THE UNIVERSITY OF THE SOUTH PACIFIC
LIBRARY
Author Statement of Accessibility- Part 2- Permission for Internet Access

Name of Candidate: DAVID MAPURU

Degree: MASTERS OF COMMERCE

Department/School: MANAGEMENT AND PUBLIC ADMINISTRATION

Institution/University: USP, Lautoka Campus

Thesis Title: Compliance and Regulation in Turn Fishing in Solomon Is

Date of completion of requirements for award: 25/03/14

1. I authorise the University to make this thesis available on the Internet for access by USP authorised users. [Yes/No]

2. I authorise the University to make this thesis available on the Internet under the International digital theses project [Yes/No]

Signed: ____________________________

Date: 25/03/14

Contact Address

School of Management

FBE, USP

Lautoka Campus

mobile: 7280147

Permanent Address

C/- ACOM

P O Box 111 Honiara

Solomon Is

Tel: (677) 21892

40-60%
COMPLIANCE AND REGULATIONS IN TUNA FISHERIES IN THE SOLOMON ISLANDS

By
David Mapuru

A Thesis submitted in fulfilment of the requirements for the Masters of Commerce

Copyright © 2013 by David Mapuru

School of Management and Public Administration
Faculty of Business and Economics
The University of the South Pacific

July, 2013
DECLARATION

Statement by Author

I, David Mapuru, declare that this thesis is my own work and contains no material submitted for the award of any other degree at any institution, except where due acknowledgment is made in the text.

Signature........................................  Date..........................

Name..................................................

Student ID No..................................................

Statement by Supervisor

The research in this thesis was performed under my supervision and to my knowledge is the sole work of Mr. David Mapuru.

Signature........................................  Date..........................

Name..................................................

Designation..................................
DEDICATION

I dedicate this thesis to my dear wife and son who are here with me in Fiji. Their patient, support and encouragement have sustained me throughout the write up process.
ACKNOWLEDGEMENT

I wish to sincerely acknowledge my supervisor, Professor Peter Edward Larmour for his supervision. I was very fortunate to have him as a supervisor because I learned a lot from him; complex theories and concepts have been broken down and explained more simply by him. This makes the write up process more interesting. Also I would like to thank my co-supervisor Dr Rafia Naz for helping me address the corrections required by the examiners prior to final submission of this thesis. She was very helpful and understanding.

Secondly, many thanks to all interviewees who have been very helpful in providing the information needed for this work. I would like to acknowledge the followings people; FFA compliance and monitoring staff, the maritime unit director and CEOs, Ministry of Fisheries’ compliance, licensing and observers, NFD pole and line manager and fishers, and the Fiji based sunshine company’s crew. I also like to thank all ex-fishers who have been very helpful and accommodating in helping me and others whose names may have been overlooked.

Furthermore, I would like to sincerely thank Dr. Manfred Ernst, Dr.Holger Szesnat and Dr. Anthony Rees at the Pacific Theological College (PTC) for their advice, support and direction. Also thank you to Dr. Jack Cobport of the State Society and Governance in Melanesia (SSGM), Australian National University (ANU), Dr. Gordon Nanau and Dr.Asenati Chung Tung at the Faculty of Governance, University of the South Pacific (USP) for their help.

I would not want to overlook Raijieli Uluinaceva for doing all the drawings in this thesis. Similarly thank so much to the Melanesian Brothers at Noro for accommodating me and all the Anglican members at Noro Parish who looked after me. Also sincere thanks to the Chaplain of the Seafarers –Noro-Fr. Hillary Anisi who has been so helpful in arranging all the interviews.

Without your help, this thesis would not reach this far. Please accept my sincere acknowledgements with thanks.
ABSTRACT

One of the resources Pacific island countries have in abundant supply is tuna. The Ocean surrounding the island States supplied one third of the world’s tuna and between 40 to 50% of the raw materials for global canneries. The high concentration of tuna stock in the Western Central Pacific Ocean and the depletion of the resource in other oceans have attracted increased fishing activities in the region. This often involves high illegally unreported and unregulated fishing activities. Despite formulation of fisheries rules to control harvesting of tuna resources, illegal fishing continues to bloom. This thesis sets out to study this problem in the Solomon Islands’ fisheries. It aims to understand the reason why fishers continue to break rules. Four questions pursued are (1) What are the motives for breaking rules? (2) Under what conditions do fishers break rules? (3) Under what circumstances do fishers comply with rules? (4) What rules do fishers find difficult to follow and (5) What rules do they find easy?

The methodology employed to help understand this problem was qualitative and the means of gathering information was through in-depth interviews with ex-fishers, current fishers of various ranks and other stakeholders. About thirty three personal interviews were conducted and two focus groups.

The findings revealed that most fishers involved themselves in IUU fishing activities for economic gain. The goal to maximize their profits makes deterring such activities difficult. Besides, the research found that Solomon Islands has weak enforcement and low penalties. Additionally, politicians often compromise their decisions in favour of violators. These make countering IUU activities difficult.

Theoretically, ‘The Tragedy of the Commons’ by Garrett Hardins clearly explains if fishers continue to serve their interest every fishers will become worse off in the long run. Solomon Islands tuna fisheries is slowly moving into that direction if enforcement continues to be weak and fisher are not aware of this threat.
<table>
<thead>
<tr>
<th>ABBREVIATIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ALC</td>
<td>Automatic Location Communication</td>
</tr>
<tr>
<td>ANU</td>
<td>Australian National University</td>
</tr>
<tr>
<td>BR</td>
<td>Biological Reasons</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>C and N C</td>
<td>Cooperative and Non-Cooperative rule</td>
</tr>
<tr>
<td>CPRs</td>
<td>Common Pool Resources</td>
</tr>
<tr>
<td>CW</td>
<td>Community Work</td>
</tr>
<tr>
<td>DG400</td>
<td>Advanced Research Methodology Course at USP</td>
</tr>
<tr>
<td>DWFNs</td>
<td>Distant Water Fishing Nations</td>
</tr>
<tr>
<td>EEZ</td>
<td>Exclusive Economic Zones</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FAD</td>
<td>Fisheries Aggregating Device</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organisation</td>
</tr>
<tr>
<td>FFA</td>
<td>Forum Fisheries Agencies</td>
</tr>
<tr>
<td>FFV</td>
<td>The name of a Taiwanese Fishing Boat</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>IPOA</td>
<td>International Plan of Action</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organisation</td>
</tr>
<tr>
<td>IUU</td>
<td>Illegal Unreported and Unregulated Fishing Activities</td>
</tr>
<tr>
<td>LOR</td>
<td>Legitimacy of Rules</td>
</tr>
<tr>
<td>MARPOL</td>
<td>Marine Pollution</td>
</tr>
<tr>
<td>MB</td>
<td>Moral Behaviour</td>
</tr>
<tr>
<td>MCS</td>
<td>Monitoring Control and Surveillance</td>
</tr>
<tr>
<td>ND (nd)</td>
<td>No Date</td>
</tr>
<tr>
<td>NFD</td>
<td>National Fisheries Development</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Government Organization</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>PD</td>
<td>Personal Development</td>
</tr>
<tr>
<td>PCPV</td>
<td>Pacific Class Patrol Vessels</td>
</tr>
<tr>
<td>PICs</td>
<td>Pacific Island Countries</td>
</tr>
<tr>
<td>PNA</td>
<td>Parties to the Nauru Agreement</td>
</tr>
<tr>
<td>PNG</td>
<td>Papua New Guinea</td>
</tr>
<tr>
<td>RFB</td>
<td>Regional Fisheries Body</td>
</tr>
<tr>
<td>ROB</td>
<td>Regional Observers Program</td>
</tr>
<tr>
<td>RSIPV</td>
<td>Royal Solomon Islands Patrol Vessels</td>
</tr>
<tr>
<td>SBD</td>
<td>Solomon Islands’ Dollar</td>
</tr>
<tr>
<td>S-EA</td>
<td>Socio–Economic Attributes</td>
</tr>
<tr>
<td>SI</td>
<td>Solomon Islands</td>
</tr>
<tr>
<td>SIG</td>
<td>Solomon Islands Government</td>
</tr>
<tr>
<td>SPC</td>
<td>Secretariat of the Pacific Community</td>
</tr>
<tr>
<td>SQ</td>
<td>Square</td>
</tr>
<tr>
<td>SSGM</td>
<td>State Society and Governance in Melanesia</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>US$</td>
<td>United States Dollar</td>
</tr>
<tr>
<td>USP</td>
<td>University of the South Pacific</td>
</tr>
<tr>
<td>VDS</td>
<td>Vessel Day Scheme</td>
</tr>
<tr>
<td>VMS</td>
<td>Vessel Monitoring System</td>
</tr>
<tr>
<td>WCPFC</td>
<td>Western Central Pacific Fisheries Commission</td>
</tr>
<tr>
<td>WCPO</td>
<td>Western Central Pacific Ocean</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wildlife Fund for Nature</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

ABSTRACT................................................................................................................................iv

TABLES..................................................................................................................................xiii

Chapter 1 Introduction and Background Information ..............................................................1
1.1 Introduction.......................................................................................................................1
1.2 Compliance .....................................................................................................................3
1.3 Brief Summation of the Commercial Tuna Issues in Solomon Islands ....................4
1.4 Research Aims and Objectives.....................................................................................5
1.5 Rationale.........................................................................................................................5
1.6 Brief Summary of Findings............................................................................................8
1.7 Brief Outline of the Structure of Thesis......................................................................12

Chapter 2 Compliance in Fisheries .........................................................................................14
2.1 Introduction.....................................................................................................................14
2.2 Key Terms Used in this Thesis .....................................................................................14
2.2.1 Common Pool Resources (CPRs).............................................................................14
2.2.2 Self-interest.................................................................................................................15
2.2.3 Models of Organization.............................................................................................16
2.2.4 Studies of Influential Models that Govern the Commons.....................................19
2.2.5 Difficulty in Stopping Non-Compliance..................................................................20
2.2.6 Character of Rules and the Actors (Regulators, Enforcers, Fishermen and Fish) .........................................................................................................................20
2.2.7 Fishing Gear..............................................................................................................29
2.2.8 Nationality..................................................................................................................30
2.2.9 Conceptual Foundations, Key Terms and their Relationship with Compliance .........30
2.2.10 Explanation of the Diagram (Raw Framework).....................................................32
2.3 Findings from Existing Research..................................................................................34
2.3.1 Biological Reasons.....................................................................................................35
2.3.2 Economic Gain..........................................................................................................36
2.3.3 Moral Behaviour.......................................................................................................37
2.3.4 Corruption..................................................................................................................37
2.3.5 Legitimacy of Rules..................................................................................................38
2.3.6 Norms.........................................................................................................................39
2.3.7 Social-Ethical Factors..............................................................................................40
FIGURES

2.1 How the key terms (concept) link to compliance.  

2.2 Conceptual framework  

5.1 Conditions that cause fishers to break rules.  

8.0 Boundary of WCPO
TABLES

3.1 Summary of people who were interviewed  
5.1 Summary of the different conditions under which fishers’ break rules  
8.1 Summarizes findings of previous literatures
Chapter 1
Introduction and Background Information

1.1 Introduction

Tuna has created very big and lucrative industries around the globe. The world’s major tuna markets are European Union (EU) and the United States of America (USA); other emerging markets are Asia, North Africa and the Middle East (Globefish 2012). The high demand for tuna has increased the total global amount commercially caught from 403,050 tonnes in 1950 to 4 million tonnes in 2002. This was an increase of 89.97%, which is alarming and an indication of overharvesting (Globalfish n.d.). Commercial large-scale tuna fishers increase their catch by intensifying their fishing activities, increasing their fleets and investing in high capacity vessels that are fitted with high tech equipment. This has resulted in the overfishing and subsequent virtual extinction of tuna in most of the ocean (World Bank 2000; PRI 2013). The Western Central Pacific Ocean (WCPO) is the only water that accommodates the world’s remaining tuna stocks (ibid. Cyranoaski 2010). This attracts Distant Water Fishing Nations ¹ (DWFNs). Most of them bought the rights through access fees and fishing licences to fish in the islands’ 200 miles exclusive economic zone (EEZ). The EEZ is the area extending 200 nautical miles from coastal States’ ² convention on the law of the sea (UNCLOS). Article 56 of this convention has given the rights to coastal States to explore, exploit, conserve and manage the resources including the tuna within their 200 miles zone (United Nation n.d.). The DWFNs have to obtain access agreements and fishing licenses with the Solomon Islands Government (SIG) to harvest tuna in the islands’ 200 miles EEZ. Likewise they have to obtain licenses and pay access fees with Pacific island countries (PICs) to fish in their waters.

Apart from USA, all the DWFNs countries fish under bilateral agreements³ with PICs. This means they negotiate with each island nation to fish in their waters hence, the benefits go directly to the coastal State. USA on the other hand signed

¹ Distant Water Fishing Nations (DWFNs) are fishers from other countries that have sought access to fish for tuna in the Solomon Islands’ or other Pacific Island countries’ 200 miles exclusive economic zones (EEZ). DWFNs vessels that are currently fishing in Solomon Islands waters are Taiwan, Japan, European Union and the United States.
² Coastal State is used interchangeably with island nations.
³ Bilateral Agreement refers to fishing agreement strictly between two countries.
multilateral agreements\(^4\) with Forum Fisheries Agency (FFA)\(^5\), thus any benefit from fishing in a particular island State goes collectively to all the member countries (World Bank 2000; Pers. comm. FFA monitoring officer number 1, 2012). Under that agreement ‘(U.S.-Pacific islands’ tuna fisheries treaty)’, USA government grants USD $18 million to PIC per year for access and licences (Bureau of East Asian and Pacific Affairs 2012).

However, despite the establishment of bilateral and multilateral agreements to facilitate proper access to tuna resources and fair benefits; compounded by the role played by island governments and regional fisheries bodies (RFB) through monitoring, control and surveillance (MCS), there are still increasing activities of ‘pirate fishing’ in the Pacific Ocean. This is commonly known as ‘illegally, unreported and unregulated (IUU) fishing activities which involve commercial fishing fleets using purse seining and long line gear to harvest tuna illegally. Such illegal activities are committed in various ways. The most obvious ones are, fishing without a licence, fishing in forbidden territories, violation of by-catch rules, discards of untargeted species and landing of protected stocks (Solomon Islands Fisheries Act 1998; Edeson, Freestone and Gudmundsdottir 2001; Xepapadea 2003). Moreover, unreported activities involve misreporting of catch. For example fishers might catch five tonnes of tuna in one set but only record four tonnes. In other instances, they do not report their catch at all (Pers. comm, observer number 3, 2012).

Thirdly, unregulated activities involve fishers that are not registered under any countries that have been accepted to fish in FFA member countries. Countries that are allowed to fish in FFA member countries are Taiwan, China, Korea, EU and USA. Any other countries that are interested to fish in the Pacific waters must register under these countries. Most of the cases relating to illegal and unreported activities involve vessels that are licensed to fish in FFA member countries under the multilateral and bilateral agreements (Edeson, Freestone and Gudmundsdottir 2001).

---

\(^{4}\)Multilateral Agreement regulates conditions signed between a DWFN and the Forum Fisheries Agency’ on behalf of its member countries.

\(^{5}\) The Forum Fisheries Agency (FFA) based in Honiara, consists of 17 South Pacific Islands countries namely, Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu. Its objective is to strengthen national capacity and regional solidarity in ensuring member countries manage their fisheries resources that falls within their 200 mile EEZ.
Additionally another relevant issue of concern is ‘corruption’ in the negotiation of access agreements and license by DWFNs (Tsamenyi and Hanich 2008). Corruption is not IUU but is viewed as one of its agents. For example, fishing companies give money to the responsible government minister to reduce their penalties. This helps encourage IUU fishing activities. As a result ‘corruption’ and IUU activities have attracted concern from PICs governments, regional and sub-regional bodies such as FFA, Western Central Pacific Fisheries Commission (WCPFC) and Parties to the Nauru Agreement (PNA). These bodies are concerned that tuna resources in the Pacific Ocean could become extinct prematurely if there are no strong measures put in place to deter overfishing. This is because IUU fishing activities are difficult to stop (Ostrom 1990; Xepapadea 2003). According to Xepapadea (2003) ‘non-cooperative’ and ‘cooperative rules’ exist in a state of equilibrium. This indicates that compliance and non-compliance to fisheries rules co-exist (please refer to section 2.2.5 for detailed explanation on this theory).

1.2 Compliance

The main issue portrayed in section 1.1 is fishers’ lack of ‘compliance’ to fisheries’ regulations. Compliance means ‘conforming to generally accepted practices or standards’; or ‘the act of obeying, dutiful or submissive behaviour to another person or the authority’ (Oxford mini thesaurus 2007, p.109). Therefore, compliance in this context refers to commercial fishers obeying fisheries’ and boundary regulations set in the Solomon Islands’ Fisheries’ Act 1998.

This thesis looks at tuna in general and covers commonly found species in WCPO such as skipjack (Katsuwonus Pelamis), yellow fin (Thunnus albacore), big eye (T. obesus) and albacore (T. alalunga) (Havice & Campling 2010).

\[ \text{Corruption is the abuse of a position of trust by regulators and fisheries enforcers to gain unfair advantage.} \]

\[ \text{The Western and Central Pacific Fisheries Commission (WCPFC) was established by the ‘Convention for the Conservation and Management of Highly Migratory Fish Stocks’ in the Western and Central Pacific Ocean (WCPF Convention). This body manages tuna in the high seas. Its 32 member countries include all sovereign PICs, participating territories, colonial rulers and DWFNs. It also has 12 non-members, which comprise other emerging DWFNs.} \]

\[ \text{Parties to the Nauru Agreement (PNA) is a sub-regional group consisting of eight FFA member countries; Papua New Guinea, Solomon Islands, Kiribati, Tuvalu, Palau, Federated States of Micronesia, Marshall Islands and Nauru. These eight countries control 25% of the world’s tuna supply. They established sub-regional agreements on the terms and conditions of purse seiners’ licences. Also it brings together these eight countries to manage their tuna and to increase their benefits.} \]

\[ \text{Refer to annex no.4 for the map of WCPO boundaries.} \]
The skipjack, yellow fin and big eye are mostly caught using pole and line and purse seining (see section 2.2.7 for the explanation of fishing gear) because they mostly swim closer to the surface of the sea and as deep as 150 meters from the surface (FAO 2013). Albacore on the other hand are caught using long liners because they normally swim 55 to 350 meters deep and at times go below that depth (Gibbs n.d. Global Fish n.d.). This study focuses on all these species (skipjack, yellow fin, big eye and albacore) in general because they equally face the threats of depletion which threaten PICs’ economies and social security.

Furthermore, the tuna under study are those that swim within the 200 miles EEZ, the archipelagic waters (slots)\(^{10}\) and 7 miles off (territorial waters)\(^{11}\) the coastline of Solomon Islands. They are difficult to manage because they are highly migratory; they can be in the Solomon Islands’ waters today but could be in another PIC’s water the next day. Furthermore, the tuna in the open waters (200 miles EEZ) are accessible to anyone including licensed and unlicensed fishers. This is because they are too distant for neighbouring coastal villages or provinces to protect. For this reason, deep sea tuna are under the jurisdiction of the national government. UNCLOS requires this to protect the tuna from overfishing and illegal fishers.

1.3 Brief Summation of the Commercial Tuna Issues in Solomon Islands

In the face of existing laws and management policies set by PICs’ governments and RFB, non-compliance in the form of IUU fishing activities continues to increase in the region. DWFNs have higher cases of violating regulations than locally based industrial fishers (SIG Audit Report 2012; Lilomo 2012; Island Sun 2010) which is a concern because the majority of the fishers operating in the WCPO are DWFNs. In Solomon Islands, only 8 fishing boats are locally based while 276 are DWFNs’ vessels from Taiwan, Korea, Japan, EU and USA (Pers. comm. Fisheries’ Officer 2012). According to Tsemenyi and Hanich (2008), tuna caught by DWFNs through IUU and corrupt practices cost the Solomon Islands’ economy 5 million US dollars in 2005. Also, there was an increase of IUU fishing activities over the last three years. A report carried out by the office of the auditor general stated 26 cases have been reported and investigated between 2009 and 2011 (Lilomo 2012).

---

\(^{10}\) Archipelagic waters refer to the water located between the islands and in this context between the provinces that are very close to each other. Large-scale commercial boats (NFD purse seiners) normally set their nets within the slots between Isabel and Choiseul province or Malaita and Gela and so on.

\(^{11}\) Territorial waters refer to the belt of sea that extends 12 nautical miles beyond the internal and archipelagic waters.
local newspaper ‘Island Sun’ most of the fishers who were arrested were DWFNs (Island Sun 2010).

This thesis seeks to find out the nature of this problem and possibly the solutions. More explicit aims and objectives of this project are outlined below.

1.4 Research Aims and Objectives

- To understand the motives, behaviour and actions of large-scale fishers in relation to compliance.

- To propose practical policies that would help address the existing reasons for non-compliance at both at the national and regional levels.

- To provide information that will achieve sustainable tuna harvesting and effective tuna management programs for Solomon Islands and wider PICs.

- To contribute towards maintenance of social economic security and harmony in small island States by providing relevant information to independent island States and RFBs’ policy makers.

- To provide knowledge for academic learning in tertiary institutions and universities in the region and abroad. Such knowledge will allow academics to further their research and develop more effective policies to address and further narrow the existing gaps.

1.5 Rationale

The Pacific island governments and RFB intervention into fisheries aim to promote effective fisheries management. The management with a long term objective to promote sustainable harvesting (i.e. fisheries that are utilized in a rational manner) and responsible (code of conduct), taking into account future generations (intergenerational considerations) (UNCED 2002).

However, although regulations and policies are put in place to guide fishers such as the UNCLOS (Edeson, Freestone, Gudmundsdottir 2001), and other RFB such as
FFA, SPC\textsuperscript{12}, PNA, WCPFC and the island States, offshore fishers\textsuperscript{13} still violate them. Such behaviours are threat to the tuna stocks in the region.

PICs have limited land mass and as a result have relied heavily on tuna to create an economic base (Hamilton et al. 2011). However, the illegal fishing activities which contribute to overharvesting may exceed the rate for regeneration, hence creating premature extinction of stocks if the islands are not prepared to take strong and appropriate measures.

Fisheries management needs to adopt measures that are linked to their management goals, such as imposing of quotas, restrictions of gear, geographical and time restrictions, prohibition of transhipment at sea, complete and accurate statistics.

Tuna is a significant resource for PICs because it is one of the natural resources that they have in abundance. The ocean enclosing PICs is the most important tuna fishing ground in the world. It provides a third of the world’s tuna catch and supplies about 40-50\% of the total raw material to the world’s canneries (World Bank 2000; The World Bank 2012; Metcalfe 2013). It is one of the islands’ main sources of income. In 1997/98 tuna earned more than US$54 million for PICs in the form of licences and access agreements. Solomon Islands was one of the main beneficiaries (World Bank 2000).

Moreover, it is one of the major income earners for SIG through access fees, licenses, exports and taxes. According to the Solomon Islands Government report to parliament (2012, p.28):

"License fees from both domestic and foreign vessels in 2011 provided about SBD 106 million (USD 14.3 million) in government revenue," ............. While this is a significant earner for the government, it is only a low percentage of the catch value. Fisheries also provide a major contribution to the Solomon Islands’ Gross Domestic Product (GDP). Total fisheries export earnings for H1 2011 was SBD 114 million (USD 15.4 million) or 8.6 per cent of total export earnings for the period" (Solomon Islands Government 2012, p.29).

\textsuperscript{12}The Secretariat of the Pacific Community (SPC) consists of 22 Pacific Island countries including Australia, New Zealand, France and USA. One of their responsibilities is to provide technical advice on tuna stocks. Most of the fisheries’ observers’ reports are sent to SPC for analysis of the stocks.

\textsuperscript{13}Offshore fishing sometimes referred to as deep sea or open water fishing. Commercial tuna fishing operates more than 7 miles from land and out in the open waters hence falls into the category of offshore fishing.
Also, the commercial tuna fishing industry is currently providing employment for 1,300 Solomon Islanders at the Noro factory. With the new long line policy enacted and initiated by PNA, an additional 500 jobs will be created. This new policy requires all fish caught within Solomon Islands’ EEZ to be unloaded and processed locally, thereby creating employment for handling and processing (East West Center 2012).

Tuna is also a significant part of the livelihood of the people. Most locals consume both fresh and canned tuna more regularly than other protein. This is because it is more affordable than beef, chicken and pork. For example, a can of Solomon Blue white tuna flakes (180g) costs SBD$8 per can (retail price) in most of the Chinese shops in Honiara. This tuna can be boiled with slippery cabbage and noodles to feed a family consisting of six members. This is the islands’ staple diet. Furthermore, a fresh medium size (approximate 40 cm in length) skip jack tuna costs roughly SBD $40 to SBD $60 in the Honiara Central Market. This could also feed a family of six in one meal. But a frozen local broiler (whole chicken) equivalent to size 15 in the supermarkets, costs SBD$100 in the Honiara Market.

Tuna is part of the islanders’ lives; they live and grow with it. Artisanal fishers sell the surplus to earn a living at the domestic markets (World Bank 2012). Artisanal fishers are small-scale subsistence fishers who used traditional fishing methods to catch tuna and other species. They use outboard powered canoes, mostly fibreglass and ray boats to do their fishing both inshore and offshore. Inshore fishing is fishing very close to shore or less than 30 metres from land (Pers. comm. enforcer number 1, 2012). However, artisanal fishers have started going off-shore because of the aid of outboard motors.

Peer reviewed journals have indicated that not much research has been done on compliance and regulations (Sunderstrom 2012). This study is one of the first to be conducted in the Solomon Islands. Most of the researches on similar topics were carried out in Europe, the Americas, Africa and Asia. Their work will be discussed in chapter 2.

---

14 Slippery cabbage is a vegetable and one of the staple diets in the Solomon Islands. It is often boiled or fried with a can of tuna (Solomon blue) by the locals.
When considering the importance of tuna to Pacific Islanders and how this resource is threatened, it becomes evident that ‘compliance’ is a very important issue. Lack of it will mean depleted tuna stocks in the WCPO. This will be a serious problem because most of the small islands States have tuna as their major natural resource. Therefore, extinction of the tuna will affect the social, economic security and harmony of small island States (Hanich 2013).

1.6 Brief Summary of Findings
This research focuses on the large-scale commercial tuna fishing industry involving DWFNs and the locally based large-scale fishers. It does not include small-scale subsistence tuna fishers. The large-scale tuna fishing in the Solomon Islands is the node of the global tuna industry which is a huge commercial operation. Concurrently the increase in competition has led most fishing companies to inject more money into their operations (Miyake et al. 2010). However, the recent economic recessions in USA and then Europe have resulted in high overhead and operations costs (Furth and Ligon 2012). Fishing vessels try to overcome these challenges by engaging in IUU fishing and corruption. Additionally, employers give bonus pay to fishers on top of their salaries to achieve certain targeted catch volumes. Such practices aim to place employers in sound financial positions. The bonus rate depends on the various fishing companies and the contract signed with fishers. Some fishing companies pay bonuses when the catch reaches 10 tonnes. For example, the Sunshine Fiji based company which currently operates in the Solomon Islands pays bonus to its crew of about FJD$200/person(SBD $714.29/person) when the catch reaches 10 tonnes in one fishing trip (Pers. comm. fisherman number 3, 2012). This incentive makes the volume of the catch more significant to fishers. They know that if their catch is low they will not receive bonus pay (Pers. comm. ex-fisher number1, 2012; pers. comm. ex-fisher number 5, 2012; pers. comm. captain number 1, 2012). It is therefore very likely that fishers could break the rules if they have less catch.

Fishers may also engage in corruption for economic gain. For instance, locally based fishers (NFD) may bribe observers to allow them to set their nets less than 7 miles offshore. While corruption may not be regarded as IUU, they contribute significantly to it. The findings will reveal that the main reasons why offshore tuna fishers break fisheries’ rules are predominantly economic based. Fishers intentionally break most of the rules to maximize their profits. Also fishers break other rules due to lack of
understanding and ignorance of the rules. There are some rules that fishers may perceive as unimportant and may violate as a result of their own ignorance. Examples of such rules are dumping of rubbish in the sea and discharging of oil and brine (waste water).

Moreover, the United Nation through its Food and Agriculture Organisation (FAO) has come up with a *code of conduct for responsible fisheries* purposely to help member countries and RFB ensure sustainable harvesting of their fisheries (FAO 1995, FAO 2001). Such a code is implemented through the international plan of action (IPOA) framework; two of them are “sustainable utilization of fisheries resources in harmony with environment” (FAO 2001, p.3) and “prevention, deterrence and elimination of illegal, unreported sustainable utilization of fisheries resources and unregulated fishing,” (ibid. p. 5).

Moreover, FAO (2001, P.2) states under its coastal state measures that:

“51.1 effective monitoring, control and surveillance of fishing activities in the exclusive economic zone” and “51.3 to ensure that no vessel undertakes fishing activities within its waters without a valid authorization to fish issued by that coastal State;”.

Additionally, the 2009 FAO agreement on ports State measures which aimed to further deter IUU activities through allowing inspections by host countries and dissemination of information has yet to produce the result in the Solomon Islands.

Interestingly, with all the stringent measures in place, fishers still find their way round the system to commit IUU fishing activities for economic reasons (financial gain); they still have the habit of being careless in some of the rules such as dumping of wastes, throwing of plastics overboard and so on.

Moreover, the findings related to ‘economic gain’ indicated not all fishers are rational decision makers, in the sense of calculating the gain and comparing it with the costs before violating the rules, as claimed by most researchers. This is because most of the fishers in the Solomon Islands do not have sufficient information about the penalties and the gains. However, they know that breaking rules could increase their monetary gains; hence, without weighing the gains and losses, they break rules secretly by evading enforcement authorities.
Solomon Islands faces lots of weaknesses relating to non-compliance issues. First it has a very large ocean, approximately 1,340,000 square kilometres (km). This makes it difficult to carry out effective physical monitoring, control and surveillance (MCS). This is due to the high costs involved and associated lack of sufficient manpower and patrol vessels (Sulu and Orr n.d.; pers. comm. enforcement officer number 1, 2012).

Secondly, Solomon Islands is experiencing weak governance and institutional problems; as a result it can not manage its fisheries effectively (Sasako 2012; Hanich, Teo and Tsamenyi 2009). This is fuelled by management measures that are poorly defined and implemented.

Furthermore, SIG finds it difficult to implement its policies against DWFNs because their governments are the major development partners of Solomon Islands. For example, Taiwan is a very important development partner but most of their vessels are the ones that regularly violate the rules (SIG Auditors’ Report 2012). The national government finds it difficult to apply full force of the laws to the Taiwanese illegal fishers because they fear possible repercussions from the Taiwanese government. This was experienced when SIG arrested a US purse seiner *Jeannette Diana* in 1980 (Scott 2005).

Moreover, the types of rule play a significant role in determining compliance. Rules that act as pre-conditions for fishers to benefit economically were found to be easy to follow. For example, the rule that requires fishers to take on board observers before they could go out for fishing is relatively easy for the purse seiners to obey.

In contrast, fishers found rules that restrict them from maximizing their gains illegally difficult to follow. For example, reporting of catch is a difficult rule. This is because fishers misreport or do not report at all to procure economic gain. Another example is fishing in territorial waters. Some fishers intrude into forbidden areas to set their nets whenever they find concentrated schools of tuna. This gives them economic advantage (Pers. comm. observer number 3, 2012).

---

15 The role of MCS is to ensure that fishers abide with their license conditions. These conditions resemble the predetermined management goals and measures.
Also, some fishing gear\textsuperscript{16} used is difficult to handle under the rule’s conditions. The most obvious one is the ‘purse seining’. Purse seining is a destructive fishing method because it does not select the size and types of fish. It takes undersized tuna\textsuperscript{17} and by-catches\textsuperscript{18} indiscriminately. This poses serious threat on the tuna stocks because killing undersize tuna will deplete them; similarly catching by-catches affect the tuna food chain (Pers. comm. ex-fisher number 9, 2012).

Getting all the fishers to comply with the regulations is difficult. Based on the theories of Ostrom, Gardner and Walker (1994), and Xepapadea (2003), fishers found it difficult to achieve ‘complete compliance’. Authorities can only deter IUU but they may not completely eradicate it. This is because it is difficult to control people who are influenced by their ‘own-interest’.

Additionally, some interviewees claimed that fishers always operate a step ahead of enforcers on IUU activities. Even if PICs and regional bodies such as FFA and PNA collectively try to come up with measures to stop IUU fishing, fishers will always find ways to exploit the system through the weak links. Hence, regulators and enforcers should not view fishers as merely passive recipients of rules and enforcement, but as active opponents who also scan their external environments and exploit the available opportunities. A typical example is the case of the electronic device – vessel monitoring system (VMS) - to monitor vessels’ positions. Whilst, such technology is a very effective way of monitoring fishers’ position, it cannot detect their activities. Fishers exploit this weakness by engaging in ‘misreporting’ and ‘not reporting their catch’(FFA monitoring officer number 2, 2013).

The governments and FFA must be pre-warned that fishers could still come up with other new ideas and practices to commit IUU fishing activities implicitly. This is because fishers depend on the tuna for business survival. The island States therefore need to scan the situation and with the help of regional organizations and universities engage in continuous research on this issue.

\textsuperscript{16} Fishing gear refers to the equipment used for catching tuna. In this context fishing gears refers to pole and line, purse seining and long linings. Detail explanation of these gears is discussed in chapter 2 section 2.2.3.

\textsuperscript{17} Undersize tuna referred to those that weigh 1 kilogram and below. These sizes are rejected by buyers (importers) or canneries.

\textsuperscript{18} By-catch is marine creatures that have little commercial value but are often caught and killed in the nets. This includes dolphins, turtles, seabirds, sharks, juvenile fish and other fish that are not targeted in the tuna operations.
The management model used to manage the ‘commons’ also plays an integral part in this problem. There are three main management models. The first one; ‘market’; promotes ‘self-interest’ or profit making; the second one; ‘community’, promotes the interests of communities; and the last one, ‘bureaucracy’, emphasizes rules, procedures and enforcement (Colebatch and Larmour 1993). A more detailed explanation of the three models is discussed in chapter 2, section 2.2.3. The current management system is predominantly public or bureaucratic. This system involves rules, procedures, command and control, and enforcement to name a few. Fishers pay their licenses and access fees to harvest the tuna. This system fails to manage tuna effectively as it has its limitations. Some of the obvious ones are lack of enforcement capacities, insufficient financial resources, punishments appear less threatening and regulators compromising themselves in many instances.

1.7 Brief Outline of the Structure of Thesis

This thesis has seven further chapters. Chapter 2 looks at compliance to fisheries’ regulations in various places in the globe; based on studies carried out by different researchers from 1990 to 2011. A diagrammatic summary of the factors influencing compliance is factored in the conceptual framework in section 2.8. It then identifies the gaps and what it hopes to explore, followed by five main questions.

Chapter 3 consists of the methodologies and methods for gathering information. It begins by outlining the approaches used by other researchers, then at the methodology used in this research and the relevant methods for gathering information. It also justifies why the various methodologies were selected instead of the others. It then discusses the sample size and how the information was analysed.

Chapter 4 is the findings for question one. Chapter 5 is the findings for question two and chapter 6 answers questions three, four and five of the research. These chapters outline and describe in detail all the interviews and the relevant analyses.

Chapter 7 summarises the answers of the questions (question one to five).

Chapter 8 is the conclusion. It begins by comparing and contrasting answers to questions 2 and 3, and 4 and 5. It then relates the findings to the literature. Then it identifies and discusses interesting findings recently discovered. This chapter ends by suggesting some policies.
Chapter 2
Compliance in Fisheries

2.1 Introduction
This chapter portrays the knowledge, theories and concepts discovered by different researchers relating to ‘compliance and regulations’ in fisheries from 1990 to 2011. Section 2.2 briefly explains some of the key terms commonly used in this thesis. Section 2.3 portrays existing research findings; these findings are clustered into groups of similar features. The relevant core concepts are summarized in the summary section 2.4; section 2.5 portrays the key theories this thesis is founded on. Section 2.6 portrays the gaps this research seeks to fill. Section 2.7 explains the conceptual framework. Section 2.8 is the conceptual framework where all the factors influencing ‘compliance’ based on existing studies are portrayed in a diagrammatic form. And section 2.9 poses the research questions.

This chapter is designed based on ‘deductive reasoning’ where a specific conclusion is arrived from a general principle, the reason being that there has been no similar study conducted in the region or the Solomon Islands in the past. Most of the relevant studies sighted were conducted in other regions most notably the Americas, Europe and Africa.

2.2 Key Terms Used in this Thesis

2.2.1 Common Pool Resources (CPRs)
Ostrom classified resources such as fisheries, forestry, water, and air as ‘common pool resources’ (CPRs). CPRs are neither public\(^19\) nor private\(^20\) goods but a separate class of goods that have their own unique attributes. The two prominent attributes are excludability and subtractability. Firstly, it is difficult to prevent the general public from accessing CPRs. All CPRs, including tuna fisheries, are naturally accessible to anybody. This is because there is no explicit physical fencing to deter unlicensed fishers from harvesting them. Trying to provide fencing would not be economically feasible because the cost of constructing such infrastructure would be far too

---

\(^{19}\) Public goods are those that are non-excludable and non-rival in consumption. This means one cannot exclude others from using goods within this category; likewise no one can compete for it. Examples of public goods are bridges, lighthouse and street signs. They serve everyone and cannot be used up even if lots of people use them.

\(^{20}\) Private goods are those that have definite owners, hence they are excludable. That is if a customer bought it, others cannot have it. They are traded in market and typically rivals in nature. Examples of private goods are goods bought in the shops, supermarkets or markets. They are private goods and are intend for private consumption.
expensive compared to the total value of the resources. Applying this concept to Solomon Islands, it would be similar to constructing a physical boundary within the 1,340,000 square kilometres (sq. km) total sea boundary to stop unlicensed and unregulated fishing vessels from accessing the tuna (Sulu and Orr n.d.). Realistically, exclusion is impractical. This is one of the reasons why illegal and unregulated fishing activities continue in the region.

The second attribute is subtractability. CPRs are subtractable in that any fishing activity reduces the overall stock. For example, if one purse seiner lands 20,000 tons of skip jack tuna in a trip, those fish are no longer available for other fishers. This is different from public goods; where a vessel using a lighthouse does not reduce or take away the availability of that service from other vessels.

Additionally, one of the unique features of CPRs is that no one owns them. Similarly, no one owns the tuna. One of the features that make tuna unique and difficult to manage compared to other CPRs is that they are highly migratory, and therefore subject to different regulations and enforcement authorities (Sulu and Orr n.d.).

2.2.2 Self-interest

Self-interest describes behaviour where an individual or organization strives to maximize personal or organization’s gain, rather than the interests of others (Business Dictionary 2013, p.6). Another definition that best captures this term is:

‘Being focused on yourself or putting yourself at an advantage’. Simply; it can be described as: ‘thinking about your needs above the needs of others around you’ (Your Dictionary 2013, p.10).

Scholars have argued that ‘self-interest’ is one of the main influential factors behind peoples’ motives, actions and behaviours. Elster (1996), mentioned: self-interest under extreme circumstances can cause actors not to care about other people. He argued that the driving force behind such behaviour is the pleasure it brings to the agent. Institutions that allow self-interest as a primary motive are the markets and majority rule (Elster 1996). Moreover, economists have warned that: ‘the world out there is bitterly competitive, and that those who do not pursue their own interests ruthlessly are likely to be swept aside by others who do’ (Frank 2005, p.8). This
could be one of the main reasons causing large-scale fishers, both DWFNs and locally based, do repeatedly engage in IUU fishing activities.

Economists go as far as arguing that ‘self-interest’ explains all human behaviour (Frank 2005). However, their perceptions are somewhat out-dated and narrowly conceived. Other scholars put it broadly by arguing that ‘self-interest’ does not completely dominate human behaviour but does play some role in almost every context. They argue when people think about what they want, they also give great weight to ‘moral principles’ and the ‘interest of others’ and act according to best fit (Elster 1996). This is what is believed to be driving current fishers’ behaviour in that whilst economic gain influences their actions, other attributes also influence their overall behaviour.

2.2.3 Models of Organization

2.2.3.1 Market

The market model is mostly driven by ‘self-interest’ and often involves commercial transactions. For example, DWFN large-scale fishers catch tuna and sell them to overseas buyers. Moreover, some fishing fleets such as the locally based National Fisheries Development Limited (NFD) catch tuna and sell them to the local cannery in Noro (Soltuna Limited). As can be seen, this model focuses on profit maximization. Most organizations that operate under this system are members of the private sector. The private sector tends to focus more on profit maximization. However, the market system also accommodates social life in general. A question such as: should drivers wear seat belts or should this be left to their own judgment based on self-interest relates to how self-interest can also affect social life.

Colebatch and Larmour (1993, p.19) mention that:

“The market model holds not only that individuals are the best judges of their own best interests, but that the best results for society as a whole comes from everyone pursuing their own interests”.

Many people understand the market model as involving the buyers and sellers. In the case of the vegetables and fruit markets, no one is really in charge. The prices are determined by the supply and demand. If there is more demand and less supply, the
price will go up. But if there is less demand compared to the supply, the price goes down (Colebatch and Larmour 1993).

Similarly, the DWFNs and locally based tuna fishers are operating under the market model. The fishers are the sellers and the major buyers are in Europe, Asia and USA. The prices are determined by market supply and demand.

However, the management of the large-scale tuna fisheries in PICs; including the Solomon Islands; do not use the market model. The tuna resources within the exclusive zones are controlled by SIG under the ‘bureaucratic model’, whereby vessels not only pay access fees and licences but they also purchase fishing days; which uses these vessel day scheme (VDS)\(^{21}\) as a stock management tool.

The fact that no one owns the tuna, and it’s highly migratory attributes; makes the tuna industry difficult to manage under the ‘market system’.

2.2.3.2 Bureaucracy

Bureaucracy is the second organization model. In this model, all transactions are governed by the hierarchical application of rules. People’s behaviour and actions are influenced by rules, procedures and policies (Colebatch and Larmour 1993). Most of the ‘commons’; including the commercial tuna industry in the Solomon Islands; are predominantly governed by ‘rules’ and ‘command and control’\(^{22}\). The fishers have to harvest according to the rules imposed by the national government. Moreover, the captains and crew of the Pacific class patrol vessels (PCPV) in the Solomon Islands do surveillance and monitoring of fishing vessels not because it fulfils their self-interest, but because someone in the hierarchy (police commissioner) requires them to do it. They are implementing the laws passed by the parliament (Fisheries Act 1998). As can be seen this established an external authority to enforce the rules. In the tuna industry the external authorities are the maritime unit and fisheries compliance officers. Such a model integrates ‘rules, authority and hierarchy’ as the main organizing principles. Fishers access resources under this model by paying fishing licence and access fees. They do not pay for the single tuna they catch, as in the ‘market’ system.

\(^{21}\) VDS is a newly introduced management tool by the Parties to the Nauru Agreement where apart from the licence and access fees, fishers also pay the number of days to fish in PICs’ EEZ and territorial waters. This also gives financial benefit to the island States.

\(^{22}\) Control and command is a hierarchical set up of organizations where members operate (function) under the direction of their supervisors. The supervisors also work under the control of their superiors; mostly managers and general managers.
Most CPRs are predominantly managed under the ‘bureaucratic’ model because of the fact that no one owns them. This model appears to be a practical means of managing the ‘commons’. However, it has its limitations as well. Often, fishers obey their license conditions only under the supervision of enforcement agents but tend to follow their business and personal interest when enforcers are not around.

2.2.3.3 Community

The third organization model is community and sometimes referred to as ‘self-regulation’ (Gunningham and Grabosky 1998). Under this model, people are affiliated according to certain ethnic groups, religious beliefs, clubs or professions. These people normally have something in common, causing them to behave in similar manner; they act communally targeting ‘collective’ interests and benefits rather than individual interests. Their behaviours are often influenced by social norms and beliefs (Colebatch and Larmour 1993). For example, artisanal fishers in the Solomon Islands behave according to traditional beliefs and practices of their communities. They sometimes abstain from harvesting fish for a certain period of time in response to ‘Tabus’ imposed by community leaders. Moreover, reciprocity is practised in such a way that if a fisherman catches some fish today, he would give some of them to his neighbour knowing that family would give him fish or other material goods next time.

Michael Taylor developed three basic elements of what a perfect community model should be. First is the attributes of norms and values whereby people behave according to their beliefs and what they value, rather than rules or self-interests. Secondly, this relationship is direct and multi-sided. Unlike the hierarchical relationship, members of the communities have equal status. And thirdly; the main form of transaction is reciprocity, i.e. if Mr A helps Mr B; B will help A in the future.

Most PICs regional organisations such as FFA and PNA are driving management of tuna towards that model. They serve the interests of member countries and create a strong collective management approach. These regional bodies encourage sharing of information about the position of fishers in their boundaries. This helps enforcers in carrying out their responsibilities effectively. Moreover, member countries work together in that any fishing vessel that is black-listed in one member country would

---

23Tabu is a notice or order given by the village chief or elders forbidding fishers to fish in a particular reef for a period of time. This is to allow the fish to spawn and multiply.
not be granted a licence in the other countries. They also organise collective information approaches such as ‘operations kurukuru’.

2.2.4 Studies of Influential Models that Govern the Commons

A number of studies have been carried out on fishers’ behaviour towards compliance with fisheries regulations. One of them was conducted by Professor Elinor Ostrom; who did a study on ‘Governing the Commons’ in 1990 with inshore fishery in Alanya in Turkey.

Her findings were analysed using three influential models. One of them relevant to this study is G. Hardin’s ‘Tragedy of the Common’s’ (Ostrom 1990, p.96).

Hardin described the ‘Tragedy of the Commons’ as “a situation where there is permanent tension between individual and collective interest in the use of open access resources” (Colebatch and Larmour 1993, p.9). This often occurs when individuals want to increase their appropriation of the resource to maximise their own gains without considering collective interests. Such individual attitudes are pursued at the expense of the group. This results in overharvesting of the resource.

For example, a number of DWFNs send their purse seiners to fish for tuna in the WCPO. If the fishers increase their fleets, the tuna stocks will be overfished. However, from each fisher’s point of view one more of their purse seiners would not make any difference. Hence, having one more purse seiner would benefit them immediately and directly, but the effect would show up in the long run when the stocks are depleted. This would be shared equally among all the fishers in the PICs. Such actions by fishers will lead to complete disappearance of the remaining tuna stocks. The ‘Tragedy of the Commons’ spells out that individual fishers tend to harvest ‘commons’ until they extinct.

Some of the reasons why such behaviour happens are because no one owns the tuna resources, and their ‘open access’ attributes. Moreover, tuna are not private goods whereby they are kept under their owners’ custodians. That is why Ostrom (1990, p.97) came up with setting up of rules to guide appropriators. However, she also

---

24 Operations Kurukuru is a communal operation approach funded by FFA, where all or most member countries; including USA, France, Australia and New Zealand personnel, patrol vessels and aircraft collectively do monitoring and surveillance exercises in the Pacific waters.
discovered that overharvesting which leads to suboptimal benefit will still occur if there is no authority to monitor and enforce the rules.

2.2.5 Difficulty in Stopping Non-Compliance

Xepapadea (2003, p.17) identified two harvesting rules; ‘non-cooperative and cooperative rules’. The non-cooperative group engaged in exploitation of the resources to gain maximum profit, while the cooperative group considers social norms, and often cooperates with the others. However, he argued that no fishers would sit on the extremes for a prolonged period of time. Instead, they switch from one end of the spectrum to the other depending on their gains (profits). This is called partial compliance or the coexistence of both (compliance and non-compliance) at all times.

Furthermore, Ostrom, Walker and Gardner (1994, p.59) found during an experiment that it is unrealistic to have fishers totally committed to regulations; this is because in every group (communities) there will be individuals who will ignore norms and act opportunistically. Also, chances for one or two fishers to break the rules are high when most appropriators follow rules. This is because defecting fishers see this as the chance to make the most of it and benefit more than the others. It is therefore impossible to maintain a total compliance. Self-interest appears to be the main motive behind non-cooperation (ibid; Xepapadea 2003; Mansbridge 1990, p.87)

2.2.6 Character of Rules and the Actors (Regulators, Enforcers, Fishermen and Fish)

The character of rules, regulators, enforcers and fishermen and the behaviour of the fish also contribute to the issue of compliance. This is because the actors possess objectives that contradict each other. Sections (2.2.6.1) to (2.2.6.5) briefly discuss the characters of the actors and try to understand how they link to ‘compliance’.

2.2.6.1 Character of Rules

Rule is defined as “Authoritative statement of what to do or not to do in a specific situation, issued by an appropriate person or body” (Business Dictionary 2013, p.34).

Ostrom, Walker and Gardner (1994, p.38) describe rules as “prescriptions that define what actions are required, prohibited, or permitted; and the sanctions authorized if the rules are not followed”.
The Solomon Islands Fisheries Act 1998 aims to oversee the management and conservation of tuna fisheries; and to ensure the country benefits economically from its resources. Moreover, it sets the guidelines and conditions on how fishers should appropriate the tuna resources. However, the rules alone would not achieve their objectives if there is no one to implement them and if they are not understood by the actors. Xepapadea (2003, p.3) argues that: “regulations have difficulties in protecting fishers from over exploitation”.

Ostrom, Walker and Gardner (1994, p.323) explain this more clearly by saying that: “Rules do not operate by themselves. To be implemented successfully, participants must be able to understand rules and know how to make them work”.

Lack of understanding and knowledge of the rules affects compliance (Alayon 2011). Additionally, Alayon found that most of the fishers where he did his research had limited knowledge of fisheries rules; out of the hundred fishers interviewed, an overwhelming majority of them (91%) know three out of twenty rules. This is one of the reasons they break rules. Hence, some fishers may have broken the rules because of lack of knowledge.

Fisheries rules in the tuna large-scale fishing industry are predominantly formal, but there are other informal and customary rules that influence fishers’ behaviour as well. The types of rules are further explained below.

a. **Formal Rules**

Large-scale tuna fishers in the Solomon Islands both locally based and DWFNs are subject to various international, regional and national rules. The UNCLOS, FFA and PNA all contributed to the Solomon Islands Fisheries Act 1998.

For assistance, below are a few examples of formal rules enacted by UNCLOS, PNA and national rules that affect the fishing conditions in the Solomon Islands.


The UNCLOS was established after conferences held in Geneva in 1958 and 1960. Its aim is to maintain peace and justice and progress to all the people in the globe (United Nation n.d.). Some examples of their rules are shown below:
• **Article 52** ‘Right of innocent passage’ allows foreign boats innocent passage through archipelagic waters of a coastal State.

• **Article 61** ‘Conservation of the living resources’ gives the right to coastal States to determine the allowable catch of the resources within their 200 miles EEZ.

• **Article 73** ‘Enforcement of laws and regulations of the coastal State’ gives the right to coastal States for inspection, arrest and judicial proceedings, as may be required to ensure compliance with the conventions’ laws and regulation’. The vessel and the crew can be released if they pay their bond or other forms of security.

• **Article 86** ‘Application of the provisions of this Part’-(high seas) - it defines the ‘high seas’ as the part that is not included in the EEZ, territorial waters, internal waters and the archipelagic waters.

• **Article 116** ‘Right to fish on the high seas’ – it gives the right to all States’ nationals to fish in the high seas subject to their treaty’s obligations provided it meets the rights, duties and interests of coastal States.

• **Article 194** ‘Measures to prevent; reduce and control pollution of the marine environment’. This law gives the right to coastal States to control pollution of the marine environment (United Nations n.d. p.43 - 80).

(a.2) **Parties to the Nauru Agreement (PNA) Rules**

Some rules enacted by PNA that are incorporated by the member countries into their national regulations are:

• The VDS; under which all licensed vessels pay the number of days to fish in a member country. As soon as they complete their days they have to exit.

• The VMS requires all licensed vessels to install ‘automatic location communication’ (ALC) on board. This enables the surveillance and monitoring department to monitor the vessel’s position, speed and course 24 hours daily from their offices. In the Solomon Islands this is done by the ‘marine surveillance unit’.

• It prohibits transhipment of catch at sea.
• It strictly requires recording of catch on a daily basis; including the high seas catch and maintenance of log books.

• It prohibits vessels from fishing in the high seas pockets\textsuperscript{25} and next to the EEZs as a condition of their licences.

• It bans the use of FADs on purse seiners in PNA members’ EEZs between July and September annually.

• It bans catch retention of big eye, skipjack and yellow fin tuna on purse seiners. This is to prevent fish dumping by catch (WWF Fact Sheet 2011).

(a.3) Solomon Islands’ Fisheries Rules

Most of the rules stipulated in the UNCLOS, FFA and PNA were adopted and have become part of the Solomon Islands’ Fisheries Act (1998). Also different types of gear are subject to licence conditions tailored for them that have some standard conditions. Some of the common ones for both local and foreign vessels (pole and line, purse seiners and long liners) are:

• The master is required to keep his licence on board at all times and shall produce it under request by any authorized SIG.

• The vessels are not allowed to fish within five nautical miles of any FAD, except those that are deployed by the vessels themselves.

• The vessels are prohibited from discharging any fish offal or waste one nautical mile off shore.

• No vessels are allowed to dump or discharge any substance in large quantity that would pollute the archipelagic or territorial waters of Solomon Islands.

• When the vessels are navigating through a no fishing zone as stipulated by their licences, they have to store their fishing gear in such a manner that they are not readily available for fishing.

• ‘The master shall maintain an up-to-date record of catch and fishing activity on the approved forms and in the approved manner’ (Foreign pole and line license conditions n.d. p.32).

\textsuperscript{25}High seas pockets are the sea that are not within any countries’ 200 miles EEZ. However, they are located in between different countries’ EEZ. And according to UNCLOS any country including DWFNs can fish in that region. But the same law also states that the surrounding countries’ can all agree to ban fishing in that region for the purpose of conservation as seen necessary.
b. Informal Rules

Informal rules are non-written rules that are non-legally binding under fishers’ licence conditions. These rules are observed by the fishers themselves according to their traditional beliefs, religion, cultures and norms. Fishers feel obliged to obey them because they think it is the right thing to do and because they believe it brings them good luck. Moreover, these are rules that fishers obey voluntarily. Different fishing companies have different informal rules depending on their values, beliefs, norms and practices. A few examples of such rules are:

- When the Japanese were manning the Solomon Taiyo limited two decades ago, a few rituals were practiced. (1) If they caught a smaller volume of fish, they would perform some rituals around the vessels such as lighting candlesticks in front of the boat and praying; they would also pour salt around the vessels. This practice is to bring good luck to their fishing operations. (2) Whenever a dead person is found at sea and the body kept on board, the Japanese would make sure that salt is poured all over the deck and vessel the splashed with salt water after delivering the dead person to the families. This is to avoid any bad luck that may affect their fishing endeavours. (3) All pole and lines are normally tied up and crew are laid off during spawning time between December and March annually. This is to allow the fish to regenerate as these months are the spawning period.

- The local fishers (NFD) also have their own rules. (1) Prior to the catch retention set by PNA, fishers supply undersize tuna and other species to nearby villages. Fishers do this for two reasons. To prevent discarding the fish in the sea and seek blessings from the villagers so that they could have good catches.

c. Customary Rules

Customary rules are those that govern fishing activities in fishing grounds owned by the tribes and villages. These rules differ depending on various communities. In the Solomon Islands, most of the reefs and the surrounding seas (5 miles off land) are owned by tribes. They have their rules on the management of their resources. Any member of the communities who may want to appropriate fish for consumption from
those reefs may do so. But those who want to harvest to sell have to seek permission from the original owners.

The pole and line fishers (large-scale) normally get their baits from inshore particularly on bait grounds owned by tribes. The fishing company has to sign agreements with the reef owners to access the baits in their reefs and to transit through other tribes’ territory. All rules in customary reefs are regulated and governed by the tribes.

However, the Fisheries Act 1998 has also provisions that guard against fishing on customary territory. For assistance, a few of the fishermen are quoted as follows;

12. (1) Commercial fishing in waters subject to customary fishing rights may be carried out subject to such rights.

(2) Any person fishing in waters subject to customary fishing rights; with or from a fishing vessel which is required to be licensed under section 14 or 16, shall be presumed, until the contrary is proved, to be fishing commercially.

(3) When it is proved that customary fishing rights have been breached the court may order compensation to be paid to the customary fishing rights holders.

(4) Any person who fails to comply with an order made under subsection (3) shall be guilty of an offence and be liable to pay in addition to compensation ordered under subsection (3) a further fine not exceeding five hundred dollars or imprisonment of six months (Fisheries Act 1998, pg.16.)

2.2.6.2 Characters of Regulators
SIG is the regulator of fishing activities in the Solomon Islands. The members of parliament pass bills. These bills become the Act. The fisheries’ director oversees the implementation of the Fisheries Act 1998 on behalf of the regulators. The fisheries minister also makes decisions over major issues as he has such discretion under section 3 and 4 of the Act. The cabinet has also decided on some major issues relating to penalties (Marau 2011). It has become public knowledge that regulators
set regulations in parliament but act otherwise when dealing with the real issues. Specifically, regulators often compromise their decisions to assist violators (mostly DWFNs) get out of the trap. Most of the overseas fishing vessels arrested for violation of SI fisheries’ regulations are often released with reduced fines or no fines at all (SIG Audit Report 2012).

Gunningham and Grabosky (1998, p.46), argue that:

“There are many recent instances where some aspect of regulatory policy has been ‘hijacked’ to serve the interests of individuals or groups with political weight at the expense of good policy. Similarly, regulators themselves may succumb to self-interested behaviour, variously being captured by the very industries they purported to regulate or engaging in ‘rent-seeking’, whereby the regulatory bureaucracy seeks to extend its own interests at the expense of the public.”

2.2.6.3 Enforcement and Enforcers’ Characters

Enforcement is defined as an act to ensure that laws, policies or rules are obeyed or forced to happen (Oxford Mini Dictionary 2007). Weak enforcement on the other hand is the opposite of enforcement. The general perception of ‘enforcement’ in the Solomon Islands and most PICs is that it is weak and ineffective in deterring IUU fishing activities.

Enforcement and monitoring agents are the front line people that make sure the rules are followed. These agents include the ministry of fisheries, the regional fisheries observers program (ROP) and the national maritime surveillance unit. However, they are often perceived as weak and ineffective. The fisheries ministry; for instance, often acts similarly to the regulators in that they are generally perceived as too lenient and tend to compromise their duties for personal gain.\(^{26}\)

The national maritime surveillance unit operates the PCPV. They do surveillance, monitoring, boarding and arrests. However, they often complain that regulators often intervene in their jobs when vessels are arrested consequently weakening their authority.

\(^{26}\)Personal gain in this case refers to enforcement officers compromising their responsibilities for cash or material goods from fishers and their employers.
Also under the Regional Observers Program (ROP) observers are required to follow fishing vessels in each expedition. These observers record the catch, weight, size and species and send the records to the SPC for data analysis. This is where stocks are updated. The observers also do vessel sightings, meaning they look out for vessels that do not have the licence to fish in the coastal State. Observers are perceived to be exposed to informal activities from fishers from time to time. This could result in them compromising their duties. Those who appear to be strict in carrying out their responsibilities can be perceived as government spies. This could result in fishers and observers having tense relationship. However, the current license conditions require 100% observers’ coverage to purse seiners and fishers to look after observers and assist them. This has reduced the tension.

2.2.6.4 Characters of the Fish

The tuna, as mentioned in chapter one, are a highly migratory species. The same schools of tuna travel to and from Solomon Islands, PNG, Tuvalu, Kiribati, Palau etc. They do not know about the national boundaries, EEZ or the fisheries’ regulations. International laws (UNCLOS), FFA, PNA and the coastal States created the boundaries and set the rules (Pers. comm. FFA Compliance Advisor, 2012). Tuna normally travels in schools and often feed around floating objects and FADS. The FADS are also regarded as homes where they take shelter during the nights. They move horizontally and in vertical patterns. Their movements are influence by psychological and environmental conditions. The psychological conditions involve the prey distributions. Tuna easily sense their prey this forces them to move away, seeking safer locations. Similarly, environmental conditions such as planktons\(^{27}\) (food), sea current, salinity, level of oxygen and the temperature of the sea influence the tuna movement (Spalding and Sibert, 1997; Pers. comm. monitoring number 1, 2012; Ex-fisherman number one, 2012, and fishing master number 4, 2012). Different tuna species prefer different temperature conditions. Skipjack and yellow fin normally prefer temperature conditions that are warmer and above 25 degrees celsius. Big eye tuna in contrast prefers to swim at a temperature that is 15 degrees or colder. This requires them to swim much deeper than skip jack and yellow fin (Spalding and Sibert 1997). Moreover, they prefer clean environment in which to live

\(^{27}\)Planktons are microscopic organisms that float of the surface of the sea. This includes algae and protozoan that float or drift on the seas. Tuna feeds on the planktons.
and spawn. Polluted environment may kill them and chase them to other ideal locations.

An adult female tuna spawns 30 to 60 million of eggs per season (June 1953). Their normal spawning period in the PICs is between the December and March annually. Solomon Islands is a spawning region because it is where the cold and warmer currents meet. It is not advisable to fish for tuna in the spawning period because tuna seen in the water are mostly juvenile (Pers. comm. captain number 2, 2012).

### 2.2.6.5 Characters of Fishermen

The fishermen referred to this thesis are those who work in the fishing boats which include engineers, crews (including bosuns), captains and fishing masters. In passenger and cargo vessels, crews, captains and engineers are organized according to division of labour. In contrast fishing vessels are different in that everyone is required to fish during fishing time regardless of whether they are engineers, cooks or crew. The fishing master is the overall boss; he manages the vessel and makes all the decisions. The captain only navigates the vessels to the fishing grounds (Pers. comm. ex-fisher number 5; pers. comm. ex-fisher number 1, 2012; pers. comm. captain number 3, 2012; pers. comm. ex-fisher number 3, 2012). It appears that the main concern of employers and the fishers is to catch as many fish as possible.

Fishermen from tropical Western Central Pacific study tuna and develop techniques to take advantage of the behaviour of tuna. Two basic methods utilised to capture large schools of tuna are setting nets surrounding floating objects and fishing on free schools. The first method involves purse seiners setting their nets surrounding floating natural logs or FADS. Large schools of tuna are often captured in this manner; including juvenile tuna. In other words undersized tuna are often found around FADS and other floating objects. Tuna in general feed around, and regard the floating objects as home. The second method involves setting nets on free or un-associated schools. The tuna feed on baitfish on the surface and most of the time the baitfish would slash water on the surface hindering the tunas’ view on their prey as well as the purse seiners who are their predators. These purse seiners would

---

28 Division of labour is where crew specialized in various responsibilities on board work according to their expertise and nothing else. For example, in cargo and passenger boats crews only do helmsman, boatman, and loading and discharging cargoes. Engineer only does engineering jobs. The cook only does cooking. But in fishing vessels everybody does the fishing.

29 Purse seiners are large-scale fishing vessels that use large nets to capture schools of tuna. A more detailed description is explained in section 2.2.7.
surround their nets on these schools and capture them. The free schools often consist of mature tuna (Spalding and Sibert 1997).

The long line\(^{30}\) fishers normally fish during the day for big eye and albacore that swim deep very close to the thermocline. The Japanese long liners normally used 15 to 30 hooks attached on a main floating line (ibid.).

Correspondingly, a number of studies were carried out on the behaviour of fishers. One of them was carried out on the behaviour of scallop (*Pecten maximus*) fishers in St. Brieu. It was discovered that fishers “*fish scallops to the last shellfish without worrying about the stock; they make larger profits; if they do not slow down their zealous efforts, they will ruin themselves. However, these fishermen are considered to be aware of their long term economic interests and, consequently, seem to be interested in the project of restocking in the Bay and approve of the studies which had been launched to achieve the plan*” (Michel 1986, p.13).

This statement appears to be universal in that while fishers in a market set-up strive to extract as many fish as possible, they are also concerned about the stock. This implies that these fishers are also concerned about current and future business interests. This attitude resembles fishers in the community set-up where people rely on the fish for their current and future livelihood. If there is no more future in tuna, the community and the future generation would be affected. This statement could be contradictory to the one mentioned on self-interest empirically argued for the Solomon Islands’ case in section 2.2.2. The best way is to incorporate these two extreme is by saying that there is place for both in society. Fishers are influenced by ‘self-interest’ to achieve short-term goals but their ‘self-interest’ could also lead them to cooperate for future benefits given proper awareness. This would enable fishers to comply voluntarily rather than by force.

### 2.2.7 Fishing Gear

Fishing gear refers to ‘*any equipment, implement or other thing that may be used in the act of fishing, and includes diving gear, fishing net, rope, pole, line, float, hook, boom, power block or winch, boat, dinghy, helicopter or aeroplane that may be used*’ (Fisheries Act 1998, p.17)

---

\(^{30}\)Long line fishers are those that use long floating lines attached to a couple of hook to fish for deep sea tuna such as albacore and big eyes.
The fishing gear mostly employed by the large-scale fishing industries operating in the Solomon Islands and the FFA member countries are purse seining, long lining and pole and line.

Purse seiners used large synthetic nets to capture the fish. This net extends from 1500 to 2000 m in length and 120 to 250 m in depth. It encircles the school of tuna while the bottom closes to trap the entire school (FAO 2013). Long line fishing uses lines extending as far as one hundred miles. These lines are kept afloat by floaters. Secondary lines spreading at intervals of 30 meters are baited and released as deep as 350 metres. The secondary lines are attached to a couple of hooks. The Japanese use about 15 to 30 hooks. This is deep sea fishing targeting albacore tuna (Bigelow et al. 2005). However, other species such as sharks and swordfish are also caught (ibid. FAO 2013). Pole and line fishing uses rigid poles (bamboo) of about 2 to 3 metres long. A short but strong line is attached to the end of the pole to a barbless hook. This is manual fishing; about 10 to 20 fishermen stand at the rear of the vessels doing the fishing. Each pole can only catch one tuna at a time. This type of fishing is designed specifically for tuna; hence it attracts less by-catch (FAO 2013).

2.2.8 Nationality

Nationality according to the English Mini Dictionary (2007, p.367) is “the status of belonging to a particular nation or an ethnic group”. In this context, nationality refers to fishers from different countries that fish in Solomon Islands’ exclusive zone such as Korea, Japan and USA. Reviewed work argued that the level of compliance also depends on where fishers and vessels originated from (Gezelius 2008). This is influenced by the cognitive theory described by Kuperan et al (1995, p.19) under ‘moral behaviour’ in section 2.3.3.

2.2.9 Conceptual Foundations, Key Terms and their Relationship with Compliance

The diagram on figure 2.1 summarises and brings together some of the key terms and characters that were explained in the preceding sections. It is called a ‘raw framework’. The complete list of factors that affect compliance will be unveiled in the later part of this chapter when findings on existing studies are discussed. However, the purpose of this diagram is to help give some idea of how these factors
influence ‘compliance’. All these factors will be factored into the main conceptual framework in section 2.7.

Figure 2.1 How the key terms (concepts) link to compliance
2.2.10 Explanation of the Diagram (Raw Framework)

Figure 2.1 summarises the relationship of the key terms discussed in section 2.2 (2.2.1 – 2.2.8) with ‘compliance’. The blue coloured circles represent the different ‘concepts’ and the white coloured oval represents ‘compliance’. The actual relationship between the concepts and compliance can be complicated as there can be multiple direct and sideways relationships between different concepts and compliance. This diagram however, portrays a simple basic relationship.

As can be seen the diagram depicts three types of relationship. The first one is a ‘direct’ relationship between concepts and compliance. This is the most common one. The second one is an indirect relationship. Some concepts link to compliance through another concept. An example shown in the diagram is fishers’ nationality; which is indirectly linked with compliance through fisher’s behaviour.

The third relationship is more ‘side’ ways. There are two types of such relationship; one is ‘one directional’ and the other is ‘both directional’. An example of one directional as shown in the diagram is the bureaucracy model and enforcement. Similarly, an example of both direction ‘sideways’ relationships is ‘enforcers’ and ‘fishers’ behaviour’.

The explanation of the diagram is in the clockwise direction. Beginning with CPRs; the diagram depicts a direct link between CPRs and compliance. Tuna as CPR, makes it difficult to exclude anyone from appropriating them. Unlicensed vessels on most occasions fish illegally within the 200 miles zones.

The government is responsible to manage tuna as required by the UNCLOS. The government system of management is predominantly bureaucratic; using the ‘bureaucratic model’ or sometimes known as ‘command and control’. As shown on the diagram, the ‘bureaucratic model’ directly links with CPRs because these resources are predominantly managed by that model. The same model also has a direct link with ‘rules’ and ‘enforcement’. This is because that model manages tuna resources using rules (Fisheries Act 1998, license conditions), policies and procedures. All fishers have to pay access fees and licences; and harvest according to their licence conditions. Also there are other informal rules that influence fishers in appropriating tuna. The informal rules are different for different appropriators depending on their practises and norms. Customary rules also influence fishers.
particularly the ‘pole and line’. The pole and line fishers are subject to customary rules when they appropriate bait fish from traditional fishing grounds. However, the rules do not guarantee compliance to the regulations; the appropriators have to obey rules to achieve compliance.

Secondly, the fact that the same model connects to ‘enforcement’ is because the rules are implemented by enforcers. The enforcers are the government agents which include the ministry of fisheries, observers and the maritime surveillance unit. The success of ‘compliance’ depends on the enforcers. However; with the vast ocean, the ‘maritime unit’ finds it difficult to monitor. Additionally, the ministry of fisheries staff and the ROP also have their limitations. One of the obvious ones is corruption.

The next actor is the fishers. Elster (1996) argued that fishers in any commercial setting are often heavily influenced by business and personal interest. As can be seen from the diagram ‘self-interest’ resembles a hub that connects with three other concepts (Tragedy of the Commons, the difficulty of stopping of non-compliance and CPRs). The Tragedy of the Common, for example, depicts that fishers tend to pursue their own self-interest rather than considering collective interests. This leads to non-compliance and ultimately exploitation of tuna resources. This theory argues that pursuing one’s individual interest would make everyone worse off in the long run. Surprisingly, most fishers in the PICs including Solomon Islands are still pursuing their ‘own-interest’; that is why IUU is still perceived to be prevalent in the region.

The other phenomenon, namely ‘difficult in stopping non-compliance’; argues that it is hard to put a complete stop violation of rules because of fishers’ self-interest. Self-interest by way of interpreting Xepapadea’s (2003) argument appears to be inseparable from fishers or human nature in general. Xepapadea formulates a rule to describe this theory called ‘non-cooperative’ and cooperative rule’. This rule maintains that ‘compliance’ and ‘non-compliance’ naturally co-exist in equilibrium. This balance has to be maintained at all times; that is why it is difficult to stop non-compliance.

Correspondingly, still focusing on ‘fishers’ behaviour’ one could see that there is an arrow connecting to ‘compliance’. This indicates there are other attributes that could cause fishers to violate rules. An example could be lack of understanding of rules. Moreover, there is an arrow connecting from ‘fishers’ nationalities’ to fishers’
behaviour. It is hypothesised that nationality of fishers also has a different bearing on their behaviours and attitudes towards rules. Some of their behaviour could be influenced by ‘self-interest’ and other factors. The arrow that connects from fishers sideways to enforcers and vice versa implies that fishers or their respective governments may sometimes negotiate with regulators (or involve in corrupt activities) causing coastal States to reduce their penalties or to impose no penalties at all. Such actions could encourage more IUU activities.

The next actors are the regulators. Regulators are those who formulate the rules. As mentioned in sub-section 2.2.6.2, regulators can also compromise their duties and contribute towards violation of the rules. The most common cases involve DWFNs. The diagram shows that ‘regulators’ have a direct relationship with compliance.

The other actor is the tuna (fish). Tuna does not know the boundaries and rules. They are highly migratory. Their migrations are mostly influenced by environmental (current, thermocline, salinity, food etc.) and psychological conditions (prey distributions and movements). Tuna are very sensitive. They can detect the presence of their prey and start to swim away to a safer place. The behaviour of the fish and its movement could affect compliance to regulations. For example; if the tuna are found less than 6miles offshore, fishers would be tempted to set their nets. Figure one shows a direct relationship between the ‘fish’ and compliance.

2.3 Findings from Existing Research

This section reviews studies done by different researchers on the issue of ‘compliance and regulations’ in the period between the periods 1994 and 2011. This is to help understand the issue better and ultimately; identifies the gaps that could be addressed in this study.

2.3.1 Biological Reasons

Ostrom, Gardner and Walker (1994, p.45) discovered from her team’s research in Brazil (field research) and secondary research in the Americas, Europe and Asia that one of the factors that have influenced fishers to comply with regulation is the biological status of the fish. Fishers tend to comply with the rules if they know that the stocks are depleting. The underlying reason is to allow for regeneration. Similar findings were confirmed by Honneland (2000, p.59) and Gezelius (2008) when they conducted their studies in Europe.

Ostrom, Gardner and Walker (1994, p.63) found that fishers’ level of compliance was high when the stock was low; but they started to disobey rules when the stocks had regenerated (ibid.). This indicates that compliance is influenced by three factors: (1) Knowledge of Tuna Stocks, (2) Self-Interest and (3) Others’ Interests. Fishers obey rules because they fear depletion of the stock will affect their business and personal interests (self-interest).

However, they start to break the rules when the stock has regenerated. In this case fishers know that they have enough fish and would tend to overfish to meet their immediate goals. Therefore, such behaviour where fishers obey rules when the stock is low, but violate them when the stock is high is linked to business and personal interests of the fishers.

Correspondingly, considering ‘(1) Knowledge of Stock’, it appears that one of the underlying reasons for fishers to comply with rules after knowing about the status of tuna stocks is ‘self-interest’. The knowledge of the stocks only acts as an instrument or secondary reason for fishers to obey rules. Hence, ‘knowledge of stocks’ is part and parcel of ‘self-interest’.

In explaining the third factor ‘(3) Others’ Interest’, some fishers also care about others. This influences their level of appropriations. Such fishers voluntarily comply with rules because they also care about their children and the future generations. They may want to ensure that there will be a sustainable supply of fish for the present and future generations.

Further, local fishers may want to ensure there is enough tuna for their children and grandchildren. Fishers’ children and grandchildren have personal blood ties with
them. Fishers therefore, may want to ensure that their generations have enough fish for the future. Such fishers may not be motivated to conserve tuna if it has nothing to do with their own children and generation.

However, it may not be completely ruled out that other fishers may obey rules when they learn about ‘the low status of the fish’ because they are concerned for people in general and not only their families. Hence, as Esler (1996) mentioned, fishers’ behaviour is not driven by ‘self-interests’ alone but also with a combination of other factors such as ‘moral principles’ and ‘the concern for others’.

Under the circumstances mentioned above, the biological status of tuna is therefore an important factor that could achieve voluntary compliance to regulations.

2.3.2 Economic Gain

It was also revealed that fishers’ level of compliance is determined by economic gain. Most commercial fishers pursue economic gain as their main interest. This can be easily comprehended because commercial fishing is a business undertaking where profit maximization is the fundamental aim. If the fishing company does not make any profit, it would not survive. Thus, economic gain in this context is tied to ‘self-interest’.

Ostrom, Walker and Gardner (1994, p.45) have discovered through experiments that ‘self-interest’ was a powerful influential factor to compliance. There were situations where the potential illegal gains were higher than the severity of sanctions to an extent that even individuals strongly committed to rules would break them (ibid.). Here, fishers weigh the potential illegal benefit against the penalties. If the gains outweigh the costs, they go ahead and violate the rules. This has attracted fishers because it helped meet their goals rather than obeying rules which may hinder their capacity to reach their goals (ibid; Kuperan et al. 1995; Hatcher et al. 2000; Jenny, Fuentes and Mosler 2006).

An investigation on why sanctions are often less severe in comparison to illegal gains revealed that ‘the courts were not willing to impose more stiff penalties than the crime itself’ (Kuperan et al. 1995, p.2). This is an important concern because ‘low penalty’ is one of the major contributing factors to this problem. Unless severe
sanctions are taken by island States, self-interested fishers will continue to violate the rules.

Moreover, Alayon (2011) discovered another interesting facet on this issue. He found that fishers’ level of income also influences their compliance level. That is; fishers who have other sources of income were less likely to violate rules than those who depend on fishing as their main source. This finding is more relevant to the context of artisanal fishers than large-scale commercial offshore fishing.

2.3.3 Moral Behaviour

The third factor that influences compliance is moral behaviour. Existing knowledge demonstrates that people’s level of morality also has a significant influence on compliance. They found that higher moral values contributed to reduced non-compliance.

Kuperan et al. 1995 found in Malaysia, Indonesia and the Philippines that although modest sanctions were not severe enough to deter non-compliance, higher proportions of fishermen still follow rules. These fishers express obligations to follow rules as important. Such behaviour is best explained by the socialization process. One aspect of this is the cognitive theory which states that an individual’s level of personal development; influences his decision to comply with rules. Based on the context of this study, compliance is influenced by the strong cultures of societies. This helps groom the citizens’ personal development including the fishers.

2.3.4 Corruption

Corruption is another component of moral behaviour. Corruption itself is not an IUU, but it is one of the instruments for IUU. It was found that rule abiding fishers may violate the rules if they know that corruption is practised by some fishers and fisheries officials. This would lead to high non-compliance to regulations (Honneland 2000, p.77).

Furthermore, Sundstrom (2012) undertook his research with small-scale fishers in South Africa. His research confirmed that corruption is one of the contributing factors to non-compliance with fisheries regulations in South Africa.

Corruption, in a simple sense means ‘the abuse of public office for private gain’ (Elliot n.d. p.177). Sundstrom (2012) mentioned that corruption within the
enforcement authority corrodes fishers’ willingness to comply with regulations. Moreover, corruption of both petty and grand nature has significant negative effect on fisheries management. Petty corruption involves small scale corruption committed by middle and junior level bureaucrats (Elliot n.d.). An example of petty corruption is, when fishers give some food or money to fisheries officers enabling the fishing boat to misreport their catch.

On the other hand, grand corruption is where such practices are happening in the political level (ibid). This often involves policy making in favour of fishers, granting of fishing licenses to name a few. Often the politicians involved are given large sums of money for such practices. In the Pacific islands States grand corruption affects fisheries management through ‘licensing and access agreements while petty corruption in monitoring and inspection (Sundstrom 2012, p.1256). In short, corruption can influence both policy formulation and enforcement (ibid).

Similarly, Honneland (2000, p.78) found that fishers started to break rules when they learned others have been involved in corrupt dealings. Such phenomenon is in lined with the contingent behaviour theory (Ostrom, Gardner and Walker 1994, p.89).

Honneland (2000, p.80) expressed the same sentiment in a different manner. He found that fishers complied because they have genuine respect for laws and the authorities. He mentioned those fishers perceived breaking rules as immoral (ibid.). Likewise, it was also revealed that some individuals have a high commitment level to follow rules and orders because they think it is the right thing to do (Jenny, Fuentes and Mosler 2006; Gezelius 2008; Alayon 2011).

2.3.5 Legitimacy of Rules

Other factors that determine compliance include the legitimacy of the rules (Alayon 2011). Legitimacy of the rules means fairness of the rules (Kuperan et al. 1995; Abusin and Hassan 2009). Different researchers have come up with various findings relating to fairness of regulations.

Kuperan et al. (1995) argued that ‘normative perspective’ has strong influence on compliance. He mentioned that fishers will comply with regulations if they perceive them as appropriate and consistent with their internalized norms. Here fishers are willing to obey the rules if they perceive them to be fair and appropriate; and when
they agree with the legitimacy of the enforcement agency as having the right to restrict their behaviour (ibid; Abusin and Hassan 2009). Also fishers comply with rules if they perceive them as compatible with the context. But they would violate them if they see the rules as inappropriate (Gezelius 2008).

Jenny, Fuentes and Mosler (2006, p.23) have broken down legitimacy of rules into three elements: (1) Distributive, (2) Procedural and (3) Interactional Justice. Distributive justice means the rules imposed and the rewards for compliance are fair. This causes fishers to have genuine respect for the laws gaining their cooperation.

Moreover, interactional justice refers to the respect and politeness showed by the authorities to the individuals who break the rules. Fishers or individual tend to comply with rules when enforcers treat them fairly and with respect.

Procedural justice refers to how consistently the rules are applied to all fishers (Kuperan et al. 1995; Honneland 2000, p.78; Jenny, Fuentes and Mosler 2006; Eggert and Lokina 2008; Abusin and Hassan 2009). There are times when some violators are treated more leniently than others. For instance, in 2010, the director of fisheries in the Solomon Islands issued the release of two Asian fishing vessels without proper proceedings. This is an exceptional treatment in contradiction to the country’s fisheries’ policies (Island Sun 2012).

2.3.6 Norms

Norms play a significant role in compliance with regulations. There are several factors relating to norms. Ostrom (1990, p.76) argued that humans possess ‘contingent behaviour’. This influences fishers to behave according to the norms of their community. If a majority of the fishers comply with rules, the others will also comply. Individuals tend to comply with regulations if others do. This is because they do not want to be seen negatively by others.

Conversely, loyal fishers would start breaking rules if the majority who are disloyal continue to break rules without being punished. It appears that effective norms play an important part in compliance (ibid. Jenny, Fuentes and Mosler 2006; Hatcher et al. 2000).

Additionally, there are some fishing communities for whom the informal norm requires them to obey the law regardless of the content. This is referred to as
legislative authority; people are expected to obey the commands of a specific superior regardless of anything else. Such people are highly law abiding citizens (Gezelius 2008).

2.3.7 Social-Ethical Factors

Another factor that influences compliance is social status. It was found that social learning theory influences compliance. This theory describes how the perceptions of others can impact on fishers’ decisions to comply. Fishers who value their social status in the community are strongly influenced by others’ perceptions. Thus, they may not want to break rules because they do not want to have a negative reputation within the community (Kuperan et al. 1995).

Likewise, Gezelius, (2008) found in his studies in the Norwegian communities that fishers are often discouraged from breaking fisheries regulation because law breakers are often subject to gossip. Gossip is considered a deterrent factor.

2.3.8 Enforcement

Enforcement is the most effective deterrent method according to previous findings. Fishers can calculate their chances of being caught or vice versa before violating rules. The effectiveness and efficiency of enforcement authorities is a significant factor that can determine compliance. Violators base their decision to violate rules by predicting the chance of how quickly and frequently they could be detected, arrested and prosecuted. If the law enforcement is strong, fishers would perceive breaking rules as a significant risk (Kuperan et al. 1995; Gezelius 2008; Eggert and Lokina 2008; Abusin and Hassan 2009; Alayon 2011). Hence, compliance tends to be high when enforcement is high but low when enforcement is weak. Moreover, fishers tend to follow rules if they are arrested and charged (Honneland 2000, p.56; Abusin and Hassan 2009). Unfortunately, the last part of the findings is disputed because in the Solomon Islands the same fishing company was reported to be arrested several times (Pers. comm. enforcement officer number 3, 2012; SIG Audit Report 2012).

2.3.8.1 Weak Enforcement and Institutions

Alayon, (2011) in his studies on Old Providence Island (OPI) Colombia found that weak enforcement gives opportunities for violation of rules. This was caused by insufficient resources to monitor fishers; the island only has two boats to do the job. Second, the overlapping responsibilities of the enforcement authority also have a
bearing on this problem. For instance, those who were responsible for monitoring fishing rules also sought to control drug trafficking. In this instance, they focused more on drug trafficking than fishing rules.

Xepapadea (2003) found that fishers in the absence of appropriate institutions, will go on and harvest as many fish (resources) before someone else does and often ignore the impact of their actions on the stock (ibid.).

Furthermore, Sasako (2012, p.2) has pointed out some of the reasons why enforcement is weak in island States. These are:

“(1) National institutions lack adequate resources and ability to effectively manage their fisheries. (2) Lack of harmonized management at the sub-regional level. (3) National institutions lacking the capacity and procedures to adequately review licenses and applications and (4) Lack of transparency in licensing, weak license conditions, poor enforcement of license conditions, lack of verification of catch data to determine levels of misreporting and/or to determine levels of accuracy, poor implementation of national observer programs, poor operation and enforcement of Vessel Monitoring System (VMS), lack of human capacity.”

These are all features of weak enforcement similar to what Alayon (2011) identified in his research.

The weak internal mechanisms and lack of resources that affect island States have enabled fishers to take advantage of this problem. This is one of the contributing factors to why non-compliance is rife in the PICs fisheries.

2.3.9 Penalty

The level and magnitude of penalties also influence compliance with fisheries regulations. Ostrom, Walker and Gardner (1994, p.56) implied that graduated sanction is the best approach to deal with fishers who break rules. Here, the rule breakers are gradually sanctioned by enforcement agencies; from verbal warning, then written warning to more severe actions. This approach has proven to have achieved the desired result. This method works well at the community level (ibid. Jenny, Fuentes and Mosler 2006).
Furthermore, fishers are deterred from violating rules if the costs of sanctions or penalties are excessive. They weigh the gains and penalties then break the rules if the potential illegal gains are presumed to be higher than the costs. They always do that in the small scale (artisanal) fishing. This is because they know the costs and penalties for breaking rules and the gain they would get. One of the reasons why this is possible is because there is open and frequent communication in small-scale community fishing (Kuperan et al. 1995; Hatcher et al. 2000; Jenny, Fuentes and Mosler 2006; Eggert and Lokina 2008). However, from empirical knowledge this remains doubtful in large-scale offshore tuna commercial fishing.

**2.3.10 Community Work**

Community work refers to involving all the stakeholders in the management of fisheries. In the case of tuna in the Solomon Islands this would involve the national government, local and DWFNs, and RFBs.

Co-management or community cooperation is one factor that also has influence on compliance (Hanich, Teo and Tsamenyi 2009). Gezelius (2008) discovered that strong community work has deterred non-compliance. This was very successful in Norway where he did his studies. Similarly, Hatcher et al. 2000 found in his studies in UK that fishers who were directly involved in quota restrictions were more likely to comply with the quota rules.

Correspondingly, Havice and Campling 2010 also mentioned that fishing regulations can be violated if they are enacted at the bureaucratic level without consulting the stakeholders. This can cause stakeholders to misunderstand, disagree, feel out of place or protest by breaking the rules (ibid. Ostrom, Walker and Gardner 1994; Abusin and Hassan 2009).

However, one of the disadvantages of involving stakeholders in the domestic (regional) fisheries policies is that they can influence legislation to their advantage. This is because most of the bigger countries often negotiate their way in formulating regulations to suit their purposes regardless of scientists’ advice on the depleting stock. This finding is true for WCPFC because its membership includes DWFNs. They often influence legislation to suit their preferences (Pers. comm. enforcement number 4, 2012). For example, currently all high seas pockets are closed. However, WCPFC powerful members who are DWFNs voted for the Philippines’ right to fish.
in the high seas pocket adjacent to PNG and were successful. This is the only pocket that is still open particularly for Philippines (Havice and Campling 2010).

2.3.11 Lack of Knowledge and Understanding on Rules
Lack of understanding and knowledge of the rules also contributes to non-compliance (Alayon 2011). It was revealed that some of the fishers did not have enough knowledge of the rules. This has contributed to breaking of the rules (ibid.). Similarly, Ostrom, Walker and Gardner (1994, p.84) have earlier found that some fishers did not understand the rules resulting in them violating the rules.

2.3.12 Socio-Economic Reasons
Socio-economic attributes include variables such as fishers’ education level, source of income and the number of skippers and crew on board. The researchers found that violating of rules tends to reduce when fishers’ education levels were high (secondary level and above); and when they also have other sources of income. These are interesting new findings (Abusin and Hassan 2009; Alayon 2011).

Moreover, violation rates tend to decrease when more skippers and crew are on board a vessel. This is because more crew tends to discourage chronic violations. This finding is relevant to community (artisanal) fishing but it does not reflect situations in deep sea fishing where the fishing master makes all the decisions (Alayon 2011).

2.3.13 Nationality
The nationalities of the fishers have strong influence on obedience to rules (Havice and Campling 2010). Some countries have strong moral attitudes. They see violating rules as immoral. This also influences their fishermen’s attitude towards compliance. Conversely, other countries display low moral values. An example of countries that have high regard for fisheries’ regulations is Norway (Gezelius 2008). Japan on the other hand is a typical example of DWFNs that is engaging in illegal whaling activities in the WCPO (Havice and Campling 2010).

2.3.14 Sense of Belonging
Alayon (2011) discovered from his research in OPI Columbia that the sense of belonging to the islands and its traditional activities (custom) is a determining factor towards compliance. This indicates that local fishers are more responsible in their fishing as they take more ownership of their resources. But outsiders do not care
about the stocks. Most of the blame relating to resource depletion are falls on outsiders (ibid.).

Furthermore, social capital or rule legitimacy plays a significant part in compliance in OPI. The island has a historical tension with the national state. This is due to their physical isolation and as such has claimed their physical independence from formal institutions in their traditional activities. This island is under Canada. However, the fishers have strong local rejection to the national state’s authority because they felt it was interfering into their traditional activities. The varying differences in opportunities and unequal power possessed by individual fishers and State fishers are also another contributing factor. The fishermen who belong to the State seem to have more opportunity and power. Such disparity has triggered rejection of the national state’s authority by islanders; which diminishes compliance to rules (ibid. p.55).

Additionally, most of the islands fisher’s in OPI did not have a good relationship with the State. Hence, they tended to collude and not report any of their members’ disloyalty (Alayon 2011).

Another related problem is the border issue. Fishers may not comply if there is a border problem between two sovereign States. In this regard, there was a border disagreement between Russia and Norway. This caused the Russian government to fish in the disputed territory breaking Norway’s fisheries law (Honneland 2000, p.99).

2.3.15 Communication

Communication also has some influence on compliance. Ostrom, Walker and Gardner (1994, p.61) did some experiments and explored the effect of communication. This experiment revealed that communication improves cooperation among fishers to a certain level but it does not totally eradicate non-compliance, even if communication is done clearly. The reason is because there are always fishers who are opportunists within any community. These fishers tend to break rules secretly when the rest obey. The reason for this could be related to the theory discussed by Ostrom, Walker and Gardner (1994, p.91) where it stated that the chance for some opportunists (fishers) to violate rules is high when the majority of fishers obey them. Such fishers maximize their gains in these kinds of opportunities. Another theory that
best explains this kind of behaviour is the ‘cooperative and non-cooperative rule’ by Xepapadea (2003, p.42).

2.4 Key Theories Underpinning This Thesis

Two interesting theories derived from existing studies are those from Ostrom (1990) and Xepapadea (2003). Ostrom (1990, p.57) argues that it is difficult and impractical to achieve 100% compliance because one or two fishers are likely to break the rules even if the majority comply. This is because self-seeking fishers would disregard the rules and try to maximize their gains. This theory was further complemented by Xepapadea (2003, p.56) with his theory of co-operative and non-co-operative rules. It argues that there are two rules in existence for harvesting of fisheries resources; those that involve obeying rules and those that violate them. He maintained that these two rules have to co-exist to maintain equilibrium. If the two forces are not in balance, they will naturally stabilise themselves. This seems to indicate that it is difficult to achieve total compliance.

However, based on the ‘Tragedy of the Commons’, Ostrom (1990, p.120) also pointed out that fishers acting in ‘self-interest’ will not improve their wealth, instead they will be worse off in the long run. Overfishing due to self-interest would extinguish the tuna stocks. This would put all the fishing companies out of business, whereas sustainable fishing would ensure business remains over the long run. Unfortunately, the large-scale tuna fishers in the Solomon Islands and those within FFA member countries are operating based on maximising their immediate business and personal benefits rather than collective benefit. And this often occurs at the expense of sustainable harvesting. That is why this thesis is important because it does not want to see what was happening in other oceans to recur in the region. Secondly, it does not want to see fishers (some of whom are locally based) to be worse off than now. This will also have a spill over effect to the country and the wider population.

2.5 Gaps this Project would fill

The researcher has identified a few gaps from the literature that drive him to pursue this study: (1) Context. Most of the studies in the review were conducted in Europe, the Americas, Africa and Asia. No similar research has been carried out in PICs or Solomon Islands. (2) Model. The management model of the ‘commons’ operated in
countries in the literature review is the community based model. This model incorporates artisanal and inshore fishing (coastal fishing), and solutions are community based. In contrast the offshore fisheries use the public (bureaucratic) model that engages ‘rules’ and ‘enforcement’ as solutions. This study will also try to see if other models would best solve its weaknesses or further strengthen the public model.

Another discrepancy is the type of fisheries studied in the literature compared to what is going to be studied in this paper. The fisheries studied in the review are mostly general species; which includes all types of species including lobsters, turtles etc. This study will only be focusing on tuna fisheries as this is a very important fisheries resource in the Pacific.

It is hoped that this study will help reduce the gaps and uncover something new and interesting in view of controlling IUU activities. Besides there is no research conducted on tuna in the Solomon Islands. This is the first study of its kind.

2.6 Explanation of Conceptual Framework

The conceptual framework in figure 2.2 is an elaboration or development of figure 2.1 and a step towards operationalising the concepts. Most of the interview questions are derived from this framework. Its purpose is to reveal what studies have been saying on factors that affect compliance.

Secondly, it aims to convey ideas into something that is easy and simple to view and understand.

A brief explanation of the framework is as follows. The circle in the centre represents compliance to fisheries regulations. It is placed in the centre because it is the main issue of the thesis. All the surrounding diagrams (rectangles) and circles represents concepts that either directly or in directly influence compliance.

The top sets of diagrams (rectangles) represent conditions that influence fishers to break rules. It is represented by a minus (−) sign because violation of rules is subtractable and often results in depletion of the stocks. It comprises seven factors namely (1) Self-interest (2) Knowledge of Rules (3) Corruption Work (4) Border Issues (5) Fish Behaviour (6) Regulators’ Behaviour. Brought forward from figure 2.1, ‘self-interest’ is externally linked to three circles. These circles represent the
following theories; cooperative and non-cooperative rules (C and N-CR), Tragedy of the Commons (T o t C) and CPRs. For assistance, C and N-CR and T o t C have their arrows pointing to ‘self-interest’ which means that they are founded on self interest. CPRs on the other hand, have an arrow pointing towards it to show that fishers pursuing to maximize their profits exploit the natural attributes of CPRS. Self-interest in this case is predominantly linked to ‘economic gain’. That is why it is represented by a box placed under self-interest. All the eight factors that influence fishers to break rules have negative signs. The eight rectangular boxes have direct connection to compliance, whereas ‘self-interest’ and the other four factors in circles are indirectly related to compliance, through ‘economic gain’.

Conversely, the bottom sets of rectangular boxes represent conditions that influence fishers to obey rules. This is symbolized by a positive (+) sign. There are two ways in which fishers obey rules. They can comply voluntarily or non-voluntarily. The bottom sets of boxes below the hub (compliance circle) represent conditions that influence fishers to comply with rules. There are nine of those that can achieve voluntary compliance. They are (1) Moral Behaviour and Personal Development (2) Nationality (3) Legitimacy of Rules (4) Sense of Belonging (5) Communication (6) Community Work and (7) Social Norms. The arrows that connect them to compliance mean that they all have direct linkage to compliance.

There is also another category that does not fit into either ‘voluntary’ or ‘non-voluntary’ called ‘Biological and Social Given’. This includes (1) Biological Reasons and (2) Socio-Economic Attributes. Fishers obey rules voluntarily or violate them depending on the situation. For example, if they know that the stocks are depleting they would obey rules but as long as the stocks regenerate; they violate the rules again. Similarly, if fishers are poor or have a low catch, they tend to break the rules. These two boxes also have direct connection with ‘compliance’.

Moreover, conditions that influence fishers to comply with rules by force are (1) Enforcement and (2) Penalties; a sub-section of penalty is graduate sanctions. The three boxes have direct connections to compliance as can be seen from the arrows. These factors are the elements of the bureaucratic model.

A full explanation of how these different factors work is explained in sections 2.3 and 2.4. This section will not duplicate them.
2.7 Conceptual Framework

Figure 2. Show all the factors that influence compliance to fisheries regulations both directly and indirectly.
2.8 The Research Questions.

This paper tries to find the answers to five simple questions. These questions relate to fishers’ behaviour to regulations. These are the questions that the researcher ventured out to find in the field work.

The questions are listed as follows:

- What are the motives, behaviours and actions of fishers in relation to ‘compliance’? (Why do fishers break rules?)
- Under what circumstances do fishers break rules?
- Under what circumstance do fishers comply with rules?
- What rules do fishers find difficult to obey?
- What rules do fishers find easy to follow?
Chapter 3  
Research Methodology

3.1 Introduction
This chapter has seven sections. The first section (3.2) describes the methodologies used by other researchers mentioned in chapter 2. Section 3.3 explains the research approach this study is taking. The third section (3.4) is about information gathering. 3.4.1 looks at the different methods of information gathering used by other researchers. 3.4.2 explores the different methods for gathering information in this study. The fourth section (3.5) portrays the sample size and why the size has been chosen. The fifth section (3.6) identifies the places of research and why those places have been chosen. This is followed by 3.7; limitations faced during the course of information gathering. The eighth section (3.8) deals briefly with the ethical side of the work. The last part (3.9) outlines the expected implications of this research.

3.2 Methodologies used By Others
Most of the researchers portrayed in chapter 2 did not explicitly mention their methodologies. This section summarizes the methodologies of these researchers into seven main groups. They are; (i) Analysis Based on Selected Models (ii) Selected Theoretical Approaches (iii) Experimental Approach (iv) Field Studies (v) Comparative Studies (vi) Triangulations and (vii) Mixed Methods.

Clauses (i) to (vii) of this section (see below) explain briefly the different approaches taken by academics in their studies of ‘compliance with fisheries regulations’.

3.2.1 Analysis Based on Selected Models
Ostrom (1990) conducted her study by analysing CPRs based on three different models. These are the (1) Tragedy of the Commons, (2) Prisoner’s Dilemma and (3) Logic of Collective Actions. She then made recommendations based on the outcome of her analyses. Similarly, Alayon’s (2011) study was focused on ‘fisheries regulations and compliance’. He conducted his research by integrating two levels of analysis: (1) Descriptive Analysis Based on Economic Performance and (2) Empirical Analysis. Alayon’s method of data collection was conducted through face to face interviews with about 100 interviewees using both the English and Spanish
languages. Structured questionnaires containing 76 questions were distributed and administered on a face to face basis.

### 3.2.2 Theoretical Approach

Ostrom, Walker and Gardner (1994, p.132) took a more holistic approach by applying three different approaches on the same issue (compliance and fisheries regulations). These three different approaches were theoretical, experimental and empirical. In short the ‘theoretical approach’ was predominantly based on mathematical calculations to study fishers’ behaviour on compliance. The experimental and empirical approaches are briefly explained in clauses (3) and (4) below.

### 3.2.3 Experimental Approach

The experimental approach (Ostrom, Walker and Gardner 1994, p.145) used game play and control group to study the same issue. One of the variables that were tested with the experiment approach was ‘communication’ mentioned in chapter 2 clause 15. Similarly, Sunstrom (2012) conducted an experimental research on the impact of corruption on regulatory compliance. An experimental approach often gives interesting results because it actually tests what scholars believe in theory.

### 3.2.4 Field Study

The third approach used by Ostrom, Walker and Gardner (1994, p.150) was field research (ethnographic). In this study Ostrom and her party went out to observe and interview what happened in the field and made analysis based on primary data.

As can be seen they opted for four different approaches to study this problem in order to obtain realistic insights on fishers’ behaviour.

### 3.2.5 Comparative Study using Field Research

Kuperan et al. (1995) conducted a comparative study of Malaysia, Indonesia and the Philippines on the issue of ‘compliance to fisheries regulations’. They collected their data using standardized questionnaires and personal interviews. The questionnaires were developed over a five month period and were tested on a trial basis on at least five fishers in one area. Changes were made to the questionnaires to suit the cultures and languages of the communities in which they were actually used. Arrangements
for interviews were either made through the intercept method at the landing points or through appointments with fishers.

Likewise, Gezelius (2008) did a comparative ethnographic field study between inshore and offshore fisheries in Norway. Collection of data was generated through interviews, observations including gossip and normative negotiations. The interviews were done using the semi-structured format informally with skippers, crews and ship owners.

3.2.6 Triangulation
Honneland (2000) used triangulation methodology which employed interviews, secondary sources, participant observations and observations to collect data; political concepts and theories were employed to study compliance issues, and to identify the possible solutions.

3.2.7 Mixed Method
Moreover, Jenny, Fuentes and Mosler (2006) used the mixed method to study this problem. This was conducted more holistically by combining various disciplines to study behavioural compliance to CPRs regulations. This includes the economics, sociological and physiological disciplines. The methods were; however, predominantly empirical; using observations and interviews.

3.3 Methodology used in this Research.
As can be seen from section 3.2, different researchers used different methodologies to try and understand the problem. There are seven different approaches used: they are (1) Analysis Based on Selected Models (2) Theoretical, (3) Experimental, (4) Field Study, (5) Comparative Study (empirical), (6) Triangulation and (7) Mixed Method.

This study has opted for ‘case study’ using the ‘qualitative’ approach. There are various reasons for choosing this approach. The first one is to meet the purpose of the research. This thesis seeks to understand the meanings and underlying reasons (motives) why fishers behave the way they do.

A field research implementing the qualitative approach would be the best prescription for this kind of study because it gathers in-depth information through personal interviews and analyses of the data in such a way that it gets down to the
core of the issue. This would give the researcher a deeper insight into the issue and help find effective and practical solutions to the problem.

Moreover, since this research is interested with meanings of fishers’ behaviour and actions, the researcher decided to undertake field research with small numbers. This disqualifies drawing of statistical conclusions, but leaves it possible to get the meanings that are a vital part of this research.

Also, it is clear from section 3.2 that pure qualitative study was not employed by researchers in their previous studies. The nearest was the mixed methods (quantitative and qualitative) but both findings have to be interfaced at some stage to come up with a meaningful outcome where both approaches agreed. But at some stage the findings would be compromised; losing its original meanings. This is not to criticize the work of others, but to argue that the ‘qualitative methodology’ could obtain other information that other approaches may not. Qualitative is unique in the sense that it has the ability to uncover underlying reasons behind actors’ motives and meanings as well as behaviour; which is important information pursued under this study.

Secondly, the time available for the field work was limited. The researcher had only one month and a week (December 2012 and first week of January 2013) to carry out the interviews. This disqualified other comprehensive methodologies, such as mixed methods, triangulations or quantitative, which require more informants and time.

Thirdly, getting a large number (at least 100) of fishers for interview is difficult therefore the study could not be statistical. Most of the fishing vessels are always out in the deep seas; they do not have any fixed schedule to come ashore. Moreover, most of the fishing boats (DWFNs) follow the movement of the fish. Sometimes lots of them can be in the Solomon Islands but as the tuna migrate to other Pacific islands’ waters the boats also follow. During December 2012 to January 2013, when these interviews were conducted, only a few vessels were sighted at the ports. The researcher; however, knew in advance that getting a large number of informants may be difficult. That was why a qualitative approach was selected; because it is suitable for a small sample size like this.
Fourthly, the researcher opted for qualitative research because that approach is more familiar to him after doing a mini-thesis in a DG400 course. The DG400 course is commonly known as ‘Advanced research methodology’ and was part of a postgraduate semester course intending to equip master’s in research students at USP and those that have completed their master’s in coursework and intended to pursue PhD studies. Students are obliged to do this course prior to taking up their masters or PhD studies.

Additionally, doing a methodology that one is familiar with would be faster and easier than doing something totally new; this would also be time consuming as one needs to learn all the basics again and implement them on a trial and error basis.

Finally, as a novice, the researcher intended to undertake this study using a familiar methodology that is simple, within his strength and capacity rather than otherwise. This would put him on a good platform before venturing into other methodologies in future studies.

The above are the seven valid reasons why the researcher decided to do qualitative methodology for his first academic research instead of the others.

3.4 **Methods (Information Gathering)**

3.4.1 **Methods used by Others**

Section 3.2 clauses 1 to 6 highlighted some of the methods used by other researchers to gather information. Some of those that have been mentioned are secondary and primary sources. However, based on that section (3.2), it appears that the primary research has outweighed secondary research in the sense that a majority of the researchers mentioned in chapter 2 engaged in personal interviews, structured and semi-structured questionnaires administered on a face to face basis, observations, participant observations, focus groups and gossip or informal talks.

3.4.2 **Methods used in this Research**

This study has adopted some of the methods applied by other researchers in section 3.4.1. The reason for adopting similar methods was firstly based on convenience. It is difficult to gather information through observation and participant observation because of the time constraints to go on trips. Secondly, the methods were selected to meet the researcher’s approach, in this case, qualitative. There are five methods used
to gather information for this study. The predominant one is primary sources particularly face-to-face interviews which usually provide greater depth. The researcher felt that this would help fulfil the requirement of the research purpose. Moreover, in two cases where the interviewer suddenly encountered fishers who were about to depart for fishing, focus groups were used. Moreover, emails were also used to gather information from experts located in another country and to refer back to officers who have been interviewed earlier in the Solomon Islands to reconfirm certain information.

Secondary sources such as reports, newspapers and online information were also used to complement the primary findings and to give figures and other relevant facts useful for this paper.

The four methods used in this research are discussed in clause (i) to (vi) below.

3.4.2.1 Face to Face In-depth Interview

Face to face interview were the main source of information gathering in this research. The interviews are in-depth where the questions were based on thirteen hypothesis derived from the literatures reviewed. Each question is open-ended allowing the interviewer to probe further into issue of particular interest; and to get to the core of the issue. The interviews were conducted both formally and informally, depending on the type of setting on site. The interviews were recorded using a voice recorder and transcribed before they were clustered into various categories for analysis. The researcher opted for in-depth interviews because it helps him capture the underlying reasons for IUU fishing activities. Additionally, the researcher perceived the in-depth interview as a method that complemented the qualitative research methodology.

The interviews were conducted with various people who have interests with the harvesting and the management of the tuna. The interviewees consist of ex-fishing masters, captains and crews, current fishing masters, captains, fisheries’ observers, enforcement personnel from the maritime unit, monitoring and surveillance advisers from FFA and fishing companies’ managers.

Most of the interviews were arranged through intercept methods. Only the enforcement officers and fishing company’s managers were pre-arranged. This was because they were more stationary hence it was easy to arrange for an interview with
them. For fishers on the other hand it was difficult to make prior arrangements for an interview because they were mostly mobile. The researcher therefore used the intercept method to interview them along the jetties and as soon as he happened to meet them. Most of the interviews were done in person and in private to avoid others interfering, watching or disturbing. Also, since a recorder was used for recording; the interviewer preferred a quiet place so that there would not be any interference to the recordings (sound). This was the intention of both the interviewer and interviewees.

Six ex-fishermen who were relatives and former work colleagues of the researcher were pilot tested with the interview questions based on the findings from the literature reviewed. But when the researcher discovered that some questions did not work out in that context, he modified the questions before asking them in the main interviews. The main interviews lasted around an hour to an hour and half depending on the interviewees’ responses. Some of them spoke more than the others. Moreover, the mode of language was communicated in the ‘Pidgin English’ for locals and English for foreigners. All laws interviewees were promised anonymity and anyone who confessed to breaking fisheries’ would not be reported to the responsible authority; hence each fisher was labelled as fisherman 1, 2, 3 and so forth. Likewise, the enforcement unit interviewees were also labelled as enforcement 1, 2, 3 and so on.

3.4.2.2 Focus Groups

The researcher also conducted two group interviews. The first one was among a group of four fishermen serving on a long-liner gear. This was a Chinese vessel registered in Fiji employing mostly Fijian crew. The other interview was with a group of three Kiribati crew serving on a Korean purse seiner. Questions like those asked in the individual interviews were asked to the groups.

The researcher did not have the choice to interview them personally because they met accidentally and by then, the vessels were about to depart for fishing. However, the researcher chose to conduct the interview with them because he thought it important to get the views of as DWFNs as possible.

3.4.2.3 Data Collection using Emails

There was some information that was gathered through the use of emails from informants who are living in either Honiara or overseas. The following key
informants submitted information through this means: director of PNA residing in Palau, compliance officers at the Solomon Islands fisheries ministry; FFA compliance officers in Honiara, former FFA staff studying in Wollongong University in Australia. Information gathered through this means consists of email correspondence, clarifications of questions and other relevant attached documents.

3.4.2.4 Secondary Sources
Information was also gathered through secondary sources such as the Ministry of Fisheries 2012 Audit Report, books, journal articles and working papers. Many secondary sources were sought from various bodies such as Solomon Islands Government Ministry of Fisheries, PNA and FFA website materials. This includes the Solomon Islands’ government Fisheries Act 1998 and fishing conditions for different types gear. Secondary sources made up the bulk of the literature review section in chapter 2.

3.5 Sample Size and Sampling Method
A total of 284 vessels were licensed to fish within Solomon Islands waters in 2012. These included 160 under bilateral access agreements, 116 foreign vessels chartered to a locally based company and 8 local vessels (Pers. comm. Fisheries Officer, 2013). The sample size for this research work was 35. This comprised people with different interests and responsibilities within the tuna fishing industry; including former fishing masters, ex-fishermen (crew), current skipper and fishing masters, enforcement officers from the maritime unit, compliance officers from FFA, fisheries observers from the Ministry of Fisheries, fishing agents and companies managers.

A random sampling using a mixture of stratified, accidental and snowball sampling methods was employed in this study. These methods were selected as best fit. Unlike household surveys, interviewing fishers was difficult because informants were scattered and highly mobile. The researcher therefore, targeted key informants who would give the relevant information he required. Most of the times he accidentally met them on the jetties after asking around from friends and strangers; and from there he was directed by snowballing.

3.5.1 Brief Explanation for Interviewing the Informants
A cross section of informants was interviewed in this manner resulting in cross dimensional perspectives from people of different fields on the same issue. These
included enforcement officers: 3 maritime unit senior officers, (two of them were the CEOs of the PCPV and one of them was the acting director); 3 FFA senior compliance officers; 7 fisheries observers, (one of them is the program coordinator in Solomon Islands and the other one was a program coordinator based in Palau); and 1 compliance officer and 1 licensing officer from the ministry of fisheries were not interviewed but they provided secondary information needed for the research.

Several managers and fishing agents were also interviewed. This included 2 managers one from the pole and line NFD vessels and a Taiwanese long line fleet manager, locally based. Additionally, one fishing agent responsible for Taiwanese DWFNs was also interviewed.

Apart from these, fishers possessing rank and no ranks, active and non-active, made up bulk of the interviewees. They are specifically depicted as follows: 3 ex-fishing masters 2 from the former Solomon Taiyo and one from NFD pole and line. Furthermore, 4 ex-fishermen were also interviewed, 3 of whom used to work for the local vessels (NFD and Solomon Taiyo). One of them used to work for a Taiwanese locally based long liner (Solgreen Company).

Current fishers interviewed consisted of a Pilipino fishing master, two local captains, one Pilipino ship’s bosun, four Fijian fishers and two I-Kiribati fishers serving in Korean purse seiners (see table 3.1 for more details). There were about three purse seiners (DWFNs) that did their transhipment outside Guzo point off Honiara but the researcher did not have the access to reach them.

Apart from the informants, a few refused to take part in the interview. One of them was the Marco Shipping Agent. This is a Korean fishing agent. They claimed that they were too busy for interviews. The ministry of fisheries compliance department was also not available for interview. Most of the key people were on leave during the visit. One of them only managed to give secondary data (soft copy) which was relevant to this research. Also a key informant for FFA who was responsible for coordinating aerial surveillances and the Kurukuru operations was away overseas so he was not available for interview. However, the researcher was satisfied that at least all the informants he interviewed should give a cross sectional view on the issue, as they have been fairly represented, and fishers utilizing the different gears were interviewed.
Table 3.1: Summary of People who are Interviewed (In-depth interview)

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>TOTAL</th>
<th>FISHING GEARS</th>
<th>ORGANIZATION</th>
<th>NATIONALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enforcement</td>
<td>7</td>
<td>-</td>
<td>FFA Maritime Unit (SIG) Fisheries Observers (SIG)</td>
<td>Solomon Is/Fiji Solomon Is</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Solomon Is/Kiribati</td>
</tr>
<tr>
<td>Managers</td>
<td>3</td>
<td>Pole and Line Purse Seiner Long Line</td>
<td>NFD Taiwanese locally based Taiwanese DWFNs</td>
<td>Solomon Is Taiwan</td>
</tr>
<tr>
<td>Current Fishermen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i)Officers Fishing Masters</td>
<td>4</td>
<td>Purse Seiner Pole and line</td>
<td>NFD</td>
<td>Pilipino Solomon Is French</td>
</tr>
<tr>
<td>(ii)Crew</td>
<td>2</td>
<td>Purse Seiner</td>
<td></td>
<td>Pilipino</td>
</tr>
<tr>
<td>Ex-Fishermen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i)Officers</td>
<td>3</td>
<td>Pole and line</td>
<td>NFD Solomon Taiyo Ltd NFD Sol green</td>
<td>Solomon Is.</td>
</tr>
<tr>
<td>(ii)Ex-Fishers</td>
<td>7</td>
<td>Pole and line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The reason why the researcher could not get a fair representation for all the fishers is because most of the fishers particularly DWFNs were not present in the two main ports (Honiara and Noro) during the time of interview (December 2012 and early January 2013). It was not clear whether they were fishing within the 200 miles EEZ or in other Pacific islands waters. Unfortunately, the researcher did not have any choice given the circumstances and the need to keep moving to meet the research
dateline (July 2013). However, the researcher was able to get sufficient information about the behaviours of DWFNs actors’ (Taiwanese, Korean, Japanese, Chinese, USA and EU) from the sources he interviewed.

Firstly, the seven locally based fisheries’ observers interviewed have vast experience working with DWFNs ranging from three to fifteen years. Most of them have been serving in Taiwanese, Korean, Japanese, Chinese, USA, EU and the local boats under the observers’ program. They are well versed with the behaviours of most of the DWFNs’ fishers in relation to compliance and regulations. The information they provided proved useful for this research.

Additionally, the local observers were perceived to be valid informants because they reported what they saw; moreover there were no language barriers talking to locals. It was also feared that the foreigners could see the researcher as a spy and might be reluctant to disclose information. This was experienced by most observers and maritime enforcers during some of their encounters. Moreover, the observers and the maritime unit officers mentioned communicating with Asian fishers as difficult due to language barriers. In view of these factors, the researcher was content to gather information from the local officers who disclosed most of the information he required.

Secondly, the maritime surveillance unit has also provided useful information about the behaviours of DWFNs. This was because they have been dealing with them regularly for boarding checks. They were also involved in arresting those who have been fishing illegally in Solomon Islands waters; and were aware of those who tried to waive their charges by negotiating with the national leaders.

Thirdly, the FFA compliance and monitoring department has been dealing with many cases involving DWFNs with other member countries. They tend to understand them better and have data of those that pose less risk and those with high risks. The information they provided was related and very helpful.

Moreover, the current fishers and ex-fishers have been working under Japanese supervision under Solomon Taiyo Limited and NFD in the last decade, when most of them worked for the joint venture industry. The locals had learnt that the Japanese treated fishing (pole and line) like their religion. They respected conservation
methods and diligently obeyed the rules. For example; they lay off fishers during the spawning session from December to March (Pers. comm. fishing master –pole and line- number 2, 2013). Moreover, they performed their ritual ceremonies when they have a low catch (Pers. comm. ex-fisher number 1, 2012). The locals’ vast experiences working under Japanese aided them to compare the Japanese and locals’ behaviour which is important for this research. This is in contrast to earlier claims of Japanese non-compliance.

Finally, there were other ex-fishers who have been serving under USA purse seiner boats and Taiwanese long linings that were also interviewed. These people have been very helpful in providing information about the attitudes of foreigners towards compliance.

Thus, despite the difficulties of not being able to interview as many DWFNs representatives as expected, the researcher was satisfied with the way information was obtained and that it would still give some fair idea on the behaviour of others.

3.6 How the Information would be Analysed

The information was analysed using the traditional manual methods. First the recorded interviews (mostly in Pidgin English language) were transcribed and translated to texts (English). They were grouped according to main themes in file cards. The file cards included the responses from interviewees as direct quotes. The researcher then tried to make sense of the responses by trying to understand them and analysing what each response may mean. The researcher also tried to link the different themes together and tried to find any connections between them.

3.7 Place of Research

Field research was conducted in Honiara and Noro from December 2012 to January 2013. These places were selected because the majority of the key informants lived there. Honiara for instance, is the main capital city that hosts all the public, private sector and non-government organizations’ (NGOs) main administrative officers. It therefore provides most of the respondents required for this study. The relevant authorities, such as the ministry of fisheries, royal Solomon Island’s maritime unit and the FFA were based in Honiara. Similarly, representatives from some DWFNs
vessels and some locally based overseas fishing companies were also based in Honiara.

Also, most DWFNs’ purse seiners do their transhipment in Honiara. Transhipment is an activity where the fish caught and stored in the purse seiners fishing vessels are transferred to ‘carriers’ bound for overseas. According to the national fisheries regulations (Section 16 of the Fisheries’ Act 1998) any transhipment of tuna caught in the Solomon Island’s EEZ, and bunkering (refuelling) must take place only either in Honiara or Noro Port.

Furthermore, it was easier to find ex-fishers in Honiara because a good number of them went on to work for other local cargo and passenger vessels after their fishing stint. Honiara port is the hub where these seafarers frequently load cargoes and passengers bound for the islands and vice versa. Hence accessing ex-fishers was easier compared to the other places within the country.

Secondly, Noro was the other preferred site because it is where the NFD fishing fleets are based. Hence, key informants were readily available. The informants in this case were fishing masters, captains, managers, fisheries observers and overseas boats’ agents. Having all these people in the same location made data collection easier.

Furthermore, some of the DWFNs’ long liners ‘and other purse seiners do their offloading and transhipments in Noro. The PNA’s policy required that fish caught in a member country’s EEZ must be offloaded (sold) to that country (East West Center, 2012). In the case of Solomon Islands the fish could be offloaded for the local processing company as well as for export. Noro also accommodates some DWFNs agents. One of them is Solomon Islands fishing company. This company has more than ten fishing vessels (both purse seiners and long liners) originally from Taiwan. Therefore, Noro is an ideal location that sources current fishermen required for this study.

3.8 Limitations

The research also sustained some challenges in getting the necessary information. As earlier alluded, fishers were always out in the sea, accessing them was difficult and dependent on when they come ashore for transhipment.
Secondly, it was difficult to stratify the samples into their different nationalities such as Taiwanese, Korean, USA or local boats which would give a fair representation of the samples. In light of this circumstance the researcher resorted to accessing data from any boat that came ashore for unloading or transhipment. This means the fishers may represent appropriators predominantly from one country depending on their availability at the time. Also the researcher managed to get information about DWFNs through local observers who observe those boats (Korean, Taiwanese, Japanese and EU), and a handful of ex-fishers who serve in overseas fishing boats.

The other challenges faced were accessing the ministry of fisheries relevant officers for an interview. It was the festive season (December 2012 – January 2013) and most of the officers were on leave. This made it very difficult to get information from the responsible people. The researcher therefore, had to seek assistance from some of the officers as his time to return to Fiji was looming. Some of the officers were sympathetic enough to provide some of the information required for his work.

3.9 Ethics

The research complied with University’s Human Ethics regulations. The information gathered was regarded as confidential unless explicitly agreed by the informant. Furthermore, some information provided is perceived as sensitive and could attract repercussion from decision makers. That is why informants are not identified.

3.10 Implications of Research

This research’s findings will help provide more effective in management and sustaining of the tuna stock. Moreover, the findings can also provide vital information to the regional bodies such as FFA, PNA and SPC to come up with corporate regional policies to manage tuna within WCPO. Likewise, individual PICs can use these finding to come up with effective policies and government Acts. Additionally, this thesis will also suggest types of policies that would help address problems identified.

All this would aid effective management of tuna in the Pacific and ensure that this resource would be sustainable for future generations. However, it is also stressed that government policies alone may not be able to reach all aspects of the activity; which is also governed by informal rules and market forces.
Finally another implication of this study is that it will add to the pool of knowledge of compliance with ‘common pool’ rules particularly in fisheries. This would give basis for further studies in the PICs and to come up with some practical and realistic solutions to this problem.
Chapter 4
Findings for Question One

4.1 Introduction
This chapter answers question one of the research. It tries to find out and understand why fishers break rules. Or in other words the motives behind their actions?

4.2 Question One - Why do Fishers Break Fisheries Rules?

It is important to know why fishers break rules because such knowledge would give an in-depth understanding on this issue.

Violating fisheries rules is a criminal activity predominantly driven by economic goals, self-interest and greed. Fishers break most of the rules secretly, hoping that they would not be caught; and consequently maximize their companies’ profits. Simultaneously, fishers make extra money through receiving of bonuses from their employers. The size of the bonus depends on the volume of the catch; i.e. the higher the catch volume the greater the bonus (Pers. comm. enforcement officer number 1, 2012). Fishers break rules such as fishing on FADS during closure, fishing without licence and fishing on forbidden territories to maximize business profits and make extra personal income.

One of the senior monitoring officers working for FFA mentioned; “vessels involve themselves in IUU because they want money. Their payments depend on the catch. So they want to get more by getting away with the system” (Pers. comm. FFA monitoring officer number 2, 2012).

Another current fisherman, an engineer of one of the purse seiners mentioned: “the main reason for illegal fishing is to make money. You can break rules for emergency reasons and to save life but the rest is to make money” (Pers. comm. fisherman number one, 2013)

However, with the introduction of advanced technologies in monitoring and surveillance activities, fishers also do not commit clear cut IUU fishing. Instead they do it secretly in ways that are difficult to detect. This is how most fishers are committing IUU nowadays. Examples of such activities are misreporting, tampering
with the VMS and setting of nets when transiting (FFA monitoring officer number 2, 2013).

Secondly, on a micro-level, fishers break rules such as catching undersize tuna, sharks’ fin and so on for personal gain. This comes in two forms; which include ‘money’ and ‘material goods’. Fishers catch undersize tuna and other species not because it would maximise their companies’ profits but because they would sell them for extra personal cash. At other times they exchange fish for material goods such as cigarettes, vegetables, crops and fruits.

Thirdly, there are other non-commercially driven reasons for breaking rules. Some of them are throwing of plastics and other non-biodegradable items overboard, discharging bilge and waste water, and failure to display fishing licence at the wheel house (Pers. comm. observer programme coordinator number 2, 2013; pers. comm. observer number 6, 2013). Fishers and enforcers may not see breaking these kinds of rules as serious compared to those that are economically driven. However, violating these rules equally has negative impacts on the tuna population similar to those that are economically driven.

Some of the reasons fishers may break these rules are ignorance, negligence and laziness. Fishers appear not to place their priorities on obeying these rules; they may also break such rules because of lack of knowledge of the direct connection between their behaviour and the tuna stocks. The common ones are those that were identified in the preceding paragraph (throwing of rubbish plastics, discharging oil and brine, and failing to display license at wheel house at all times). Fishers may see these rules as less important. Similarly, enforcers may not emphasize these rules enough as they do with those that try to restrict maximization of profits through illegal means. That is why those rules are frequently broken.

However, floating non-biodegradable items such as plastics and cans are dangerous to the tuna and other species. This is because plastics, tins, ropes, bottles and other items can float for years; tuna will think they are food and get trapped onto them. The MARPOL 1973/78 strongly restricts pollution of the sea by floating vessels and offshore platforms. This includes prohibition of all discharges (plastics and all domestic and chemical wastes) (IMO n.d.). This rule appeared weak but has been strengthened after the London Convention and should have been enforced as of
January 2013 (Kairis 2012). Its effectiveness has not been felt in the Solomon Islands as yet, let alone the Pacific region.

Whilst island States may not put strong emphasis on countering such violations, it is becoming a concern because rules broken through ignorance and negligence are widely committed by most fishers. Also the rate at which they are committed is increasing. It is feared that such behaviour will amount to depletion of the stocks. Based on Spalding and Sibert (1997, p.32), tuna prefer a clean and pollution free environment. If they sense that the environment is polluted, they move or migrate to other cleaner environments.

Fourthly, fishers break rules to fulfil social obligations. Most families, relatives and friends of fishers expect them to bring some fish home. Fishers often feel obliged to respond positively to such requests. They mostly fulfil such expectations by catching undersize tuna. Families and relatives are very important backbone to fishers. Most of them work as fishermen to help and support their families and relatives. Catching undersized fish to take home to families and relatives is an example of this bond. Sometimes fishers deliver trays full of fish to villages for church festivals, feasts and other important occasions. This is commonly practise by locally based vessels because they have families and friends locally; and because they often fish in the archipelagic waters and 7 miles off the coastland. This is closer to land compared to DWFNs that are often fish out in the 200 miles exclusive zones.
Chapter 5
Findings for Question two

5.1 Introduction
This chapter looks at question two. The question discusses the types of circumstances that enable fishers to violate their licence conditions (rules).

5.2 Question Two Under What Circumstances do Fishers Break Rules?
The findings revealed three general conditions that determine compliance to fisheries’ regulations. These are ‘fishers’ motives’, ‘punitive’ and ‘community’ attributes.

As can be seen in figure 5.1 the diagram slightly diverts from the original framework in figure 2.2 because it is a modified version based on the findings. The major change is the relocation of punitive factors from its original bottom position (figure 2.2) to the centre of the framework. This change is necessary to explain the conditions and their relationship with compliance. All the other factors depicted in the original framework are deliberately hidden in this diagram so that it deals only with the predominant factors that are active in the case of Solomon Islands. The purpose of this version is to illustrate the conditions that influence fishers to comply with rules. Furthermore, the bottom arrows appear missing in the lower part of the diagram to indicate that those five voluntary attributes have not been utilised or failed in some respect to achieve ‘voluntary compliance’.
5.2.1 Conditions for Breaking Rules

Figure 5.1 This diagram shows circumstances under which fishers break rules.
Table 5.1: *Summary of the different conditions under which fishers break rules.*

<table>
<thead>
<tr>
<th>Fishers’ motives</th>
<th>Enforcement</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Social Obligation</td>
<td>(1) Weak Enforcement</td>
<td>(1) No Social Norms - This is not a practice in</td>
</tr>
<tr>
<td>- Social responsibility</td>
<td>- Insufficient PCPV (need two more patrol vessels)</td>
<td>tuna fisheries in SI.</td>
</tr>
<tr>
<td>(2) Misunderstanding of rules</td>
<td>- VMS could not detect fishers’ activities.</td>
<td>(2) No Communication - No regular update of fish</td>
</tr>
<tr>
<td>(3) Ignorance and Laziness</td>
<td>- Fisheries’ officers too lenient and forgiving to</td>
<td>stocks by authorities.</td>
</tr>
<tr>
<td></td>
<td>violators</td>
<td>(3) Legitimacy of Rules - Fishers break rules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>although they think they are fair.</td>
</tr>
<tr>
<td>(3) Financial Gain</td>
<td>(2) Penalties are low and in Solomon Dollars (low</td>
<td>(4) Community Work - No co-management.</td>
</tr>
<tr>
<td></td>
<td>currency)</td>
<td>- Lack of fishers’ participation in surveillance activities.</td>
</tr>
<tr>
<td>(4) Personal Gain (money and material goods)</td>
<td>(3) Political Influence (Regulators’ behaviour)</td>
<td>- Fishers do not contribute their inputs to policy’ formulation</td>
</tr>
</tbody>
</table>


The conditions that determine the level of compliance depend on three factors namely; ‘fishers’ motives’, ‘punitive’ and ‘community’ conditions. The three factors are placed in different positions of the diagram. The fishers’ motives box is located on top of the rest of the other boxes (diagrams) but under conditions that influence fishers to break rules. It is typed in bold because it is one of the important components of the relationship.

Fishers’ motives represent the underlying reasons that influence fishers to break rules. The findings revealed that the conditions that motivate fishers to break rules are related to four main factors. These are self-interest, social obligations, misunderstanding of rules, and ignorance and laziness. These factors are generally classified as ‘fishers’ motives’. And as can be seen in figure 5.1, self-interest in this context is rooted in ‘monetary gain’. This relates to five other variables, namely (1) Financial Gain (2) Personal Gain and (3) Fishing Gear (4) Fishers’ Nationality and (5) Legitimacy of Rules.

Punitive on the other hand consists of mechanisms that try to restrain fishers’ motives. It is located in between fishers’ ‘motives’ and ‘compliance’ as a buffer. Moreover, it resembles ‘non-voluntary’ compliance because it employs enforcement and penalties to get fishers to obey rules. The bureaucratic model is placed together with ‘punitive’ condition because ‘punitive’ is an attribute of that model. They are typed in bold because they are the second important component of the relationship.

However, despite the presence of the ‘buffer’, fishers continue to break the rules. This is portrayed by the arrows originating from fishers’ motive’ and those that directly linked to monetary gain#31. And as can be seen all the arrows are linked to ‘compliance’ to demonstrate they have penetrated the punitive buffer. The dotted rectangle lines indicate the ineffectiveness of the punitive conditions. The researcher hides the arrows from appearing through the punitive boundary to make the punitive conditions appear conspicuous.

The punitive mechanism consists of three factors; the first one is weak enforcement. This results from other associated factors such as limitations of the VMS, insufficient patrol vessels and leniency of fisheries officers in dealing with violators. The text

---

31 As can be seen from the diagram all their arrows are piercing through the punitive conditions to compliance.
‘unlicensed vessels’ was placed in that box to show these vessels are able to fish illegally within the exclusive zones because of ‘weak enforcement’.

The second factor is low penalties. Solomon Islands has low penalties that appear less threatening to fishers. And the third one is ‘political influence’ or regulators’ behaviour. Hence, the three factors compounded to the general weak punitive conditions.

The third important component of this relationship is the ‘community model’. It is placed above the ‘conditions that influence fishers to comply with rules’. These boxes are positioned right at the bottom of the entire diagram. The ‘community model’ is placed in the same box with ‘voluntary’ because the model has attributes that voluntarily get fishers to comply with rules rather than by force. It is also represented by a positive sign because it serves to help prevent depletion of stocks. This box is in bold because it is the third important component of the relationship.

One would notice that the five community conditions do not have arrows connecting to compliance. This is to indicate that these conditions are weak and ineffective.

The other important component of this diagram is the ‘compliance’ which is placed below the punitive region in bold. Compliance is the central issue of this study and the three mentioned components determined the level of compliance.

5.3 Detailed Discussion of the Items Under the Three Condition.

5.3.1 Fishers Motives.

5.3.1.1 Social Obligation
Social obligation in this context refers to the attitude whereby fishers take undersize tuna and other species such as rainbow, marlin, wahoo and so on to families, communities and villages. This is a common practice of feeding immediate families, but also a symbol of goodwill and a way of seeking blessings from churches and communities. Existing studies do not identify this factor as contributing to the level of non-compliance, but this research acknowledges it as having some bearings on this issue.

---

32 Community management is ineffective because it has not been adopted into the Islands’ tuna management framework.
Purse seiners, particularly the NFD fleets, from time to time break rules relating to social obligations. They sometimes catch and deliver undersize tuna to villages or communities for church festivals and feasts. Most local fishers believed if they give fish to the communities for church related activities such as festivals\textsuperscript{33}, they will be blessed with a good catch. And as earlier alluded a good catch means high bonuses (Pers. comm. ex-fisher number 1, 2012).

It must also be noted that the type of gear used contributes to determining the level of violations. The purse seiners may not intend to catch undersize tuna, but this is difficult because both large and undersize tuna normally swim together. Making matters worse; purse seining is an unselective fishing method that scoops both the large and undersize tuna on board. Knowing that the undersize would be rejected by buyers, fishing masters normally supply these fish for free to the surrounding villages. This is regarded as an act of social responsibility. Fishers may also sell some of them for personal income and take some home to feed their families and friends.

5.3.1.2 Misunderstanding Fisheries’ Rules

It is the work of the fisheries observers and fisheries’ officials to remind and explain the rules to fishers. Fishers from different nationalities have different levels of understanding of the English language. This affects their interpretation of the rules, their general understanding and their level of compliance. It was assumed that one of the reasons fishers break rules is the language barrier (Alayon 2011).

The questions raised during the interviews were aimed to confirm this hypothesis. It started with the local fishing vessels and ended with the foreign fishing vessels. The majority of the local fishers interviewed did not have any difficulties in understanding the fisheries’ regulations compared to their Asian colleagues. Most of them confirmed that the rules are clear and they are well versed in them. Some of them blurted out the rules:

“(1) licence and conditions must be pasted at the wheel house most of the time, (2) Purse seiners (DWFNs) and long liners are not allowed to fish 12 nautical miles from shore, (3) NDF purse seiners are not allowed to fish within 5 nautical miles

\textsuperscript{33}Festival is when churches celebrate their saints’ day through church services, feastings and dancing. This involves large gathering of people from all the neighboring villages.
Fishers are not allowed to catch undersize tuna (1.5kg) and purse seiners are not allowed to set nets among whale sharks.” (Pers. comm. captain number 2, 2012; pers. comm. ex-fisher number 3, 2012; per. comm. ex-captain, 2012).

However, whilst local fishing masters find most of the rules easy to understand, it does not guarantee they will follow them; two of the local respondents mentioned:

“The rules are normally handed down to the fishing master on board. However, not everyone is perfect.” (Pers. comm. ex-captain, 2012)

“My opinion... captains and fishing masters understand and are well versed with the rules but choose to break the rules to meet their goals.” (Pers. comm. ex-fisher number 6, 2012)

Following the two responses, it must be noted that understanding the rules does help in clarifying doubts and confusions over certain rules but it does not mean it would achieve 100% compliance either. The two responses are the testimonials of these statements. This is because there are other factors that influence compliance; while some of them have already been mentioned, others will be discussed shortly.

Only one local fishing master mentioned that he found difficulties in understanding the rules regarding territorial waters. This is because the language used is more technical and requires explanations (Pers. comm. fishing master–pole and line-number 1, 2012).

Another issue that needs clarification is the VDS. There is still confusion among fishers (both local and foreign) concerning this scheme. One of the interviewees mentioned:

“The VDS is an issue. Fishers only report the day they do their fishing. They don’t report the other days they search for the fish. Although the observers’ record those days as fishing, the vessel’s log regards searching for fish as not counted” (Pers. comm. observer number 1, 2013)

Whilst the level of understanding of the rules appeared to be satisfactory for the local fishing masters, it is quite contrary for the Asian fishers. Most of the interviewees
confirm that the majority of the Asian fishing vessels found problems speaking the English language and understanding it:

“I found working with Taiwanese and Chinese boats challenging because of language barrier.” (Pers. comm. observer number 3, 2012)

Moreover, one of the liaison officers that work with DWFNs particularly Taiwanese purse seiners and long liners expressed the same difficulty. He mentioned:

“One of the challenges I found working with the Taiwanese boats is communication. Some of them don’t speak English.” (Pers. comm. DWFNs fishing agent, 2012).

Similarly, one of the former purse seiner’s crew of the NFD boats mentioned:

“One of the difficulties with complying with the rules was that most of the officers do not know how to speak or understand English.”(Pers. comm. ex-fisher number 7, 2012)

The managing director of the police maritime unit and the CEO of the RSIPV Auki also faced communication difficulties with Taiwanese fishers when they do boarding and arrests. They preferred that fishers should know how to speak English before they are permitted to fish in the Solomon Islands. Alternatively the laws should be translated in the fishers’ languages (Pers. comm. enforcement officer number 3, 2012; Pers. comm. enforcement officer number 2, 2012).

One of the managers of the Taiwanese long lining company based in Honiara mentioned that some of the Taiwanese fishing vessels have captains who are not well educated (Pers. comm. manager number 1, 2012). This could be one of the reasons for this problem.

Most non-English speaking fishers are expected to carry one interpreter with them. This should be a requirement. One of the respondents confirmed:

“We have captain Kida on board who interprets the rules to the fishing master in Japanese” (Pers. comm. ex-fisher number 3, 2012)
Having quoted the above statement; the question is - why do fishing agents, enforcers, and observers still struggle to communicate with those fishers? Do those vessels have on board translators? Or are those translators incompetent?

Some of the informants did not mention any translators at all in their encounters while others did, but confirmed that these translators speak very poor English that one could hardly understand.

Some of the interviewees suggested that the best way to solve this problem is to have a translated printed script of the licence conditions in the fishers’ language. This would help solve any misunderstanding and leave no room for excuses by the fishers. But the question of who shall bear the costs of translating the ‘licence conditions’ to the fishers’ language could be an issue faced by the coastal states. However, it must be understood that tuna fishing is a commercial activity that yields financial returns and simultaneously incurs costs. Such costs are often referred to as operations costs or costs of doing business. Similarly, the costs of translating the ‘fishing conditions’ to non-English fishers should be treated as costs for doing business and should be met by the fishers.

As can be seen misunderstanding the rules due to language barriers can contribute to non-compliance to fisheries regulations. The records showed that those fishers that have violated rules are non-English speakers. Whilst this could be caused by other factors as well, such as ‘economic gain’, misunderstanding the rules can also play a part in this.

Another thing that must be emphasized here in addition to transcribing all rules to fishers’ language is that each vessel should have on-board a translator. This is because sometimes fishers claimed not to understand the laws due to language barriers but this can be a mere excuse to avoid prosecution.

5.3.1.3 Monetary Gain

a. Financial Gain

Fishers’ motives are dominantly controlled and influenced by ‘financial gain’. Whilst ‘financial gain’ and ‘economic gain’ are often used interchangeably by most lay people, financial gain is a narrower concept than the latter. Economic gain on the other hand tends to be more broader taking into account a range of other factors such
as social and public considerations such as their tax contributions to State treasury and so on (Mansbridge, 1990, p.89). In essence fishers, are more concerned about the amount of money flowing into their pockets as opposed to their own financial gain plus their contributions to the state treasury etc. (Pers. comm. ex-fisherman number 4, 2012; pers. comm. fishing master –pole and line-number 1, 2012).

The tuna industry is a commercial undertaking. Like any commercial operation their main goal is to maximize profits. However, challenges such as increased competition, high operational costs (labour, fuel, new technologies) and the recent global economic recessions in Europe has mounted pressure on most fishing companies (Ostrom, Walker and Gardner 1994, p.1). The worst that could happen if they do not make profit is business closure. Fishing companies are therefore under great pressure to avoid business closures. Such pressures are often passed on to fishing masters. They have to achieve high fish catch on every outing. The managements are able to achieve this by providing incentives for higher catch. This was confirmed through the interviews. A question asked to fishers, was whether they are paid according to their catches. A captain of one of the NFD pole and liners responded:

“Yes in NFD more fish means more money. Fish from 1kg will be counted as my tonnage. Very small undersize will be rejected.” (Pers. comm. captain number 1, 2012)

The response implies that the greater the catch, the greater fishers’ earnings. Furthermore, the payments are normally done as soon as the vessels unload their catches (Pers. comm. Port chaplain, 2012). However, it would take longer for fishers to receive their pay incentives if they do not fill their vessel’s capacities quickly and return for off loading. The situation could even be worse if fishers have very low catches or could not catch any fish at all (ibid.). This is where the problem lies, because when they do not catch enough fish they tend to engage in illegal fishing activities (steal or break rules). The motive behind such action is survival.

Additionally, more than half of the interviewees mentioned that fishers resort to illegal fishing activities to maximize their profits.

The CEOs of the RSIPV Auki mentioned:
“Fishers come from very far (Taiwan, Korea etc.) steal to try and recover their costs. This is because they used lots of fuel. Sometimes during high catches they bring their friends (other vessels) in other parts of the world to come to fish. All because of revenue….situation caused them to play dirty.” (Pers. comm. enforcement officer number 1, 2012)

The ‘2012 SIG Performance Audit Report’ recorded 12 DWFN’ caught for illegal fishing in Solomon Islands EEZ between March and November in 2010. In March two flagged Chinese long line fishing vessels were apprehended by the Royal Solomon Islands patrol vessels for illegal fishing (breaching section 16 of the fisheries ACT). These vessels are FFV Sun Star and Liao Da Gan 55048 (ibid.).

On June another six Chinese flagged vessels were arrested again for illegal fishing (breaching section 16 of the fisheries ACT 1998). These are (1) Ffv LL-Liao Da Gan 5504 (2) Ffv PS-Xin Shi Ji 101 (3) FFV PS-Xin Shi Ji 102 (4) Ffv PS-Tai Fu 101 (5)Ffv PS-Tai Fu 102 and (6) Ffv PS-Zhong Tai(ibid.).

Furthermore, in September two fishing vessels were arrested for fishing on FADS while they were closed. This was a breach of regulation that was contrary to PNA Regulation 31A. These two vessels were (1) Ffv Pacific Breeze and (2) Ffv Shilla Pioneer (ibid.).

And in November two vessels were arrested for committing two different crimes. The Chin KuoFa 2 refused to fill in its log sheets, a breach of her license conditions contrary to section 16 and 35 of the Fisheries Act 1998. On the other hand the Ffv Fu Hao 168 fished in customary fishing grounds of the islands of Tetepari, Rendova and the Roviana Islands group. This was a breach of her conditions contrary to section 16 of the Fisheries Act 1998(ibid.).

b. Personal Gain.

Personal gain is when fishers break rules such as catching undersize tuna to sell for personal income or to exchange for crops, vegetables, cigarettes and other material goods.

Existing studies did not confirm these factors as affecting the level of compliance, but this research found them as having some bearings on this issue. Personal gain is
committed by the locally based pole and lines, and purse seiners. For instance, pole and line fishers choose to catch undersize tuna to take home to their families and friends. It is the general expectation of families, relatives and friends that fishers should return home with some fish. Fishers know this and often catch undersize tuna to fulfil this obligation; and in doing so they violate fisheries rules (Pers. comm. ex-captain, 2012).

Fishers also catch undersize tuna, other species such as wahoo, marlin, rainbow and shark’s fins to sell or for personal income. At other times fishers exchange tuna and other species (except shark’s fins) for vegetables, fruits, crops or tobacco (cigarette). The main reason why some fishers engage in such behaviour is because they are not satisfied with their salaries (Pers. comm. ex-captain, 2012).

Below is evidence to support the above statement from two former pole and line fishing masters and an ex-fisherman:

“When the observers are not around I usually catch the small tuna (bonito), if the company reject them, I take them to villages for exchange or sell them." (Pers. comm. ex-fishing master –pole and line - number 2, 2013).

“Sometimes we break the rules of catching undersize if we do not catch the required size. But then we exchange them for money and vegetables." (Pers. comm. ex-fisher number 2, 2012)

“During our time we break rules especially undersize to give to family and sell some in the markets." (Pers. comm. ex-captain, 2012)

c. Fishing Gear

The types of gear employed by fishers also determine the rate of non-compliance committed. Fishers may try to follow rules but the gear used might make it difficult to obey them. Existing findings did not mention fishing gear as a contributing factor to non-compliance. Hence, it does not appear in this paper’s hypothesis. But the field research indicated that the ‘fishing gear’ also contribute to determining non-compliance behaviour.
This section looks at the pole and line, long lining and purse seiners as fishing methods widely used in the tuna industry in FFA and WCPFC member countries.

Firstly, pole and line is the most sustainable way of fishing. This is because this fishing technique only selects the targeted species with the right size. If the pole and line hooks an undersized tuna, the fisher would normally release the fish on mid-air and the fish would fall back to the sea. This fishing; specially designed for tuna; uses a pole made of bamboo, a line attached to it and a hook at the end of the line. It is a manual fishing method and can only catch one fish at a time. This type of fishing is fading away because it is uneconomical. NFD is currently operating 2 pole and line vessels but is in the process of engaging two more vessels because international conservation bodies are putting pressure for sustainable harvesting. Tuna that are caught using pole and line are said to be paid with much higher prices than those that are caught using other methods (Pers. comm. manager number 2, 2012).

The majority of the respondents mentioned that pole and line is the best method of harvesting because it does not indiscriminately kill the untargeted species including dolphins, sharks, turtles and undersize tunas. For assistance, three responses, written in respondent’s own words are given below to provide evidence for this finding.

A former bosun for one of the NFDs pole and line operations mentioned:

“Pole and line is a sustainable fishing because it is selective. If we reach a certain school that includes undersize we will leave them and move on.” (Pers. comm. ex-fisherman number 3, 2012)

A complementing statement in favour of pole and line was made by a former purse seiner and pole and line fisher. This was what he said:

“Pole and line is a good fishing because it only selects the big fish.” (Pers. comm. ex-fisherman number 1, 2012)

Moreover, a current fishing master of one of the NFD pole and line said:

“Pole and line normally don’t break rules because of the fishing technique.” (Pers. comm. fishing master –pole and line-number 1, 2012).
The third point is a significant one in terms of the hypothesis. It portrays that the ‘pole and line’ fishing method integrates well with the fisheries rules. This is because it voluntarily selects fish of the required size. Furthermore, it is dolphin free and has the lowest by-catch. Fishers can only break rules if they opt for it. Some fishers still violate rules purposely to sell the fish (make extra money) and exchange with communities (Pers. comm. ex-fisher number 2, 2013), but the fishing method is environmentally friendly.

The second fishing gear, ‘long lining’, is perceived as the second most sustainable fishing method in rank. This fishing also does not indiscriminately kill the fish; they have very long lines that branch out to other lines with hooks. Each hook can only catch one fish. This is a deep sea fishing technique targeting albacore tuna in the deep sea. And since this is a deep fishing method, only the bigger size fish are caught. Hence, undersize are not caught in this type of fishing (Pers. comm. manager 1, 2013).

However, some crew of the long line fishing mentioned that this type of fishing is also destructive. This is because it does not select the type of big fish. All the fish such as wahoo, marlin, mackerel are also caught including sharks. These untargeted species are often discarded into the sea. This is because fishing masters do not want any other species except the targeted ones (Pers. comm. ex-fisherman number 4, 2012).

Conversely, purse seining appears to be the most destructive fishing method compared to the others. The majority of interviewees confirmed this. This fishing method does not select the fish. All the targeted and untargeted fish are captured in the net. This includes the undersize, dolphins, sharks, turtles and other species. Most of the times the undersize tuna and other species die before they are hauled inboard. This is because the net usually grabs and squeezes the fish very tightly during the hauling process.\(^\text{34}\) Tuna are very weak and vulnerable, such a process easily kills them. Moreover, all the unwanted species are normally discarded into the sea as waste. This is because fishers do not want to fill up their storages space on species that they would not sell.

---

\(^{34}\) *The hauling process is when the purse seiners heave or pull their nets from the seas with the fish trap inside.*
Below is some evidence from former and current fishers on the fishing method:

“I have witnessed other fishing vessels that have broken fisheries rules particularly the net boats (purse seiners) that kill undersize.” (Pers. comm. ex-fisherman number 5, 2012)

Moreover, the second comment is from a local who used to serve in a USA purse seiner:

“It is very hard to minimize by-catch because normally the undersize, turtles, dolphins and sharks are also captured during the process. The undersize tuna always die because it is very hard to select them and often they die before we can release them.” (Pers. comm. ex-fisherman number 6, 2013)

“The net boat is difficult to follow rules because the method is unselective.” (Pers. comm. fishing master –pole and line- number 1, 2012)

“Purse seiners are worst type of fishing because they fish indiscriminately and if the storage is full the undersize fish will be thrown into the sea unless they are close to land.” (Pers. comm. ex-fisherman number 4, 2012). While purse seining is not illegal, the majority of interviewees (ex-fishers and current pole and line fishers) felt that such fishing should be banned.

However, it was also argued that such a fishing method should not be banned completely but be conducted responsibly. This is because such a fishing method is used to catch surface swimming tuna that long line does not have the capacity to do. And pole and line despite its advantages, is high cost, declining and would not meet the global demand for tuna (food security) (greenfishbluefish 2013).

5.3 Punitive Compliance Incentives

5.3.1 Weak Enforcement

Fishers are involved in illegal fishing activities because the present enforcement effort appears weak. This study has identified four enforcement mechanisms that have contributed to the overall weak enforcement. They are (1) Insufficient Physical

---

35 This would require appropriate measures in how purse seiners conduct their fishing activities, strong enforcement with appropriate penalties. One way to fish in a responsible manner is to ban FAD fishing and only allow free school fishing. This is because FAD contains lots of undersize tuna compared to free school.
Enforcements (assets) (2) Limitations of Non-Physical Enforcement (VMS) (3) Weaknesses of the Ministry of Fisheries’ Compliance Department and (4) Informal Behaviour.

5.3.1.1 Inadequate Physical Enforcement (Patrol Vessels)

Physical enforcement refers to the use of assets or patrol vessels to police the country’s EEZ. SIG has two PCPV. These boats were donated by the Australian government under its defence cooperation. One of the primary tasks of these boats is maritime surveillance and fisheries protection. These tasks focus on deterring IUU fishing activities. Under their jurisdiction they may board fishing vessels suspected of breaching their license conditions. This may subsequently result in arrests where necessary. These assets are one of the main management tools used in physically deter IUU fishing activities (Pers. comm. enforcement officer number 1, 2012).

Unfortunately, these patrol vessels have not completely deterred pirate fishing. There are gaps identified that have contributed to weak physical enforcements. The first one is that the vessels could not effectively cover the entire Solomon Islands maritime boundary. This is because the 1.34 million sq km EEZ is too large to cover in a single operation (Pers. comm. enforcement officer number 1, 2012; pers. comm. enforcement officer number 3, 2013). EEZ of such scale can only be managed effectively with additional patrol boats. One of the CEOs of the patrol vessels confirms the above statement when he was asked whether he is satisfied with the current enforcements:

“The two vessels alone cannot look after our vast seas. We need to have additional vessels to station up north and south.” (Pers. comm. enforcement officer number 2, 2012)

In addition, one of the observers (Pers. comm. observer number 1, 2013) also mentioned that: “The reason for stealing fish is because there is not enough physical surveillance to monitor those activities in our boundaries”.

The two responses are clear evidence of inadequate coverage by the patrol boats. This has created loopholes within enforcement making IUU difficult to deter. This problem reconfirms the need for additional patrol boats.
The second problem contributing to weak physical enforcement is financial constraints. Patrolling the country’s EEZ is very expensive. It costs half a million dollars to send one patrol vessel out for only ten days. The SIG could not afford continually financing such commitment. It can only cater for the crews’ salaries and benefits. However, it was the Australian government through its defence cooperation assistance that has funded this operation; including the fuel and provisions. This has been on-going since the vessels were first donated in 1988. However, the high operating costs resulted in infrequent patrols; and if they do, the vessels have to take turns to patrol the seas for only ten days (maximum). They do not take the dual approach which could be more effective. This is because of the high costs and the need for one vessel to be on standby for other emergencies. This situation has forced the maritime unit to resort to the non-physical enforcement method using the VMS (Pers. comm. enforcement officer number 2, 2012). However, most respondents felt that the physical presence of enforcers is very important. To substantiate this claim, a related question was asked of interviewees; if they could think of another method that would achieve compliance, apart from physical enforcement. A CEO of one of the patrol vessels responded:

“I do not think so, except our heavy presence out there in the seas.” (Pers. comm. enforcement officer number 2, 2012)

The CEO has been in the industry for some time; he knows what is happening out there. His response was perceived to be based on his experience and sound judgment. He suggested that their heavy presence would make a difference. His comment is not isolated. Other stakeholders confirm the same perception although they were interviewed separately at separate times and locations. One of the fisheries observers mentioned:

“The responsible authorities should increase their physical surveillance to deter illegal activities.” (Pers. comm. observer number 4, 2013)

In addition, one of the former purse seiner’s crew members was asked whether he could remember any time he sighted the patrol vessels when his vessels went out fishing. He responded:
“No sightings of patrol vessels or air surveillance were seen.” (Pers. comm. ex-fisher number 7, 2012)

These quotations provide evidence that there was no regular patrol on the EEZ. The high operation cost is one of the reasons why their presence has not been felt. This resulted in ineffective enforcement. The same CEO also mentioned:

“We can only catch unlicensed vessels through patrol.” (Pers. comm. enforcement officer number 2, 2012)

All he was saying was that unlicensed vessels can only be caught through regular patrols. But with the current constraints, fishing vessels (long liners and purse seiners) can enter and exit without being detected. These fishers will not be accounted for unless physical enforcement is tightened.

The third problem relating to weak enforcement is insufficient manpower to man the boats. According to the director of the maritime unit, the assets are under-staffed. Under marine safety requirement each patrol vessel should have nineteen crew members before they could sail. Currently, they do not have that number. This was because some of the crew was undergoing training. Requests for recruitment were forwarded to the police commissioner but nothing was heard (Pers comm. enforcement officer number 3, 2012). This problem has forced this section to do less surveillance activities; resulting in ineffective enforcement. For instance, the time of the interview was towards the end of the year (2012) and by then most of the vessels’ licences had expired. But because of the manpower shortage, the boats could not do their regular patrols. One of the maritime officers mentioned:

“At this time most of them (fishing vessels) would have their licence expired and it would be the best time to patrol our EEZ, but we are having manpower shortage. Our presence out there would make the difference.” (Pers. comm. enforcement officer number 2, 2012)

This clearly reflects another loophole within the enforcement system. The boats could not go out because of the under manning problem. Un-flagged vessels could be very difficult to detect in such circumstances because they do not carry fisheries observers on board. Similarly, vessels licensed in FFA member countries but not Solomon Islands could get away easily if they do not carry observers.
Furthermore, the provincial capitals of the remote parts of Solomon Islands do not have fuel depots for refuelling. Lata, the provincial capital of Temotu, for instance, does not have such a facility. This makes it difficult for the patrol vessels to do surveillance of the eastern side of the country including Makira Province. Consequently, this leaves that region at greater risk of IUU activities. Even if vessels are detected for breaching their licence conditions, patrol vessels could not be sent to the remote areas because of the refuel constraint. Similarly, fishing vessels licensed to fish in Vanuatu and New Caledonia but not in the Solomon Islands could exploit this weakness by entering Solomon Island’s EEZ without being detected (Pers comm. enforcement officer number 2, 2012).

5.3.1.2 Weakness of Non-Physical Enforcement (Vessels Monitoring System)

Non-physical enforcement is the use of information technology to detect IUU activities and monitor vessels’ positions. It is called ‘non-physical’ because enforcers do not have to be physically present onboard but they can still monitor fishers’ activities from their offices. The most common non-physical enforcement mechanism used by FFA member countries is the VMS. The VMS is used by the FFA surveillance department and the Royal Solomon Islands Police maritime unit to monitor movements of licensed fishing vessels. It is required under their licence conditions that all vessels must be fitted with VMS (Pers. comm. FFA monitoring officer number 1, 2012; pers. comm. enforcement officer number 1, 2012; pers. comm. FFA monitoring officer number 2, 2013).

The FFA office monitors all the fishing vessels in all the PICs’ waters while the coastal State only monitors vessels within their EEZ unless other member countries wish to share their data. The maritime surveillance unit in Honiara could see all the licensed fishing vessels within Solomon Islands EEZ but the fishers could not see each other.

There are two VMS display units used by fishing vessels; the first one is known as ‘VMS original’. It displays in its screen the fishing vessels’ registered numbers and the routes the vessels are taking. VMS google, on the other hand, indicates the position of the fishing vessels as objects in green. It can turn red to indicate an

\[\text{Data sharing is when a coastal State allows another coastal State to view positions of fishing vessels in its 200 miles EEZ through its VMS. For example if Fiji, Vanuatu and Solomon Islands share their data, their monitoring and surveillance department will be able to see the positions and movements of the fishing vessels in the other 200 miles.}\]
abnormal acceptance alert. This refers to vessels that have bad records for not following rules or those that have repeatedly broken rules in PICs waters. This is the category that enforcers should closely monitor. Normally when such a sign appears the police maritime unit uses their professional judgment to assess the situation and may physically check the fishing vessels if their assessments indicate seriousness of the situation (SIG Audit Report, 2012)

The introduction of VMS has helped address some of the major problems experienced with physical enforcement. First, it has a wider coverage; operators and regulators can see all the fishing vessels’ positions. Secondly, it gives sufficient information to the police maritime unit to help make accurate decisions. This has enabled them to send patrol vessels to places where IUU activities are likely rather than the traditional practice of sending boats blindly, hoping to find any illegal fishing activities.

However, the VMS has a limitation in that it could not accurately identify the IUU activities. Despite this limitation, it is an important MCS tool that should be used in conjunction with other management tools. In other words it should not be used as a stand-alone enforcement tool. For instance, it needs the presence of patrol vessels and observers to check what is going on in the sea. So if fishing vessels are committing IUU activities, enforcers may not be able to detect them. One of the typical examples of the types of rules that can be violated is under-reporting of catch. The VMS would not be able to detect this. Thus, if fishing masters collude with the fisheries observers, such an offence would be difficult to detect. One of the fisheries observers interviewed also highlighted the weakness of VMS in his response:

“The boats casting nets within or less than 6 miles will be indicated in the VMS but monitoring officers might not know whether it is drifting or fishing.” (Pers. comm. observer number 3, 2012)

The quotation confirms that VMS does not fully deter IUU activities. Furthermore, some fishing vessels might be claiming to transit through Solomon Islands’ EEZ but may set their nets if they see schools of tuna on their way. The VMS would not be

37 The traditional practice is often ineffective, inefficient and costly.
able to detect this (Pers. comm. FFA monitoring officer number 1, 2012). Similarly, the VMS could not detect under-reporting by fishing vessels, hence officers stationed at the FFA and SI maritime surveillance unit would not be able to pick this up (ibid.). This means that VMS does not supersede the other enforcement mechanisms such as patrol boats and fisheries observers. Instead it needs to collude with them in order to control IUU activities. However, a complete and on-going collusion of these three forces is in doubt because these other mechanisms also have their own weaknesses. It must be acknowledged; though, that the VMS has helped strengthen enforcement but its weakness must not be over looked. Fishers could capitalize on this. New technological inventions that can solve current problems are highly desirable.

5.3.1.3 Leniency of Fisheries Department

The fisheries ministry has a compliance department that enforces fisheries regulations. This division investigates all the fisheries cases and forwards them to the Ministry of Justice for court proceedings. Other times they settle problems out of court. However, other stakeholders are often dissatisfied with this department. They perceived them as too sympathetic to violators and often compromising their responsibilities. One of the ex-pole and line fishers from the former Solomon Taiyo Limited confirmed:

“Fishers break rules because fisheries officers are too lenient; I suspected some deals must be going on.” (Pers. comm. ex-fisher number 8, 2012)

He further commented: “The enforcement is weak; it needs to be tightened (strengthened). The officers are not strict enough and often compromise their duties.”

This direct quote was his (ex-fishers) description of the character of the fisheries department. However, whilst the respondent does not provide any evidence to prove his comment, similar responses were given by other respondents. One of the ex-fishers on the NFD purse seiners’ boats commented in his recommendations to improve compliance to fisheries regulations by saying:

“Fisheries should tighten up enforcement to achieve compliance. But if they are slack, fishers would take advantage of it.” (Pers. comm. ex-fisher number 6, 2012).
Furthermore, the fisheries department was also described as unorganized and not conscientious in carrying out their tasks. One of the CEOs of the patrol vessels was commenting on this by saying:

“I am not satisfied with the fisheries department. We just waste our times holding fishing vessels because their names are not in our lists. But then were advised to release them.” (Per. comm. enforcement officer number 2, 2012)

To clarify the above, the patrol boats are often given lists of all the licensed vessels in the Solomon Islands prior to their surveillance operations by the fisheries department. During the course of their duties, they sometimes come across vessels that are not on their list. It was when they apprehend such vessels that the fisheries department advised them to release them because their names were mistakenly not included in the list. This often discourages the patrol vessel’s officers because lots of effort was put into this kind of job. Similarly, fuels were also wasted in accompanying these boats to base.

The same CEO further added:

“We only act on fisheries authority. We bring them in but the fisheries themselves do the investigations. If we have CID to conduct the investigations it would be good but most of the times they (fisheries) do the investigations and often manipulate the laws to set the fishers free.”

The above statement clearly states how enforcement within the fisheries department is perceived as weak. This encourages fishers to break the rules knowing that they could avoid punishment from the system.

Also it was argued that the use of administrative procedures for infringement is the most efficient way of solving problems; rather than the judicial process. Vessels prefer to be dealt with through the administrative proceedings if they break their licence conditions as this method is faster38 and less costly to their operations even if they are required to pay higher fines (Pers. comm. manager number 2, 2013).

However, the only limitation with this procedure is political and bureaucratic interference. Under the Solomon Islands Fisheries Act, section 49 the responsible

---
38 Most fishers prefer their cases to be dealt with efficiently. Beside an idle vessel is an unproductive vessel.
minister can use his discretionary power. So even if the correct fine is submitted to him by the fisheries officers he can reduce them as he wishes. This can give way to corruptions (Pers. comm. fisheries officer number 2, 2013). This requires amendments to the Fisheries Act to limit political and bureaucratic interference.

5.3.1.4 Fisheries Observers (Corrupt Behaviour)

The current ROP appears to be more effective compared to other enforcement mechanisms. However, everything has its own weakness. This section will begin with the strengths of the ROP and then explore their potential weaknesses resulting in the gaps in enforcement.

Under FFA policy, member countries are to have fisheries observers on-board accompanying the fishing vessels. Fisheries observers are recruited and trained recruited under the ROP. To date the SIG has around 300 local observers. Most of them are form five and six school leavers from the various provinces in the Solomon Islands. Eight of them were interviewed; including their manager; and an observer coordinator based in Palau. Those other observers were selected by their managers and have been serving more than ten years. They have been with most of DWFNs and local vessel. One of them was a Kiribati observer interviewed when his vessel a Korean purse seiner- went to Honiara port to get some provisions.

This program requires 100% coverage of all purse seiners and 5% of all long liners. The 100% coverage means all purse seiners have to have observers before they could go fishing. The rule does not allow any purse seiner to fish without an observer. On the other hand the long liners are not so that strict. They can go without observers as they require 5% coverage (SIG Audit Report 2012).

The observers assist both SPC and FFA with their jobs. For instance, they help provide data to SPC for analysis. The analysis helps determines the fish stocks in Pacific islands waters. Rules can then be formulated to conserve the stocks based on SPC’s analysis. In order for this to happen, observers have to record the quantity of different species caught; including by-catches (turtles, sharks, dolphins, whales etc.). The central part of this job also involves measuring and recording fish and noting their weights.
Similarly, the observers monitor fishers’ daily activities and report any violations of rules to the fisheries department. This has helped in deterring IUU activities. One of the observers responded:

“Our job is also to monitor vessels fishing because in the past some foreign boats went to EEZ that they were not allowed to fish. Another role is to monitor trans-shipment in high seas. We also monitor discharge of oils and other harmful waste on the sea because this affects the tuna.” (Pers. comm. observer number 3, 2012)

Another observer also specifically mentioned vessel sighting as part of their responsibility. He mentioned: “Vessel sighting is part of our program. Even if it’s a flagged or registered vessel, we have to note their details, position and activities.” (Pers. comm. observer number 1, 2013)

The ROP appears to be an effective form of enforcement mechanism because it deters fishers from violating fisheries rules. The majority of the respondents confirmed this. Three quotes extracted from the transcripts provide some evidence to this. The first comes from a French engineer working for one of the NFD purse seiners:

“In other oceans when I was working for a French boat, we used to fish illegally without a licence and everybody does that. But here, it is difficult to break rules because of the presence of observers.” (Pers. comm. fisherman number 1, 2012)

A Kiribati fisheries observer on a Korean purse seiner (DWFNs) also mentioned the same thing: “with the presence of observers, they (fishers) are bit frightened to break rules”.

Furthermore, one of the captains of the NFD pole and line confirmed: “we followed what they (observers) said because they represent the government” (Pers. comm. captain number 1, 2012)

Fishers tend to respect and fear observers because although they are not enforcers; they are the watch dogs for the government. They can report any IUU activities they see to responsible authorities. Furthermore, the 100% observer program helps reduce under-reporting and no reporting. This makes reporting very consistent and perceived as accurate (Pers. comm. observer number 1, 2013).
Even one of the fisheries office personnel that used to analyse the observers’ reports confirmed that observers’ job performance has improved a lot compared to the past. “The data indicated that they have done very well because if they do not, they can easily spot it from the quality of the data.” (ibid.).

Hence, the general impression by many stakeholders to the ROP is that it is very effective because agents see and report first-hand information to the government; their reports are accurate and it is the cheapest method compared to the assets and air surveillance (Pers. comm. observer programme coordinator number 2, 2013; pers. comm. observer number 4, 2013; and pers. comm. enforcement officer number 3, 2013).

However, although the ROP has improved a lot and become more transparent in terms of the log sheets and its reporting system, bribery and corruption must not be ruled out completely. There is potential for such activities to re-emerge. Some of the observers interviewed confirmed that there are times when they were lured into such informal activities. But they refused because they fear losing their jobs if caught (Pers. comm. observer number 2, 2012); others denied coming across such encounters (Pers. comm. monitoring officer number 2, 2012; and pers. comm. observer number 1, 2013).

However, the public in general argued that fishers can still be susceptible to forms of corrupt behaviour. It has happened in the past. Most of the ex-fishers confirmed this. One of them, an ex-fisherman from a USA purse seiner confirmed:

“They (fisheries observers) do their jobs but I can’t understand why we continue to catch undersize tuna.”

He further said: “During our time there are still gaps in the enforcement mechanisms; even after the VMS was introduced; they still steal by negotiating with observers” (Pers. comm. ex-fisher number 7, 2013).

Another ex-fisherman on the former NFD purse seiner Solomon Premier responded to a question that sought his opinion on the work of observers. He responded as follows: “Observers do their job very well but when we remove sharks’ fins, he just watched. We also gave him the money when we sold the fins.” (Pers. comm. ex-fisher number 1, 2012).
When similar questions were asked of some former fishing masters they denied involvement in any corrupt activities; claiming that they worked very closely with observers. However, they agreed that such activities are prone to happen and can be done in secret by other fishing masters, but it is difficult to tell (Pers. comm. ex-fishing master- pole and line - number 1, 2012; and pers. comm. ex-captain, 2012).

One area that could still give way for non-compliance to fisheries regulations (weak enforcement) is the 5% observer coverage with long liners and pole and lines. One of the former fishing masters of one of the Solomon Taiyo pole and liners mentioned:

“If observers don’t follow us we will also break rules but when they are with us we pretend to be good fishers. All fishers are the same.” (Pers. comm. ex-fishing master – pole and line- number 2, 2013)

Another former purse seiner crew of the NFD boats also mentioned: “During our time fisheries observers are seen on-board but not regularly. That is why fishers are not afraid to violate rules”. He further recommends that “they must be present all the time to deter non-compliance.” (Pers. comm. ex-fisher number 7, 2012)

The above statement stresses the importance of 100% observers’ coverage to all forms of fishing gear. Fishers can break rules if they have the chance and one of the obvious ones is if observers are not present.

5.3.2 Unlicensed Vessels

Any vessel that does not fish in the Solomon Islands; including PICs under the bilateral and multilateral agreements; is termed illegal and unregulated fishing (Pers. comm. enforcement number 5, 2012). These fishers are difficult to detect with the VMS because they are not fitted with one. Nor do they have fisheries observers on board. Fisheries observers’ presence makes it difficult for fishers to break rules. Unlicensed vessels could only be detected with the heavy presence of the patrol vessels on the seas; and vessel sightings by fisheries’ observers (Pers. comm. enforcement officer number 2, 2012).

Secondly, vessels under multilateral and bilateral arrangement can still pose similar difficulties as the unlicensed vessels mentioned earlier. There are some vessels that only purchase licences to fish in certain FFA member countries but then decided to fish in other FFA member countries. Solomon Islands has been a victim of such
crime. In 2010 two Taiwanese vessels were arrested by the RSIPV Auki for fishing illegally within the Solomon Islands 200 miles EEZ (Solomon Star, 2010). These two vessels did not have the licence to fish in Solomon Islands waters although they have licences to fish in other FFA member countries. Such vessels are difficult to monitor with the VMS. In this context, vessels that do not have the license to fish in the Solomon Islands will not appear in the maritime unit’s VMS screen unless the other FFA member countries that host the fishing vessels agreed to share their data. Whilst some countries, like Vanuatu, willingly share data with Solomon Islands, other countries, like Fiji, are reluctant to do so. This problem has contributed to the overall weak enforcement (Pers. comm. FFA monitoring officer number 1, 2012).

5.3.3 Low Penalties
Penalty is defined as “a punishment for breaking a law, rule or contract” (Oxford Mini English Dictionary, 2007:p.406). According to the fisheries’ laws, any vessel that is involved in IUU fishing activities would be punished. The punishment normally comes in the form of a fine of monetary value; and its severity depends on the nature of the IUU activity. This is one effective way of discouraging fishers from violating rules. However, this can only be effective if the penalties are high so that fishing companies make losses if they pay the fines. But if they are low, fishers will still violate rules. This is because fishers often compare their potential losses and the gains of breaking rules. If the gain outweighs the loss, they will violate fisheries laws. Fishers only obey rules when the loss exceeds the gain (Pers. comm. observer number 1, 2013). Fishers could also be blacklisted or banned from fishing and their catches if they continue to disobey rules.

One of the reasons why fishers continue to commit IUU in Solomon Islands is because of the low fines imposed by the government. Most respondents confirmed that the fines are too low. This information was gathered after a question was asked on what they (fishers, enforcers, FFA) think about the level of penalty imposed by the Government.

39 If vessels are black listed for involving in IUU fishing in the Pacific islands, they would be put in a very awkward financial Position and in extreme cases they would have to relocate to other region (eg. Indian Ocean) which could be difficult and costly.
Of the many responses, three of them are provided here as evidence to confirm that the penalties are relatively low. The transcripts are quoted in their own words. The first one is from an ex-fisherman in one of the USA fishing boats:

“I do not think the penalties are sufficient, that is why most fishers do not care about breaking rules.” (Pers. comm. ex-fisherman number 8, 2013)

Furthermore; this was what a former bosun of a NFD pole and line said:

“The penalties are insufficient to deter fishers from breaking rules. This is because most of the fishers are multi-millionaires. The penalties could only be valued to half of their catch; hence this could not deter them from breaking the rules.” (Pers. comm. ex-fisherman 5, 2012)

Fortunately, the researcher managed to get a current fishing master and this was what he said:

“I think the penalties are not tough enough that is why fishers continue to break them. This is because the benefits outweigh the costs.” (Pers. comm. captain number 2, 2012)

As can be seen from the three responses; they all agreed that the penalties are relatively low and should be inflated. This would discourage violators from breaking the rules. Similarly, the acting director of the police maritime unit suggested:

“If only fishing companies (employers) terminate their fishing masters and captains for violating rules would compliance be achievable.” (Pers. comm. enforcement officer number 3, 2012)

‘Termination’ would make fishing masters and captains scared of violating rules; in other words this would mean losing their jobs. However, based on the interviews no fishing companies have ever included such rules in their code of conduct. This indicates that employers only focus on the catch regardless of the approach. One of the reasons why this happens is because the penalties are low. If the fines are inflated, fishing companies will try to ensure that their fishers follow the rules.
Additionally, some interviewees mentioned that there were times the penalties are further reduced. One of the CEOs of the patrol boats confirmed this in the statements he gave:

“We (government) are too lenient with penalties, at one occasion we only got SBD $1.97 million from fine after it was reduced from SBD$20 million.” (Pers. comm. enforcement officer number 1, 2012).

He also mentioned one very important point that needs to be noted here:

“With tuna, oil, timber and gold, it is not the resource owners that give the price; it is the rich people that are giving the price. Then why are we reducing the fine? Last year we were supposed to earn SBD$1 million fine instead it was reduced to SBD $300,000”.

The penalties are administered in two ways. First, cases are channelled through the formal judicial process where alleged illegal activities are heard before the magistrate. The judge decides on the penalties. Alternatively, cases are settled out of court where the fisheries minister or the cabinet decide on the penalties based on the advice of the attorney general.

One ex-fisher also mentioned: “Penalties are there but sometimes both government leaders negotiate; resulting in compromised penalties.” (Pers. comm. ex-fisherman number 1, 2012)

On another incident, in 2010 two Taiwanese fishing vessels, that were arrested because their nets drifted 30 miles within Solomon Islands’ territorial waters had their SBD $2.5 million dollars fine reduced to SBD $1.5 million by the cabinet. The original amount was imposed by the minister of fisheries in line with the Fisheries Act but the cabinet met and reduced the penalty (Solomon Star 2010).

The implication here was for the government to impose maximum penalty and not to give concessions to violators. But most of the time violations of regulations are settled out of court meaning both parties agree on a certain amount (fine) rather than in the case of the judge deciding upon the amount. Furthermore, fishers that frequently violate fisheries rules are from the key development partners of Solomon Islands such as Taiwan. This makes it difficult for the government to stand by its
rules. This often results in concessions and compromises. As a result it weakens the country’s enforcement. Moreover, if fishers know that the government is too lenient (sympathetic) they would not be deterred. One of the FFA officers mentioned:

“The existing enforcement tools are good but getting the maximum fine for those that do IUU will help deter IUU.” (Pers. comm. FFA monitoring officer number 1, 2012)

This answer reflects that the government is not firm with its penalties. Often they deflate the fines, to suit the violators. This removes any sense of fear from potential violators.

Furthermore, there is no standard penalty for FFA member countries. Each of them has their own sets of penalties for various IUU activities. Likewise, Solomon Islands has its own; however; it has the lowest compared to the others (Pers. comm. FFA monitoring officer number 1, 2012). Based on the Fisheries’ Act 1998, most of the penalties for violations of rules range from SBD $500 for breaching of customary fishing rights to a maximum of SBD$1 million for breaching of license conditions.

Most other PICs have their penalties in US dollars. Palau, for instance, fined a Taiwanese fishing vessel US$65,000 for illegal shark’s fishing and failing to maintain its VMS in 2011 (Pacific islands law enforcement network n.d.).

Additionally; in 2012 the Marshall Islands government fined a Japanese vessel US$125,000 for transhipment on the sea rather than in port. Sharks’ carcasses were also discovered on board which is also a violation of rule (ibid.). In Nauru, any vessel that violates the country’s fisheries’ rule will pay fines ranging from A$10,000 to A$100,000, and each crew pays A$5,000 (Nauru’s Fisheries Act 1997).

As can be seen; Solomon Islands’ penalty is too low compared to the others and the fact that its currency is about ten and seven times weaker than the US dollar and Australian dollar respectively. One of the respondents mentioned:

“I think the Taiwanese boats break our rules because the penalties are too low. If they are in US dollars they would think twice.” (Pers. comm. enforcement officer number 2, 2012)

He further added:
“At the moment all the fines are in Solomon Dollars. Other PICs such as Kiribati, Palau, and FSM have penalties in USD. Deterrent would be effective if penalties are in USD”.

In addition, the acting director of the police maritime unit also mentioned:

“Our penalties are very low. We should increase it and convert to USD. The best way to deter IUU is to put maximum fine. This would send a warning signal to fishers”. (Pers. comm. enforcement officer number 3, 2012)

The low penalties mean that fishers can easily settle them without any problem, and continue to violate the rules. This is one of the reasons why fishers are not deterred from commit IUU activities.

In 2011 the RSIPV Auki arrested two foreign long line fishing vessels (FFVs) which had violated their fishing license. These vessels were found to be owned by the same company that owned two other vessels that were arrested by the police on February 2010 (Solomon Star, 2011).

At other times the government overlooked certain illegal activities that do not appear serious to them. For example, discrepancies in under-reporting a handful of fish may not sound serious to the government. Violators often get away with such behaviours. One of the observers mentioned:

“They (fishers) just don’t bother to record the other species. For example we might record one black marlin but when we check their records they don’t record it. I do not know if there is any penalty for this misreporting. We have reported them but till now no actions taken against them.”(Pers. comm. observer number 4, 2013)

In addition, the CEO of RSIPV Auki mentioned that under reporting is often overlooked in the Solomon Islands. He further mentioned: “any fishing vessel that fails to record only few fish is already committing IUU and should be penalized. In FSM, a fishing vessel did not record only one fish in the log and the government fined them US $70,000. Solomon Islands on the other hand is too lenient and that is why fishers can easily break rules.”(Pers. comm. enforcement officer number 1, 2012).

Another reason why fishers break the rules is because they are not aware of those penalties. Two fishers mentioned:
“I am not aware of the penalties but I only know the rules.” (Pers. comm. fishing master –purse seiner - number 2, 2012). A current captain of the NDF purse seiner also mentioned:

“I am not aware of the penalties associated with breaking the rules.” (Pers. comm. fishing master –pole and line- number 1, 2012)

The first respondent is a fishing master of a pole and line vessel whereas the second one is a captain of one of the NFD purse seiners. This could also be a contributing factor for fishers to break rules.

The last remark from fishers on the violation of rules is that some interviewees think penalties alone will not deter fishers from violating the rules. They suggested that blacklisting of fishers would discourage them from committing IUU activities. This would indicate that they do not have good social standing with resource owners hence, other coastal nations would not grant them a licence to fish in their territorial waters as well. Moreover, blacklisting prevents fishers from fishing anywhere in the region (Pers. comm. ex-fisherman 4, 2012; enforcement officer number 2, 2012 and pers. comm. observer number 5, 2012).

5.3.4 Political Influence (Regulators’ Behaviour)

The political influence of senior bureaucrats is one of the strong influencer leading to non-compliance. There are times when politicians and senior government officials interfere with the work of the enforcers and in the subsequent settlement of relevant issues. One of the observers mentioned in one of his responses:

“The top people sometimes interfere with our job; weakening it”. (Pers. comm. observer number 1, 2013)

A typical example is an incident from June 2010. At that time six Taiwanese flagged fishing vessels were arrested for fishing illegally in Solomon Islands’ waters, contrary to section 16 of the Fisheries Act 1998. These vessels were the Ffv LL-Liao Da Gan 55049, Ffv PS-Xin Shi Ji101, FFV PS-Xin Shi Ji 102, Ffv Ps-Tai Fu 102, Ffv Ps-Zhong Tai 1. (SIG Audit Report, 2012). According to the CEOs of the RSIPV Lata they arrested these vessels and were still on their way with the vessels to Aola base when the Solomon Islands’ high commissioner to Taiwan called them through
satellite phone to release the vessels. The officer claimed such attitude confused and
discouraged them, and ultimately weakens enforcements (Pers. comm. enforcement
officer number 2, 2012).

The second way that politicians may weaken compliance is in a situation where they
go abroad to sign fishing access agreements. Most of the time politicians would be
treated so well by the DWFNs host country that they tend to sign agreements outside
the Act. So instead of DWFNs agreeing to Solomon Islands’ terms the opposite
happens; that is SIG agreeing to the DWFN conditions. This is another reason why
rules are violated (Pers. comm. enforcement number 5, 2012)

Additionally, such treatment also influences the government’s decisions on issues
such as penalties. For instance in November 2011 three cases were reported for
alleged breach of licence conditions. Two of the cases were suspected for
transhipment at high seas while the other one failed to have on board its original
licence. The report mentioned that the vessel that failed to have on-board its original
license was fined SBD $30,000 but the other two have not paid any fine (SIG Audit

5.4 Community

5.4.1 Norms

Norms can be defined as the acceptable behaviour or practices in a society,
community, institution or work place (Ostrom 1990, p.134). In the offshore tuna
industry the acceptable practices are determined by the fisheries’ regulations or the
licence conditions. These conditions should guide all fishing activities and their aim
is to make sure PICs still have tuna in the future (The Fisheries Bill 1998). Informal
rules and norms differ for different fishers. Sometimes the norms are classified based
on the companies, nationalities of flagged vessels and so on. Formal rules sometimes
come into conflict with informal practices. For example, if fishers know that some of
their colleagues break rules without being penalized, they tend to do the same.

It was argued that normal practice plays a very important role in compliance to
fisheries regulations (Ostrom 1990, p.135). The interview questions revolved around
this hypothesis. They were designed to confirm this concept in the Solomon Islands’
fisheries. It was claimed that corrupt behaviours have been practised in the fisheries.
The questions therefore were aimed at getting the reactions of other fishers on this issue.

To begin with, fishers are people who always want to break those conditions in order to maximize their gains. There is no doubt that some may have been breaking rules and still getting away with it because no one caught them. Others; however, engaged in IUU activities and got caught. The normal procedure when one gets caught is to be arrested by the patrol vessels. They are then taken to the Aola base for further questioning by fisheries department. From there, a report would be submitted for court proceedings. Usually if the fishers are guilty charges would be made through fines. Fishers can only be released if they pay the fines. But in most cases such matters are settled out of court; which means they do not go through the judicial system.

In the latter case, some fishers or their States normally negotiate on their behalf with the responsible coastal State’s resulting in the vessels being released without paying anything or significantly less. This normally happens after the fishers have been arrested and penalties given by the minister responsible or through the attorney general. Other times such decisions are taken up to the top body of the country, involving ministers, prime ministers and their counterparts from the flagged vessels’ countries. A typical example was the incident written under clause (9) ‘low penalty’ whereby the fisheries minister charged two Taiwanese vessels SBD $2.5 million for illegal fishing but then the cabinet revoked this decision and reduced the penalty to only SBD $1.5 million (Solomon Star 2011).

Three types of reactions were received from respondents on the above scenario. The first group of fishers and enforcers was not happy at all with such behaviour from the government. They felt that everyone should be treated fairly. Three responses were extracted from a local fishing master, a foreign boat manager (locally registered) and a local captain of one of the pole and line vessels.

The local captain immediately reacted to this question by saying:

“It would be fair if all fishers are treated the same. If we follow rules when others do not, but still get away with it, this won’t be fair.” (Pers. comm. captain number 2, 2012)
Also an overseas operations manager of a Taiwanese long liner expressed disappointment on this when he mentioned:

“This is not fair because we pay and they don’t. Same time they catch the fish we suppose to catch.” (Pers. comm. manager number 1, 2013)

“If boats are arrested for illegal fishing and then all for a sudden they are released because things are taken up at higher level than this indicated that we are just nothing. Why did the government make rules and at the same time break them?” (Pers. comm. captain number 1, 2012)

The respondents were not happy with such practices by the authority. This is because they felt that the authority should not play favouritism as they have been sacrificing a lot trying to abide by the rules. The fact that the government that is supposed to be in a neutral position starts behaving in this way really discourages them. They think that other fishers would be more reckless with the rules and would start to commit clear IUU activities if they are aware that other fishers have been released without paying any fines. This confirms fairness, procedural justice issues (Jenny, Fuentes and Mosler 2006).

Below are three different quotes from a pole and line manager of the NFD, an observer and an ex-fisherman from DWFNs (USA boat).

“If corruption is involved in the fishing industry this will attract others to do the same also.” (Pers. comm. manager number 2, 2012)

“If boats fished illegally and heavily penalized, others will be afraid. But if they are given less penalties others will be reckless. Koreans are more like Malaitans.” (Pers. comm. observer number 3, 2012)

“If other fishers learnt that corruption with leaders is being practised by fishers, other fishers will also break rules. This is because fishing masters talk with each other.” (Pers. comm. ex-fisherman number 7, 2013)

The three responses indicate that fishers would not faithfully keep the rules if corrupt behaviour continues. Instead; others would also try to follow the short cut (easy
Therefore, the existence of norms alone does not achieve compliance, but the fact that the majority comply with it would achieve compliance.

5.4.2 Communication

Communication is means of sending information (Oxford English Mini Dictionary, 2007). Ostrom, Gardner and Walker (1994, p.134) found through experimental research that communication achieved greater compliance; particularly within communities. This is because authorities used this as a means to remind fishers of their commitments to regulations. Such practices also help create unity among fishers.

Likewise, exchange of information among FFA member countries is a deterrent to IUU fishing. This can be made possible with well-developed channels of communication and up to date information sharing among members (Pers. comm. FFA Regional compliance advisor, 2012).

In contrast, regular (daily) communications between fishers, fisheries department and enforcement authorities rarely happen in the local tuna fishing industry. Fishers tend to mind their own businesses and only communicate regularly with their offices. Such communications only reminded fishers to catch more fish and often if fishers could not live up to those expectations, they tend to involve themselves in IUU activities (ibid.).

A question was asked whether the data filled on the log sheets by fishers and observers submitted to SPC are returned in the form of feedback. This feedback would provide light to the fishers on the available stocks in the PICs. Researchers stated that fishers tend to comply with rules if they know the facts about the level of the stocks; in other words if the pursued stock is declining. But they tend to be reckless if the facts indicate that the targeted species are still plentiful (Honneland 2000, p.99). Some quotes from interviewees to complement this statement are as follows:

“We would be happy if the fishers could give feedback annually on the figures we gave. What are their analyses on the figures? This would give us a clear picture on where we are in terms of controlling our stocks.”(Pers. comm. manager number 2, 2012).
An experienced fisheries observer also agreed that regular feedback would help increase compliance. He mentioned that feedback is not the normal practice. But he is very optimistic that such practice would help management of the tuna resources. Below is what he said:

“This is not part of the system. But if feedbacks are given to captains it would help to give more insights.” (Pers. comm. observer number 2, 2012)

The above statement was further complemented by a purse seiner senior overseas crew working for one of the NFD boats. This was what he said:

“I think if we get regular feedback from fisheries it would help us to take part actively in managing our fishing.” (Pers. comm. fisherman number 1, 2012)

As can be seen only one element of communication was asked; that is ‘giving feedback to fishers’ based on the data collected. Most of the interviewees agreed giving feedback would help increase communications. Written communications in the form of brochures, pamphlets, newsletters, SPC’s reports of the tuna stock, plankton, climate effects on tuna, current and so on are useful information. Additionally, observer and the ministry of fisheries’ compliance officers could verbally advise fishers regularly and hold awareness sessions during transhipments at the ports. All FFA countries should do this.

Unlike inshore fishing (community) where fishers know what everyone does, and work together for the best interest of everyone, offshore fishing is different. Fishers are more independent and pursue their own interest. However, the research found that fishers (fishing masters) have a large network. They communicate with each other regularly in search for schools of fish. Other issues such as corrupt activities can be relayed during such times as they chat informally over the HF radio system. The findings revealed that fishers were often discouraged when they learnt that other fishers break rules through informal practices. This may encourage other opportunists to follow suit.

5.4.3 Legitimacy of Rules

Most of the fishers interviewed were satisfied with the rules and think they are fair. Some fishers alluded to the fact that they were concerned about the fish too. They
would like the harvesting to be sustainable because fishing is their ‘bread and butter’. Others in the pole and line do not have any problems with the rules at all because their fishing method complies with the rules. However, they felt that the rule that allows ‘local purse seiners to fish very close to land’ is not fair. They suggested that such rules should be amended so that only pole and lines can fish on those fishing grounds (Pers. comm. captain number 1, 2012; pers. comm. fishing master –pole and line-number 1, 2012; pers. comm. fisherman number 2, 2012).

Moreover, others also want to see these rules revised to strengthen the management of these resources. Such rules that should be included are – complete ban of FAD fishing. This request is congruent with what Spalding and Sibert (1997) mentioned in their journals. They found that lots of juvenile fish are normally present around FADs and most floating object such as logs and debris. Setting nets around FADs would therefore kill the undersized tuna. Other prohibitions that fishers want to see included in the Fisheries’ Act are ‘no fishing during spawning times (December to March)’ and ‘prohibition of purse seiners to fish 5 nautical miles close to land’ (Pers. comm. observer number 3, 2012; pers. comm. fishing master-pole and line- number 1, 2012).

While most of the fishers interviewed think that the rules are fair, some still think they are weak and want to see them strengthened. Some of those thought to need amending include those mentioned in the preceding paragraph. Furthermore, the fact that fishers are satisfied with the rules does not mean they would obey them. The researcher could not see any direct relationship between legitimacy and rules. However, conducting experimental research would help to confirm this hypothesis.

5.4.4 Community Work

Community work in this context comes in two forms. The first one refers to the way licensed vessels help the enforcement authorities look out for unlicensed and unregulated vessels that may enter Solomon Islands 200 miles zone and report them accordingly. This would help the enforcement authorities a great deal. However, the findings revealed that such a responsibility was not vested in fishers nor do they voluntarily carry it out. One of the difficulties in carrying it out is that there are lots of flag vessels from various countries that have been granted the licence. This makes
it difficult for them to identify the licensed and non-licensed (Pers. comm. enforcement officer number 3, 2012).

The second investigation is to verify if DFWNs and their home country have contributed to fisheries’ regulations. It is assumed such practise would help fishers to comply with rules. This is because fishers will feel part of the management; besides they will take more ownership of the rules and since they contribute their inputs, they will want to see the rules are followed. The findings; however, revealed that DFWNs were not consulted or given any input in the formulation of fisheries’ rules in FFA member countries. This is due to the fear that they would manipulate the rules to suit their preferences at the expense of sustainable fishing; as is occurring in WCPFC (Pers. comm. FFA Regional compliance advisor, 2012).

5.4.5 Nationality and its Impact on IUU

This research begins by investigating the hypothesis by Aloyan (2011) that ‘local fishers’ tend to be more diligent towards compliance to rules compared to overseas fishers; who only care about making more money. The findings; however, revealed mixed reactions from local former and current fishers. Some of them blamed the Asian fishers for violating rules. One of the first local fishing masters of the former Solomon Taiyo Ltd’s pole and line mentioned;

“The local fishing masters tend to care more about the resources than their foreign counterparts. For example, it was a local fishing master that reported the USA vessel Jeannette Diana in the 80s.” (Pers. comm. ex-fishing master – pole and line - number 1, 2012)

Likewise, one of the former fishermen of the same company’s pole and line argued on similar ground. He has been serving for 24 years as a fisherman and this is what he said:

“Our boat was locally owned so fishing masters and captains abide to our rules. But the foreigners from the foreign boats are another story because they sometimes reluctant to listen to us. Besides, they may decide to violate rules because they are the boss and we are just crew.” (Pers. comm. ex-fisher number 2, 2012)
The two respondents were saying that local fishers; particularly fishing masters are rule abiding people. However, other fishers produced contradicting statements. One of them a former fishing master for Solomon Taiyo for ten years mentioned:

“If observers don’t follow us we will also break rules but when they are with us we pretend to be good people. All fishers are the same.” (Pers. comm. ex-fishing master –pole and line- number 2, 2013)

He was saying that local fishing masters do break rules. He went on to say that breaking rules is not limited to economic gain only, but they catch undersize tuna to give to villages, exchange with villagers for other local products and to give fish to family members (ibid.).

Another former fishing master of NFD for eight years also mentioned:

“Solomon Islanders often violate rules this is because of their low level of income so they catch undersize (1.5kg) fish to sell for extra cash. They also have no care attitudes, knowing that tuna spawn in millions” (Pers. comm. ex-captain, 2012)

Also this is a version from a French engineer serving in one of the NFD purse seiners about some Solomon Islanders:

“I saw a Solomon Island guy trying to kill a shark for its fins and I told the observer to talk to him because he is a Solomon Islander he can talk to this guy” (Pers. comm. fisherman number 1, 2012)

Furthermore, there are overwhelming complaints about the local NFD purse seiners from fisheries’ observers. One of the senior observers mentioned:

“NFD boats set their nets outside the 6 miles (very close to shore).” (Pers. comm. observer number 2, 2012)

It is clear from the various responses that the hypothesis which states “that local fishers tend to be more diligent towards compliance” is not absolutely true. As can be seen a number of local fishers have been violating rules. Breaking rules is predominantly influenced by economic gain. But there are other factors that emerged as well, such as social obligations and personal gain. Moreover, the personalities of the fishing masters also play an important part with compliance.
Secondly, the research proceeded on to verify if it is true that all foreign flagged vessels do not care about the rules. The findings; however, do not fully conform with this assumption. This is because all overseas flagged vessels did not behave in similar manner. Some fishers from DWFNs are even more cooperative than local fishers. But there are others that do not care about the rules.

Most of the foreign boats from Japan and the USA appear to have a good social standing as far as compliance to fisheries regulations is concerned. The CEO of the RSIPV Auki mentioned:

“Japanese boats highly comply with our fisheries regulations.”

(Pers. comm. enforcement officer number 1, 2012)

This is contradictory to their behaviour on their current whaling activities. Japanese whalers have created a bad impression from the international community because of their violation of regulations relating to whaling. However, they seem to be very cooperative in tuna harvesting. One of the former fishing masters of the NFD pole and line boats also mentioned that the Japanese fishers are very diligent in complying with local fisheries regulations. This was what he said:

“The Japanese are more careful in following the rules. This is because this kind of fishing is their tradition, custom, norms etc. so they have to follow its rules and rituals.” (Pers. comm. ex-captain, 2012).

Another pole and line fishing master of the Soltuna Processing Company Limited also highly commended the Japanese fishers. This person has been working under the Japanese for more than 10 years and is well versed in their attitudes to fisheries’ rules. This was what he said:

“During our time under Solomon Taiyo Limited overseas fishers such as the Japanese were more concerned about conservation method to an extent that they laid off workers during spawning time.”(Pers. comm. fishing master–pole and line-number 1, 2012).

After noting that the Japanese have a very high compliance rating, a question was asked why they are like that. One of the respondents a CEO of the RSIPV Auki
responded by saying that the Japanese fishers have a good reputation because they joined the Japanese Deep Sea Tuna Association. This is a means of creating informal norms. This Association provides certain benefits to the fishers including information about plankton and weather, and bargains on their behalf for other benefits etc. Vessels have to have good social standing in order to join or remain part of the association (Pers. comm. enforcement officer number 1, 2012).

However, Tarte (1996, p.156) noted that the Japanese government appeared contrary to its reputable fishers in the discussion tables involving RFB’s policies on fisheries management and its aid assistance to PICs. Implicitly, Japan appears to focus more on gaining maximum benefit from the resources while turning a blind eye to its long-term sustainability. When UNCLOS defined the EEZ policy, Japan was not prepared to accept it, arguing that the 200 miles zones should be free fishing ground for all and should not be under the jurisdiction of the neighbouring coastal States.

The Americans fishers also demonstrated good reputation in complying with rules similar to their Japanese counterparts40. One of the fisheries’ observers mentioned:

“Foreign boats they respected the observers. American captains are very good; they cooperate and seek our clarification when in doubt.” (Pers. comm. observer number 3, 2012)

Furthermore, one of the local captains of the NFD boats has highly commended overseas fishing masters and engineers he was working with in the local purse seiner boat. Based on his observations he claimed that (foreigners) are more careful in following rules than the locals. Below is what he said:

“The overseas people are very concerned on the rules especially killing sharks, turtles etc. They are more concerned than the locals”. He went on and said: These expats in our boats are from Mexico, South Africa, France and Philippines.” (Pers. comm. captain number 2, 2012)

One foreign crew member mentioned by saying:

40 The Japanese counterparts are the fishers and not the bureaucrats that behave contrarily as mentioned in the preceding paragraph.
“I want to follow rules because I believe it is the right thing to do rather than religion. But I just want my children to have a chance in life and if my son wants to become a fisherman in the future I have to ensure that he has fish in the future” (ibid.).

The hypothesis at the beginning of this section; which stated that foreign fishers did not really care about following rules; has not been verified so far. Instead foreign fishers are perceived to be more careful and ethical in following rules compared to the local fishers.

However, the Taiwanese fishers confirmed this hypothesis. This is because there were overwhelming responses that blamed them for violating most of the fisheries’ regulations.

One of the FFA officers mentioned:

“Taiwan has huge number of vessels conducting illegal activities. This is because they have high number of license vessels.” (Pers. comm. FFA monitoring officer number 2, 2012)

The acting director of the police maritime unit and the CEO for the RSIPV Lata respectively said:

“All the countries break rules but the Taiwanese break the rules most even if they are licensed, they still break the condition. May be because they have lots of fishing companies.” (Pers. comm. enforcement officer number 3, 2012)

“The Taiwanese vessels were breaking the rules more than the others. Our relationship with Taiwanese government could be taken advantage of. For example JinzanFa fished illegally in our seas when Taiwan was building our Referral Hospital. So they just pay $17,000 fine and was released.” (Pers. comm. enforcement officer number 2, 2012)

A question was asked on why the Taiwanese fishers seem to be behaving extraordinarily compared to other foreign fishers. A few responses were given by certain key informants and noted down as follows:
“This is because they have high number of licensed vessels.” (Pers. comm. FFA monitoring officer number 2, 2012)

The FFA officer argued that if Taiwan has the highest fishing vessels, it would have the highest probability of violators. “This is what is happening out there”. (Pers. comm. FFA monitoring officer number 2, 2012)

Another respondent, a CEO of the RSIPV Auki; explained the reason for their (Taiwanese) negative social standing was because most of the Taiwanese vessels are privately and family owned. They do not have an association or body that looks after their interests; such as the Japanese Deep Sea Tuna Association. Such a body could have greater influence on fishers in that any vessel that violates rules could be terminated from the body. This would mean fishers missing out on some benefits. They would therefore strive to adhere to the rules as much as possible. This would earn them good reputation from the public. Since the Taiwanese fishers did not affiliate to anybody, they tend to pursue their own interests and often end up engaging in IUU fishing activities (Pers. comm. enforcement officer number 1, 2012).

The operations manager of one of the Taiwanese long liners based in Honiara explained why some of his colleagues break rules:

“Some captains break rules because they are not educated. They may be one or two miles inside the EEZ of another country”. He continues to say that “rules are fair but captain who are not educated may not understand. We have a translator.” (Pers. comm. manager number 1, 2013)

The second group of fishers that violated fisheries regulations is the Koreans. According to the version of one of the observers:

“Some countries cooperate well with the rules and some don’t. The reason for such is I don’t know. I found Koreans and Taiwanese not cooperating; they don’t have record for the by-catch and undersize.” (Pers. comm. observer number 1, 2013)

However, it must also be noted not all the Taiwanese and Korean vessels are breaking rules. One of the observers mentioned:
“I have been an observer in two Taiwanese boats, one Korean and five Chinese vessels. Out of the five vessels, I haven’t seen any of them breaching rules.” (Pers. comm. observer number 3, 2012)
Chapter 6
Findings to Questions Three, Four and Five

6.1 Introduction

This chapter answers question three, four and five of the thesis. Question three tries to find out the circumstance under which fishers comply with rules. Question four looks at the types of rule fishers find it difficult to follow and the fifth question looks at the types of rules fishers find easy to follow.

6.2 Question Three - Under What Circumstance do Fishers Comply With Rules?

There are two ways in which fishers comply with fisheries' regulations. These are (1) Voluntary and (2) Non-Voluntary Means (Pers. comm. enforcement observer number 2, 2012). Voluntary compliance is where fishers comply with rules willingly. Some of the reasons fishers voluntarily comply are because they are satisfied with the rules, they think the rules are fair or everyone will benefit if they obey them.

In contrast, involuntary compliance is when fishers obey rules by force. That is obedience is not done willingly but is influenced by other external factors such as enforcement and penalties. Such fishers break rules if enforcers are not around (ibid.).

While the interview initially found that fishers obey rules either involuntarily or voluntarily; further probing into this issue revealed that the majority of fishers complied involuntarily rather than voluntarily.

6.2.1 Involuntary Compliance

Some responses were gathered from interviewees when a question on why fishers obey rules was asked. Some of the responses are given below.

One of the current captains for the NFD pole and line vessel mentioned:

“We obey rules because we do not want to get into trouble. We have families who depend on us.” (Pers. comm. captain number 1, 2012)

A senior Pilipino crew also add to the above response by saying:
“We have to obey rules so that we won’t get penalized which would affect us and our families.” (Pers. comm. fisherman number 2, 2012)

Most of the captains, fishing masters and crew are family (married) people. And most of them are the sole bread winners of their households. They value their family very much. Hence, they do not want to do anything bad that would affect their job.

Similarly, others value their job as very important to them; hence they follow rules for that reason. This was what some of them said:

“Anyone who kills turtle, sharks’ for their fins would be terminated” (Pers. comm. captain number 2, 2012)

Others obey rules because of the presence of enforcement authorities. This is what one of them said: “we follow rules because the fisheries’ observers often go with us. They always board our vessel every month so it is difficult for us to do anything (break rules)” (Pers. comm. ex-fisher number 3, 2013).

Likewise, one of the captains of the NFD purse seiner boat said that they follow rules because PNA and FFA’s policies are getting very strict (Pers. comm. captain number 3, 2012). However, one of the reasons fishers follow rules could be because of the presence of observers. Monetary interest (self-interest theory) may not allow fishers to obey rules when they have the opportunity to maximize their gains. Possible rules that could be broken are misreporting and not reporting catch at all. They could also disconnect their VMS and pretend that it is malfunctioning, and then they go and set their nets in forbidden territories.

6.2.2 Voluntary Compliance

Conversely, fishers comply voluntarily with rules for various reasons. This research managed to identify four of them. These are (1) Self-Interest (2) Ethic (3) Sense of Belonging (4) Sympathy.

Some fishers obey rules because it would benefit them. Hence, rules are obeyed in this case out of self-interest. For example, an expatriate fishing bosun of one of the NFD purse seiners mentioned that they normally leave the undersize tuna alone whenever they see them so that they can grow to the right size before harvesting them (pers. comm. fisherman number 2, 2012). Others may also comply with rules
such as preserving ‘undersize’ because they would not be able to sell them to their commercial buyers. Also undersize may occupy space in the storage preventing them from catching more of the right size. One of the observers from a DWFNs purse seiner said:

“They follow rules because they receive money from the fish. If they throw plastics the fish will die.” (Pers. comm. observer number 6, 2013)

The above responses clearly indicate that fishers obey rules to serve their interests. One can say that fishers obey rules because of self-interest (long term interest) or even break rules because of self-interest (short term interest). Thus, ‘self-interest’ becomes one of the influencing forces.

Secondly, fishers comply with rules due to their moral behaviour. Some of them obey rules because they believe it is the right thing to do. One of the foreign fishers mentioned:

“I want to follow rules because I believe it is the right thing to do. I just want my children to have a chance in life and if my son wants to become a fisherman in the future I have to ensure that he has fish in the future.” (Pers. comm. fisherman number 1, 2012)

Moreover, fishers obey rules because their fishing master may be very strict. This is what occurred in some of the NFD purse seiners that have foreign nationals (Pers. comm. captain number 2, 2012).

Thirdly, fishers claimed to obey rules because of the sense of belonging. This was what one of the local ex-fishing master said:

“During my time we follow the rules because we are from Solomon Islands. So whatever they told us to do we follow. We do not catch small fish unless we want to eat them.” (Pers. comm. ex-fishing master –pole and line- number 2, 2013).

Such comments from some of the locals could come from their sense of pride in their country and sense of ownership of the resources. But it could also link to self-interest. They not want to harvest juvenile tuna, for instance, because if the stocks are badly depleted, it would affect them, their family and the future generations.
The fourth reason for complying with regulations is that fishers sympathise with the fish. They mentioned that they sometimes felt sorry for the turtles, dolphins or the juvenile tuna and other species. They do not want to see them die unnecessarily and would like to give them a chance to live. Moreover, they mentioned that they do not know what to do with them if they capture them. Hence, the best option is not to kill them (Pers. comm. captain number 2, 2012)

6.3 Question Four - What Rules do Fishers Find Difficult to Follow?

There are number of rules that licensed vessels find difficult to keep compared to the others. The field work revealed the following as difficult rules: (1) Catch Retention (2) Displaying Licence (3) Casting Nets on Whale Sharks (4) Casting Nets Close to Shores (5) Catching Species of Special Interest (turtles, dolphins, sharks) (this rule is difficult for purse seiner gear) (6) Throwing Rubbish Overboard (7) Throwing Rubbish and Discharging Oil (8) Misreporting.

To begin with, catch retention is one of the rules that most purse seiners and long liners find difficult to keep (Pers. comm. observer number 2, 2012; pers. comm. observer number 3, 2012; pers. comm. observer number 5, 2012). This rule prohibits discarding of undersize tuna and other species into the sea. This is one of the PNA policies, which require all the member countries to follow. This is because the smaller size tuna are not accepted for export purposes. Moreover, lots of undersize tuna or other species could take up the space in the storage. This could be very challenging; especially when the price of tuna increases. Most purse seiners and long liners therefore, resort to dumping of undersize and the by-catches to allow room for the targeted species (ibid.).

Secondly, simple requirements such as displaying of licence on the wheel house are often not met. Most of the times licenses are kept in the master’s cabinet folders and on some instances are not present on board (Pers. comm. enforcement officer number 2, 2012). One of the observers who was with one of the patrol vessels mentioned:

“*There was an incident where we boarded a vessel for not displaying its licence and as we were about to escort it, the Fisheries office call us that they have the licence in Honiara. It is a condition that all vessels must display their licence on board at all times.*” (Pers. comm. observer number 1, 2013)
It is not really clear why fishers failed to obey a simple rule such as displaying of license on the wheel-house. This could be caused by negligence (Pers. comm. FFA monitoring officer number 1, 2012). Also sometimes vessels are already on the sea when their licence is approved so they could not get the original copy on board prior to their fishing expedition.

Thirdly, not casting nets on whale sharks is a difficult rule to follow for purse seiners. This is because the fish they want always accompany the whale sharks and most of the time they are tempted to set their nets among the whale sharks (Pers. comm. captain number 2, 2012). Similarly, a fisheries observer in Honiara also mentioned the same thing. He claimed that fishers do not really care about the other prohibited species; if they see the fish they want are there, they would throw down their nets (Pers. comm. observer number 5, 2013).

Fourthly, casting nets 6 miles from shore is a common problem violated by NFD purse seiners. Numerous complaints were raised by fisheries observers on this issue (Pers. comm. observer number 2, 2012).

Another rule that is normally broken is the difficulty of avoiding by-catches such as turtles, dolphins, sharks etc. Purse seiners find it hard to avoid catching turtles, dolphins and sharks because tuna normally swim together with them. And as earlier mentioned, purse seining is an unselective fishing method (Pers. comm. enforcement officer number 2, 2012).

One of the observers mentioned: “Species of special interest such as turtles, sharks, Dolphins often accidentally caught in the nets. It is hard to save them because by then they are dead already.” (Pers. comm. observer number 4, 2013)

Moreover, throwing rubbish overboard and discharging brine (waste water) into the sea is a major problem with fishers. Other FFA member countries are very strict with this, Solomon Islands; however, has not been very strict with this rule. This is an international rule because discharging of such wastes kills the fish, including tuna (Pers. comm. observer number 6, 2103).

Finally, one of the difficult rules is ‘misreporting’. This comes in all sorts of forms. Sometimes fishers record the target species such as skip jack, yellow fin and big eyes but they neglect the by-catch. Other times they misreport the target species as well.
For example, there might be less big eyes, among that catch, fishers would only record them as skipjack if skipjack is the majority of that catch. Moreover, fishers may also under-report their catch mostly 1 to 2 ton less than the actual amount. Another problem relating to this is not doing exit and entry reports and not doing reporting of their catch at all (Pers. comm. FFA monitoring officer number 1, 2012). One of the observers mentioned:

“Filling the log sheet is one of the difficult jobs for Asian fishers particularly the Taiwanese.” (Pers. comm. observer number 2, 2012)

6.4 Question Five- What Rules do Fishers Find Easy to Follow?

This research also looks at the types of rules fishers find easy to comply with. Only few rules were identified during the course of the interview. These are (1) Fishing Away from Restricted Areas (2) FAD fishing (3) Observers to be On-Board and (4) Prohibition to Kill Turtles.

To begin with, different fishing gear found different rules easy to follow. Pole and line found reducing by-catches such as turtles, sharks, dolphins and other species easy to follow. This is because pole and line is a selective fishing method and is easy to cope with the rules (Pers. comm. ex-fisher number 3, 2013). Purse seiners on the other hand find keeping low by-catches difficult to maintain because it is unselective harvesting.

Secondly, DWFNs did not find any problem in fishing away from restricted areas such as the archipelagic waters or closer to shores (Pers. comm. observer number 3, 2012). However, the NFD purse seiners found it hard to comply with the rules. Often they set their nets less than 7 miles near shore (Pers. comm. observer number 3, 2013). This is because most of the tuna are more plentiful in this area than in the open seas. One of the reasons for this is because most of their nutrients are found within that vicinity (ibid.).

Thirdly, FAD fishing during closure is another rule that fishers do not find difficulty in obeying. Normally, fishers do not set their nets on FADs during its closure. Perhaps one of the reasons it was obeyed is because of the presence of observers (Pers. comm. observer number 2, 2012).
Another rule that has high compliance rate is the 100% observers program on all purse seiner vessels. All purse seiners seem to comply with this rule well. Any vessel that does not have an observer will not go out for fishing. Besides, fishing masters start to get too close with observers after initially seeing them as spies (ibid).

Based on the answers, the types of rules that are easy to follow are classified as ‘economically related’ and types of ‘gear’ used. Most of the rules that are easy to follow in this case are those that have economic gain. This answer does not mean that it contradicts the other answers mentioned earlier. However, it only indicates that fishers are more mindful of the increased enforcement and the presence of new technologies such as the VMS. Most of the above rules are obvious rules that could be easily spotted if they are violated. Fishers are also getting smarter as enforcement tightens up. Thus, they do not commit clear cut IUU activities such as those identified. Instead they do other IUU activities that are quite difficult to detect. Most of these illegal activities are in the form of misreporting and others outlined in question 3.

It is therefore appropriate to say that the answers depicted fishers obey these rules non-voluntarily.

Please refer to the lists of the main and follow up-questions covered chapter 4, 5 and 6 and set out in Annex 4.
Chapter 7
Summary of Findings

7.1 Introduction.

This chapter summarises the answers for all the research questions (questions 1 to 5).

7.2 Summaries

7.2.1 Summary of Question 1 (Why do Fishers Break Rules?)

There are four reasons why fishers break fisheries’ rules. The main one is ‘profit maximisation’. Fishing companies always strive to maximise their profits as this is their main business objective. Such goals can lead fishers to violate rules if they could not achieve their economic goals through following the rules.

Similarly, fishermen are willing to break rules if their chance of being detected is low because this would mean increased ‘bonus pay’ as a result of high catch volume. The bonuses increase as the catch increases.

Secondly, fishers break rules for ‘personal gain’. This includes selling of undersize tuna and other species such as king fish, marlin and others to the locals or exchange for other home grown food. Similarly, fishers may also be involved in shark finning for the same purpose. This is slightly different from the ‘first reason’ because fishers indulge in such activities to increase their own personal gain rather than maximising business profits.

Thirdly; fishers break rules to fulfil ‘social obligations’. This may mean supplying undersize tuna to families, relatives, friends and communities. This is normally committed by locally based fishers. Families and friends are important to fishers. Supplying fish is one way of supporting them. Likewise, supplying the fish (undersized) to communities for church related activities, important gatherings or just for consumption is important for the locally based fishers because it can bring them good luck (blessings) in their fishing expeditions.

The fourth the reason is ‘ignorance’ and ‘negligence’. While most fishers are aware of these rules against throwing plastics, and discharging of oil, they still violate them. It appears as if they are too lazy to obey them. And at times they do not see them as
being as important as other fishing rules such as fishing without licence, FAD fishing etc.

7.2.2 Summary of Question 2 (Under What Conditions do Fishers Break Rules?)

There are three main conditions that determine the level of compliance; these are ‘fishers’ motives’, ‘punitive’ and ‘community’ conditions. Motives are the factors that drive fishers to break rules. Based on the findings, the conditions that influence fishers to break rules are (1) Self-Interest (2) Social Obligation and (3) Misunderstanding of Rules. While self-interest is a broad area, the self-interest in this case is predominantly monetary related. The findings reveal there are six attributes that are related to ‘self-interest’. These are (i) Financial Gain (profit maximisation) (ii) Personal Gain (income and material goods) (iii) Nationality (iv) Fishing Gear and (v) Un-Licensed Vessels. The general perception that is identified from this list of factors is that ‘fishers’ motives’ are financially driven.

‘Punitive’, on the other hand; are the mechanisms put in place under the ‘bureaucratic management model’ to deter violation of rules. However, the findings revealed that the ‘punitive’ conditions are too weak and ineffective. That is why ‘non-compliance’ or IUU fishing is still rife and difficult to extinguish. One of the main components of ‘punitive’ for instance is ‘enforcement’. Enforcement is weak because the PCPV that have been mandated to carry out this responsibility are insufficient to patrol the entire EEZ. The Solomon Islands’ sea boundary is too large for two assets to monitor effectively. Furthermore, inadequate financial resources do not allow the assets to do regular patrols. It is very expensive to police the sea boundary. Other limitations also experienced are the lack of fuel depots particularly along the eastern outer islands; leaving that region exposed to the mercy of fishers.

Other areas that have contributed to weak enforcement are the limitation of the VMS and the forgiving attitudes of fisheries officers. While the VMS has strengthened monitoring and surveillance activities, it could not detect specific IUU activities committed by vessels other than position of vessels. Most vessels still engage in IUU fishing on crimes such as misreporting and no reporting. Moreover, the way in which fisheries observers are so forgiving and helpful to violators does not help in this endeavour.
In contrast, the fisheries observers program that has been guilty of ‘corruption’ in the past has greatly improved. This is because the system is designed in such a way that ‘corruption’ can be easily identified from the data. The coordinators interviewed confirmed that the data collected so far has revealed absence of such behaviours. However, the 5% observers’ coverage in the long liners and pole and line is still a concern. This is because fishers can still engage in IUU fishing in those vessels especially with the absence of observers.

The second factor that has contributed to the weak enforcement is ‘penalty’. The penalties imposed by the government appear to be low. Such penalties do not deter fishers from violating rules. This is because they know the gain would outweigh the costs. Additionally, there are penalties that are often further reduced by the government. These are the penalties that are settled out of court.

The third factor that has contributed to the weak enforcement is ‘political influence’. There are instances where the work of enforcement authorities has been undermined by both political and bureaucratic interventions. This concerns situations where violators have been arrested and escorted for further investigations and confiscation when political leaders as well as senior bureaucrats authorise the release of those vessels. This discourages and weakens the work of enforcers. Furthermore, this could be caused by the strong diplomatic ties Solomon Islands has with the DWFNs mother countries. Another reason could be the way in which fisheries’ ministers go to sign fishing access agreements with overseas countries but because of the ‘red carpet’ treatment and hospitality received, the minister tends to sign more than what is stated in the licence conditions.

The community attributes; namely ‘positive norms’ and ‘communication’; have not been utilised to achieve voluntary compliance. In other words, there has never been a standard positive norms practised in the tuna industry. Most of the time fishers seem to behave independently trying to fulfil their own interests. Similarly, there is no such thing as stock update being circulated to fishers from responsible authorities in the form of pamphlets, reports, brochures, awareness etc. Thus, the community model has not been engaged. Moreover, taking strong ‘fishers’ motives’ against weak ‘punitive conditions’ and the non-existence of the community model, results to countering IUU fishing a challenge. The other two factors under this model are
‘community work’ and ‘legitimacy of rules’. The findings in chapter 5 revealed that there is no such thing as DWFNs actively taking part in formulating of rules or being consulted of any changes and vessels sightings. Moreover, despite the fact that most fishers perceive the rules as fair, it does not stop them from breaking them. Others also mentioned that the rules need to be further strengthened.

7.2.3 Summary of Question 3 (Under What Circumstance do Fishers' Comply with Rules?)

Fishers obey rules in two ways. One is involuntarily and the other is voluntarily. The findings revealed that fishers obey rules involuntarily because they fear of getting into trouble. Fishers have families who depend on their work for financial support. Any problem caused relating to illegal fishing might put them into trouble which could disconnect the support currently received by their family members. Moreover, fishers mentioned that the presence of observers makes it very difficult to violate rules. Not only that, but the technology used to dictate IUU by enforcers make it difficult for them to commit such crime secretly.

In contrast, factors that influence fishers to comply with rules voluntarily vary; a couple of reasons were given by fishers. One of the reasons fishers obey rules is their long-term interests. Fishers comply voluntarily to preserve undersize tuna so that they could be left for the future. This is done in the best interest of fishers.

Secondly, there are other fishers who have high moral values. These fishers believe that what is wrong should not be followed and what is right should be followed. Such behaviour is influenced by their personal development.

Thirdly, some local fishers (fishing masters) obey rules because of their strong sense of belonging. These people care more about the rules, perceiving them as belonging to them.

And the other reason some fishers obey rules is because they sympathise with the fish and the marine mammals. They know that the fish also wants to survive like humans; hence any fish that is not required by their company should be saved.
7.2.4 Summary to Question 4 (What Rules do Fishers Find Difficult to Follow?)

Rules that fishers found difficult are classified under three categories. These are ‘financial interests’, ‘negligence’ and ‘gear type’. According to the findings, difficult rules that have financial interests are catch retention, casting nets on whale sharks, casting nets close to shores, and misreporting. Fishers found it difficult complying to these rules because violating them gives them maximum economic benefit.

There are other rules fishers find difficult to follow due to negligence, ignorance, laziness or a perception that those rules are less important. These rules are, failure to display the licence at the wheel house, throwing of rubbish (plastics) and discharging of oil, and misreporting. Misreporting also falls into this category because sometimes fishers just fail to report catch such as the by-catches, due to negligence.

The other reason fishers may find it hard to comply with the rules is because of the type of gear used. Purse seining and long lining frequently breach the rules forbidding catching and killing species of special interest. Often this rule is not broken intentionally. Fishers may try their best to avoid trapping or catching such species but they may find it difficult because of the gear used.

7.2.5 Summary to Question 5 (What Rules do Fishers find Easy to Follow?)

Rules fishers find easy to comply with are (1) Fishing away from Restricted Areas (2) FAD Fishing (3) Observers to be On-Board and (4) Not to kill Turtles.

The first three rules can maximise fishers’ financial gain if violated while the fourth one does not bring any financial benefit to the fishers’ employers. The fact that fishers found them easy to obey does not mean that fishers no longer have any economic interest. It only indicates that fishers could not violate the explicit rules because of the presence of observers on board. Hence, most fishers do not commit clear cut IUU violations. However, fishers are also getting smarter as enforcement tightens up. Instead they do other IUU activities that are quite difficult to detect. Most of these illegal activities are in the form or misreporting and others outlined in question 3.
Chapter 8
Conclusions and Recommended Policies

8.1 Introduction.

This chapter comprises four sections. 8.2 compares and contrasts the answers of questions two and three. 8.3 compares and contrasts answers to questions four and five. 8.4 is the conclusion of the two sections. 8.5 relates the findings to previous literature. 8.6 points out new and interesting findings. 8.7 tries to find if knowledge discovered by others has been contradicted by these findings. And section 8.8 comprises recommended policies aimed to help further deter IUU fishing activities. However, suggested policies are only confined to those that the researcher thinks are realistic and practical to implement and which relate to the research findings.

8.2 Comparing and Contrasting Answers to Questions 2 and 3

When comparing answers to question 1 ("under what conditions do fishers break rules?") and 2 ("under what conditions do fishers comply with rules?"), financial gain is the common feature. Looking at question 1 which reads "under what conditions do fishers break rules?" the conditions identified are interwoven between 'financial gain', 'community attributes' and 'enforcement'. However, from the three elements, 'financial gain' is the major condition that answers the question because it has eight different factors affiliated to it as the root cause. On the other hand the two community attributes were dysfunctional in the community sense. However, they were abused by fishers in pursuit of monetary gain. Enforcement mechanisms were not sufficient enough to stop the fishers who pursue economic gain.

Similarly, question 2 reads "under what conditions do fishers comply with rules?" One of the answers was voluntary compliance. Fishers who have some background knowledge about tuna and a few local fishers, who possessed a 'sense of ownership' to the resource, voluntarily obey rules because they consider both the present and future long-term benefits. However, these people are only a minority group. The majority however are those that focus more on the immediate benefit of tuna, hence follow rules only by force via enforcement. This group pursues monetary gain as their ultimate goal. Hence, monetary gain becomes the common factor for questions 1 and 2.
8.3 Comparing and contrasting answers to questions 4 and 5

Additionally, financial gain also becomes the main condition when comparing question 3 and 4. Question 3 reads ‘what rules do fishers find difficult to obey?’ and Question 4 ‘what rules do fishers find easy to obey?’ Based on the findings for question three, fishers found it difficult to obey rules that would restrict them from achieving illegal potential economic benefits. The obvious ones that were identified are fishing in territorial waters, misreporting and not reporting at all. Likewise, economic gain becomes the influencing factor for question 4. The question reads “what rules do fishers find easy to obey?” Pole and line fishers found rules that do not bring economic benefit easy to follow. One that was identified in this case was the rule that prohibits killing of turtles and dolphins. Pole and line fishers found it easy to follow. On the other hand purse seiners found rules that give them pre-conditions for financial benefits easy to follow. The rule that has been identified in this case is the 100% coverage for observer program.

8.4 Conclusion of Above Two Sections

When looking at the reasons ‘why fishers break fisheries’ rules and relating them to the four questions’, it is clear that ‘financial gain’ was the hub of the issue because it has a direct link to the four questions. Financial gain influences fishers’ attitudes to and treatment of the rules. In analysing the answers to the four questions, it becomes obvious that ‘financial gain’ is a common factor for all of them. This finding is in line with the answer to question 1 of the thesis which investigates why fishers break rules. Among other reasons such as ignorance and negligence, misunderstanding and social obligations, the main reasons for non-compliance are to maximise profits and for fishermen to increase their income; which would obviously support their families.

8.5 Relating the Findings to Previous Literature

While reviewing literature relating to this issue based from Ostrom in 1990 to Sasako in 2012, it is clear that the majority of the studies were undertaken with inshore fishers (coastal), some of whom comprise artisanal fishers and river fishing. In contrast, limited studies have been carried out on deep sea – offshore-fisheries, particularly tuna; which is a highly migratory species and a major global business.

However, it appears that out of the three to four findings from this work, about three quarters resembles the work that other scholars have already discovered for coastal
fisheries; only the remaining quarter was new. For instance, this research found that the main reason for fishers to violate fisheries’ rules is for ‘economic gain’. However, this is not a completely new finding; four other scholars have already discovered some aspects of it. Ostrom (1990, p.142), Kuperan et al. (1995), Hatcher (2000), and Jenny, Fuentes and Mosler (2006) each found that coastal fishers always weigh perceived illegal gains against the penalties for breaking rules. If the gains are more than the costs, they would violate the rules and vice versa if the gains are less.

Conversely, the research in the Solomon Islands discovered that deep sea fishers tried to achieve ‘financial gain’ illegally through slightly different means. Unlike inshore and artisanal fishers in the researched context, most of the offshore (deep sea) fishers in the Solomon Islands have little knowledge about the penalties and the world tuna prices (raw material). This makes it difficult for them to make any cost benefit analysis. Instead they committed IUU fishing based on evading enforcement; believing that they would maximize their profits in this way.

Secondly, fishers appear to have broken the rules out of ignorance. Most of the time they tend to break certain rules that they perceived as less important; such rules include polluting the sea, and throwing plastics and other rubbish. They do not know such actions would deplete the tuna stocks. Correspondingly, Abusin and Hassan (2009, p.21) mentioned that a socio-economic variable such as education level contributes to compliance. In other words they found that compliance to regulations is high when fishers’ education level are high (secondary education and above).This paper found something slightly different in that fishers who have background knowledge on marine and fisheries studies are more cooperative than those who only possess navigational and secondary qualifications. This is because ‘basic fisheries knowledge’ helps fishers to understand the tuna’s nature and how vulnerable they could easily become. Moreover, they know that tuna needs a clean environment to feed and spawn. Such understanding encourages them to keep the environment clean. Furthermore, their knowledge helps them to treat tuna and other fisheries’ mammals with respect. This is because the marine ecosystem depends on each other for survival. Killing one part of the food chain would affect the tuna. In this way harvesting would be conducted in a more sustainable manner leaving less chance for any destructive and illegal activities and respect for other non-targeted species.
Thirdly, fishers particularly the locally based ones break rules to meet social obligations. Literature reviewed has not identified this issue in coastal fishing. However, this is evident in Solomon Islands. This is because Solomon Islanders just like any PICs are a communal society; they regard their immediate families, relatives and friends as important. Helping and meeting families’ and friends’ needs is one of the central components of this relationship because it maintains strong family ties. In this context, families and friends gain the fishers’ loyalty more than do fisheries rules. Additionally, one of the reasons why they catch undersize tuna for families and friends is because they may think it is not a serious breach. Tuna are a common pool and the locals assume they have the right to harvest tuna for consumption without any restrictions. To reiterate, this paragraph emphasizes the importance of family loyalty and connection above fisheries rules. Fishers therefore regard supplying of a few undersize tuna for community and family consumption as acceptable.

Moreover, the paper further investigates the conditions that could enable fishers to break rules. The findings point to the fact that penalties and enforcement are the pivotal factors. Relating these findings to the literature in chapter 2, Kuperan et al. (1995), in their paper argued that fishers break rules when the penalties are less severe and if they know there is less chance of getting caught. The research in the Solomon Islands confirmed these theories; enforcement officers particularly those from the maritime unit complained that fines are often reduced the fisheries’ ministry, the fisheries minister who has the discretion, and the cabinet.

Another factor mentioned by Kuperan et al. 1995 as a reason why fishers break rules is the chance of being caught. Fishers break rules if they perceive there is less chance of being caught. This is relevant to the Solomon Islands where the EEZ is very large. The efficiency of the enforcement authorities to arrest IUU fishers could be hampered by the large EEZ and other related factors such as lack of manpower and insufficient assets (patrol vessels) to carry out physical arrests and monitoring.

Similarly, Honneland (2000, p.127), Xepapadea (2003), Gezelius (2008) and Abusin and Hassan (2009) found that ‘compliance tends to be high when enforcement is high but otherwise when enforcement is low’. The main reason why non-compliance may be thriving in the Solomon Islands is because there are still gaps within the MSC mechanisms. The major reasons are insufficient resources and capacity to monitor.
fishers resulting in weak enforcement; weak institutions and poor management procedures (Alayon 2011; Sasako 2012). There is no disparity between the findings mentioned in previous literature and the research done in Solomon Islands on this area. The only thing is that the EEZ for Solomon Islands like other PICs is naturally very large. This adds a burden to effectively monitor the 200 miles using physical assets because of the costs involved.

The fifth area that was considered was the conditions that determine fishers to comply with rules. The findings portrayed that a small number of fishers comply with rules voluntarily. This means they obey rules willingly. There appear to be three main reasons for this: (1) Knowledge Based (2) Moral Behaviour and (3) Sense of Belonging. Most fishers mentioned that they would not set their nets if they see high concentrations of juvenile tuna among the school. They mentioned that they would go far away to search for bigger tuna. Ostrom, Walker and Gardner (1994, p.211) also confirm mentioning that fishers would obey rules when they know that the fish are small to allow for regenerations but would continue to exploit fish when they have matured. In the case of Solomon Islands, fishers would not set their nets among juvenile and undersize tuna (below 1.5kg) for two reasons. First, there are fishers who wish to see that smaller fish mature before they could be harvested. This also gives opportunities for these fish to spawn and multiply. In doing so, they prevent the fish from depleting. These are the fishers who act ethically and those who have some background knowledge on the tuna’s biological nature. They fish but at the same time think about future benefits. Such thinking guides their behaviour and actions during fishing operations. But there are other fishers that obey this rule only because the fish exporting companies or canneries do not need the smaller fish. Fishers in this category are not genuine. Such fishers could cast their nets if they see few juvenile tuna among the bigger tuna; or they could also set their nets if they see whale sharks among bigger tuna. These types of fishers are not genuine and would not be part of this category. They would be regarded as fishers who pursue their own interests.

The second reason for voluntary compliance is ‘moral behaviour’. Three other scholars have already discovered this. Kuperan et al. (1995), for instance, found that a high proportion of the community in Philippines, Indonesia and Malaysia have very high commitment to compliance even though sanctions were relatively low. They
have high moral behaviour. Jenny, Fuentes and Mosler (2006) and Gezelius (2008) also found the same theory more than ten years later in different places. These two researchers discovered that the community they study comes from societies that emphasize strong ethical behaviour, and those that value strong obedience and loyalty to superiors as important regardless of the content of the rules. Referring to the research in the Solomon Islands, some of the foreign fishers serving in the local boats, particularly from South Africa, Mexico, France, Philippines and those from the USA boats have portrayed most of the features mentioned by the three authors. It clearly shows the strong influence by their societies on their upbringing.

The third reason for voluntary compliance is the concept of ‘a sense of ownership of the resource’. Honneland (2000, p.107), argued that fishers complied with regulations because they have genuine respect for laws and authorities. Similarly, eleven years later in 2011 Alayon found the same thing in Colombia. He observed that local fishers fish more responsibly and obey the laws more willingly than foreigners. In contrast, the research in the Solomon Islands agrees with what they said but also disagrees with them in some ways. Some of the local fishers mentioned that they obey everything fisheries observers told them because they are SIG employees. They further, mentioned that they willingly obey the government rules because it is their government. The local fishing masters embrace Solomon Islands’ fisheries rules because they felt that only them and their children would suffer if they overfished.

However, some of the Solomon Islanders may not perceive things the same way. This is because they may not see ‘sense of belonging’ as important to them nor the future generations. All they want is money. Secondly, their limited knowledge on the nature of tuna makes them think that tuna will still be plentiful in the future. Empirically, Solomon Islanders are perceived to be low in moral and ethical behaviour compared to USA, Mexico, and South Africa etc. According to the 2012 corruption index, Solomon Islands is rated 25 compared to USA 73, Mexico 34 or Japan 74 (Transparency International 2012). According to this rating, the lower the score the more corrupt a country becomes. Solomon Islands scored more poorly than the other countries mentioned. This is why some of the local fishers do not care about
compliance. Likewise, the ‘sense of belonging’ does not fully represent Solomon Islands’ case but may be more effective at the community level.

The two other interesting findings from this paper are the answers to the two last questions of the research; i.e. (3) What Rules do Fishers Find Difficult to Obey? And (4) What Rules do Fishers Find Easy to Obey? Economic gain stands out very clearly in both questions. What was interesting was that previous literature did not come out with this finding particularly on the connection of rules with economic gains. The answers clearly portray that fishers find rules that have some economic benefits difficult to follow; and rules that do not have economic benefits easy to follow. Furthermore, fishers find that rules that give them the pre-requisites to gain economic benefit are easy to follow. This shows and confirms that tuna fishing in the Solomon Islands is heavily dictated by ‘economic gain’. There is no theory mentioned in the literature reviewed in chapter 2 on this. However, the findings indicate that the type of rules and fishers’ willingness to comply depends on the gain.

Table 8.1 Summarizes Findings to Previous Literatures

<table>
<thead>
<tr>
<th>Factors affecting compliance</th>
<th>Research findings in SI</th>
<th>Contradictory findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Biological Reasons (Ostrom, Gardner and Walker 1994; Honneland 2000; Gezelius 2008)</td>
<td>- Confirmed&lt;br&gt;Practised by a few fishers (p.129)</td>
<td></td>
</tr>
<tr>
<td>(2) Economic Gain/Self-interest (Ostrom, Gardner and Walker 1994; Kuperan et al. 1995; Hatcher et al. 2000; Jenny, Fuentes and Mosler 2006; Alayo 2011)</td>
<td>- Confirmed&lt;br&gt;One of the main reasons for breaking rules. They break rules to maximize their organizations’ profits (p.78)</td>
<td></td>
</tr>
<tr>
<td>(3) Moral Behaviour (Kuperan et al. 1995; Elster 1996)</td>
<td>- Confirmed&lt;br&gt;Practised by a few fishers (p.115-116)</td>
<td></td>
</tr>
<tr>
<td>(4) Corruption (Ostrom, Gardner and Walker 1994; Elliot nd; Honneland)</td>
<td>- Confirmed&lt;br&gt;One of the factors affecting compliance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2000; Sundstrom 2012)</strong></td>
<td>(p.93).</td>
<td></td>
</tr>
<tr>
<td><strong>7) Social-Ethical Factor</strong> (Kuperan et al. 1995; Gezelius 2008)</td>
<td>- Confirmed</td>
<td></td>
</tr>
<tr>
<td><strong>8) Enforcement (Ostrom, Walker and Gardner 1994; Kuperan et al. 1995; Honneland 2000; Xepapadea 2003; Jenny, Fuentes and Mosler 2006; Gezelius 2008; Eggert and Lokina 2008; Abusin and Hassan 2009; Alayon 2011)</strong></td>
<td>- Confirmed</td>
<td>Enforcement determined the level of compliance in SI. Enforcement appears to be weak (p.83)</td>
</tr>
<tr>
<td><strong>9) Penalty (Ostrom, Walker and Gardner 1994; Kuperan et al. 1995; Hatcher et al. 2000; Jenny, Fuentes and Mosler 2006; Eggert and Lokina 2008)</strong></td>
<td>- Confirmed</td>
<td>Rules are broken because the penalties are too low compared to other PIC (p.95-98). Unaware of penalties associated with breaking rules (p.99)</td>
</tr>
<tr>
<td><strong>10) Community Work</strong> (Hatcher et al. 2000; Gezelius 2008; Hanich, Teo and Tsamenyi 2009; Abusin and Hassan 2009; Havice and Campling)</td>
<td>-Not confirmed</td>
<td>Community model has not been practiced as a deterrent factor (p.106).</td>
</tr>
<tr>
<td>2010</td>
<td>(11) Lack of knowledge and understanding and of Rules (Alayon 2011; Ostrom, Walker and Gardner 1994)</td>
<td>-Contradictory</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>(12) Socio-Economic Reasons (Abusin and Hassan 2009; Alayon 2011)</td>
<td>- Confirmed</td>
</tr>
<tr>
<td></td>
<td>(13) Nationality (Gezelius 2008; Havice and Campling 2010)</td>
<td>- Confirmed</td>
</tr>
<tr>
<td></td>
<td>(14) Sense of Belonging (Alayon 2011; Honneland 2000)</td>
<td>- Contradictory</td>
</tr>
<tr>
<td></td>
<td>(15) Communication (Ostrom, Walker and Gardner 1994; Xepapadea 2003)</td>
<td>- Unconfirmed (non-practised deterrent factor)</td>
</tr>
</tbody>
</table>

8.6 What Interesting Findings have been Discovered?
This section briefly highlights some interesting findings that have not been mentioned in existing studies. Other findings such as ‘economic gain’ have already
been mentioned in existing research but have not been strongly emphasized and have been specifically confined to ‘financial gain’.

8.6.1 Financial Gain

The large-scale tuna industry in the Solomon Islands and FFA member countries is predominantly commercially oriented. Profit maximization is of paramount importance. Fishers do anything they can to survive and further prosper. This is why most of the rules are violated, hence becoming one of the main contributing factors to IUU fishing activities in the Solomon Islands. Existing studies have not fully grounded this issue as the main problem as it was fairly distributed with other factors mentioned in the framework in section 2.7. This finding; however, identifies profit maximization as the main reason for IUU fishing activities.

8.6.2 Social Obligations

This is a finding that existing studies have not mentioned but it does occur in the Solomon Islands. Social obligation related breaches are believed to be committed by the locally based pole and lines, and purse seiners. For instance, pole and line fishers may choose to catch undersize tuna to take home to their families and friends. It is the general expectation of families, relatives and friends that fishers should return home with some fish. Fishers know this and often catch undersize tuna to fulfil this obligation; and in doing so they violate fisheries’ rules (Pers. comm. ex-fisher number 1, 2012).

Purse seiners, particularly the NFD fleets, also break rules relating to social obligations. They sometimes catch and deliver undersize tuna to villages or communities where there are church festivals and feasts. Most local fishers believe if they give fish to communities for church related activities, they would be blessed and as a result will achieve a good catch. And as earlier mentioned a good catch means high bonuses (Pers. comm. ex-fisher number 2, 2012).

However, it must also be noted that some purse seiners may not intend to catch the undersize tuna, but it is difficult because both large and undersize tuna normally swim together. And to make it even harder purse seining is an unselective fishing method where it scoops both the large and undersize tuna in one operation. Knowing
that the undersize would be rejected, fishing masters tend to deliver them to the surrounding villages. This could also be seen as social responsibility.

8.6.3 Diplomatic Relationship

The SIG (regulators) appears to find it difficult to apply the full force of the law when a flagged vessel from a development partner violates its licence conditions. Most of the vessels that violate fisheries rules are from Taiwan. However, Taiwan is one of the development partners that actively help SIG with national projects and cash hand-outs. As a result, decisions; on cases with ministerial or cabinet discretionary, are often compromised, resulting in low penalties or no penalty imposed.

8.6.4 Bureaucratic Model

The bureaucratic or public model used to manage tuna resources does not appear to be effective. The enforcement mechanism is a drawback. This is because it appears weak and does not have the capacity to be effective in achieving compliance. Secondly, it appears as if the regulators and enforcers are trying to fight against fishers whose interest is the fish and monetary gain. Hence, whatever compliance achieves would be non-voluntary; which may mean if there is a gap in the enforcement, the violation rate may escalate. There is lack of participation which could have helped strengthen compliance.

Thirdly, the new public management seems to be giving way for poor governance and corrupt practices. This is because the traditional rules, procedures and systems that had to be strictly followed in the past have been relaxed. This is why government leaders can now make decisions based on their discretion (Hughes 2003).

8.6.5 Fishing Gear

Existing knowledge does not mention fishing gear as a factor that affects compliance. However, this study has discovered gear used as one of the main contributing factors to non-compliance. As has been pointed out in the main findings and subsequent discussions, purse seiner fishing is a very destructive method and is makes it very easy not to comply with the rules.
Rules that prohibit capturing of undersize tuna and by-catches such as sharks, turtles, dolphins and so on are often violated. It would be difficult to follow fisheries rules closely with this gear.

8.6.6 Language Barriers
The language barrier is another factor that emerges out of this research. Most of the fishermen are from non-English speaking countries such as Taiwan, Korea, Japan and EU member countries. Hence, the observers and enforcers find it very hard to communicate when boarding and verifying records. It was also feared that fishers might not understand some of the rules and therefore violate the rules. This is because all the licence conditions are written in English.

8.7 Has Existing Knowledge Contradicted By These Findings?
8.7.1 Local Fishers Tend to have Higher Level of Compliance than Foreigners

not True

It is clear from the various responses that the hypothesis suggesting: “that local fishers tend to be more diligent towards compliance to rules” appears not absolutely true. As can be seen, a number of local fishers have been violating rules. Breaking rules is predominantly influenced by financial gain. But there are other secondary factors that emerged as well, such as social obligations, personal gain, carelessness and ignorance. Moreover, the personalities of the fishing masters also play an important part with compliance.

Secondly, the research proceeded to verify if it is true that all foreign flagged vessels do not care about the rules. The findings; however, do not fully confirm this assumption. All overseas flagged vessels did not behave in a similar manner. It was revealed that some fishers from DWFNs are more highly cooperative than local fishers. But there were also others that do not care about the rules.

Most of the foreign boats from Japan and the USA appear to have a good social standing as far as compliance to fisheries regulations is concerned (Pers. comm. enforcement number one, 2012).
8.7.2 Understanding Rules Does Not Mean Fishers would Obey them - not Completely True.

One of the hypotheses in chapter 2 section 11 stated that fishers’ rate of compliance could be higher if they understood the rules. However, it was discovered that this perception is not completely true. Most fishers (large-scale) in the Solomon Islands understand the rules but they still violate them. The answer to this issue is quite complex as there is no single reason for fishers to violate rules. However, monetary gain is one of the main motives behind their actions. This is because this tuna industry is heavily commercialized; profit maximization is the main objective behind such operations. Other reasons such as fishers’ laziness and ignorance of rules, social obligations and responsibilities also contribute in disregarding the above hypothesis.

8.7.3 Fairness – Most Fishers Said that the Rules are Fair but they Do not Stop them from Violating them

Similarly, chapter 2 section 5 argued that fishers follow rules if they perceive the rules to be fair and in line with their context. Whilst, the researcher acknowledges this factor’s contribution in voluntarily achieving compliance, fishers still violate rules. This is where Xepapadea’s (2003) ‘cooperative and non-cooperative rules’ come in to play. Moreover, it is where factors mentioned in (ii) surfaced; such as monetary gains, social obligations, laziness etc.

This indicates that all the compliance related factors in the conceptual framework section 2.7 helps improve the level of compliance but they will not bring complete compliance. This makes Xepapadea (2003) and Ostrom, Walker and Gardner’s (1994, p.139), arguments stronger.

8.7.4 Tragedy of the Commons.

Earlier in Chapter 2 page 22 Ostrom, Walker and Gardner (1994, p.250) argued under the theory (Tragedy of the Commons) that fishers would ultimately be worse off if they pursue their ‘self-interest’. Hence, regulations were set up to control this. However, the findings revealed that despite the presence of ‘regulations’ (a) Fishers still pursue ‘Self-Interest’ which results in the breaking of rules; and (b) Regulations are not Enforced. So it was found that there is a slow moving Tragedy of the Commons in the Solomon Islands which can only be remedied if: (a) Fishers did not
act in their self-interest (may be for moral or customary reasons) (b) Enforcement was stronger so they could not act in their self-interest.

Also it seems that the wider fishing communities and their management are not aware of the Tragedy of the Commons and the impact it can bring to the tuna fishing industry. More communication and greater awareness is needed to change the mindsets of fishers, their management and all stakeholders including regulators. This will ease the rate at which rules are violated and give sufficient time for the tuna to regenerate themselves.

8.8 Policies Targeting Voluntary Compliance (Cooperation)

8.8.1 Policies Designed to Address Lack of Knowledge of Fisheries Regulations.

i. All enforcers (fisheries ministry staff, observers and patrol vessels’ officers) must be trained and be regularly updated on any amendment to the regulations

ii. All enforcers should be trained in the areas of ethical behaviour. This is to help deal with informal pressure from ‘self-focused’ fishers.

iii. Fishers (masters and captains) should be well versed in Solomon Islands fisheries regulations and the licence conditions as a pre-requisite of being granted a licence. Those who satisfy this requirement should be certified. Compliance officers and enforcers would need to check this condition during their regular boarding.

iv. The fishing masters and captains of all fishing vessels wishing to fish in the Solomon Islands must not only possess navigational certificates but also fisheries’ qualifications as a pre-requisite to fish in the Solomon Islands. FFA member countries should also consider this as part of the regional policies. This entails their holding a marine and fisheries studies qualification. This would help achieve compliance voluntarily rather than relying only on involuntary compliance.

v. Awareness should be conducted for all fishers when they call in to ports for unloading and transhipment. This will help other crew who are not educated to know the rules. This attempt is targeting voluntary compliance.
8.8.2 Policies Designed to Address Lack of Understanding of Fisheries Regulations

i. Enforcers need to understand all the rules and know how to implement them.

ii. Rules should be written in clear simple English.

iii. Rules should also be written in DWFNs’ languages (Korean, Taiwan and Japan etc.). And DWFNs should pay for the costs as part of their operation costs.

iv. All DWFNs non-English speakers should have an interpreter on board who has sound English; both verbal and written. This should be an important requirement prior to granting of a licence.

v. Rules must be fully explained to all fishers by fisheries compliance officers prior to fishing operations.

vi. Observers should continue to remind fishers on the rules as an on-going process.

8.8.3 Policies Targeting Compliance through Biological Reasons

i. There should not be any fishing activities during spawning sessions from November to March every year.

ii. The SPC, PNA and the SIG should update fishing companies and fishers out in the sea about the tuna stocks (skip jack, big eye, yellow fin and albacore).

8.9 Policies Targeting Non-Voluntary Compliance (Punitive)

8.9.1 Penalties

i. All penalties for violating regulations should be increased and be applied in US dollars.

ii. Penalties charged to violators must be at maximum and must not be compromised.

iii. Development aid by development partners that owned DWFNs should not influence or compromise penalties.
iv. All arrests should go through the judicial system, and no cases should be settled out of court. But in circumstances where infringements are to be dealt with through the administrative procedures, politicians and senior bureaucrats must be given limited discretion (refer to v).

v. No discretion should be given to government ministers or officials on important issues that are required to go through the judicial system.

vi. If undersized tuna caught reach a certain weight (say 50kg) fishers must pay a certain amount in US dollars.

vii. Other violations such as illegal fishing (fishing without license), fishing in forbidden territories, and failure to report catch (failure to fill log sheets), and continuous violation of rules should be blacklisted (blacklisted means that the vessels will not be able to fish in any other international waters).

viii. Any vessel that is involved in corruption shall be black listed if proven guilty.

ix. All violators should be treated the same, under the same conditions, rules and penalties.

x. All fishing masters and captains must know all the penalties for various IUU activities; they should be tested by the fisheries compliance and licensing officials.

xi. Throwing of rubbish and discharging oil and waste water overboard should attract heavy fines.

xii. Stiff penalties and enforcement should be applied to bad behaviours such as dumping of oil, rubbish and waste in the sea.

xiii. Any fishing company that violates the rule twice should be expelled.

xiv. Any fishing vessel that fishes illegally should be black listed.

8.9.2 Enforcement

i. Patrol vessels should have sufficient manpower all the times.
ii. The patrol vessels should have a strong presence out in the 200 miles EEZ at all times.

iii. Forty percent (40%) of total charges to any penalties for IUU activities should be given to enforcers as incentives and to maintain operations.

iv. Government to construct a fuel depot at Lata to enable patrol vessels to refill. This would enable physical surveillance and monitoring at the eastern and south eastern end of Solomon Islands.

8.9.3 Fisheries’ Officers

i. Fisheries officers should be diligent in carrying out their responsibilities. A reward system (incentives) should be introduced to promote loyal and faithful work.

ii. Any officer who is found guilty of informal activities (accepting gifts and bribes) shall be dismissed immediately if proven guilty. Also a police case could be taken up if the offence is serious.

iii. All licence process should be done in a transparent manner and by a committee. Fisheries officers that granted fishing licences in a non-transparent way would be dismissed.

8.9.4 Fisheries’ Observers

i. Observers who are involved in informal activities shall be dismissed immediately if found guilty.

ii. Observers who help in achieving ROP mission and objectives shall be rewarded.

iii. The observers program should provide 100% coverage to all fishing gear.

8.9.5 Fishing Gear

i. Purse seiner fishing methods (gear) should be banned.

ii. Only pole and line fishing method should be encouraged in the Solomon Islands’ waters.

iii. FAD fishing should be banned; only free schools should be allowed.
iv. There should be a policy on the recommended net mesh if use of purse seiners is still encouraged.

8.9.6 Licensing

i. The number of licences granted should be based on SPC’s scientific reports rather than on other reasons such as diplomatic ties, development partners or government discretion and so on.

ii. Licences should be granted to fishers from countries that showed a clean record or who are not high risks, for example Japanese EU and USA boats.

iii. Vessels should have the original hard copy of their licence at all times to allow for easy spot checks by physical enforcers.

iv. No license should be granted to family owned fishing vessels. All fishing vessels should be affiliated to fisheries’ association in their country if it exists.

8.9.7 Local Purse Seiners

i. The privileges allowed to locally based purse seiners (NFD) to fish in the archipelagic waters and 7 miles off the coastline must now be banned.

8.9.8 Policies Strengthening Community Approach

i. All FFA and PNA member countries should have standard penalties and fisheries management regulations.

ii. Any vessels found guilty of fishing illegally and failing to report catch should also be banned from other FFA member countries.

iii. All FFA member countries should share VMS information data. This would avoid fishers licensed in one member country sneaking secretly into an unlicensed territory.

iv. Combined FFA members’ surveillance operations such as the ‘Kurukuru’ should be conducted twice a year.

v. The government should encourage partnership with the community (fishers) to manage tuna resources.
vi. Fishers should be given the responsibilities along with observers to look around for any illegal fishers within the 200 miles EEZ, fishing in territorial waters and forbidden areas, transhipment in high seas, throwing of rubbish and discharging of oil.

vii. Incentives should be granted to fishers who comply with rules and help report other violators. This could be done in either increased catch quotas or concessional charges when the licence is renewed or both.
Bibliography


Center for Marine Biodiversity and Conservation, nd ‘Small scale artisanal fisheries research network,’ viewed 31 May 2013, <http://cmbc.used.edu/Research/artisanal/>


Darby, A. 2009. ‘Fish fight crucial to survive of islanders: some Pacific nations need a future beyond climate change and protecting their tuna may be the answer’, The Sydney Morning Herald, viewed 1 August, p.2.

East West Center, 2012, ‘Solomons tuna licensing to boost economy: local catch processing to increase revenue, control’, viewed 6 June 2012


FAO, 2009, Agreement on port state measures to prevent, deter and eliminate illegal, unreported and unregulated fishing, viewed 23 December


FAO, 2013, What are long lines?, viewed 12 June 2013


Gezelius, SS 2008, Paths from law enforcement to compliance: cases from the fisheries, viewed 18 November 2012.

Gibbs, E, nd, Tuna, viewed 7 June 2013.


Greenfishbluefish, 2013, Catching those tuna: the challenge of purse seine versus longline tuna fishing, viewed 17 February 2014,<greenfishbluefish.wordpress.com/2013/03/03/the-challenges-purse-seine-versus-longline-tuna-fishing/>


Kuperan, VK, Abdullah, MN, & Ticao, CSMI 1995, *Enforcement and compliance with fisheries regulations in Malaysia, Indonesia and the Philippines*, viewed 12 November 2012, <dlc.dlib.indiana.edu/dlc/bitstream/handle/.../18%20Kuperan.pdf?...1>


Ostrom, E, Gardner, R, & Walker, J 1994, Rules, games, and common-pool resources, the University of Michigan Press, United States of America.


Scott, B 2005, ‘US Treaty: treaty on fisheries between the government of certain Pacific island states and the government of the United States of America (U.S. Multilateral Treaty on Fisheries), viewed 7 June 2013,
<http://www.ffaf.mcs/node/280>


South Pacific Commission, n.d., ‘Oceanic Fisheries Programme; Tuna fisheries of the Western and Central Pacific Ocean’, viewed 21 June 2013, 


Solomon Times, 2012, ‘Regional Action to fight illegal Tuna Fishing in the Pacific’, 
Solomon Times Online, viewed 7 June 2013, 


Western and Central Pacific Fisheries Commission, 2009, *Commission VMS Standard Operating Procedures (SOPs)*, viewed 18 August 2012,
Wise, M 2011, ‘3-way tussle’, *The Fiji Times Online*, viewed 27 August 2012,

WWF Fact Sheet, 2011, ‘*Offshore Fisheries; ensuring the sustainability of Pacific Tuna*’, viewed 8 June 2013

World Bank, 2000, *Chapter 3 managing tuna resource*, viewed 25 May 2013,
<http://search.yahoo.com/search;_ylt=A0oGdXw3GaBRny8AYnNXNyoA?p=Chapter%203%20Managing%20Tuna%20Fisheries>
<chr-devicevmandtype=EGMBandtype_param=EGMB>

World Bank, 2012, *Pacific Islands; the ocean is our mother*, viewed 18 May 2013,

<ideas.repec.org/p/crt/wpaper/0312.html>

Please refer to Annex 1 for other sources obtained from other materials.
APPENDICES

ANNEX 1. MATERIALS OBTAINED FROM OTHER SOURCES.

Business Dictionary 2013

Oxford mini Dictionary thesaurus 2007

Your Dictionary 2013

2012 License conditions for local companies chartering foreign purse seine vessels to operate in Solomon Islands waters (Ministry of Fisheries SIG)

Foreign pole and line license conditions (Ministry of Fisheries SIG)

Foreign purse seine vessels’ license conditions (Ministry of Fisheries SIG)

Hanich, Q. 2013, Workshop seminar on the South Pacific: from ‘arc of instability’ to ‘arc of opportunity’? February 8, 2013: State, Society and Governance in Melanesia. Australian National University.

Locally-based foreign long line vessels’ license conditions (Ministry of Fisheries SIG)

Locally-based foreign purse seine vessels’ license conditions (obtained from the Ministry of Fisheries SIG)

Local pole-and-line vessels (Ministry of Fisheries SIG)

Nauru’s Fisheries Act 1997 [online] Available at:<


Solomon Islands Fisheries Act 1998 (SIG, Published by SI Printers Limited)

Solomon Islands Government Performance Audit Report 2013, Managing Sustainable Fisheries (Tuna fishery) in Solomon Islands Fisheries Exclusive Economic Zone (Office of the Auditor General SIG)
ANNEX 2: MAP SHOWING BOUNDARIES OF WESTERN CENTRAL PACIFIC OCEAN (WCPO)

Figure 8 Map showing WCPO boundary. It is the region within the red line.

Source: SPC: Ocean Fisheries’ Programme
ANNEX 3: LIST OF INTERVIEWEES IDENTITY AND NAMES.

In total I interviewed 35 interviewees. However, as part of the agreement prior to the interview, the informants were promised anonymity. To avoid copying the names accidentally and later circulating them, I have purposely left this space blank. The list of names however, is available to examiners, on request.
ANNEX 4. LIST OF MAIN AND FOLLOW-UP QUESTIONS

Below are samples of questions used to interview interviewees (personal communications and focus group). It portrayed questions asked to Regional Compliance Advisers, Regional Monitoring Officers, Enforcement Officers, Ex-fishers (Pole and line, Long line and Purse seiners), Ex-fishing Masters, Ex-Captains, current Crew, Fishing Masters and Captains, Fisheries’ Observers, Fishing Agents and Fishing Managers.

Also a sample of the question asked to ‘focus group’ is also depicted in this section. Nearly the same questions were asked to different groups of informants. This is to get their perspectives on the same issue.

(1) Questions for Enforcement Officers (Surveillance and Maritime Unit)

Main Question: Can you please introduce yourself and your primary tasks? (this allows the interviewee to talk about his job and responsibilities).

Follow-up Questions:

- Is there any trend you noticed on the number of fishers violating rules (is it increasing or decreasing)?
- Do you think your job in enforcement is very effective?
- What do you do to deter unlicensed vessels?
- Do you think the PCPV is sufficient to monitor the national water? Please explain your answer.
- What do you think as some of the reasons why fishing vessels break rules?
- Is there other alternative you think the government could do to achieve compliance rather relying on enforcement alone?
- Do the licensed vessels take part in reporting unlicensed vessels?
- Is violation of fisheries’ rules committed by fishers from one particular country only or all the countries? Explain your answer.
• Do you sometimes experience overlapping responsibilities such as search and rescue, disaster relief work etc. that diverts your attention from fisheries? Explain.

• How this does has an impact on non-compliance to fisheries’ regulations?

• How satisfied are you in achieving compliance in your job? Why?

(2) **Questions for Regional Compliance Advisor.**

**Main Question:** Please briefly introduce yourself and your primary roles.

**Follow up Questions:**

• Explain how the compliance mechanisms designed by FFA are applied to member countries?

• Do DWFNs contribute to the management tools for fisheries?

• How effective are the management tools FFA has formulated?

• Does this mean that the rate of IUU is reduced because of the effectiveness of the management tools? Please explain your answer.

• Why do you think fishers’ break rules?

• Do fishers have any concern at all if the stock is depleting in the region? Why?

• Can you think of any other ways to achieve compliance apart from enforcement?

(3) **Questions for Ex-fishers (Pole and Line).**

**Main Question:** Please briefly introduce yourself and your job when you were a fisherman.

**Follow up Question:**

• Who make the decisions in the fishing operations on board?

• What are the rules that other fishing boats normally break?
• What are some of the reasons why these boats break the rules?

• Do fishing boats given bonuses if they reach certain catch volumes?

• Are the rules (license conditions) handed down to the fishing master by the fisheries ministry?

• Does the fisheries ministry update all the fishers on fisheries’ stocks?

• Do you at times see the local patrol vessels around your vicinity doing physical monitoring and boarding checks? Why?

• What are some of the management tools you think can be applied to ensure voluntary compliance to regulations?

(4) Question for Ex-Fisherman (Purse Seining).

Main Question: Briefly introduce yourself and also talk about your job?

Follow up Question.

• Is there any other way fishers could select the fish while hauling up the nets?

• There are certain rules to manage our tuna resources; are the fishing masters aware of the rules and their license conditions? Please explain your answer.

• What else are some of the rules you see fishers normally break?

• Why do you think fishers break rules although they know about the rules?

• When fishers hit a certain catch volume do their employers give them bonuses?

• Who make all the decisions for fishing on-board?

• Have you seen at any time the fishing master and captain argued over the decisions to break rules?

• Have you seen observers coming around?

• Do you think observers are faithful in their jobs? Why?
• Do fishing masters given updated stocks on the fish in the sea?

• Do captain and fishing masters understand these rules? Why?

• How do fisheries department hand the rules to the fishing masters?

(5) **Questions for Ex-Fishers (Long Line).**

**Main Question:** Briefly introduce yourself and your job as a fisherman.

**Follow up Questions:**

• Who makes all the decisions regarding fishing activities where to go fishing etc. on-board?

• Does your captain ever inform fishers (crew) about the fisheries’ rules? Why?

• Do you have fisheries observers on-board?

• How do you see the observers, do you think they are faithful in carrying out their jobs? Why?

• Are there any rules that fishers normally break?

• When you guys break the rules, where are the observers?

• What are some of the reasons fishers break rules?

• Apart from observers, what other mechanisms do you think we should apply to deter IUU?

• Do you think the penalties imposed by the government sufficient to deter IUU?

• Does the fisheries ministry disseminate the updated data on the stocks?

• Do you at times witness arguments or disagreements between fishing master and officers over decisions to violate rules?

• This fishing company that you used to serve, where is it originally from?
• Is there any regulation in your company that would terminate fishers from violating rules?

• This means you are only terminated when you break companies’ rules or disobey the captain’s order?

(6) **Questions for Ex-Fishing Masters.**

**Main Question:** If you could briefly introduce yourself and your responsibilities as a former fishing master?

**Follow up Questions:**

• What are some of your duties and responsibilities as a fishing master?

• When you were the fishing master, what was the composition of crew like?

• When you were fishing, do you have the rules (license conditions) with you?

• Are the rules easy to understand?

• Is there any difference on the way local fishers and foreign fishers respect the rules?

• Who make the decisions on board?

• Have you seen other fishers violating rules during your time?

• Why do you think fishers break rules?

• Are there times fisheries observers follow you on your fishing trips?

• Do you think they are faithful with their jobs?

• Does the fisheries department update you on the stocks?

• Do you think regular communications between fishers and regulators would help improve compliance?

• Is there any other ways we can use to manage our tuna resources apart from physical and non-physical enforcement?
• Please say anything you wish to say.

(7) Questions for Current Captain (Purse Seining).

Main Question: Please introduce yourself and your current responsibilities as a captain.

Follow up Question:

• Based on your experience, do you think we still have sufficient Tuna? Explain your answer.

• What are some of the reasons why our tuna stocks are declining?

• Does your employer give you certain catch volume to achieve per outings? And how does it work if any?

• There are certain rules that fishers have to abide with, are you aware of them? Why?

• Do you think the rules are clear and easy to understand?

• Do you think the rules are fair?

• If some of the fishers break rules such as killing whales, sharks etc. and if the employer knows about this, are the fishers going to be disciplined?

• It appears as your fishing master and yourself are very low abiding, is there any reasons why both of you are like this?

• Do you know about the ranges of penalties that are imposed on different violation of rules?

• Is there any difference between the ways local and foreign fishers abide with the rules?

• Can you tell me where the overseas fishers that you are talking about are from?

• What do you think fishers committed IUU fishing in our waters?
• Do your vessels at any time report other vessels that might not have the license to the authorities? Why?

• How do you see the observers? Do you work closely with them? Why?

• Do you have the VMS?

• Do you think the VMS is fair?

• How do you and some of the other fishers feel when the regulators compromised the penalties to some other fishers that have violated the rules?

• Do you think the government enforcement is effective? Why?

• Norms or fishers behaving according to the majority fishers works well in community fishing, do you think this also applies in our context? Why?

• Can you think of any other approach that could help to achieve compliance apart from enforcement?

• Anything else you want say?

(8) Questions for Fisheries Observers.

Main Question: Please introduce yourself and tell me more about your job as an observer.

Follow up Question:

• What are some of the reasons why you think fishers involve in IUU fishing activities?

• Why do DWFNs so interested in illegal fishing?

• Do fishers work well with you or do they sometimes see you as spies?

• Do you remember anytime fishers attempt to give you gifts, perhaps intentionally to compromise your decisions and responsibilities? Why?

• Are there any rules that fishers find challenging or difficult to keep? Why?

• How effective or successful is your job? Why?
• How does the national government or FFA conduct observers’ training?

• Do you think program conducted by FFA is good and help you in your job?

• Since you have been observing in both overseas and local boats, is there any difference between locally based fishers and DWFNs?

• From your observation, is there any sign that the stocks are decreasing? Explain.

• Do you think the rules are fair for the fishermen?

• Most of the fishers are non-English speakers and the rules are written in English; do you think fishers understand the rules? Why?

• What are the compositions of the nationalities of the DWFNs vessels?

• Why do you think some fishers obey rules?

• Do you think the enforcement tools currently practice is effective?

• Is there any effective ways coastal States could do to manage unlicensed vessels from fishing illegally in our EEZ?

• In terms of communication or giving feedback on the tuna stocks to fishers on a regular basis, do think this can help improve compliance?

• I just want to know if compliance in the large-scale offshore fishing industry follows the majority trend i.e. if majority of fishers break rules without being caught or punish the others will also break rules?

• Does your presence deter fishers from breaking rule? How?

• Do you think the current enforcement mechanisms are sufficient to deter IUU? Explain.
(9) **Questions for Fishing Master.**

**Main Question:** Please introduce yourself and your job as a Fishing Master.

**Follow up Questions.**

- How long have you been working in the fishing industry.
- What is your responsibility as a Fishing Master?
- What is your comment on the stocks - are they decreasing, increasing or remain stable? Explain your answer.
- How long does it takes for you to fill your storage capacity?
- Where do you normally fish?
- Can you tell me why the stocks are declining as you mentioned?
- Do you also believe that El-Nino and overfishing causes this fish stock to decline? Explain.
- Do you think the rules are fair for you fishermen?
- Can you give any example of the rules that is not fair and should be amended?
- How do the fishing conditions (license conditions) are handed down to vessels?
- Do you think the rules are easy to understand?
- Why do think fishers break rules?
- Most fishers claimed that the pole and line normally don’t break the rules; instead it is the purse seiners that break rules a lot. Do you agree, why?
- What are some of the reasons why purse seiners break more rules than pole and lines?
- Is there any difference between how local fishers and foreign fishers respect the rules?
• Do you know of the various penalties for various illegal activities?

• Why do you obey fisheries’ rules? Why?

• If your crew violates fisheries rules does the management takes action against them?

• Do you think the current surveillance, monitoring and enforcement are sufficient to deter fishers from IUU?

• What do you think of the penalties, do you think they are sufficient to deter IUU? Why?

• How do you fishers feel when some other vessels that were arrested for breaking rules were later released by our leaders without paying maximum penalties?

• Do you think such attitude would encourage other fishers to break rules? Why?

• Is there any feedback on the stocks on a regular basis? Do you think feedback would help to improve compliance? Why?

• Do you think the harvesting methods currently used could sustain the stocks?

• How effective do you see the work of observers? Why?

• Can you think of any other means the government could use to further deter noncompliance in addition to those currently used?

(10) **Questions for Captains (Pole and Line).**

**Main Question:** Please introduce yourself and your responsibilities.

**Follow up Question:**

• Based on your experience please inform if Tuna fishing in our sea still looks promising or if you have noted depletion of the stock. Please explain your answer.

• How long does it take you to fill your storage capacity?
• What is the composition of the crew nationalities?

• Do you have fisheries regulations (license conditions) with you?

• Do you think the rules are fair?

• Why do you think fishers involved in IUU fishing activities?

• Do you think the penalties imposed by the government are tough enough to deter fishing from committing IUU fishing? Why?

• Do you think the way some of our purse seiners fish very close to coast (less than 7 miles) would affect our fish stocks? Why?

• Do you break fisheries’ rules? Why?

• What influences your vessel to obey fisheries’ rules?

• When other vessels that break rules are released without paying their fines, how do you feel? Does this encourage you to break rules as well?

• Normally if majority of fishers violate rules without being penalized, the rest would follow suit and vice versa. Does such norm happen in the Solomon Islands?

• Do you think the enforcement, surveillance and monitoring mechanisms used to manage our resources effective or how do you see them?

• Do you think the rules are fair?

• Are you given incentives for certain catch volume? How?

• How do you find the work of the fisheries’ observers?

• Is there any feedback on the stocks on a regular basis from the Fisheries’ Ministry?

• Do you think the current fishing practices would continue to sustain the stocks in our region? Explain.
Questions for Shipping Agent.

Main Question: Can you please introduce yourself and your responsibilities?

Follow up Question:

- When was this shipping agent established?
- How many fleets do you have?
- What sort of fishing do your fleets do (what sort of gears do your fleets have)?
- Which countries are the boats under your agent are from?
- What are some of the difficulties you may encounter with them?
- Where do they normally do their transhipment especially if they come into Solomon Islands’ waters?
- Do you think that the fisheries’ rules are fair? Why?
- Which rules do you think other vessels including yours find it hard to cope with?
- Which other rules do you think they find easy to follow?
- Why do your fleets choose to comply with the regulations?
- Why do you think other fishers break fisheries’ regulations?
- What is your opinion on the penalties impose by the government, are they sufficient to deter fishers? Explain.
- How do you feel when other fishers that violate rules are set free without being penalized? Does this means that your fishers would also attracted to breaking rules?
- Do you think the enforcement mechanisms impose by the government sufficient to deter IUU fishers?
- Do you think if feedback on the estimated stocks is disseminated to fishers, would improve rate of compliance?

- How do you see the woks of observers, are they carrying out their duties diligently?

- Do you think the current fishing practice would help sustain tuna for the next 2 decades?

(12) **Questions for Managers.**

**Main Questions:** Appreciate if you could briefly introduce yourself and your job?

**Follow up Questions:**

- How do you find your catch so far? Why?

- Do you think the rules impose by the government fair?

- What are some of the reasons why other vessels involve in IUU fishing activities?

- Do you think the penalties imposed by the government are too expensive?

- How do you feel when other fishers that break rules are released without being penalized?

- Do you think this kind of attitude would encourage other fishers to violate rules?

- Do you think the current monitoring, surveillance and enforcement are effective to control our tuna stocks?

- Do you think regular feedback on the fish stocks would help cooperate more in following rules?

- Do you think the way in which our government issuing license to other fishers would affect your fishing? Explain.

- What is your outlook on the way in which fishing is going on; are you optimistic that we would still have tuna for the next two decades?
Questions for Focus Group

Main Questions: Tell me about your boat and where it is originally from?

- Tell about your job as fishermen.

Follow up Questions:

- Is this kind of fishing sustainable? Why?
- Do you think we still have enough tuna in the Pacific? Why?
- Do fishers break fisheries’ regulations? Why?
- What sorts of regulations do you see other fishers break? Why do you think they break them?
- Have your vessels ever broken fisheries rules? Why?
- What are some of the reasons why fishers do not break rules?
- Do you think the rules are fair? Why?
- What are some of the difficult rules? Why?
- What are some of the easy rules? Why?
- What are your views on the penalties for breaking rules?
- What is your view on the enforcement authorities?
- Do you think regular feedback on the stock level would help improve compliance? Why?