, a theoretical account of the EAF by looking at the definition, principles and background of the EAF.
- Review, the global policies which adopt an EAF (annex 1) and discuss the duty that emerge from the EAF adoption by global policies.
- Provide, a description of the FAO's EAF implementation roadmap recommended by the FAO to help States implement the EAF.
- Describe, how the EAF is implemented through the IFMP in the Canadian province of British Columbia.
- Review the successes of the IFMP.

### **1.3 Research questions**

To cover the scope and objectives of this paper, I will provide answers to the following research questions;

- What is the legal base for the implementation of the EAF?
- What are the FAO's EAF implementation processes?
- How is the EAF implemented under the IFMP?
- What are, the lessons that could be learnt from the implementation of the IFMP?

### **1.4 Thesis structure**

This paper is structured as follows;

- Chapter two outlines, the methods that will be used in this paper and also provide an account of the key issues of EAF concept.
- Chapter three, examines the legal base for the EAF. It provides an account of how the United Nations Law of the Sea Convention (UNCLOS), the Convention of Biological Diversity (CBD) and the Code of Conduct for Responsible Fisheries (CCRF) adopt the EAF.

- Chapter four, reviews the FAO's EAF implementation processes. It provides an overview of, the role fisheries management institutions play in the management of fisheries and the FAO's EAF implementation processes.
- Chapter five examines the IFMP, as an EAF example in practise. It looks at the, policies, social, political and scientific structures involved in the implementation of the IFMP.
- Chapter six provides, discussions and concluding remarks on some key issues addressed in this paper.

## **CHAPTER 2: Methods and the EAF concept**

### **2.1 Methodology**

Methodology for a scientific and research paper is never standard. The methodology of a paper depends on the project and the discipline (Schneider 2014). This paper is qualitative and as such, lays emphasis on the processes and meaning (Danzin *et al.* 1998) of the key issues of the implementation of the EAF. In more details, this paper focuses on providing a descriptive account of the implementation of the EAF from a human dimension. The methodology, of a descriptive study could as well be developed personally by the researcher (Eliot *et al.* 2005). Fig. 3 has been developed by the author to illustrate how this study is organized and will be analysed.

#### **2.2.1 Data collection**

The research method, used in this study is secondary or desk research and involves the collection of already existing data (AQR 2013-2014) and involves no field work. The method used in collecting data in this study, is one presented by (Eid *et al.* 2006) known as nonreactive web-based methods. Nonreactive web based method, refers to the use and analysis of already existing database(s) and text collection from the internet (Eid *et al.* 2006). Data collection, shall follow a four step procedure as prescribed by Rudestam *et al.* (2001) which includes;

- Firstly to locate the website that has the required information.
- Obtain the password if necessary
- Master the download format or data extraction
- Explore the downloaded data

To this end, data collected for our work are from trustworthy sources of on-line publications (Dochartaigh 2012), and include; google search, google scholar, the University of Tromso on-line library (munin), FAO database (considering the fact that the FAO is responsible for the development of fisheries globally see, FAO Constitution 1945), the Department of Fisheries (DOF) database in Canada, the UN treaty collection database (pursuant to article 102 of the UN Charter which empowers

the UN to publish all treaties concluded under its auspices for public consumption, see article 102 of the UN Charter) and other credible on-line libraries.

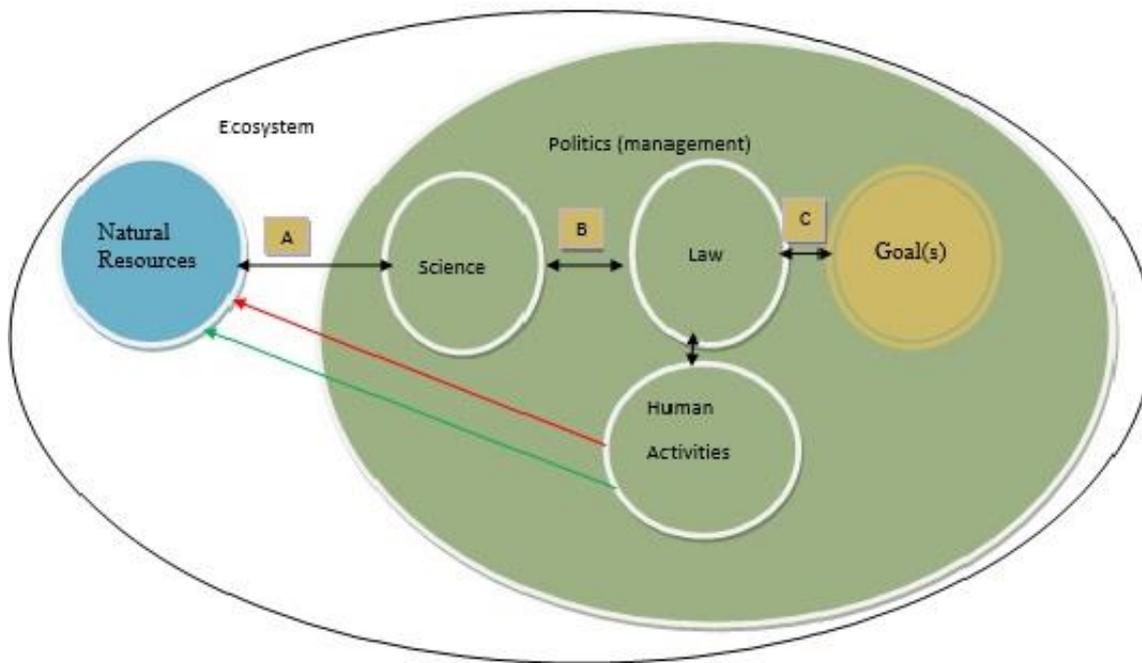
Furthermore, the search strategy used in this study is one recommended by (Dochartaigh 2012). I will, use key texts which are uniquely associated with our study such as ‘policy bases of the implementation of the ecosystem approach to fisheries’, author’s names such as “Garcia .S M”, and search by citation, to search for the relevant data that is needed for this study (Dochartaigh 2012).

### **2.2.2 Data analysis**

The approach used to analyse data contents in this study, is deductive and involves reasoning and judgments from the general to the particular circumstance (Research Methods Knowledge Base 2006). I have not used any software program, to help with the analysis of the data. I will begin the analysis, by looking at the EAF concept from a theoretical perspectives (by looking at the core issues which define the EAF) as illustrated below (Fig.3). I will further look at the global treaties, which adopt principles of the EAF, followed by a study of the FAO’s recommended EAF implementation processes and how the EAF, is being implemented using the IFMP (Fig.3). Account of the implementation of the EAF in this study, will deal on the human dimension of the implementation of the EAF.

Annex 1, provides a list of treaties which supports and adopts an EAF. This study will deal on three treaties, UNCLOS, CBD and CCRF. Consequently, those treaties shall be interpreted based on the conditions provided by the 1969 Vienna Convention for the Interpretation of Treaties. Article 31 of the Vienna Convention, covers the general rule for the interpretation of treaties and provides that, treaties should be interpreted based on the wordings or the ordinary meaning of the words used in the provision (See article 31 of the Vienna Convention 1969).

Casual models, tables, annexes and diagrams shall be used to summarise large findings as recommended by Bernard (2013).



**Key;**

Line A, B, C is the means employed by managers to achieve management goal.

Line A indicates flow of scientific information.

Line B indicates process of enacting laws.

Line C indicates process to implement the laws to achieve management goals.

Length of arrow (A-C) indicates cost incurred by managers, the longer the arrow, the bigger the cost.

Double arrow indicates flow of information and interaction in fisheries management process.

Red arrow indicates negative effect, green arrow indicates positive effects.

Figure 1 Diagram showing the processes required for the implementation of the EAF (Authors).

### 2.3 Theory: Understanding the EAF Concept

EAF, builds on the conventional approach to successfully manage fisheries (Garcia 2006). Conventional or traditional fisheries management approach, is species specific, sectorial, and mostly top-down (Fig.4) (Garcia 2006). Whilst, an EAF is an extension of the conventional approach to fisheries management as it is cross-sectorial, integrated, multi-species and interactive (See Fig.4) (Garcia 2006). The EAF, is being promoted as the foundation of the solution to unsustainability of fisheries (James *et al.* 2012).

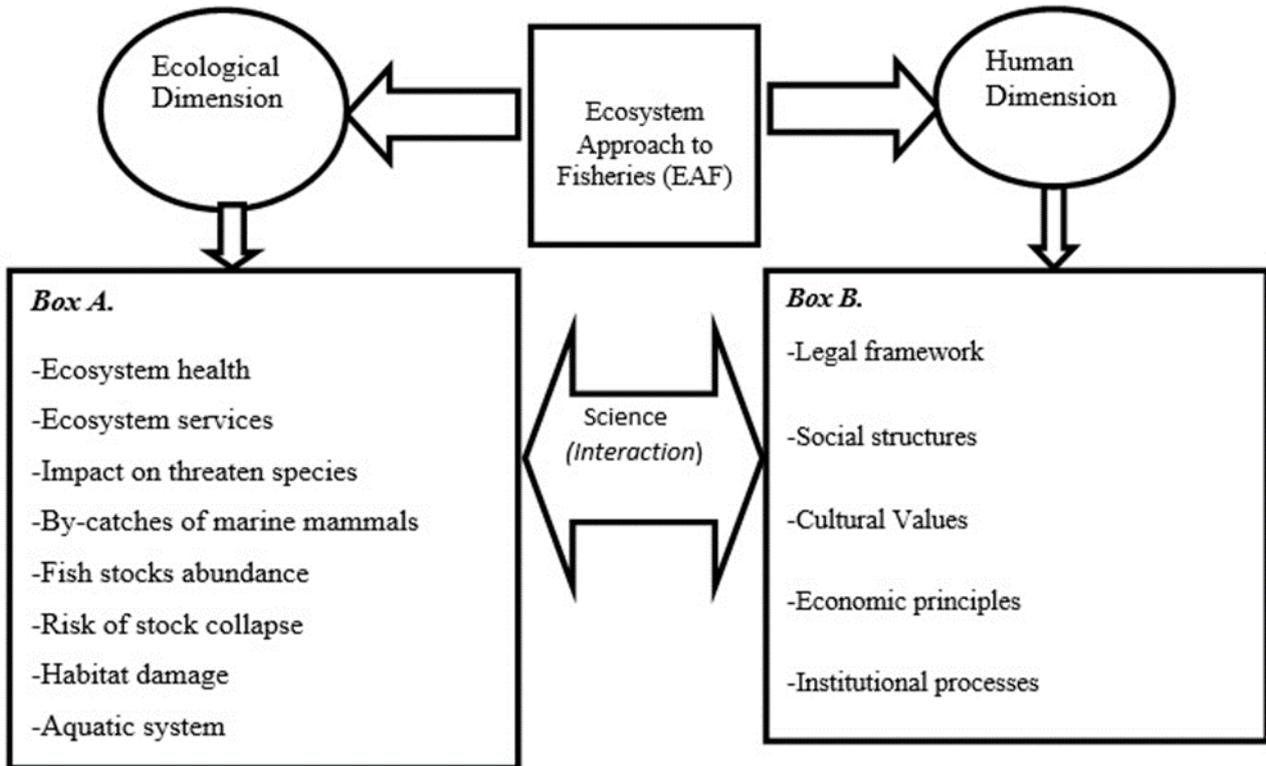


Figure 2 Diagram showing the different dimension from which an EAF could be studied (Authors)

There are, different ways of referring to the EAF (Tanaka 2012; Garcia *et al.* 2003). The CBD for instance, refers to the concept as the Ecosystem Approach (EA) or Ecosystem Management which is associated with the management of both flora and fauna (Convention on Biological Diversity 1992). The State of Canada sometimes uses the term Integrated Management (IM) in the management of ground fisheries in the Pacific, which involves the comprehensive planning and regulation of human activities to ensure long term sustainability of fisheries (Garcia *et al.* 2003; Fisheries and Ocean Canada 2014). Ecosystem-based Management (EBFM), has also been used for instance by the US National Council which suggest credence to environmental consideration over socio-economic and cultural benefits associated with the management of fisheries (Garcia *et al.* 2003).

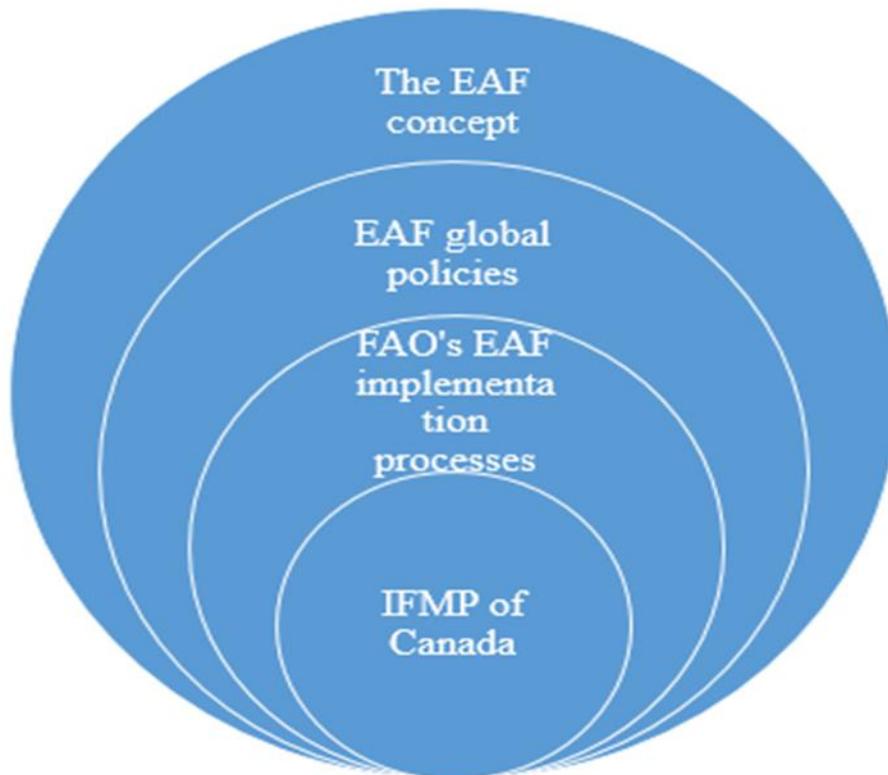


Figure 3 Diagram showing the structure of this paper and analysis pattern (Authors).

The EAF is the term used by the FAO based on the fact that, the term is not limited narrowly to management, but covers also development, planning, food safety and a host of other issues (Garcia *et al.* 2003). Irrespective of the names given to these concepts, they seem likely to have the same goal which is to sustainably manage fisheries. The differences between those different appellations are in their operational mechanisms (Garcia *et al.* 2003) implying that, the way the concept is referred to do not affect their overall objective and principles but only stresses their *modus operandi*.



Figure 4 Diagram showing the extension concept from conventional approach to EAF (Authors).

### 2.3.1 The Ecosystem

Ecosystems are life supporting structures, and are composed of different elements summarised below (Fig.5). The key elements of an ecosystem include its characteristics, complexity, functioning, natural variability and boundaries which are important in the implementation of the EAF (Garcia *et al.* 2003). The ecosystem, can simply be defined as the interaction between groups of organisms and their environment (King 2007). In a broader perspective, an ecosystem is a community of organism interacting with each other and with their environment such that energy is exchanged and system-level processes, such as the cycling of elements emerge (Ellis 2014).

Ecosystems exist at different scales and boundaries. An ecosystem can be considered from different geographical scale (Garcia *et al.* 2003; UN 2006), from a grain of sand with its rich mircofaunna, to a whole beach, a coastal area, or estuary, a semi-enclosed sea and, eventually the whole earth (Garcia *et al.* 2003). Fisheries stocks and management (including an EAF), are relevant at intermediate geographical scale from a few to a thousand kilometre (Garcia *et al.* 2003).

Aquatic and terrestrial ecosystems, are the two basic types of ecosystem (Sharma 2014). Our concern is with aquatic ecosystem, which is the habitat for fish. Garcia *et al.* (2003) identifies four compartments of a fishery ecosystem which include; biotic, abiotic, fishing and institutional

compartments illustrated below (Fig.5). The biotic compartments, include living habitats such as man and fishery for instance. While, the abiotic compartments are associated with physical elements such as water quality and climate (Garcia *et al.* 2003). The fishery compartments includes the harvesting processes that takes place in the fishery while, the institutional compartment of an ecosystem includes the laws, regulations and organizations needed for fishery governance (Garcia *et al.* 2003).

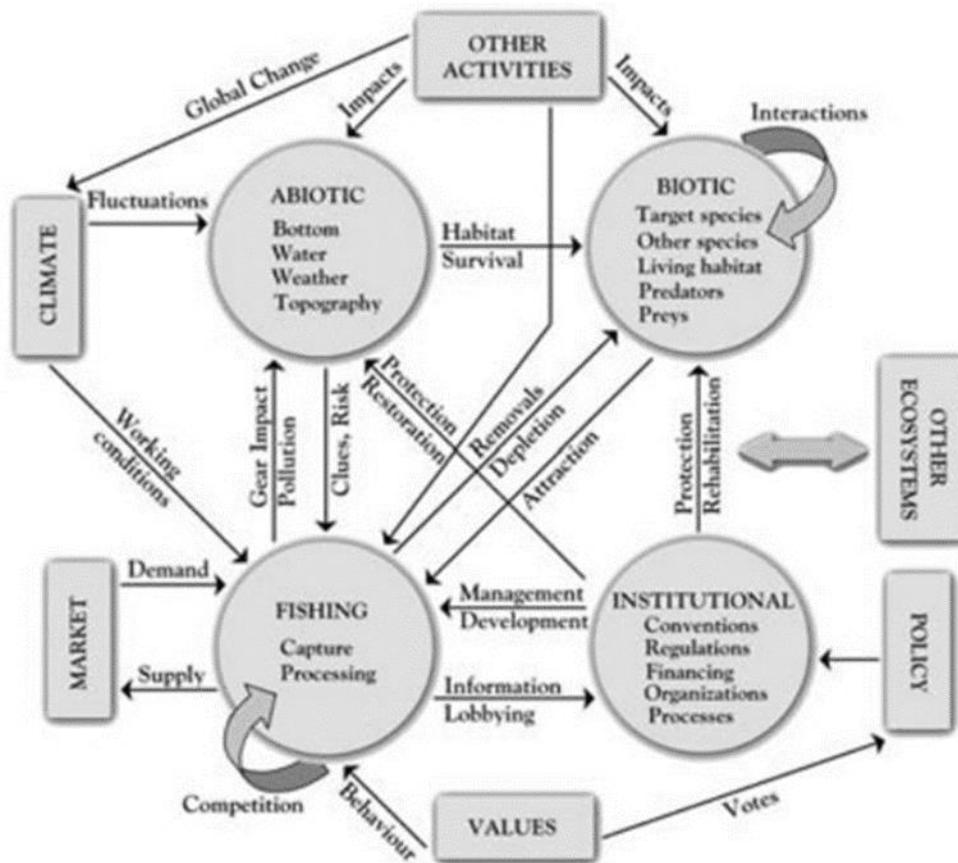


Figure 5 Diagram showing the ecosystem and its components (Garcia *et al.* 2003).

Ecosystems, and their components are dynamic and constantly changing. Ecosystem structure, species composition and functioning change seasonally and in a way that is not yet understood (Garcia *et al.* 2003). Changes in the ecosystem could occur over a long period of time or at short notice, which could lead to frequent change in distribution, abundance and physiology of marine organism, associated with changes in the extension localization, structure, productivity and other characteristics of the ecosystem (Garcia *et al.* 2003).

### **2.3.2 Ecosystem services**

Ecosystem services, are the benefits that people derive from the ecosystem (The sustainability project 2003; IUCN 2014; UK National Ecosystem Assessment 2009-2012). All benefits that man can derive from the ecosystem, have not yet been established because of lack of knowledge (The sustainability project 2003). However, ecosystem services have been classified in three categories; ecological, economic, cultural (The sustainability project 2003; IUCN 2014), and they provide the following functions; provisioning, regulating, habitat and cultural functions (UK National Ecosystem Assessment 2009-2012) to mankind. In providing a regulating function, ecological services turn to support life. Evolution of forest ecosystem and ocean plankton for instance contributes significantly to the development of greenhouse effect which provides us, with climate stability making life on earth possible (The sustainable project 2003).

As a provisioning function, economic services generated from the ecosystem which enhances life in terms of food and economic returns earned from exchanging those products for monetary rewards (The sustainability project 2003). Humans for example, who are part of the biotic or biological components of the ecosystem (Fig.5), feed from other biotic components of the ecosystem such as fishery for their livelihoods (Garcia *et al.* 2003). For cultural significance, ecosystem services generate cultural benefits when they are connected to basic beliefs and values, and are thought to have intrinsic values, for moral, ethical or aesthetic reasons (The sustainability project 2003).

Man's demand for ecosystem services, has increased over the 20<sup>th</sup> century (The sustainability project 2003). Irrespective of the ecological, economic and cultural significance of ecosystem services, ecosystem and the biodiversity that support them are still being degraded and lost at an unprecedented scale due to overexploitation caused by poor management (IUCN 2014).

### **2.3.3 Sustainable development concept**

Knowledge about sustainable development, is helpful for our understanding of the concept and the implementation of the EAF (Staples *et al.* 2009). Sustainable development is a, broad concept in natural resource management, and is simple a way of balancing up humans needs and ecological wellbeing as summarised below (Fig.6). Staples *et al.* (2009), defines sustainable development as a balance between ecological well-being and human wellbeing that does not compromise the needs of future generation. Sustainable development and the EAF have similar objectives. The main objective

or goal, of sustainable development in fisheries management is to improve, the well-being of all the people engaged in the fisheries sector as well as the natural productive system (FAO 2001-2015a).

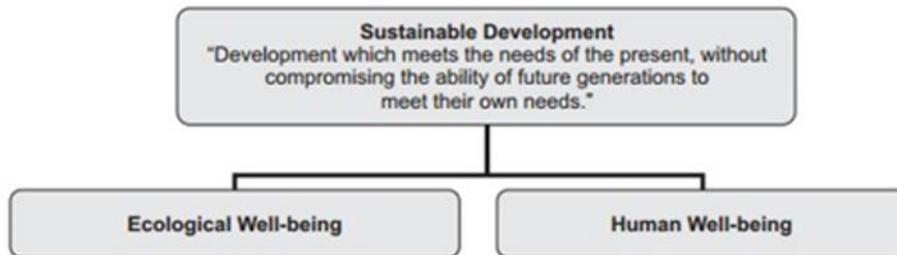


Figure 6 Diagram illustrating sustainable concept (Staples et al. 2009).

### 2.3.4 Definition of an EAF

There is no agreed definition of the EAF (Garcia 2003; Long 2012). The most used, definition of the EAF is that presented by the expert consultation conference on Ecosystem Based Management held in Reykjavik, Iceland (FAO 2003a). The experts defined EAF as (FAO 2003a);

An approach which strives to balance diverse societal objective and taking into account the knowledge and uncertainties about biotic, abiotic and human components of the ecosystem and their interaction and apply an integrated approach to fisheries within ecologically meaningful boundaries.

Authors and publicist have also defined the EAF. Staples *et al.* (2009) defines the EAF as;

A way of managing fisheries and aquaculture that balances the objective of society (e.g ecological and economic objectives), by applying and integrated approach across geographical areas that reflect natural ecosystem.

Based on the definitions of the EAF from FAO (2003a) and Staples *et al.* (2009), one could conclude that, the EAF is the management of every human activity in an aquatic ecosystem that has anything to do with fishes, their sustenance and livelihood for the benefit of all mankind.

The EAF implies that, management must deal with full set ecological consequences of an activity and also understand the social and economic implications that the activity provides (Fletcher 2008). The EAF, is not a move from the conventional fisheries management which was species specific but rather a holistic approach which involves sectorial and cross-sectorial approaches (FAO 2003, Garcia 2006). Single species concepts such as Maximum Sustainable Yield (MSY), are still incorporated into the EAF framework (Garcia *et al.* 2003).

Implementation of the EAF, is to solve particular problems associated with the management of fishery and is implemented in a geographically specific collection of animal, plants and supporting environmental process (UN 2006). EAF could be applied, to a small or large scale marine ecosystem such as an ocean (FAO 2009). The scale used to define Large Marine Ecosystem (LME), includes its pattern of biodiversity, productivity and hydrography (UN 2006). To apply EAF at the local level, require more elements of governance for co-management purposes (FAO 2009). EAF may be applied, to any geographical region which may or may not be a jurisdictional boundary, such as in the Gulf of Guinea (UN 2006).

### **2.3.5 Background of the EAF**

EAF is not really a novelty, its roots are deep in the early days of fisheries management (Garcia et al. 2005). Movements, to adopt the EAF started as far back as 1972 during the World Conference on Human Environment (FAO 2003b). Recently, endeavours to adopt an EAF could be traced from 1991. It was recommended in 1991 during the 19th session of the FAO Committee of Fisheries (COFI) that new approaches which adopt conservation, environment, social and economic consideration is needed in fisheries management (FAO 2003b). What followed, was the conclusion of the Reykjavik Declaration in 2001 which stressed the need for States to implement the EAF (Preamble Reykjavik Declaration).

At the 2002 World Summit on Sustainable Development, there were calls to participants and States to implement the Reykjavik Declaration by 2010 (FAO 2005-2015a). Between, 1972 - 2002 global treaties concluded to manage living marine resources have all adopt the EAF or its principles (Wang 2004). The CBD for instance, explicitly adopts the Ecosystem Approach (EA) through its Conference

of Parties (COP). At the 2012 Earth Summit in Rio, heads of States who attended the conference, renewed their commitment to implement the EA in the management of marine resources in accordance with international law (Section 158 UN report 2012).

The implementation of the EA, has not enjoyed a smooth start as there are some issues such as, the need for thorough scientific knowledge about the marine environment which is still lacking and affects the application (Garcia *et al.* 2003).

### **2.3.6 Principles of an EAF**

There are 12 principles of an EAF. The 12 principles of the EAF were presented on the fourth meeting of the Conference of Parties (COP) held in Malawi and they include (Malawi principles 1998);

- Management objectives are a matter of societal choice.
- Management should be decentralized to the lowest appropriate level.
- Ecosystem managers should consider the effects of their activities on adjacent and other ecosystems.
- Recognizing potential gains from management there is a need to understand the ecosystem in an economic context, considering e.g. mitigating market distortions, aligning incentives to promote sustainable use, and internalizing costs and benefits.
- A key feature of the ecosystem approach includes conservation of ecosystem structure and functioning.
- Ecosystems must be managed within the limits to their functioning.
- The ecosystem approach should be undertaken at the appropriate scale.
- Recognizing the varying temporal scales and lag effects which characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
- Management must recognize that change is inevitable.
- The ecosystem approach should seek the appropriate balance between conservation and use of biodiversity.
- The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
- The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

The Malawi EAF principles, listed above must be taken into consideration when operationalizing an EAF (Hoffman *et al.* 2006). The EAF principles, stems from conventional fisheries management (Garcia *et al.* 2003). A detail study of the global EAF policies will be done in chapter 3. EAF principles are reflected as concepts such as ;Human and ecosystem well-being, resource scarcity, maximum accepted fishing level or Maximum Sustainable Yield (MSY), Maximum Biological Productivity, Impact Reversibility, Impact Minimization, Rebuilding of Resources, Ecosystem Integrity, Species Interdependence, Institutional Integration, Uncertainty, Risk and Precaution, Compatibility of Management Measures, The Polluter Pay Principle (PPP), The User Pays Principle (UPP), The Precautionary Approach (PA), Subsidiary, Decentralized and Participation and Equity in global policies (Garcia *et al.* 2003).

All EAF principles enshrined in global policies mentioned above are, important but due to want of time we cannot study them in detail. The PA for instance, calls for prudent foresights to avoid unacceptable situation, taking into account that changes in fisheries system, are only slowly reversible, difficult to control, not well understood and subject to change in the environment and human values (FAO 1995). PA is implemented through, controlling access, licensing, data collection and analysis (FAO 1995).

Implementation of PA depends, on the risk associated with the management of the fishery (FAO 2005-2015b). In other words, the PA is a shift of the burden of proof from the State to the individual. Individuals, must prove that, their actions are harmless to the environment under the PA to fisheries management framework (Speth *et al.* 2996). When the impact or risk associated with the management of fishery cannot be ascertained, PA can take the form of a moratorium or ban (FAO 2005-2015a) such as, the moratorium placed on commercial whaling by the International Whaling Commission (IWC) (Environment news service 2010).

### **2.3.7 Purpose of the EAF**

The purpose of the EAF was discussed, in the Reykjavik Conference. The experts held that, the purpose of the EAF is to develop and manage fisheries in a manner that addresses the needs of the society, such that the present and future generations should benefit from the full range of the ecosystem services (FAO 2008). Implementation of the EAF should carter for human as well as ecosystem wellbeing (FAO 2005-2015a).

Many States and political entities have, demonstrated strong commitments and have actually developed plans to implement an EAF (European Commission 2008; Fisheries and Oceans Canada 2008) in their territories, what right do States have to implement an EAF? The next chapter, shall look at the global laws that adopt an EAF.

## **CHAPTER 3: Legal base for the implementation of the EAF**

### **3.1 Introduction**

The objective of this chapter, is to provide the legal base for the implementation of the EAF by studying how global policies such as, UNCLOS, CBD and CCRF adopt principles and guidelines of the EAF. The rule of law, is indispensable in fisheries management (Tebaiy *et al.* 2014). National and international laws, are required in the management of fisheries as they form the legal regime under which fishery should be managed (Cochrane 2002). As far as the right for States to implement the EAF is concern and as we shall see from our analysis, treaties concluded at the global level have adopt an EAF implicitly and explicitly, given States the right to implement the EAF in their national territories.

Selecting the relevant instruments which adopt an EAF is subjective (Garcia *et al.* 2003). However, annex 1 contains a list of the relevant global policies in international environmental law which adopts the EAF. As our analysis will show, UNCLOS and the CCRF do not explicitly adopt an EAF, while the CBD explicitly adopt the EAF. Furthermore, and as we shall examine, the UNCLOS regime is responsible for global fisheries management.

This chapter is structured as follows; the first part of this paper will look at fisheries management under the UNCLOS regime. The second part of this chapter will examine how UNCLOS, the CBD and the CCRF adopt an EAF.

### **3.2 Overview of the conservation of living marine resources under the UNCLOS regime**

The duty, for States to set-up arrangements to manage their fisheries including the duty or right to implement the EAF stems from international environmental law and supported as we shall see by guidelines developed by the FAO. International environmental law, forms part of international law and emanates from the Statues of the International Court of Justice (ICJ). Article 38, of the Statues of the ICJ recognized international conventions, customs, general practices recognized by civilised States

and judicial decisions as sources of international law (See article 38 of the Statutes of the International Court of Justice 1945).

International environmental law, provides the framework for the peaceful, sustainable, and accountable management of the environment and its resources nationally and internationally. Birnie *et al.* (2009; 4) argue that, international environmental law is not a separate branch of law but is simply "...the application of public and private international law to environmental problems". Much of contemporary international environmental law, deals with sustainable use of fresh water, fisheries, forest, biological diversity or endangered species (Birnie *et al.* 2009).

As far as the global management of fisheries is concern, the conclusion of UNCLOS saw the adoption of a comprehensive framework for the conservation of living marine resources (FAO 2005-2015c). For States, to be able to partake in the management of fisheries under the UNCLOS regime, they must be sovereign (Preamble Law of the Sea Convention 1982). A sovereign State is a State, which has a permanent population, defined territory one government and a capacity to enter into relations with other sovereign States (See Article 1 of the Montevideo Convention 1933).

States have, sovereign rights under the UNCLOS regime to manage living marine resources in the Exclusive Economic Zones (EEZ), the Territorial Seas (TS) and the Internal Waters (See the Law of the Sea Convention 1982) (Fig.7). State sovereignty, in the management of living marine resources is to explore and exploit the resources therein (Article 56 of the Law of the Sea Convention) suggesting that, coastal States do not have preferential rights but solely exclusive rights to explore and exploit living marine resources under their jurisdiction (Beckman and Davenport 2012). This simply implies that, the right of the coastal States in the EEZ starts and ends with the right to explore and exploit such resources, whatever that implies. Birnie *et al.* (2009) on the other hand, goes further to argue that, the exclusive rights given to States under UNCLOS in the EEZ suggest a right to control access, exploitation and conservation of natural resources and is different from the rights enjoyed by States in the high seas.

Table 1 Main institutions concern with the implementation of international fisheries management policies

<b>Institutions</b>	<b>Jurisdiction</b>	<b>Main mandate</b>
UN General Assembly (UNGA).	<b>Global</b>	Global fisheries management issues
International Tribunal for the Law of the Sea (ITLOS).		Dispute resolutions
Food and Agricultural Organization & Committee on Fisheries (COFI).		Fisheries development
Non-Governmental Organization (NGO)		Environmental and resource protection.
	<b>Regional</b>	
Regional Fisheries Bodies		Management of shared stocks
	<b>National</b>	
Government Ministries		National fisheries management
Civil Societies		Advocate stakeholders right
	<b>Local</b>	
Cooperatives		Local development of fisheries policies and measures

Before, we look into details the UNCLOS regime it's important that we look at how fisheries were managed before the conclusion of UNCLOS.

### 3.2.1 Pre-UNCLOS era

The EEZ and the high seas, add up to the Internal Waters, Territorial Seas, Contiguous Zones, and the Continental Shelf constitute the legal boundaries of the ocean (Fig.7). Those regions, existed before the conclusion of UNCLOS and stems from Customary International Law (CIL) (Birnie *et al.* 2009), what States will normally do in the absence of a binding legal framework or rule of law.

CIL is endorsed in Article 38(1) of the ICJ Statutes referred to above. Two elements constitute CIL, general practice of states (objective element) or States behaviour over a long period of time and the opinion juris (Substantive element) or States beliefs (Beyerlin *et al.* 2011). CIL doctrines are legally non-binding to members and do not usually require States consent for it to be binding on them (Birnie *et al.* 2009). The only consideration for CIL to be binding amongst members is that, the practice should be crystallized or regular (Birnie *et al.* 2009).

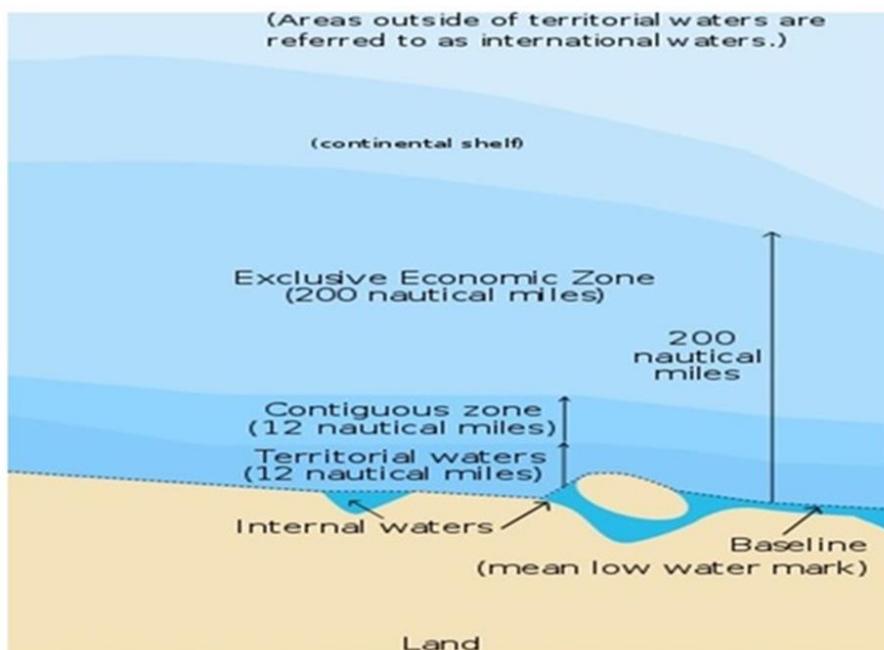


Figure 7 Diagram showing the various regions of the ocean which States can exercise sovereignty (Hollis 2013).

The practice that obtained in the 17<sup>th</sup> and 18<sup>th</sup> century was that, coastal States for the sake of proper management had jurisdiction to manage natural, resources that occur in the narrow belt of the sea surrounding the nations coastline and the rest of the ocean was free for all nations to exploit (UN 2012; Bernie *et al.*2009; Rothwell *et al.*2010; Churchill *et al.*1999).

The overexploitation, of living marine resources by distant vessels pushed coastal States to extend, national claims over offshore resources (UN 2012). The United States of America (USA), in the 1880's *Bering Sea fur* case with Britain attempted to extend her jurisdiction in the management of seals beyond 3miles but her motion was squashed by the courts. The Bering Sea Arbitration held that, the USA had no right to protect or manage seals beyond the 3 nm limit from their territory (Birnie *et al.* 2009; Churchill *et al.* 1999; Rothwell *et al.* 2010), thus upholding the freedoms of the high seas doctrine.

Events occurred in quick succession by 1945, when President Truman of the USA, issued the Truman Declaration, asserting the sovereign rights of coastal States over resources found in the continental shelf (Birnie *et al.* 2009). What followed by 1945, was extension of the EEZ by some Latin American States such as Chile from 3miles to 200nm (Birnie *et al.* 2009). After 1945, was the establishment of international fisheries commissions such as the International Whaling Commission (IWC) formed in 1946 to provide proper management of the whale stocks and development of the whaling industry (Preamble IWC Convention 1946). Bilateral agreements which were ad hoc in character were concluded, between States in the spirit of proper management of fisheries such as the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas adopted at UNCLOS 1 (Churchill *et al.* 1999).

By the early 1970's coastal States assertion of a 200nm EEZ gained popular currency as the 1958 Geneva Convention was unable to prevent these assertions (Birnie *et al.* 2009). Due to the inability of UNCLOS I and II to resolve issues pertaining to sovereign rights over maritime territories, and proper legal framework to ensure the conservation of living marine resources, the convening of UNCLOS III put to rest all those issues (Churchill *et al.* 1999). Both developing and developed States such as Canada and Norway, advocated broad coastal States jurisdiction for fisheries which later on developed to the EEZ regime when UNCLOS was concluded (Churchill *et al.* 1999). The Sea Bed Committee, at the earlier stages of UNCLOS III and supported by most States revealed three approaches to conserve fisheries based on their migratory characteristics; sedentary species, coastal species, anadromous species and wide-ranging species (Churchill *et al.*1999).

### 3.2.2 UNCLOS fisheries management regime.

The three approaches to conserve living marine resources are reflected in UNCLOS. UNCLOS, was concluded in 1982 during the third United Nations Conference of the Law of the Sea and came into force in 1994. The then president of the Conference in his opening remarks described UNCLOS as “A Constitution of the Ocean” (Koh 1982; 1), suggesting the conclusion of a comprehensive and dependable policy document for ocean governance.

The conclusion of UNCLOS, as a comprehensive policy document for ocean governance has not been properly accommodated by some quarters. Some authors doubt if UNCLOS has effectively codified CIL (Lee 2006), while others simply describe the document as “a flawed” and not elaborate enough to deserve ratification from some coastal States (Bandow 2004;1). Those opinions and more, have an effect in the way policies were negotiated after 1982 as we shall see later.

However, UNCLOS adopts two approaches to sustainably manage fisheries these approaches, depends on the area which these species occur and the biological characteristics of the species (FAO 2005-2015c). Rothwell *et al.* (2010) styled these approaches as, the zonal and species approaches illustrated below (Fig.8). The zonal approach, simply refers to the allocation of large spaces of the ocean previously part of the high seas to the coastal States for proper management (Rothwell *et al.* 2010). The conservation and management of species, based on their biological characteristics known as the species approach is the second approach adopted by the UNCLOS fisheries management regime. Fisheries by nature, migrate from one region of the ocean to another, policies adopted, to manage them must take into account these tendencies (Fig.9) (Rothwell et al. 2010).

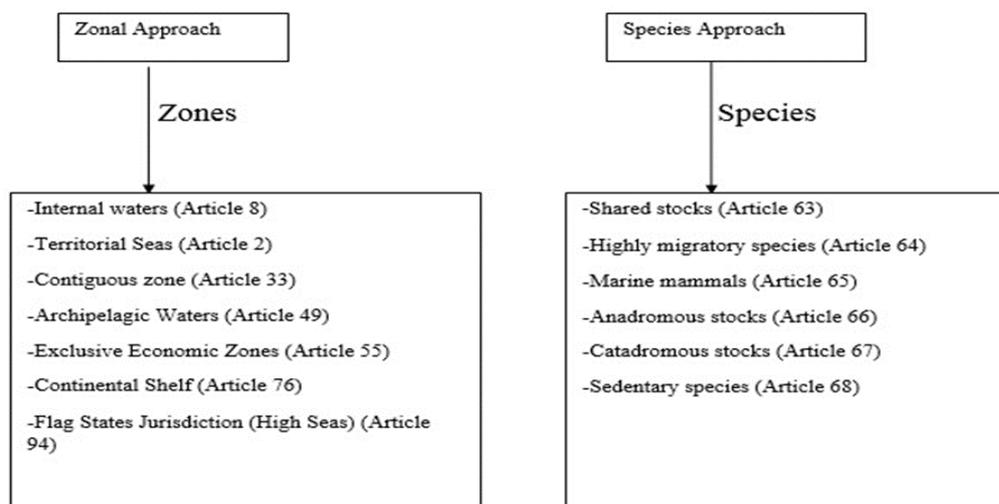


Figure 8 Diagram showing the zonal and species approaches adopted by UNCLOS for the conservation of living marine resources (Authors).

By the zonal approach, and pursuant to part II and V of UNCLOS, some areas of the ocean are under the sovereignty and control of coastal States to manage all living marine resources therein, these areas include; the Internal Waters, Territorial Seas, Contiguous Zones, Continental Shelf and EEZ (Fig.7).The living marine resources covered by the UNCLOS are illustrated above (Fig.8). The management, of living marine resources in the high seas are covered by part VII of UNCLOS and it's the mandate of Regional Fisheries Management Organizations (RFMOs) and the flag States.

The zonal and species approach of the UNCLOS, has also come under some strong criticism. Tanaka (2010), for instance perceive that the zonal and species approaches of UNCLOS have failed to sustainably manage fisheries and thus there is need for change.

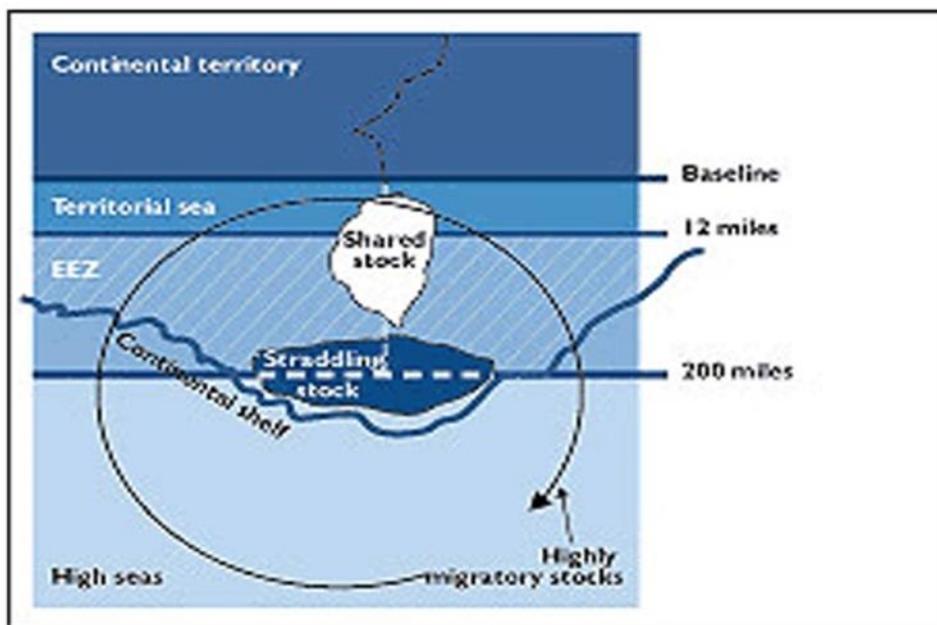


Figure 9 Diagram showing the migratory pattern of shared stocks under UNCLOS regime (FAO 2005-2015c).

### 3.2.3 Some global fisheries management policies concluded after 1982 consistent with UNCLOS

Probably, the critics of UNCLOS had an edge in their debate about its vagueness. By the early 90's, it was clear that International environmental law relating to fisheries management needed significant

change (Rothwell *et al.* 2010). In 1992, the UN Conference on Environment and Development (Earth summit) was convened in Brazil and saw the conclusion of the 1992 Rio Declaration on Environment and Development. The main aim of the conference, as reflected in the Declaration was to encourage, the enactment of international agreements which respect the interest of all people and protect the global environment (Preamble Rio Declaration 1992).

What followed, after 1992 was the conclusion of international agreements such as Agenda 21, the CBD, Fish Stocks Agreement (FSA) 1995, The CCFRF just to name a few. These agreements are crucial for our study and will be studied in greater details in subsequent sections.

### **3.3 Global policies which adopt the EAF**

Annex 1, contains a list of some global policies which adopt an EAF. This paper, for reasons already provided will deal on three instruments, UNCLOS, the CBD, and CCRF.

#### **3.3.1 UNCLOS and the EAF.**

Events leading to the conclusion of UNCLOS, have been mentioned. UNCLOS was concluded in 1982 and came into force in 1994. UNCLOS is one of the longest treaties in history (Hollis 2013) and has 320 articles and 9 annexes. The objective of UNCLOS is to promote the peaceful utilization of marine resources and protection of the marine environment (Preamble 1992 Law of the Sea Convention). The conditions adopted by UNCLOS apply *mutandis mutandis* to State parties (See article 2.2 of the Law of the Sea Convention 1982). UNCLOS applies to all area of the ocean.

As far as the adoption of the EAF is concern, UNCLOS does not adopt explicitly the EAF. UNCLOS adopts implicitly, the EAF by adopting principles of the EAF which we shall hereto mention. UNCLOS adopts principles of the EAF such as the MSY. Article 61.3 and 199.1a of UNCLOS provides that, States shall design measures to maintain or restore populations of harvested species at level that can produce MSY, and must take into account the effects on species associated with or dependent upon harvested species (See article 61.3 and 61.4 and 119.1a of the Law of the Sea Convention 1982).

Part XII of UNCLOS, provides conditions for the protection and preservation of the marine environment. Article 192 and 193 of UNCLOS provides that, member States have the obligation to set up policies to protect their marine environment (See Article 192 and 193 of the Law of the Sea Convention 1982).

### **3.3.2 The CBD and the EAF**

The CBD was concluded, against the backdrop of concern about human activity on natural resources. Due to, the impact of human activities on natural resources (leading to species extinctions), the United Nations Environment Program (UNEP), convened the ad hoc working group of experts on biological diversity in November 1988 to explore the need for an international convention on biological diversity (Secretariat of the Convention of Biodiversity 2000).

The work of the ad hoc working culminated on May 22, 1992 with the Nairobi Conference (Secretariat of the Convention of Biodiversity 2000). The Convention was opened for signature on the 5<sup>th</sup> of June 1992 and entered into force on the 29<sup>th</sup> of December 1992 (Secretariat of the Convention of Biological Diversity 2000). The CBD has 195 parties as of date including Canada.

The CBD supplements UNCLOS (Article 22 of the Convention of Biodiversity 1992). The objective of the CBD is to, promote sustainable use, fair and equitable sharing of biological diversity (Article 1 of the Convention of Biological Diversity 1992). Biological diversity according to the CBD, implies all living resources (including fish) both in land and other ecosystem (See article 2 of the Convention of Biological diversity 1992). The CBD is applicable to areas within and beyond the national jurisdiction of its member States (Article 4 of the Convention of Biological Diversity 1992).

The CBD, adopts explicitly an EA. The working term, for the CBD is the EA as against the EAF which is widely used by the FAO (for reasons we have explained before) and also adopted in this paper. The EA, is a central principle in the implementation of the CBD (CBD guidelines 2004). Article 6 of the CBD, calls on member States to adopt strategies to sustainably manage their biological diversity. Such strategies according to article 6, must supports sectorial and cross sectorial programs and policies (See article 6 of the Convention of Biological Diversity 1992). Article 7 of the CBD, identifies and monitor activities which “have significant adverse impact on the conservation and sustainable use of biological diversity” (See article 7 of the Convention of Biological Diversity 1992). The concepts of marine protected areas were adopted in article 8, while article 10 simply called for stakeholder’s cooperation

in the management of biological diversity (See Article 8 and 10 Of the Convention of Biological Diversity 1992).

The 42 articles of the CBD, do not explicitly adopt the EAF. The Conference of Parties (COP), was established pursuant to article 23 of the CBD to keep under review the implementation of the CBD by formulating and adopting protocols that will supplement the CBD (See article 23 and 28 of the Convention of Biodiversity 1992). It's therefore against that backdrop that the CBD's COP adopts the EAF.

The COP of the CBD has entered several decisions since its establishment. The decision which is central for our study is COP 5 Decision V/6 which explicitly adopts the EA (COP 5 Decision V/6);

Calls upon Parties, other Governments, and international organizations to apply, as appropriate, the ecosystem approach, giving consideration to the principles and guidance contained in the annex to the present decision, and to develop practical expressions of the approach for national policies and legislation and for appropriate implementation activities, with adaptation to local, national, and, as appropriate, regional conditions, in particular in the context of activities developed within the thematic areas of the Convention.

### **3.3.3 The CCRF and the EAF.**

Issues, affecting the long-term sustainability of fisheries paved the way for the conclusion of the CCRF. Concerns over the over-exploitation of fish-stocks, damages to the ecosystem, economic losses and issues affecting fish trade led to the conclusion and adoption of the CCRF (Introduction Code of Conduct for Responsible Fisheries 1995). Talks about the need for the CCRF, started in the early 90s.

The nineteenth session of the FAO Committee on Fisheries (COFI), held in March 1991 recommended that the FAO should develop the concept of responsible fisheries and elaborate a Code of Conduct to that end (Annex 1 Code of Conduct for Responsible Fisheries 1995). After a series of negotiations, the CCRF was adopted during the Twenty-eight session of the FAO on 31 October 1995 (Annex 1 Code of Conduct for Responsible Fisheries 1995).

The CCRF is a voluntary document, arranged in 12 articles which reflects, develops and supplements UNCLOS (Article 1(1.1) of the Code of Conduct for Responsible Fisheries 1995). The CCRF, is global in scope and has as objective, to provide principles and standards for the conservation, development and processing of fisheries to members and non-members of the FAO (Article 1(1.2&3), and 2 of the Code of Conduct for Responsible Fisheries 1995).

As far as the implementation of the EAF is concern, the code broadly endorses ecosystem management principles (Wang 2004). Article 6 of the CCRF adopts the general principles for responsible fisheries and provides that, the right to fish must be consistent with the right to protect the environment (See Article 6.1 of the Code of Conduct for Responsible Fisheries 1995). Article 7, of the CCRF adopts the general conditions of fisheries management and provides that, fisheries management “should...be based on the best scientific evidence available and be designed, to ensure the long-term sustainability of fishery resources at levels which promote the objective of their optimum utilization and maintain their availability for present and future generations” (See article 7.1.1 of the Code of Conduct For Responsible Fisheries 1995).

Furthermore, article 7.5.1 of the CCRF adopts the PA and states that States should, adopt the PA widely to conserve and manage fisheries and the marine environment (See article 7.5.1 of the Code of Conduct For Responsible Fisheries 1995). Article 8 of the CCRF, handles the issue of fishing operations. Article 8.5.1 calls on States to use “sufficiently selective” gears to minimize waste, discards, catch of non-target species, both species and non-species and other impacts associated or dependent species by drawing up laws to that effect (articles 8.5 of the Code of Conduct for Responsible Fisheries 1995). Article 9 of the CCRF, covers aquaculture and provides that States should promote responsible development of aquaculture, by evaluating the effects of aquaculture development on genetic diversity and ecosystem integrity (See article 9.1.2 of the Code of Conduct For Responsible Fisheries 1995).

### **3.4 Duty or right to implement the EAF**

The adoption of the EAF by global policies implies that, States have a duty or right to implement an EAF. This duty is weak as explained below. UNCLOS for instance adopt principles of the EAF and provides in article 61 that States “shall” design and restore population of harvested species to achieve MSY (article 61 of the Law of the Sea Convention 1982). The use of the word “shall” indicates a

strong and mandatory obligation. The weakness that, UNCLOS decisions have is that they do not explicitly adopt the EAF but principles of the EAF which could raise arguments about its adoption (Wang 2004) or interpreted to mean something else. The CBD on the other hand through the COP, explicitly adopts the EAF and calls on States “to apply” the EAF (decision V/6 COP). The uses of the word ‘to apply’ indicate also a strong and mandatory duty. That strong requirement, has significance in fisheries management. A strong duty implies that, States have no choice but must implement the EAF. However, for this to happen in practise depends on the weight of the instrument in question (Makagon 2012).

International law is generally characterised into “hard law” and “soft law” (Makagon 2012; Beyerlin et al. 2011)). “Hard laws” are theoretically legally binding, while “soft laws” are theoretically non-binding (Makagon 2012; Beyerlin et al. 2011). This therefore implies that if an instrument is a “hard law” instrument, if member States fail to apply its conditions they will be prosecuted in a law court. UNCLOS for instance is a convention and therefore a hard law instrument. In the Southern Bluefin Tuna (SBT) case between New Zealand vs. Japan, Japan was prosecuted by New Zealand at ITLOS because she failed to conserve and cooperate in the conservation of the SBT stocks pursuant to article 290(5) of UNLOS (International Tribunal for the Law of the Sea 1999). However, a breach of a soft law instrument generally comes with some political consequences (Beyerlin *et al.* 2011).

As far as the legal weight to implement the EAF is concern, neither UNCLOS nor any global legally binding instrument expressly adopts an EAF (Molenaar 2009). The COP of the CBD, a soft law instrument (Beyerlin et al. 2011) adopts the EAF explicitly.

All key international agreements adopted over the last two decades, stress the need for the adoption of ecosystem approaches to fisheries (FAO 2005-2015 c). UNCLOS, CBD and CCRF are just a handful we examined for want of time. Based on our study, we can therefore argue that the global policies have adopted the EAF, to this end, States have the right to implement the EAF (Enviropaedia 2007).

Institutions exist at the global and local levels, to facilitate the implementation of fisheries management policies as illustrated below (Table.1). Worthy to note that, the global institutions listed in table 1 do not have managerial mandates or better still, they do no manage fisheries. Central to those institutions are, the Food and Agricultural Organization (FAO). The FAO, was created by the UN in 1945 to promote the common welfare of nations (Preamble FAO Constitution 1945). In the absence of a World

Fishing Organization to manage global fisheries just as the World Trade Organization (WTO) for international trade, the FAO is charged with the duty to promote the development of fisheries worldwide (Article 1(1) 1945 FAO Constitution). In the spirit to promote the development of fisheries, the FAO adopts processes to facilitate the implementation of the EAF. The next chapter shall study in greater details institutions charged with fisheries management and the FAO processes for the implementation of the EAF.

## **CHAPTER 4: Fisheries management institutions and EAF implementation processes**

### **4.1 Institutions in fisheries management**

Institutions are crucial in the management of fisheries. The Support Unit for International Fisheries and Aquatic Research (SIFAR) argues that, institutions are paramount to understanding how activities in the fishing sector operate and are also critical to the success of fisheries management (2004). In the same vein, Jentoft (2004) holds that, institutions are essential to fisheries and fisheries could not exist without them. Those notions and even more, has caused the author to ask this question, what are institutions in fisheries management?

Institutions in fisheries management, could involve a lot of things. Jentoft (2004) on the one hand perceive the moral family, company or organizations to be key elements in defining institutions. Also, Jentoft (2004) recounting Magaret Levi (1990) maintains that, the definition of institutions is never complete if it does not include power to be amongst the defining attributes of institutions.

As far as the definition of institutions is concern in fisheries, Adams (1996) define institutions in fisheries management as, mechanism for the formal expression of common principles, and they exist to facilitate co-operation amongst human beings. On the other hand, the FAO (1997a), considers fisheries management institutions as support structures, created for the purpose of governance, consisting of a management authority and interested parties.

The perceptions of fisheries management institution by FAO (1997a) and Adam (1996), broadly spell out three issues which constitute fisheries management institutions. Both definitions clearly view human beings, laws and a management authority as fundamental considerations of fisheries management institutions. In other words, fisheries management institutions could be viewed as a collection of human endeavour, with a legal personality oriented towards continuously providing just tendencies to fisheries and those who depend on the resource for survival be it at the local, national or international level (Table 1). In more details, fisheries management institutions could be seen as bodies

of individuals, recognized by law to undertake activities to provide oversight and stewardship for the development, sustainability and equitable distribution of fisheries at the local, national, regional and global levels. We must note that, institutions described by FAO (1997a) are the modern institutions in fisheries management and that which is adopted in this paper. However, traditional institutions do exist in some areas, which manage fisheries and perform other functions which may or may not have legal recognition (FAO 1997a).

## **4.2. Evolution of fisheries management institutions**

Local communities, using religious beliefs, rituals organized the management of fisheries in the pre-modern era of fisheries management (New world encyclopaedia 2013). Fisheries, have been managed in some places for hundreds of years ago. In 1900 in France for instance, the “prud’homies” or the “wise men of the port” ensured that there were fair allocation of the resources and instituted harvesting regulations amongst others (Tempier 2013). Community based fisheries management however, encountered various challenges in modern fisheries era as each community and their marine resources become a part of national or global economy and fisheries were managed purely from a, perspective of economic growth with no attention given to ecological sustainability (New world encyclopaedia 2013) Modern fisheries management institutions started around 1936 (New world Encyclopaedia 2013).

Global policies, have provided an obligation for States to set up modern fisheries management institutions. The CCRF for instance stressed that, States should ensure that, an effective legal and administrative framework at the local and national level is established to conserve and manage fisheries (Article 7.7.1 CCRF). UNCLOS and the FSA, have stressed same for the management of shared stocks.

Institutions, now exist at local level such as co-operatives (or group of people with a voluntary desire to achieve common benefits from a fishery) for instance, the Alaskan Salmon Marketing Cooperative in the USA. At the national level, institutions exist such as government ministries for example, the Ministry of Fisheries and Animal Husbandry in Cameroon. At regional levels fisheries management organizations exist to manage fisheries such as the Indian Ocean Tuna Commission (IOTC) to manage shared stocks that occur in the Indian Ocean. And finally, the FAO exist at the global level to provide guidelines for the development of fisheries worldwide (FAO 1945 Constitution).

### **4.3 Role of institutions in fisheries management**

The role fisheries management institutions play, depends on the characteristics of the particular fisheries or nation and the needs of the resource user (FAO 1997a). The responsibility that fisheries management institutions have is to make sure that, they take actions to face those needs with a long-term objective rather than a short term one (Cochrane 2002). The CCRF on the other hand provides that, the objective of any fishery should be long-termed (Paragraph 7.2.1). The role institutions play is crucial to achieving long-term solutions to management challenges.

The overall role of fisheries management institutions is to manage fisheries sustainably, by performing actions which could be drawn from biological, social and economic perspectives. The FAO (1997a) provides the role and functions of fisheries management institutions and states that, the primary role of institutions in fisheries management is to make sure that, fisheries are managed in a responsible and sustainable fashion to meet management objectives by determining the nature and extent of users right (by determining who gets, what, when and how) from the fishery.

The FAO (1997a) further maintains that in the spirit of undertaking responsible and sustainable fisheries management, institutions should be created to perform at least one of the following functions below;

- Identify, the interested parties to the fisheries and oversee the formulation of the management objective.
- Interact and cooperate with interested parties to set up management plans, and define the criteria upon which decisions and regulatory measures will be based, evaluate and adjust as necessary.
- Ensure the implantation of management measures.
- Research, through collecting and analysing data.
- Liaising and negotiating, on behalf of the fisheries interest with users of either resources or area having an impact on fisheries.

The functions, of a fisheries management institutions listed above generally applies to the management of stocks occurring in a particular geographical region say a State and are not shared (FAO 1997a). The mechanism for cooperation in the management of shared stock (Stocks which migrate from one geographical region to another) is operated mainly according to the conditions provided by the UNCLOS and the FSA, same is true for stocks occurring in the high seas.

In any case, for institutions in fisheries to perform their functions at least the ones we mentioned above is an up-hill task. The first problem maybe to determine, who are the interested parties to the fisheries? To determine the interested parties of a fishery is also relevant as we shall see in the process of implementing the EAF (FAO 2009). More often than not, determining those who have interest in the fisheries is challenging to institutions. In some cases, the general public are *ipso facto* interested parties. Interested parties however could be stakeholder, contrasting parties (Commercial companies, artisanal etc.) (Fisheries and Ocean Canada 2014). The FAO (1997a) defines interested parties in fisheries as any person or groups of persons having legitimate interest in the conservation and management of the resources being managed.

Identifying interested parties in fisheries helps a lot to solve the problem of over-exploitation, and conflict amongst participants (Adams 1996). Sometimes, there may be conflict amongst interested groups in the fisheries industry and also between other maritime industries, if there is not enough surveillance or mechanisms to solve conflict of interest from management (Ministry of climate and Environment Norway 2009). In the case of Norway, the government have instituted and integrated management approach involving all maritime companies to solve the problem of conflict of interest (Ministry of climate and Environment Norway 2009).

The function, for fisheries management institutions to interact with all interested groups in the fishery, to conduct research about the fishery, ensure that there is compliance with management norms, and protect the environment are all important functions in fisheries management and also relevant in the implementation of the EAF but for want of time, we cannot examine all those functions in greater details.

The role institutions play in management of fisheries has come under strong criticism. Critics blamed institutions, for failing to stop the overexploitation and eventual collapse in some major fish stock, due to corruption and overdependence in science amongst others. As far as stock depletion is concern, there has been depletion of some rich fisheries such as tuna and cod just to name a few. The collapse

of the Canadian cod fishery for example in the mid 90's was partly blamed on the Federal Ministry of Fisheries and Oceans. The Federal Ministry of Fisheries, was blamed for pursuing economic gains and expanding the fishery rather than ensuring the biological sustainability of the fishery (Canada history 2013).

Furthermore, according to International Consortium of Investigative Journalism (ICIJ) (2012), institutions have failed to properly manage fisheries because of their endemic corrupt practises such as, violation of official quotas and illegal catches which contribute to the emptying of the ocean from fish.

Along the same line of thought, the World Bank and the FAO (2009) alludes that subsidies granted to fishermen and companies as incentives to reduce the cost of fishing contribute greatly to promote unstainable fishing as fishing, will continue even when the stock is declining and unproductive.

Criticisms, levied to fisheries institutions are many and cannot all be looked at here for want of time. Fisheries institutions nevertheless are responsible for effective management and should, be held accountable for their actions when things go wrong, "to whom much is given much is expected". True that institutions have failed in some respects to stop the overexploitation of fisheries, but they have also achieved some successes in the role they play to manage fisheries. The Striped bass (*Morone saxatilis*), recovery in the USA for instance have been accredited to the works of the Atlantic States Marine Fisheries Commission (NOAA 2011). The International Whaling Commission (IWC) have also been instrumental in recovering world's whale population that were over exploited (WWF 2015).

#### **4.4 Global institutional roadmap for the implementation of the EAF**

The FAO, is the global institution responsible for the development of fisheries through the FAO Fisheries and Aquaculture Department and the Committee on Fisheries (COFI) at least pursuant to Article 1 and 16 of the 1945 FAO constitution (1945 FAO Constitution). The FAO according to the 1945 constitution has the mandate to collect, compile, analyse and diffuse data and information on fisheries and aquaculture (1945 FAO Constitution).

The FAO was founded in 1943 at Hot Springs (USA), during the UN conference on Food and Agriculture, and was formally instituted during the first session of the FAO conference in Quebec,

Canada in 1945 (Philips 1981). The mandate, of the FAO as read in the 1945 Constitution is to alleviate mankind from hunger and starvation by promoting agricultural programs worldwide. The FAO has developed processes for the implementation of the EAF. In 2003 after the Reykjavik Conference, the FAO was put under pressure to develop guidelines for the implementation of the EAF by 2010 because, States could not implement the EAF due to lack of knowledge (Garcia *et al.* 2003).

#### **4.4. 1 FAO processes for the implementation of the EAF**

The FAO, through the Fisheries and Aquaculture Economic and Policy Division (FIF) and the Aquaculture Management Division (FIM) of the Fisheries and Aquaculture Department have issued guidelines for the implementation of the EAF in 2003 and has also introduced same in 2009 which supplements the 2003 guidelines. Our study is based on both but shall dwell more on the 2009 guidelines because it emphasis on the social, economic and institutional aspects of implementing the EAF (FAO 2009).

It's worth noting that, the FAO guidelines are not policies by themselves or they do not interpret laws (FAO 2009). The guidelines will only help in the implementation of the CCRF (As we said in chapter 3) and shall also serve as a makeshift idea as studies continues as to how proper the EAF can be implemented. According to the FAO (2009), the guidelines should be considered as preliminary to be revised as the EAF concept evolves and as additional practical experience becomes available (2009). The FAO roadmap for the implementation of the EAF involves four main processes which are thereafter summarised below.

The five processes for the implementation of the EAF, as recommended by the FAO (2009) (Fig.10) include;

- Initiation and preparation
- Formulation of the EAF policy and identification of issues
- Development of a management plan and operational objective
- Implementation
- Monitoring and evaluation.

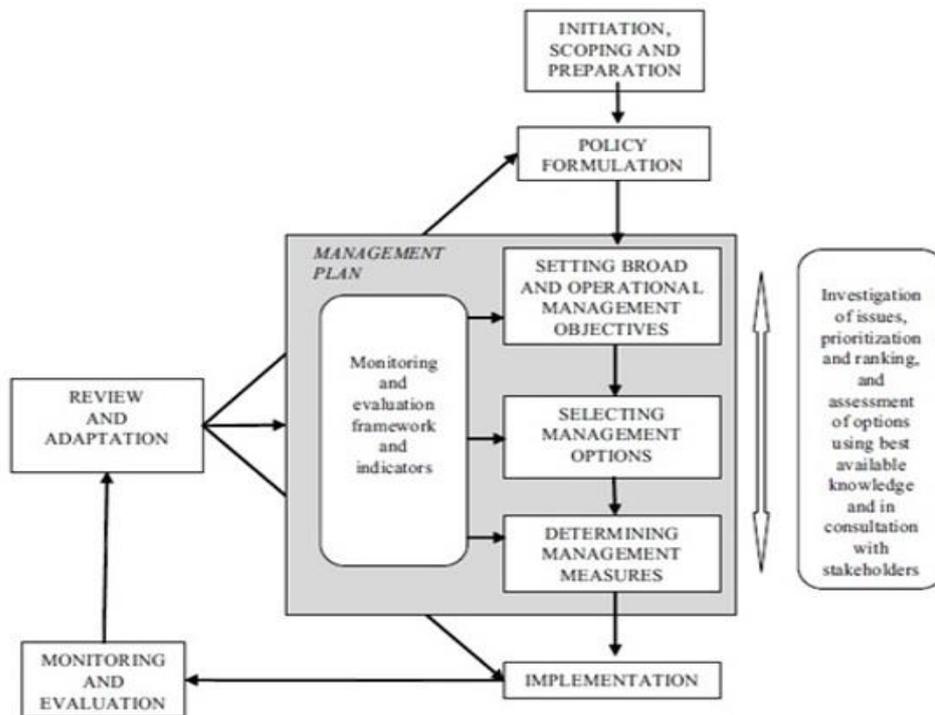


Figure 10 EAF implementation processes (FAO 2009).

Table 2 Initiation and preparatory phase of the implementation of the EAF (Authors).

Initiation and preparation phase (Constituent elements and their functions)	
Properties and their elements	Functions (Main) in the implementation process of the EAF
Fisheries authority (Which authority is involved?) <i>-Private or -Public</i>	-Allocate resources (Human and financial) for the implementation of the EAF. -Initiate and establish an EAF process plan
EAF working group (Who should be part of the working group?) <i>-Sociologist</i> <i>-Biologist</i> <i>-Economist</i>	-Identify stakeholders -Establish EAF plan

- <i>Skilled negotiator</i> etc.	
EAF management plan (What are the steps to follow to make EAF operational?)	-Contain the objectives and actions needed to make the EAF operational.
Stakeholders (Who are the participants?)	-Identify societal goals
EAF project and objectives (What is the scale of the project, LME or local?)	-Reproductive ecosystem services
EAF policies (What is the content?)  - <i>Principles of the EAF</i>	-Facilitate the materialisation of the EAF project.

Implementation of the EAF is not hand on, it is a sequential and interactive endeavour. The initiation and preparation phase is the first phase, in the process of implementing the EAF (Fig.10). As it obtains with, many interactive endeavours, the first phase is usually the most delicate phase and entails a lot of elements that will make or break the project (FAO 2009). Table 2 has been constructed by the author, to summarise the key elements of the initiation and preparation phase and their role in the implementation of the EAF.

To start with, implementation of the EAF is a project that requires the coordination of a fisheries authority which may be a public or private entity (Usually these authorities are public and are usually government ministries) as seen in table 2 above (FAO 2009). The competent authority must be identified in the initiation and preparation phase because they are in charge of allocating resources both human and financial and also responsible in establishing an initial EAF process plan. The human and financial resources, are key elements to the successful implementation of the EAF and must be secured at the beginning stages of the implementation process (FAO 2009).

When the competent authority is identified, the first task they perform is planning. Planning involves information gathering concerning some key issues of the fisheries such as, what is the condition and state of the resource? What are the risks of not responding to the concerns? If there is need to implement the EAF what is the scale? What is the type of fishery pelagic or demersal? Who are the indigenous people in the community involved? (FAO 2009). The duty to identify, consult and cooperate with the indigenous people in a locality where the EAF will be implemented is a legal one.

According to the preamble of the 2007 UN Declaration on the Right of Indigenous People, indigenous knowledge is important for the sustainable development and management of the environment. Article 19 of same provides that, States should consult and cooperate in good faith, with the indigenous people concerned before implementing legislative and administrative measures that may affect them (See the 2007 UN Declaration on the Rights of Indigenous People).

The human resource as seen in table 2 must be dynamic, multi-disciplinary, and collaborative and must consist of all EAF discipline (FOA 2009). They must possess the potential to collaborate with different partners and stakeholders group. Very importantly, the human resource must have people who are skilled negotiators, because they are the ones responsible to sell the EAF project and objectives to the general public and must importantly to the stakeholders (FOA 2009). The human resource group must be able amongst other things to break any deadlock that may arise during negotiations amongst interest groups and stakeholders in the fishery (FAO 2009). Finally, the human resource group needs an inter-sectorial advisory group or committee to coordinate the work at a higher political and administrative level, depending on the scope and scale of the EAF project (FOA 2009).

The human resource group, is responsible for identifying stakeholders. We saw, in the earlier section of this chapter who stakeholders in fisheries management are. The human resource group must identify and consult with the individuals, organizations and agencies that should be consulted and be involved beyond the immediate partners of the project and educate them about the EAF project (FOA 2009). The reason for the consultation is that, the human resource group must be able to identify the problems faced by the stakeholders and how it could be addressed by implementing the EAF. Most importantly, the human resource group must establish rules of engagement as to how the stakeholders should engage and participate in the EAF project (FAO 2009).

Both the human resource and the stakeholders group must cooperate to come up with an EAF plan, which must have clear objectives (See table 2 and fig.10). That plan, must be communicated to the masses through workshops and other capacity building forums, with means provided by the fisheries authority (FAO 2009). In fact, the authority in question must make sure and assure that the EAF plan is highly publicized. All interested parties, stakeholders and the general public must know what is going on. Languages used during such forums must be clear and simple for all to understand (FAO 2009).

Policy formation is the last part of the first phase of the implementation process of the EAF. Once all the ground work has been done, all negotiations with the different stakeholders have been arrived at, and the EAF plan has been adopted, the next step is to protect the plan through the setting up of the EAF policies that will be respected by all (FAO 2009). The next part of this paper will dwell more on the policy formation, but it suffices us to say here that such policies depend as well on the scale of the EAF project.

In any case whether big or small, the EAF policy must be visionary and take into account; the description of the ideal state of the fishery, the ecosystem which the authority aspire to achieve both in terms of its biological status and in terms of their socio-economic circumstances and governance arrangement FAO (2009). For instance, the vision of a small scale fishery maybe to achieve national recognition (FAO 2009). And, contribute to the socio-economic development of the nation at large not only in the local community where the fishery occurs.

Policy formation, must include some priority issues. The next phase of the implementation process is to identify priority issues in forming EAF policies and will be discussed below.

#### **4.4. 2 Identification of priority issues and the formation of the EAF policy**

Identification, of the priority issues and formulation of the EAF policy is an elaboration of the policy formulation process (FOA 2009). Formulation of the EAF policies may sometimes, require the amendment or scrapping of the existing policies and management framework. EAF policies, are designed based on the feedback gathered from all relevant stakeholders groups about the information on the fishery, its policies, the present legal framework and the socio-economic atmosphere of the region in question and must conform to EAF principles (FOA 2009).

We must note that, the setting up of priorities depends on a number of issues which include; the macro-economic policy of the country, the particular focus of the current political regime or commitment that have been made in terms of international agreements and conventions (FAO 2009).

The formation and contents, of an EAF policy on the other hand depends on the scale of the EAF project (FOA 2009). According to the FAO, typical policy goals of an EAF policy at the local or national level may include the EAF principles and statements relating to the socio-economic situation of the community, gear restriction, fishers rights and access (Management and use rights), priorities given to different fishery subsectors or the role the fishery sector should play for instance in creating jobs, some of which were discussed in the sections above. At the global level as we saw in chapter three, such policies may include statements concerning the decline of trans-boundary stocks, impact on other sectors such as oil and gas exploration sectors. They may also include input control measures such as TAC as recommended by UNCLOS (See article 61 of the Law of the Seas Convention 1982).

At the end of the policy making exercise, a document should be made available to all stakeholders and the public in general, so as to ensure compliance and transparency. The policy document in question must be revised regularly to incorporate relevant development and experiences gained (FAO 2009).

After the establishment of the EAF policy document, there must be mechanism to implement those policies. Managers must therefore develop an EAF management plan and set its objectives (FAO 2009).

#### **4.4.3 Development of an EAF management plan and its objectives**

The EAF management plan, provides a mechanism to support the implementation of the adopted EAF policies and the institutional framework of the EAF. The management plan according to the FAO (2009), specifies the objectives and actions needed to achieve the broad goals of an EAF project (table 2 and Fig.10). The management plan also provides the role of engagement, how stakeholders and partners of the EAF project are supposed to participate in the EAF project and most importantly, how the reference points and indicators of the project are to be selected (FOA 2009).

The management plan, and their objectives must include the EAF principles. The objective of the management plan should be divided in two; broad management objectives and operational objectives. Operational objectives on the one hand are objectives related to the fishery system such as, to maintain

the biomass of the fishery to achieve MSY while, the management objectives refers to the objectives related to management such as the development of research and management capacity (FOA 2009).

The objectives, whether operational or managerial must be prioritized because of want of resources and their degree of importance. Some objectives, are more important than others and should therefore take credence over the other (FOA 2009). Prioritizing EAF objectives constitute and uphill task for management, and may lead to conflict of interest amongst stakeholders. Management, must therefore at that juncture make hard choices. When faced with tough choices, management must take into account the “second best” to every of stakeholders opinions through extensive negotiations, to come up with a solution (FOA 2009). If the deadlock persists, then management must make a final choice without any other consultation and negotiation with the stakeholders groups and move to the implementation phase of the project.

#### **4.4.4 Implementation phase**

The implementation phase of the EAF project begins when, the EAF plan has been drafted and the objectives and goals have been set and approved by the competent authority and all interested groups and partners (FOA 2009). Implementation of the EAF involves the participation of the governmental agencies and a broad institutional set-up including collaboration with partners outside the fisheries sector.

Implementation of the EAF, requires a broad management scope and support from higher levels within the national administrative and political arena and from other partners such as NGO from the private sector for coordination and provision of resources necessary for implementation. Often implementation will also require further training of staff to fully understand the EAF concept (FAO 2009).

After the implementation of the EAF project, a compliance group, information and management unit, should be put in place to constantly study and review the project for updates if necessary (FOA 2009). For a wider project, observer’s schemes such as Vessel Monitoring System (VMS), for survey and control of closed areas and MPA should be available. At this level, communication and transparency are crucial for the success of the EAF project, observers and law enforcement officers must truthfully report what they observe (FAO 2009).

The processes to be followed by States and managers to implement the EAF have been described, they are very elaborate (At least as of now pending new findings) and if fully implemented, they will achieve the desired results and revive the fisheries sector, but are managers desirous to practically adopt an EAF? The development, of the EAF processes which we have described above should render the single-species objectives to fisheries management incongruous if managers are willing to implement them. Maurtinez *et al* (2015) argues that, fisheries management is still predominantly single-species oriented and takes little account of the ecosystem processes and key aspects of the EAF irrespective of the fact that, policy documents have adopted the EAF.

The opinion of Maurtinez *et al.* (2015), should not be laugh off. Implementation of the EAF, requires some key elements of governance which may be lacking in a system and impedes the adoption of the EAF. In practise, the successful implementation of the EAF according to the FAO (2009) depends largely on the following;

- The political commitment of the State in question.
- The appropriate legal and institutional framework that will enable practical implementation.
- The capacity and skills of the human resource and the equipment they have.
- Cooperation across the relevant sectors and department.
- Level of stakeholders support.
- Appropriate funding.

The theoretical processes listed above for the implementation of the EAF, are crucial for the success of the EAF project, none is more important than the other. For want of time, we will not discuss these factors in greater details all the issues involved for the practical implementation of the EAF processes. In the next chapter, we will study in greater details how all those issues contribute to the successful implementation of the EAF. Amongst, those determinant factors listed above for the successful implementation of the EAF political commitment, will be looked at briefly below.

According to the FAO (2009), political commitment is the most important determinant factor for the implementation of the EAF. If there is strong political commitment, all the other determinant factors such as department cooperation, funding will be available suggesting that there will never be the implementation of the EAF without a political commitment, so what is political commitment? Political commitment, is the level of awareness of politicians and the civil society of the benefits of adopting a particular approach or supporting a particular initiative (FAO 2009).

As illustrated above (Fig.1), politics is the driving force behind fisheries management processes and objectives. What obtains in fisheries management, is as a result of strong political lobbying. The strength of politics cannot only be seen in fisheries management, before a country for instance engages in war with another country requires a political rather than a military decision. Politics therefore overrides all administrative processes of a State or any entity. Implementation of the EAF cuts across other sectors such as tourism, agriculture, shipping and a host of others (FAO 2009). Based on that institutional intersection, there is bound to be conflict of interest when a decision to implement the EAF is arrived at. There is therefore a need to maintain a strong political commitment.

Maintaining a strong political commitment over time is challenging because politicians, come and go with different political agendas to execute (FOA 2009). In any case, it is very important for a system or State to sustain an EAF agenda irrespective of the particular agenda of politicians that is the only way to in which the human and institutional capacity can be built to make the EAF mainstream (FAO 2009). For there to be a strong political commitment to implement the EAF, the following factors must be considered according to the FAO (2009);

- 1) *The quality of scientific advice.* The quality of advice politicians and elites of the civil society get is a good determinate factor to buster a political commitment to pursue an EAF project (FOA 2009). Science may sometime fail to procrastinate rightly, but it helps greatly if politicians believe that the advice they got from scientist is accurate and dependable and that they (politicians) do not need to look anywhere for another opinion or advice (FOA 2009). We are all witness to, the change in the way politicians pursue the emission of CO<sub>2</sub> due to the advice they got from scientist about its effects on the planet. Furthermore, politicians have been persuaded to ban and discourage smoking especially in public places due to the warnings received from scientist about the sporadic effects smoking in public can cause to smokers and non-smokers alike. Politicians will be committed to implement the EAF if they are persuaded by good and dependable advice from fisheries scientist.
- 2) *Obligation to international instrument.* Politicians, could implement the EAF because international treaties and laws which they are parties to warrants them to do so, thus policy engagement could be a strong determinant factor to implement the EAF (FOA 2009). The Vienna Convention stresses this duty and adopts in article 26, the principle of *Pacta Sunt Servanda*, which provides that, all parties to a treaty must perform their obligations under that treaty in good faith

(See Article 26 of the 1969 Vienna Convention). To this end, political commitment for a State to implement the EAF could be busted by their engagement to International policies as well.

- 3) *Diversified Stakeholders group*. A diversify stakeholders group could also help to buster political commitment. It's believed that, if the stakeholders groups are diversified as containing different professionals, they will make a better and stronger argument and reduce political polarization and this obtains as well in lobbying for implementation of the EAF by stakeholders groups (FAO 2009). A diversify stakeholders group is capable of making stronger arguments from different provinces or disciplines about the consequences of not acting, that is if the politicians are adamant to act (FAO 2009).

The processes, for the implementation of the EAF as developed by the FAO has been described. The next issue is, how is the EAF implemented in practise? The next chapter shall describe how the EAF is implemented in the IFMP project in Canada.

## **CHAPTER 5: Integrated Fisheries Management Plan of the ground-fisheries in the pacific region of Canada, an example of an EAF project**

### **5.1 Introduction**

The implementation of the Integrated Fisheries Management Plan of the ground-fish in the Pacific (IFMP) was initiated as we shall see, by the government of Canada to solve the problems that arose with the management of the ground fisheries in the Pacific. The IFMP is therefore an example of how an EAF is implemented in practise by a government.

Implementation of the EAF is now, a global responsibility for member States based on its adoption in global treaties such as UNCLOS and supplementary instruments, looked at previously. States are therefore required based on their sovereign rights to adopt their own policies and EAF projects to manage fisheries found under their jurisdiction and use perhaps, the FAO's EAF implementation process framework as their guide.

Canada being a member of UNCLOS and a sovereignty State implements the EAF in the management of the Pacific ground-fisheries through the IFMP. How is the IFMP implemented? In this chapter we will provide an overview of how the IFMP is implemented by the State of Canada as an example of an EAF project. We will look at the IFMP implementation process, the institutions and interested groups involve in the IFMP implementation process and how they interact to achieve IFMP objectives.

As we shall see in this chapter, the IFMP was initiated to solve the problems associated with the management of the ground-fish in the Pacific region such as stock depletion and marine degradation. The objectives of implementing the IFMP are met as most species of the ground-fish covered by the IFMP have recovered. This chapter is therefore structured as follows; the first part of this chapter will look at the case study justification for the IFMP. The reasons and background of the IFMP will be accounted for in the second part of the paper. The third part of this chapter will examine how the IFMP is implemented in the Pacific region of Canada, and the last part of the paper will look at the results or the benefits associated with the implementation of the plan in the Pacific region of Canada.

## **5.2 IM and IFMP relationship**

IM is the core concept of the IFMP. As our analyses will show, IM and EAF are related concepts, hence justifying our reliance on the IFMP. Garcia *et al.* (2003; 7) argues that “the EAF are subsets or alliances of IM”. Charles (2011) on the other hand holds that, IM and EAF have the same objectives. By Charles’s (2011) account, IM and the EAF seek an integrated and holistic approach in the management of human uses in a given area, paying attention to ecosystem impact of those human uses which is inherent in the EAF and incorporated in IM.

The IFMP, is a developed and successful EAF project. The IFMP takes into perspectives EAF concepts such IM, PA and MPA (Fisheries and Ocean Canada 2010). Science is an indispensable variable to study and understand ecosystem process in implementing an EAF (National Marine Fisheries Service 2009) the IFMP combines the best available science in the collection of data and harvesting of species (Fisheries and Ocean Canada 2015). As far as achieving EAF objectives are concern, the IFMP demonstrates the best efforts to achieve management objectives (British Columbia Salmon Marketing Council 2014). Furthermore, the IFMP is considered by some as the most comprehensive right-based management program in the world (Strauss 2013).

## **5.3 Canada and the IFMP**

Canada is the biggest maritime State in the world, located in the Northern most part of North America and has a total population of 34.126.00 million in habitants as per the 2011 FAO statistic (See FAOSTAT 2015). As far as the management of fisheries is concern, the Department of Fisheries (DFO) or the Ministry of Fisheries is the main administrative institution charged with the management of fisheries in Canada (Fisheries Act 1985).

The 1985 Fisheries Act, as amended in February 26, 2015 provides that the DFO has the mandate to provide conditions for the management of fisheries in Canada (Fisheries Act 1985). The DFO is therefore responsible to implement Canada’s right base program. Canada operates a right-base program to manage fisheries found in regions under her jurisdiction (Article 10 of the 1985 Fisheries Act). As a result of her right-based program, Canada distributes quotas to fishermen and commercial companies in order to maximize individual financial profitability and stability, and exercise flexibility and freedom in planning and conducting their own fishing activities (FAO 2010-2015).

Canada's fishery and aquaculture department, contributes enormously to the economy of Canada. In 2009 for instance, the sector offered about 54,500 persons with job in Canada (FAO 2010-2015). The reasons why, the fishing sector contributes greatly to employment is because, Canada produces huge tons of fish annually. The total fisheries production in 2011 was 102, 380, 0 tonnes of which, 84% came from captured fisheries and the rest from aquaculture (FAO 2010-2015).

Canada is a net exporter of fish. In 2012, Canada's exports was valued at USD 4.2 billion, while imports at USD 2.7 billion, given a surplus of approximately USD 1.5 billion (FAO 2010-2015). Canada has also demonstrated her commitment and support for global treaties. Canada is a member of the relevant treaties such as UNCLOS which support sustainable fisheries as we saw above and also a member of 12 RFMO's including the American Tropical Tuna Commission (ATTC) amongst others (FAO 2010-2015). Based on her commitment to global treaties Canada, and her pursuit of sustainable fisheries, Canada has adopted several IFMP projects since 1995 (Fisheries and Ocean Canada 2013a). Our study is based on the IFMP conducted in the ground-fish in British Colombia (BC).

The IFMP started some decades ago in BC and, originated from a pilot program initiated in the region in 2006 that combined the halibut (*Hippoglossus Stenolepis*), sable-fish (*Anoplopoma Fimbria*) and ground-fish trawl program (Strauss 2013). Strauss (2013) provides a detail background of the IFMP project.

According to Strauss (2013), the reason for the implementation of the IFMP was because the ground-fish of the Pacific was declining due to little management. Strauss (2013) details that, around 1970, the ground-fish in the B.C was open to domestic and foreign fleets and as a result of poor management the stock began to decline.

To rebuild the declining stocks of the ground-fisheries in B.C, managers employed several approaches which included; entry licensing, annual catch limits, fishery closure and gear and vessel restriction (Strauss 2013). By 1995 and according to Strauss (2013), the ground-fisheries in the Pacific were closed down due to severe overharvesting and the inability for managers to ensure compliance to catch limit. The problems, faced by managers of the ground-fisheries in the Pacific around 1995 could be summarised below; Shortened seasons, ineffective catch limit, unsafe fishing conditions, high discards rates, and inconsistent supply of fish seafood (Strauss 2013).

Around the mid-90s, there was a change in the management of fisheries in B.C, with the allocation of fishing rights programs in the ground-fisheries and other fisheries such as halibut (*Hippoglossus Stenolepis*), sable-fish (*Anoplopoma Fimbria*) fisheries (Strauss 2013). In 2006, managers implemented the IFMP as a pilot program that combined the halibut (*Hippoglossus Stenolepis*), sable-fish (*Anoplopoma Fimbria*) and ground-fish trawl program (Strauss 2013). The IFMP also incorporated, all commercial hook and line caught rockfish (*Sebastes*), lining cod (*Gadus*) and dogfish (*Squalus acanthias*) in the program (Strauss 2013).

In the 2010/2011 fishing season, the program was made permanent and has successfully achieved its goals. According to Strauss (2013), the IFMP program has been able to reduce bycatch, increase profit, create jobs, and a put in place a fleet-wide catch limit that is rarely exceeded, making the IFMP programme the most comprehensive right-based management program in the world.

### **5.3.1 Case study area and location for IFMP**

The ground-fish IFMP is operated, along the coast of the Canadian province of BC (Fig.11). BC is situated in the Pacific region of Canada and is the westernmost of Canada's 10 provinces (British Columbia 2015). BC shares borders to the South with Washington State, Idaho and Montana, Alberta to the East, Northwest and Yukon territories to the North and Alaska to the Northwest (British Columbia 2015). With a population of 4.62 million inhabitants (2012 censor), BC has a total land and freshwater area of 95 million hectare, larger than France and Germany combined (British Columbia 2015).

As far as the fishing areas of the IFMP is concerned and as illustrated in the map below, the areas allocated for fishing under the IFMP is provided by the 2007 Pacific Fishery Management Area Regulation (Pacific Fisheries Management Area Regulation 2007). The IFMP occur in eleven (11) fishing areas along the coast of BC as illustrated above (Fig.11). These areas include; Areas 3C,3D,3D,4B,5A,5A,5B.5B,5C,5D,5E.

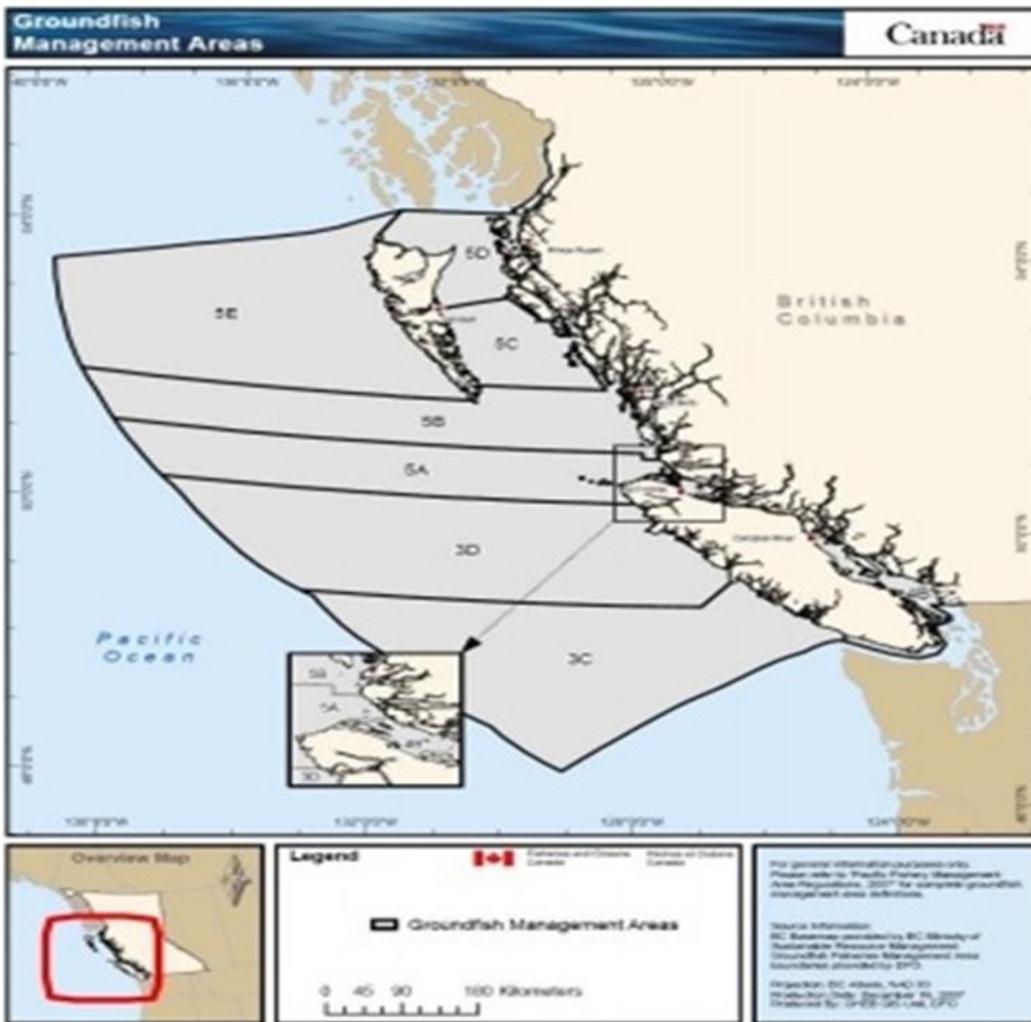


Figure 11 Map showing the IFMP implementation area (Fisheries and Oceans Canada 2014).

Area numbers, are given to detect the fisheries that could easily be found in those locations. Owing to the fact that, fisheries are highly migratory some species such as widow rock (*Sebastes entomelas*) occurs coast wide while others such as, the big skate (*Raja binoculata*) occur in area 5C/5D (Fisheries and Ocean Canada 2014).

### 5.3.2 The ground-fish

The ground-fish is the fish type covered by the IFMP as illustrated in table 3 below. The ground-fish simply refers to fisheries which leave on or near the bottom of the sea (Fig.12) (Pacific Fishery Management Council 2014). The IFMP covers about 200 species of ground-fish (Fisheries and Ocean Canada 2014).



Figure 12 Picture showing the ground-fish (NOAA 2012).

### **5.3.3 Institutions and management of the IFMP**

The establishment of EAF policies are crucial for the implementation of the EAF project (FAO 2009). There are, several national policies involved in the implementation of the IFMP some of which are illustrated below (table 3).

The 1985 Fisheries Act, 2002 Species at Risk Act, the 1996 Oceans Act are some of the relevant policies which provide the conditions for the management of fisheries in Canada and the implementation of the IFMP. As far as the IFMP is concern, the 1996 Oceans Act and the 1993 Nunavut Land Claim Agreement are the most relevant policies. As provided in the 1996 Oceans Act, the DFO is the main administrative body involve in the implementation of the IFMP (Oceans Act 1996; Fisheries and Ocean Canada 2014). To this end, the DFO makes decisions with regards the implementation of the IFMP.

### **5.3.4 Participants and type of fisheries managed by the IFMP**

The participants, of the Pacific ground-fisheries are identified under three fisheries and they include; First Nations fishermen, recreational and commercial fishermen (Fisheries and Oceans Canada 2014);

- 1) First Nations, are participants of the Pacific ground fishery according to the 1990 Sparrow decision. The 1990 sparrow decision will be discussed, but first we must determine perhaps briefly who First Nations are. There is no legal definition of First Nation (Government of Canada 2012). According to the Government of Canada (2012), First Nation is usually referred to the Indian people in Canada both status and non-status. In more details First Nations, are the early migrants from India who settled in North America (Government of Canada 2013).

The history, of First Nation is important to our understanding of the significance they get from the DFO in the implementation of the IFMP. First Nation settled in six regions in Canada including BC (Government of Canada 2013). The Government of Canada (2013), account the history of the First Nations settlement in Canada and provides that the First Nations were the first settlers of BC and occupied the land for settlement purposes in 1849. James Douglas, the governor of Vancouver entered into several treaties with the First Nation communities in BC to transfer their land, to the administration in exchange of money and gift for the consideration that the First Nation community still gained access to the land for hunting and fishing. In 1854 BC was reluctant to continue the treaty with the First Nations as they were deprived from fishing and hunting in the land. That deprivation continued even when BC joined the confederation (Government of Canada 2013).

In recent years, the Government of Canada has been working in partnership with First Nation in the spirit of reconciliation, to build stronger First Nation communities and resolve all outstanding land claims (Government of Canada 2013). The desire to resolve all differences with First Nations is reflected in the IFMP. In the 1990 Sparrow case, the court held that, where an aboriginal group has an aboriginal right to fish for Food, Social and Cultural (FSC) purposes takes priority after conservation of the resources (Supreme Court of Canada 1990). Based on the Sparrow case decision, the First Nations are participants to the ground-fish in the Pacific and interested parties in the IFMP (Fisheries and Oceans Canada 2014).

- 2) Recreational fishery occur coast wide and is subject to tidal waters, and is regulated through Sports Fishing Licence requirement (Fisheries and Ocean Canada 2014). More information about recreational fishery is provided below.
- 3) Commercial fishery is the third fishery managed by the IFM. Seven distinct commercial ground-fish sectors (Ground-fish trawl (T), Halibut(L), Stable-fish(K), Inside Rockfish (ZNI), Outside Rock Fish(ZNO) and Long Cod and Dog Fish fisheries) are operated under the IFMP and are managed through Individual Transferable Quota (ITQ) (Fisheries and Ocean Canada 2013; Fisheries and Ocean Canada 2014). According to Fisheries and Oceans Canada (2014), there are 300 active ground-fish vessel recognized under the IFMP as of 2014.

Table 3 Key elements and properties of the IFMP (Authors)

<b>Elements of the IFMP</b>	<b>Substances of the IFMP</b>
IFMP	B.C
Duration	Indefinite
Fish-stock involved	Pacific ground-fish
Reasons for the IFMP	-Sustainable ground-fish stocks -Reproductive ecosystem services
Policies	-Oceans Act (main policy)
Managing institution	DFO
Participants/interested groups	-First Nations -Recreational fishermen -Commercial fishing companies
Gears used	-Trawling -Hook and line -Traps
Mechanism of governance	Right-based
Method of governance	-Closed and open seas -MPA -PA -Quotas etc.
Results	-Food security -Employment -Increase revenue

### **5.3.5 Stock assessment mediums of the IFMP**

Decision making, in the management of stocks are done based on sound science from the DFO Science Branch (Fisheries and Ocean Canada 2014). The DFO's Science Branch together, with the Ground Fish Integrated Advisory Board and the Ground-fish section of the DFO Science Branch Pacific Region provides the DFO with information regarding the management and policy options of the IFMP (Fisheries and Ocean Canada 2014).

The Centre for Science Advice Pacific (CSAP), provides science advisory processes in the Pacific regions (Fisheries and Ocean 2014). As recommended by the CSAP, scientific assessment and advice representing the management of the fishery is peer reviewed annually in regional peer review meetings (Fisheries and Oceans Canada 2014).

Aboriginal traditional knowledge or traditional ecological knowledge, is also considered when making decision about the ground-fisheries (Fisheries and Ocean Canada 2014). Observations and comments provided by the First Nations (Fig.13), are considered in the management decisions of the IFMP when provided (Fisheries and Oceans Canada 2014). The DFO staffs, performs a routine work to collect all information and data regarding the general biology of the fishery, analyse and process those decisions before management decisions are made. Decision making in the IFMP involves a governance process.

### **5.3.6 Governance mechanism of the IFMP**

The governance mechanism and the methods, used by the DFO and associated committees to achieve the objectives of the IFMP are many. Fig.13 was constructed by the author, to summarise the institutions and interactions between the stakeholders in the implementation of the IFMP. The methods used by the DFO to achieve the objectives of the IFMP include; by-catch limit, mesh size restriction, small fish protocol, open and closed seasons, quotas, closed areas, MPA and PA (Fisheries and Ocean Canada 2013a; Fisheries and Ocean Canada 2014). Those measures cannot be looked at in greater details for want of time but nevertheless, they are vital in governing the IFMP.

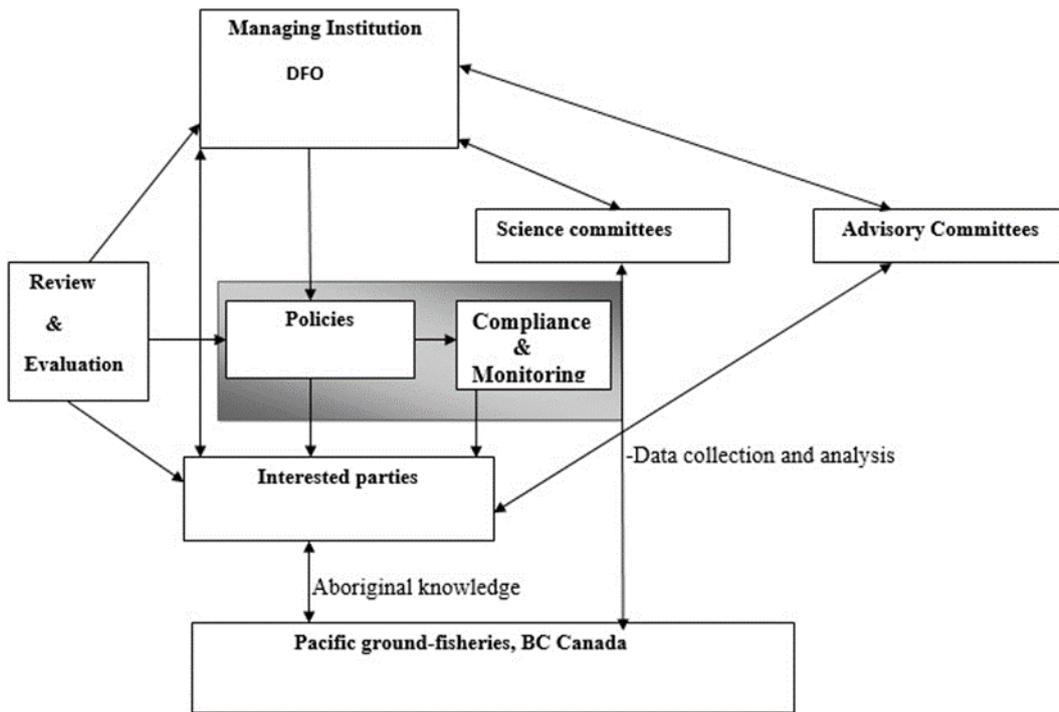
First Nations FSC fishery occurs all year round, and there is seasonal commercial and recreational fishery under the IFMP (Fisheries and Ocean 2014), proper management is therefore required. To this end, several committees and sub committees have been established to provide management advice (Fisheries and Ocean Canada 2014);

- Halibut Advisory Board (HB)
- Sports Fishing Advisory Board
- Ground Trawl Advisory Committee (GTAC)
- Sablefish Advisory Committee (SAC)
- Ground-fish Hook and Line Sub-Committee (GHLC)
- The Commercial Industry Caucus (CIC)
- The Ground-fish Integrated Advisory Board (GIAB)

Those committees listed above, play different functions in the governance process of the IFMP. We cannot examine the role played by all those committees mentioned above for want of time but, the Sport Fishing and Advisory Boards for instance provide recommendations to the DFO on matters relating to recreational fishery (Fisheries and Ocean Canada 2014). These committees meet regularly with the DFO through bilateral consultations, advisory processes, management board meetings, technical groups and other roundtable forums to discuss issues concerning the IFMP (Fisheries and Ocean Canada 2014).

Canada has a top-down system of government as we saw above. Access and allocation decisions of the IFMP, are taken by the DFO as recommended by the Fisheries Act after consultation with all stakeholders and committee members involved (Fisheries and Ocean Canada 2014; Fisheries Act 1985). The DFO, provides access to all three types of fishery that operate under the IFMP including the First Nation, recreational and commercial fishery.

For the First Nation fishery, the DFO has agreements with First Nations communities such as Nisga and the Maa-Nulth to provide access to the fishery subsistence, monitoring, reporting and other matters (Fisheries and Ocean Canada 2014). The DFO, has also provided the First Nation with communal commercial ground fish licenses and quota (Fisheries and Ocean Canada 2014).



**Key;**

All arrows indicate interactions amongst different institutions

Figure 13 Diagram showing the institutions and processes involved in the implementation the IFMP ground-fish project (Author's).

As far as governance of the recreational fishery is concern, daily and possession limits are in place for various ground fish species (Fisheries and Ocean Canada 2014). The British Columbia Tidal Waters Sports Fishing Guide provide catch limits for each species. Guide provided by the British Columbia Tidal Waters Sports Fishing Guide helps the DFO to provide allocation of the recreational fishery. For instance, there is a commercial recreational halibut (*Hippoglossus Stenolepis*) allocation, formula that allocates 15% of the commercial-recreational TAC to the recreational sector and 85% to the commercial sector (Fisheries and Ocean Canada 2014).

For the commercial fishery covered by the IFMP, TAC for each species are allocated between the different fish sectors, trawling, hook and line and halibut (Fisheries and Ocean Canada 2014). A more detail, list of the allocation of the ground-fish species between the commercial sectors is available in Fisheries and Ocean Canada (2014). For want of time and space, I cannot provide the full list but for

the Rock fish for instance, the Pacific Ocean perch (*Sebastes alutus*), trawling allocation was 99.98%, hook and line allocation was 0.02% and Halibut was 0.00% (Fisheries and Ocean Canada 2014).

The IFMP, also strives to avoid stock depletion and ecosystem integrity, in the spirit of achieving EAF objectives. For instance, species such as the species of shark which have been protected by the Species at Risk Act of Canada are eliminated from direct fishing under the IFMP (Fisheries and Ocean Canada 2013a). As for restoring ecosystem integrity, the DFO have integrated PA and MPA into the IFMP. The DFO, for instance after consulting with the interested groups have initiated two, MPA's in the Pacific region and they include; the Hydrothermal Vent, designated in 2003 and the S.Gaan Leiglas-Bowe seamount MPA (SK-B) designated in 2008 to restrict fishing in those areas and to achieve conservation objectives and healthy ecosystems (Fisheries and Ocean Canada 2013a).

### **5.3.6 Compliance mechanism of the IFMP**

Compliance mechanism is an important element in an EAF plan (FAO 2009). In the IFMP, the Conservation and Protection (C&P) program is responsible for compliance (Fisheries and Ocean Canada 2014; Fisheries and Ocean Canada 2011). The C&P program, is part of the EAF program to facilitate compliance with the acts and regulations associated with Canada's aquatic resources (Fisheries and Ocean Canada 2014). The C&P, uses the following methods to ensure compliance of the IFMP (Fisheries and Ocean Canada 2014; Fisheries and Ocean Canada 2011);

- Education
- Partnering
- Enforcement
- Mediation

The C&P operates through fisheries officers, who ensure the compliance of Canada's ocean regulatory framework (Fisheries and Ocean Canada 2011). In the IFMP, there are about 155 fisheries officers stationed in the Pacific region in areas such as B.C and Yukon territory and ensure that there is compliance with Canadian fisheries management policies which we mentioned above and that, the IFMP conditions are respected (Fisheries and Ocean Canada 2014). The activities, of the fisheries officer are encrypted in section 5 of the Fisheries Act. As far as the IFMP is concern, the fisheries officers for instance reports all acts and occurrences in the ground-fisheries, including commercial ground-fish landing (Fisheries and Ocean Canada 2014).

Furthermore, air surveillance and sea patrols are conducted to ensure the successful implementation of the IFMP (Fisheries and Ocean Canada 2013a). Patrols at sea for instance, are conducted using small craft and Canadian Coast Guard (CCG) vessels. The CCG vessels are staffed and operated by CCG staffs, and marine enforcement officers. Fisheries officers, may be deployed on board CCG vessels throughout the year to patrol specific fisheries, as required by UNCLOS and Canadian policies.

At the end of each year, the IFMP plan is assessed and reviewed after consultation with interested parties (Fisheries and Ocean Canada 2014). During the review, short and long term objectives are re-discussed. The short and long term objectives reached at in 2014 are available in Fisheries and Ocean Canada (2014) and include amongst others, mechanism to increase data collection and a lot more (Fisheries and Ocean Canada 2014).

#### **5.4 Benefits and cost associated with the implementation of the IFMP**

The primary objectives or reasons why the IFMP was established, has been discussed and include the need to provide food security and a productive ecosystem as we saw above. Food security and reproductive ecosystem services are all principles of the EAF (FAO 2009).

The IFMP as implemented in the province of BC has successfully achieved its primary objectives. Based on what we have covered above, the implementation of the IFMP has contributed to employment, FSC food security, sustainability of stocks and a reproductive ecosystem. The Canadian Ground-fish Resource and Conservation Society (CGRCS) for instance, praised the conservation methods employed to manage ground-fish in the BC and alludes that, due to proper management, BC ground-fish, has contributed valuably to jobs and revenue year after year (See Canadian Ground-fish Research Society 2010). Furthermore, stocks managed by the IFMP such as the Pacific halibut ((*Hippoglossus stenolepis*) are healthy and sustained (SCS global services 2013).

The benefits, associated with the implementation of the IFMP came with some cost, which includes;

- *Strong commitment to global policies (political will)*. The objective of Canada's ocean management strategy is to manage fisheries (according to the principles of sustainable development adopted by global polices to which she is a member State) such that, the resources meet the needs of present and future generations (article 32(a) of the Ocean Act of 1996; Policy Horizon Canada 2013). It's also on that basis that the IFMP was established (See Ocean Act of

1996). The IFMP, is therefore operated based on Canada's obligation to treaties which support fisheries management in an ecosystem context. Canada to this end has the will to meet up with all the global requirements needed to implement the EAF such as reduce fishing efforts and avoid ecosystem degradation.

- *Funding.* The total amount of money used for the IFMP or perhaps the annual budget of the IFMP has not been disclosed. The fact is, Canada has the means for instance to hire the human resource and the skills required for the implementation of the IFMP such as biologist, law enforcement officers, and qualified staffs to conduct continuous assessment of the plan.

The successes of the IFMP is evident and has been mentioned. The next chapter shall analyse the results and key issues raised in this study.

## **CHAPTER 6: Discussion and conclusion**

### **6.1 Introduction**

Institutions have always been criticized for the decline of stocks and marine habitat degradation, based on their specific, single and sectorial traditional approaches to fish stocks and ecosystems (Staples et al. 2009; Wang 2009; Tanaka 2010). Consequently, global institutions, policies and national establishments have focused on and have started to adopt a holistic and diversified cross-sectorial approach to sustainably manage fisheries and earn reproductive ecosystems. A lot, has been written already about the EAF. The human dimension of the implementation of the EAF, needs to be fully understood (FAO 2009). The main objective, of this study was to deeper and enhance existing knowledge about the implementation of the EAF as recommended by global institutions and as practised by Canada through the IFMP. Our findings have been reported. Be that as it may, there are still some key issues to be discussed.

### **6.2 EAF and the traditional approach to fisheries management, where do we draw the line?**

The EAF, paradigm is akin to the conventional approach employed by institution. Both approaches are oriented towards the management of human activities. The differences between the EAF and the conventional approach is simply a change or modification of objectives. The change in objective(s) is now witnessed in the inclusive and general character of the EAF as compared to, the exclusive objectives of the traditional approach (Fig, 4) (which quite often did not lead to sustainable fisheries (Staples et al. 2009; Wang 2004). Tanka (2012; p.237) is of the same opinion and argues that, “the distinguishing feature of the ecosystem approach is that it is integrated and holistic”.

The principles that underpin the EAF, are crucial for the implementation of the EAF (Hoffman et al. 2006). Those principles, were listed in this study but were not explored due to want of time. Probably, future studies will provide an in-depth analysis to EAF principles so as to broaden understanding of the EAF concept. However global treaties such as UNCLOS, which adopts the conventional approach to fisheries management widely adopt EAF principles signifying that, the EAF framework is not new in fisheries management as maybe perceived. Garcia et al. (2003), is of similar opinion and argues that, the EAF is not a novelty, its roots are buried deep in fisheries management.

### **6.3 Right to implement an EAF**

The legal base or right for States to implement the EAF emanates from global policies. This study revealed that, global policies have explicitly adopted an EAF suggesting therefore a change of objective to embrace all concerns associated with the management of fisheries. That change in objective can be witnessed in policies concluded after UNCLOS. UNCLOS adopts implicitly the EAF, treaties concluded after UNCLOS such as the CBD adopts explicitly the EAF illustrating strongly that global policies are now more than ever before committed to adhere to a more comprehensive approach to manage fisheries to sustainable levels. This study nevertheless did not cover the reasons why no legal binding instrument adopts explicitly the EAF. Future studies may as well consider looking at the reasons why legally binding instruments do not explicitly adopt an EAF for the purpose of providing clarity to global EAF policies which at the moment is lacking (FAO 2009).

Previous studies have examined the legal base for the EAF (Garcia et al. 2003; Wang 2003; Emmanuel 2012). This study goes further, to examine the duty that emanates from the EAF being adopted in global policies. Our analysis revealed that, the duty to implement the EAF is a weak duty. To this end, managers, States and regional organizations will not be persecuted in a law court if they do not pursue an EAF. Tanaka (2012; 238) in the same vein maintains that, “it will be difficult or impossible for international courts and tribunals to judge the violation of an obligation to apply the ecosystem approach”. On the bases of our analysis, States and managers can well understand the right(s) associated with the implementation of the EAF.

The relationship that exists between the FAO and global policies, was highlighted in this paper for the sole objective that readers should fully understand the significance attached to the FAO’s EAF implementation roadmap. The FAO’s EAF roadmap developed by the FAO is not solely to fulfil the mandate of the FAO prescribed in the FAO 1945 Constitution but also to facilitate the implementation of global policies.

## **6.4 FAO's EAF roadmap**

Conventional fisheries management institutions, have been held responsible for the poor management of the resource (International Consortium of Investigative Journalism 2012; World Bank and FAO 2009). It was therefore evident that the objective of fisheries management must change from being exclusive (Tanaka 2010). The FAO makeshift guidelines, were developed to ease the implementation of the EAF in practice amidst concerns and difficulties raised by States on the practicalities of implementing an EAF to sustainably manage fisheries (Garcia *et al.* 2003).

Implementation of the EAF could be a challenging experience (Wang 2004; Garcia *et al.* 2003; FAO 2009) as it requires political will, funding and democratic institutions and committed staffs to successfully implement the approach. However, this study did not examine those challenges or impediments for States to implement the EAF but provide deeper explanations and examples through which the political will for States to implement the EAF could be instigated such that, managers could as well know how to summon the will to implement the EAF.

## **6.5 IFMP issues (successes and coherence)**

My study of IFMP demonstrated that, Canada is able to successfully implement the EAF. Not much, has been written about the IFMP in scholastic literature. States, are not legally required to adopt the FAO roadmap for the implementation of the EAF (FAO 2007). The IFMP is consistent with the FAO's EAF implementation roadmap, thus suggesting strongly that, the FAO roadmap can be used for practical implementation of the EAF.

Furthermore, this study has been able to identify some benefits and obstacles associated with the implementation of the IFMP which was not indicated by some previous studies which details the success of the IFMP (Canadian Ground-fish Research Society 2010; SCS global services 2013). Therefore, my study of IFMP contributes to better understand what is actually forgone and what can be benefited from the implementation of an EAF project.

Information about the IFMP, presented in this study was what we could lay hands on through our online search. We definitely did not get all the right information we wanted for the study. All attempts to reach the staff of the DFO were futile. To this end, key information such as the annual budget required for the implementation of the IFMP are missing in this study.

## 6.6 Conclusion

At this juncture, we deem it necessary to revisit our research questions. Four research questions, were asked at the beginning of this paper and have been answered accordingly. The first research question was to determine the legal base for the implementation of the EAF. In chapter 3 of this study, we found out that global policies such as UNCLOS, CBD and CCRF implicitly and explicitly adopt and recommend an EAF implying that, States have a duty to implement the EAF in the management of fisheries. This duty however is facultative, and largely depends on States sovereign will.

Our second research question, was to provide a descriptive account of the FAO's EAF implementation processes. In chapter four of this study, we looked at the FAO's EAF implementation processes and found out that, the EAF implementation process as developed by the FAO consist of five main stages which begins with the initiation to the evaluation stages (Fig.10). Be that as it may, the FAO's EAF implementation processes are makeshift, pending more research on the concept.

The third research question was to describe how the IFMP is implemented in the B.C to manage the ground-fisheries. In chapter 5, we studied the institutions charged with the governance of IFMP project and realised that, the IFMP is diversified and comprehensive and all stakeholders and interest groups are involved in governance of the project. Our study also revealed that based on the application of a diversified and comprehensive approach as recommended by global policies and institutions, stocks that were depleted, are now recovering and the ecosystem of B.C is becoming more reproductive. Moreover, our results revealed that the IFMP is consistent with FAO's EAF implementation roadmap.

The fourth research question was to account for the Canadian experience in implementing the IFMP. In chapter 5, we recounted the Canadian experience by stating the obstacles and benefits associated with the management of the IFMP. Canada employed huge funding and human resource potential to successfully implement the IFMP. In return the stocks of the ground fisheries were restored and jobs, food supply and eventually an increase in revenue was realised from the project.

All in all, global policies and institutions charged with the development of guidelines and conditions for the management of fisheries have all adopted and recommended a holistic and comprehensive approach in the management of fisheries. Its makes sense however that, considering the shortcomings

of the traditional exclusive approach and coupled with studies carried out on the aquatic ecosystem, management must endeavour to seek an alternative way of managing fisheries. The right, to implement the EAF is weak and depends on States sovereign and political will. Nevertheless, Canada has adopted an EAF as required by global policies, in the management of the ground-fisheries through the development of the IFMP, with outstanding results. That notwithstanding, and judging from the Canadian experience, the successful implementation of the EAF requires, strong political will, funding, democratic institutions, dedicated and trustworthy staffs.

## **Annex 1**

1971 Ramsar Convention on Wetlands of International Importance

1972 Stockholm Declaration of the UN Conference on the Human Development

1973 Convention on International Trade of Endangered Species of Wild Flora and Fauna (CITES)

1979 Bonn Convention on the Conservation of Migratory Species of Wild Animals

1980 Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR)

1982 UN Convention on the Law of the Sea (UNCLOS)

1991 Global Environment Facility (GEF)

1992 Declaration of the UN Conference on Environment and Development

1992 Helsinki Convention on the Protection and Use of Trans boundary Watercourses

UN Framework Convention on Climate Change (UNFCCC)

1992 UN Commission on Sustainable Development (CSD)

1995 UN Agreement on Straddling and Highly Migratory Fish Stocks

1995 Code of Conduct for Responsible Fisheries

1992 Convention on Biological Diversity

Jakarta Mandate on Marine and Coastal Biological Diversity

UN Framework Convention on Climate Change (UNFCCC)

UNEP Regional Seas Conventions

2001 Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem

## 2002 Plan of Implementation of the World Summit on Sustainable Development

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