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COMM CIRC 12/97
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среда, 8 августа 2012

Отчет Семинара по наращиванию потенциала развивающихся стран: совершенствование управления промысловыми данными, Сеул (Республика Корея), июнь 2012 г.

ВСЕМ ЧЛЕНАМ КОМИССИИ И НАУЧНОГО КОМИТЕТА

По просьбе Республики Корея я распространяю отчет семинара "Наращивание потенциала развивающихся стран: совершенствование управления промысловыми данными", который проводился в Сеуле в июне 2012 г. Семинар координировался г жой Х. Квон (представитель в Комиссии) и финансировался Корейским министерством продовольствия, сельского, лесного и рыбного хозяйства. Одиннадцать приглашенных докладчиков из РРХО, национальных и многосторонних организаций, в т. ч. руководитель отдела обработки данных АНТКОМ, обсудили центральные темы и рассмотрели конкретные примеры. В семинаре участвовало примерно 60 занимающихся вопросами промысла ученых и менеджеров из 30 стран.

На семинаре, помимо прочего, было решено, что:

- типы данных, которые требуются для рыбохозяйственных исследований и управления, как правило, хорошо задокументированы;
- разработка и внедрение программ сбора данных остаются ключевой проблемой и ограничивающим фактором на многих промыслах;
- рыбодобывающая промышленность играет важную роль в обеспечении сбора данных на многих промыслах, и было бы желательно расширить эту роль так, чтобы охватить все промыслы.

Андрю Райт
Исполнительный секретарь

Телефон: +61 3 6210 1111
Факс: +61 3 6224 8744
email: ccamlr@ccamlr.org
Web: ccamlr.org

PO Box 213, North Hobart, Tasmania 7002 Australia
181 Macquarie Street, Hobart, Tasmania 7000 Australia

COMMISSION FOR THE CONSERVATION OF ANTARCTIC MARINE LIVING RESOURCES
COMMISSION POUR LA CONSERVATION DE LA FAUNE ET LA FLORE MARINES DE L'ANTARCTIQUE
КОМИССИЯ ПО СОХРАНЕНИЮ МОРСКИХ ЖИВЫХ РЕСУРСОВ АНТАРКТИКИ
COMISIÓN PARA LA CONSERVACIÓN DE LOS RECURSOS VIVOS MARINOS ANTÁRTICOS

CCAMLR

PO BOX 213, NORTH HOBART, TASMANIA 7002 AUSTRALIA
181 MACQUARIE STREET, HOBART, TASMANIA 7000 AUSTRALIA
Website: www.ccamlr.org

Phone: (61) 3 6210 1111
Fax: (61) 3 6224 8744
Email: ccamlr@ccamlr.org

**ВСЕМ ЧЛЕНАМ КОМИССИИ
И НАУЧНОГО КОМИТЕТА**

COMM CIRC 12/97
SC CIRC 12/47

8 августа 2012 г.

Отчет Семинара по наращиванию потенциала развивающихся стран: совершенствование управления промысловыми данными, Сеул (Республика Корея), июнь 2012 г.

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Андрю Райт
Исполнительный секретарь

Прилож.

Ministry for Food, Agriculture, Forestry and Fisheries

농림수산식품부
Ministry for Food, Agriculture, Forestry and Fisheries

#88, Gwanmunro, Gwacheon-si, Gyeonggi-do, Korea, 427-719
International Fisheries Organization Division,
Tel)+82-2-500-2414, 2415, Fax)+82-503-9174
Website) www.mifaff.go.kr

July 17, 2012

Attn: Executive Directors and Secretaries of the five tuna RFMOs/CCAMLR
Subject: The Report of the 2nd Workshop on the Capacity Building of Developing States on the Improvements in Fisheries Data Management

Dear Mr. Executive Director/Secretary,

I am writing this letter to kindly request you to transmit to the parties, members and cooperating non-members of your organization the report of the 2nd Workshop on the Capacity Building of Developing States on the Improvements in Fisheries Data Management hosted by the Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) of Korea from June 12-14, 2012 in Seoul.

As informed in May this year, MIFAFF hosted the workshop and it turned out to be successful thanks to the kind cooperation you extended to us. As the convener of the workshop, I would like to take this opportunity to express my appreciation in this regard.

The presentation files, photos and other related materials are available for download at www.meci.co.kr/societyevent/capacitybuildingworkshop/download.html. It would be much appreciated if you could circulate this report to the parties, members and cooperating non-members of your organization.

Best Regards,

Joon-suk Kang
Director General , Distant Water Fisheries Cooperation Bureau
Ministry for Food, Agriculture, Forestry and Fisheries, the Republic of Korea
Tel : 82 2 500 1524/ Fax : 82 2 503 9104
Email : joonsukang@korea.kr

Enclosed: The Report of the 2nd Workshop on the Capacity Building of Developing States on the Improvements in Fisheries Data Management
CC: Kevin Piner; Makoto Miyake; Emmanuel Schneiter; Ross Wanless, David Ramm; Miguel Herrera; Nicolas Vogel; Chang-ik Zhang; Sungkwon Soh; Sung-il Lee

The 2nd Workshop on the Capacity Building of Developing States

on the Improvements in Fisheries Data Management

June 12-14, 2012

the Sheraton Grande Walkerhill Hotel

Seoul, Korea

The Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF)

of the Republic of Korea

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The 2nd Workshop on the Capacity Building of Developing States on the Improvements in Fisheries Data Management

Day 1

Opening, Keynote and Introduction1

1. The 2nd Workshop on the Capacity Building of Developing States on the Improvements in Fisheries Data Management (hereinafter the "workshop") hosted by the Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) of Korea started at 9:30 on June 12, 2012 at the Sheraton Grande Walkerhill Hotel in Seoul, attended by around 100 participants from 36 countries. Dr. Jung-kyu Oh, the Vice Minister, opened the event with a welcome remark in which he emphasized the importance of accurate and timely data in fisheries management and the need to assist developing states in building capacity to achieve their development aspirations.

2. Dr. Joon Suk Kang of the Distant Water Fisheries Bureau of the Ministry delivered the keynote speech, under the title of "*Significance of Data in Fisheries Management*." The following is the summary of his presentation:

Fishery resources do not only contribute to food security but also bring about various social and economic benefits. However, a wide range of factors are putting constraints on limited fishery resources. In response, many international and regional fisheries management organizations are putting management measures in place, but they are often faced with difficulties in making timely decisions due to the lack of reliable scientific data. A delay in management measures in turn leads to a delay in achieving management targets thereby creating a negative feedback loop in fisheries management. Therefore, data improvements, in terms of the quality, timeliness and accuracy are urgently needed.

3. Prof. Chang-Ik Zhang (Pukyoung National University) delivered the introductory speech under the title of "*New Regime of Fisheries Resources Assessment and Management*." He first briefly introduced the current status of the world's capture fisheries and then outlined how stocks are assessed and how the results of stock assessments are used by fisheries managers. The following is the summary of his presentation:

Many of the world's fish stocks and related marine and coastal ecosystems are in a concerning status and fisheries managers around the world are exerting a lot of efforts to come up with proper management tools to rebuild stocks, based on the best available scientific evidence coming from stock assessments. There are five steps for stock assessment and management, namely i) identification of unit stock ii) determining population ecological parameters iii) determining methods or models for stock biomass iv) determining stock assessment models v) determining proper measure for each stock targeted for conservation and management by setting either target reference points or limit reference points. Broadly, there are four main elements that contribute to the fluctuations of a fish stock, which are recruitment, growth, fishing mortality and natural mortality. Since these elements all play together to have impacts on the ecosystem in which various stocks occur, it is necessary to understand each element clearly for effective fisheries management. One of the management tools that factors in all these elements is "ecosystem-based fisheries management". This approach is drawing attention from the world's fisheries managers as it transcends the shortcomings of conventional single species management approaches. To support the ecosystem-based fisheries management decisions, a group of Korean fisheries scientists came up with an approach to stock assessments so called "Integrated Fisheries Risk Analysis Method for Ecosystem (IFARME)" to be applied to Korea's fisheries. This method has three components, i.e., the assessment, forecasting and management.

Session 1-Presentations on Fisheries Data Management

4. Dr. Kevin Piner (research fisheries biologist, NOAA) delivered the first presentation under the title of "*Assessment Models and Data Needs*." He first provided an overview on stock assessments and fish population and the interaction of these two. He then talked about the role of data in studying population dynamics and the models used to assess the status of stocks. The following is the summary of his presentation:

Fish population dynamics are influenced by four factors, i.e., growth, births, fishing and natural death, and various models are used to take a look into the status of fish stocks. Most of stock assessment models depend on the reconstruction of past population dynamics to provide advice on the future outcomes of management decisions. In order to run these models, different types of data such as catch, fishing effort, biological and life history are needed and the types of data affect the processes included in the model and the level of complexity and realism of models. Currently, there are many kinds of models being used, from simpler ones such as biomass dynamic models to more complex ones such as age-structured production models and multi-species and ecosystem models. Simple models require limited processes and data input, but tend to lack realism. In contrast, complex models have more data and cost requirements than simpler models but can provide more realistic estimates of model. In a

sense, there is no “free lunch” when it comes to stock assessments.

5. Dr. Makoto Miyake (scientific advisor, Japan Tuna Fishermen’s Association) delivered the second presentation under the title “*Procedures for Tuna Data Collection, Reporting, Processing and Analysis with Special Attention on Data Gaps*.” He provided an overview on the basic data requirements, namely, nominal catch, fleet size, catch and effort, size of fish and biological samples one by one.

The following is the summary of his presentation:

Catch data are collected through catch documents, daily and weekly catch reporting, logbook records and port survey. These data reported from vessels are then cross-checked when landing through port and market landing records, sales slips, transshipment records, consumer market survey and trade data. However, landed catch estimates do not always correspond to actual catch amounts due to many factors such as processed conditions (GG, round, filleted, etc), discards and false reporting, and this makes it difficult for scientists to assess how many fish were removed from the stocks. To stop these possible data gaps in nominal catch data, standardized conversion factors should be used and records from various sources should be thoroughly cross-referenced. With regard to the fleet, data are usually collected by the size of vessels, to each of which different data collection procedures are applied. While data collection protocols for large scale fishing vessels are fairly well-established, there are still uncertainties in data related to small scale vessels and this is the area that needs improvements. Regarding catch and effort, data are collected by months, species, gear types, areas and set specifications. These data are used as the basis for CPUE and abundance indices. However, there are also uncertainties in catch and effort data in terms of their coverage and catch and effort values. This problem can be addressed by standardizing CPUE calculations and set by set information, and by taking unquantifiable elements into account. Biological sampling is conducted mainly to identify size frequencies and species composition of catches. These data are collected on various sites, including on-board, at landing and processing sites. Sampling should be done as randomly as possible to achieve better representation and should be done with standardized measuring protocols.

Following his presentation, a participant from Ghana asked about the feasibility of measuring all fish landed by developing states and a participant from Cote d’Ivoire commented on some of the challenges faced by developing countries in maintaining logbooks such as illiteracy of fishermen and confidentiality of information on fishing operations. Dr. Miyake noted the difficulties, but still reiterated the importance of data submission, suggesting alternative way of reporting fisheries data, including reporting through an interview instead of daily catch records.

6. Dr. Ross Wanless (Africa Coordinator, Birdlife International) provided the third presentation under the title of "*Seabird, Shark, and Turtle Bycatch in Tuna Longline Fisheries: Problems, Solutions and the Need for Data*." He briefly introduced the work of Birdlife International and then provided an overview on seabird, sea turtle and shark bycatch-related issues in longline fisheries, including the uncertainties in the impacts of longline operations on bycatch species, development in mitigation technologies and data requirements.

The following is the summary of his presentation:

Seabirds and sea turtles are slow to breed and reproduce, and it makes it difficult for the damage done to these species to be reversed. However, true impacts of tuna longline operations on seabirds, sea turtles and sharks are currently unknown. According to available estimates, approximately 300,000 sea turtles and tens of millions of sharks are being killed in fishing operations. Sharks are of particular concern because they have a great significance in ecosystem dynamics as the top predator. Catch rates of sharks are high partly because they are being caught both as bycatch and target species, so different approaches (e.g technical fixes, mandatory conservation and management measures) are needed to address shark bycatch. Shark bycatch issues are also tricky to deal with since it has socio-economic aspects especially for coastal developing states, where sharks are utilized as a food resource.

To deal with bycatch-related issues, bycatch working groups are formed in RFMOs, and some of them, IOTC and ICCAT among others, are moving towards strong measures to mitigate the incidental mortality of seabirds but there is still a lot of work to do. Broadly, three types of measures are used to reduce seabird bycatch—tori lines, night setting and line weighting. None of these three measures work alone to produce desirable results and they work better when two or more measures are combined. However, fishermen tend to be reluctant to use these measures for operational inconveniences and safety reasons, latter of which often involves the use of weighted lines. To address this safety issue, Birdlife International developed "safe leads" that eliminate the risk of swivels flying back and injuring crew, while still achieving good sink rates and bycatch mitigation effects. Also, a Japanese fishing master invented a "Yamazaki Double Weight System" which also resolves both the operational concerns and bycatch mitigation effects. Turtle bycatch and death rates can be reduced by using circled hooks. Currently, the impacts of longline operations on bycatch species are being monitored through observer programs employed by many RFMOs, but their goal is rather unambitious and the target coverage is only 5 percent. Fisheries managers should not rely wholly on observer programs since there is still much room for improvement in these programs. Other challenges in reducing seabird, sea turtle and shark bycatch include the conflict between national data confidentiality and RFMO requirements and poor data quality. To address these issues, more data on the implementation and effectiveness of mitigation measures need to be available, and the standardization and sharing of bycatch information among fleets and RFMOs are needed.

Following the presentation, a participant from Ghana raised a question regarding the cost of

mitigation measures such as circled hooks, and Dr. Wanless answered that the measures would incur some costs but such cost would be rather insignificant.

7. Mr. Schneiter provided the fourth presentation under the title of "*SPC-OFP's Role in Developing Tuna Fisheries Data Management Capacity in Developing Countries*." He briefly introduced the history and tasks of SPC/OFC and then talked about the background on the fisheries in the South Pacific region; the need to collect and manage data; and the services provided by SPC-OFP to developing countries and the Western and Central Pacific Fisheries Commission (WCPFC). The following is the summary of his presentation:

Since the SPC-OFC was established and started its service in the late 1970s, it has been providing scientific services relating to oceanic fisheries management to its members including data management, fisheries monitoring, ecosystem and biological research and stock assessments. Collecting, analyzing and managing fisheries data at the regional and national level, which is the main task of SPC-OFP, is important, especially when it comes to the conservation and management of highly migratory species such as tuna. Currently, the SPC-OFP is closely working with the WCPFC, from whose Convention Area comes 60 percent of the global tuna catch, as the Commission's contracted science provider and data manager. Members of the WCPFC are required to submit fisheries data including annual catch, the number of active vessels, operational and aggregated catch and effort data, and size composition data to be processed, analyzed and inventoried by the SPC-OFP. The Secretariat is currently using the TUFMAN Database System, which enables the management and entry of various types of tuna fishery data types, linking each type of data to other types, generating summary reports and mapping catch/effort charts, vessel tracks and VMS track comparisons. The SPC-OFP is also conducting data audit to ensure the standardization of data, and to improve data quality, coverage and collection. Other tasks of the OFP include data management training, Pacific Island observer training, and maintaining secure websites that contain information on the Pacific region's fisheries for member countries. For decades of operations, the SPC-OFP has learned some lessons—requirements to collect data need to focus on key users; data collection and management need to be standardized; data collection needs to be actually enforced; database technical support, training and data auditing by independent auditors need to continue; and the collection and management of the most important data should not be compromised by collecting and managing data of less priories.

Session 2-Discussion on Fisheries Data Management

8. Following the six presentations, a general discussion on fisheries data management took place. Ms. Hyunwook Kwon (Deputy Director of International Fisheries Organized Division,

MIFAFF) moderated the discussion as the panelists (the speakers for Day 1--Dr. Zhang, Dr. Piner, Dr. Miyake, Dr. Wanless and Mr. Schneiter) shared their thoughts on the issue and addressed questions raised around the floor.

9. As a research fisheries biologist and modeling expert, Dr. Piner said data collection procedures were not his area of expertise, but this kind of workshop could be a good place to discuss various issues related data management.

10. Dr. Wanless reiterated that data gaps were staggering and there was still a long way to go. Based on his personal experience, he expressed concern about how we used observer/fisheries data and hoped that the participants could bring passions to make necessary changes back home.

11. Dr. Chang-Ik Zhang said the workshop could cover a wide range of data issues. He also noted the conflict between national data confidentiality and RFMO data requirements. He also mentioned that he was impressed by SPC-OFP's data management program and their important role in assisting developing countries.

12. Dr. Miyake said that it was important to collect necessary data identified by fisheries scientists and he was looking forward to other case studies related to other ocean basins that would be presented on Day 2.

13. Mr. Schneiter expressed the same concerns as the other panelists on data quality and coverage. He emphasized that without good data, no proper management could be in place.

14. After the panelists, comments and questions were provided around the floor. A participant from Costa Rica first congratulated the speakers on their insightful presentations and echoed that no management to support fisheries management could be possible without accurate data. He appreciated that the workshop was a good opportunity for fisheries managers and policy makers to better understand the data collections and related procedures. He noted that capacity building was still needed to solve data gap problems in developing countries.

15. A participant from the Prince's Charities' International Sustainability Unit commented that in obtaining necessary data, there were many constraints faced by developing countries such as insufficient governance, financial and human resources. He asked the panelists if they had any thought on how to circumvent those issues.

16. Dr. Wanless said many species of concern are highly migratory and shared stocks and hampering the ability of proper management would pose significant risks to future generations and long term viability of fishing operations. He also mentioned that improving data was difficult, and there would always be rooms for improvement, but this should not be the excuse for delay in much needed actions.

17. A participant from Korea's fishing industry noted that a race for fish led to the depletion of many stocks and many RFMOs had measures in place to conserve and manage those stocks. He said, however, developed members of such RFMOs were pushing developing members to implement high levels of management measures without proper consideration of their needs. He concurred with the concerns expressed by the participants from Ghana and Cote d'Ivoire, many of whose fishermen were subsistence fishers and operating in small scale. He also emphasized that RFMOs needed to check the reality of developing countries and the workshop could be a good opportunity to discuss data-related issues while keeping the constraints faced by developing countries in mind.

18. Regarding this comment, Mr. Schneiter from the SPC said that the SPC also focuses on capacity building of developing states by deploying national tuna data coordinators to member countries in need so they can collect necessary data with the assistance from these staff.

19. Mr. Herrera noted that all tuna RFMOs adopt management measures and those measures issue from one or more RFMO members, in the form of proposals to be discussed by all Members. Management measures are adopted following a process of consultation among all members, who commit to the future implementation of the provisions contained on those measures. These include measures which set the standards for data collection and reporting to RFMOs, as agreed by IOTC Members. In some cases, RFMOs acknowledge the difficulties that some members have to implement the measures agreed, in particular developing states, agreeing to pay special consideration to these needs of those countries, through the implementation of capacity building programs. However, Mr. Herrera noted that the main objective of capacity building programs is to assist RFMO States Members in the

implementation of management measures, until such a time where the members concerned can maintain the activities on their own, and therefore fulfill their obligations to RFMOs.

20. Dr. Miyake said that all those who were taking resources from the sea were obliged to provide necessary data and the lack of capacity should not be an excuse for the non-submission of data. He also commented that developed members needed to help developing ones in capacity building, but also noted that even when you had established the system, it could not continue without additional aids. He expected that this issue could be dealt with in detail on Day 2.

21. The moderator closed the discussion by saying that everyone knew the importance of fisheries data but there were still many challenges to be addressed. She also said that each government needed to be committed to improving data management.

22. At the end of the discussion, Dr. Wanless demonstrated Hook Pods to the audience.

Day 2

Session 3—Case Studies from RFMOs and Individual Countries

23. Session 3 was open with Dr. Miyake's presentation under the title of "*Data Issues in the Tuna RFMOs (Comparison of Data Bases and Requirements among RFMOs.*" He briefly introduced the five tuna RFMOs and compared those organizations to one another in terms of their area of competence, mandate, management advice, science provider, data collection, information dissemination. He also emphasized the importance of harmonization amongst RFMOs and their efforts in that direction.

The following is the summary of his presentation:

There are five tuna RFMOs—IATTC, WCPFC, ICCAT, IOTC, CCSBT with different areas of competence, mandates and management procedures. Harmonizing requirements amongst these RFMOs is important for many reasons: tuna fleets are highly mobile and tend to shift from one ocean to another; tuna fisheries are often multi-species and multi-gear; many of species under management are highly migratory and thus need similar management measures

amongst ocean basins; and IUU fishing takes place regardless of ocean areas. Although the five tuna RFMOs have some common aspects, they have different requirements in terms of bycatch species, level of data required, biological study protocols, data substitution procedures and vessel registration from one another. To address the issue of harmonization of data requirements, international organizations and RFMOs are making efforts. For instance, the UN Food and Agricultural Organization (FAO) is working on the global record of fishing vessels. The tuna RFMOs have formed a Coordinating Working Party (CWP) of fisheries statistics and are having joint tuna RFMO meetings so called "the Kobe process" and relevant working groups. At Kobe meetings take place discussions on harmonizing some of management requirements and other important elements such as fishing capacity (e.g definition of fishing capacity as "potential yield"). Different RFMOs define fishing capacity differently and it is difficult to quantify the capacity. For these reasons and others, although there are general agreements on the need to freeze fishing capacity at the current level, this issue has become one of the most difficult agenda items of tuna RFMOs. Other common agenda items include setting reference points and dealing with IUU problems. All these efforts cannot produce desired outcomes without proper consideration on the special requirements of developing members. These requirements are clearly stipulated in the Convention of the tuna RFMOs, and these organizations have special funds and programs to assist their developing members.

His presentation was followed by a question raised by a participant from MIFAFF. She said she had thought of fishing capacity as the number of vessels or gross tonnage and asked Dr. Miyake if the concept of "potential yield" was widely accepted among international and regional fisheries organizations.

Dr. Miyake answered that the term was defined by fisheries scientists in 1989, when FAO was drafting IPOA-Fishing Capacity. However, since there is no agreed quantifiable way of measuring capacity since it could often change depending on many factors (e.g.fish prices), the cubic meter of fish holds and number of vessels are used to measure capacity as proxy. He concluded that whatever the definition might be, capacity should be managed.

24. Mr. Nickolas Vogel (Data Manager, IATTC) provided the sixth presentation under the title of "*the Collection and Management of Fisheries Data in the Eastern Pacific Ocean: Past, Present and Future*." He started by introducing the background of Inter-American Tropical Tuna Convention (IATTC), the organization's history and mandates. Then he outlined how fisheries data are collected, processed and managed in IATTC, what kind of capacity building activities are taking place, and the future projects of the Commission. The following is the summary of his presentation:

The IATTC was established in 1949 as an agreement between the United States and Costa Rica and strengthened by the Antigua Convention, signed in 2003 and effectuated in 2010. Currently, the Commission has 21 members and one cooperating non-member (Cook Islands). In the Convention Area, major target species are tropical tunas such as bigeye and yellowfin,

and purse seine fisheries are regulated by three rounds of total closures including the area called "*El Corralito*," and by imposing individual vessel bycatch limitations and full retention requirements. Catches from longline vessels are regulated by individual bigeye tuna quota systems. The Antigua Convention gives the IATTC the mandate to directly collect data and since the major gear type in the EPO is purse seiner (approx. 85% of total catch), many of data are collected through the Commission's observer program made up of IATTC and National Observer Program, which was established in 1979. Eight countries are operating National Observer Programs, whose protocols are consistent with the ones of the IATTC. Currently, the observer coverage for large purse seiner is 100 percent. Smaller purse seiners are also operating in the EPO, but their impacts on total catch are rather insignificant. IATTC data coming from various sources such as landing data, weekly at-sea near real-time reports, observer data, logbook data and biological data are channeled into the IATTC through field offices. The IATTC has a long history of capacity building through observer program and IATTC field officers. Other such activities include scientific assistances to developing members. However, the fund for capacity building activities has been rather insufficient and unstable, so it has been decided that 50,000 dollars from the IATTC regular budget will be allocated to capacity building from 2013. As a future plan, the Commission is aiming to improve the data coverage of artisanal longline fisheries to better assess the stock status in the EPO.

25. Mr. Herrera (Data Coordinator, IOTC) provided the seventh presentation under the title of "*Capacity Building in the Indian Ocean: Lessons, Challenges and Opportunities*." He started with a short introduction to the IOTC, followed by an overview of the status of fisheries statistics in the Indian Ocean, capacity building activities under the coordination of the IOTC Secretariat, in particular those under the framework of the IOTC-OFCF project, and the main challenges, lessons learnt, and future prospects of capacity building in the region.

The IOTC has thirty member and cooperating non-contracting parties, with nineteen coastal states, seventeen of which are developing countries. Coastal countries that are Members of the IOTC catch as much as 60 percent of the total combined catches of main market species of tunas, with a high share of the catches taken by small scale fisheries in the Indian Ocean. Like other RFMOs, IOTC has standards for the collection, reporting and dissemination of data on IOTC fisheries, which include data on total catch, effort, and length frequency from all fisheries that catch IOTC species. The quality of these data is monitored and assessed by the IOTC scientific Committee through the IOTC working parties, in particular the Working Party on Data Collection and Statistics. Following a request from the Commission, the IOTC Secretariat assessed the quality of data collection, processing, and reporting systems in countries of the region, and distant water fishing nations, in 2011, with results presented to the IOTC Scientific Committee. Overall, 75% of the catches, of yellowfin and bigeye tunas, of small and medium scale fisheries in the region where assessed as poor quality, due to

deficient data collection and/or processing systems in the countries assessed. Overall, 25% of the total catches of yellowfin and bigeye tunas, by all fisheries in the region, where assessed as poor quality.

The IOTC Agreement and some of the Management Measures adopted by the IOTC contain provisions that call for the IOTC or other parties to assist developing countries in the region in the implementation of management measures adopted by the IOTC, where necessary. Provisions in IOTC Resolution 11/04, On a Regional Observer Scheme, call for IOTC Members that have artisanal fisheries to sample the fisheries sufficiently, and for the Commission to identify external sources of funding to assist the countries that require so.. Funds for the implementation of capacity building activities in the Indian Ocean come from several sources, including: IOTC's regular budget (30,000 US$); voluntary funding from Japan (IOTC-OFCF project, USD 1.5 million);, IOTC accumulated funds (250,000 US$); and the EU (Indian Ocean Large Scale Regional Tuna Tagging Project;14 million Euros). The IOTC-OFCF Project aim is to enhance data collection and processing systems for tuna resources in developing countries of the Indian Ocean. The Project was initiated in 2002 and has implemented activities in the majority of countries that are coastal countries in the region, including: documentation of fisheries; organization of training sessions and workshops; strengthening of data collection and processing, through the implementation of sampling programs and transfer of software and hardware; recovery of historical data; and follow-up of activities implemented by the Project once that the Project discontinues support.

The implementation of capacity building activities in the Indian Ocean is challenging for several reasons, including: i) the large number of coastal developing countries and the high importance of artisanal fisheries in those countries; ii) insufficient funds devoted to capacity building; iii) insufficient commitment from some administrations to maintain the activities implemented once that foreign assistance is discontinued;; iv) lack of coordination from cooperating agencies, with implementation of activities that are overlapping. The implementation of capacity building activities in a country requires that the government of such country realize the importance of long-term data collection programs to ensure the sustainability of its fisheries and the people that depends on them; as well as its commitment to secure the funds necessary to maintain the activities at the end of the capacity building cycle. Similarly, in implementing capacity building activities foreign agencies shall make every possible effort to coordinate their efforts to avoid overlapping of activities or the implementation of activities that do not fully respond to the immediate needs of the country or fail to ensure commitment from the governments concerned to the future maintenance of those activities using domestic funds.

26. The eighth presentation was provided by Dr. SungKwon Soh (Science Manager, WCPFC) on the "Process of Establishing Fishery Monitoring in the East Asian countries." He introduced how targeted assistance in capacity building was taking place in the western edge

of the WCPFC Convention Area with a special focus on the process of the West Pacific East Asia Oceanic Fisheries Management Project (WPEA). The following is the summary of his presentation:

WCPFC has been conducting regional stock assessments, and for many years, the lack of species and size composition data and questions regarding the accuracy and reliability of annual catch estimates in the waters of the Philippines and the Pacific-side of Indonesia have emerged as a key source of uncertainties in regional stock assessments for bigeye and yellowfin tuna. Therefore, a data collection program, called Indonesia and Philippines Data Collection Project or IPDCP, was proposed in 2003 and implemented in early 2005. Funding support was a challenging issue for the continuity of the IPDCP, and the WCPFC Secretariat submitted a proposal to the Global Environment Facility (GEF) for the development of data collection and governance over tuna fisheries in Indonesia, Philippines and Vietnam. In March 2009, GEF approved funding support totaling about USD 1 million over three years and the project officially commenced in January 2010. The WPEA Project has two components: one is fish monitoring, data enhancement and fishery assessment; and the other is strengthening policy, legal and institutional arrangements in line with WCPFC requirements and developing fishery management plans in the participating countries. The WPEA project has more than 50 individual activities per year, and for each activity, the national tuna coordinators submit their activity proposals with corresponding budget to the Secretariat for its implementation. The main goal of the project activity was to collect biological data, operational data and total annual catch by gear and species for regional stock assessment. The activity outputs were in the form of compiled catch data, consultancy reports, and/or workshop reports. Over the last two years, some level of progress in data collection and estimation of total tuna catch was made through the WPEA project. Though still limited, WPEA project could produce annual catch estimates by gear and species and assist the implementation of logbook program in the three participating countries. The WPEA project also identified the most important data gaps for regional stock assessment, and some of future activities to address such gaps were planned. For Indonesia, annual catch estimates should include those from fisheries in the archipelagic waters as agreed by the Commission. In the Philippines, collection of reliable catches from small-scale hook-and-line fishery data was considered as a high priority for future work. In Vietnam, reconstruction of historical annual catches, logbook data collection for the purse seine and gillnet fisheries, and review of observer data collection system were pointed out as high priority project activities in the future. He concluded that the capacity building of developing countries in data collection requires continuous support of financial aids and input of technical expertise.

27. Dr. David Ramm (Data Manager, CCAMLR) delivered the ninth presentation under the title of "*Fishery Data Requirements, Uses and Management at CCAMLR*." He first gave a brief overview on CCAMLR and Southern Ocean fisheries and ecosystems, and then outlined

the Commission's data requirements, uses and management. The following is the summary of his presentation:

CCAMLR is different from other RFMOs in that the Commission was established by international treaty and is concerning more about sustaining the Antarctic marine ecosystems and resources. The Commission has been an exemplary case of applying ecosystem based and precautionary approach. The fisheries in the Convention Area target two types of toothfish (Patagonian and Antarctic), mackerel icefish and krill, and management decisions of the Commission are made based on the best available science. The fisheries in the Convention Area are divided into five different categories depending on the status of stocks and the availability of relevant data: new fishery (advanced notification is needed, no recent information is available); exploratory fishery (advanced notification is needed, fishery-based research is conducted); established fishery (e.g. krill--comprehensive stock assessments are conducted and available, advanced notification is needed); lapsed fishery (operation has ceased and assessments are outdated); and closed fishery (directed fishing on the target species is banned). Since the best available science depends heavily on fishery data, the Commission has strong data requirements and many of these data are mainly collected on board fishing vessels (e.g catch and effort real-time reports, haul-by-haul data, STATLANT catch and effort data). Scientific observer data include cruise reports, logbook data, and fish conditions. There are also survey data and compliance data needed. Each data should be entered in a well-established form developed by the Commission, and these data are channeled into the Secretariat Data Center to be maintained, and the Center provides necessary data to the CCAMLR subsidiary bodies, working groups and scientific/fisheries management community among member countries pursuant to CCAMLR's data access rules and procedures. Fishery data collected and disseminated as explained above are then used for fishery monitoring and compliance, stock assessment, identifying ecosystem interactions, status and trends, maintaining biodiversity and conservation and producing fishery and trade statistics. CCAMLR's data management systems were independently reviewed in 2011 to identify the room for improvement. To facilitate the work of CCAMLR, the fishing industry has an important role in providing required data to the Commission.

28. The last presentation for Session 3 was provided by Dr. Sungil Lee (Researcher, National Fisheries Research and Development Institute, NFRDI, of Korea) under the title of "*Challenges and Improvement in Data Collection in Korea*." He introduced the fisheries data collection and management procedures, the challenges and the areas of improvement related to thefisheries data management in Korea with a special focus on the country's distant water fisheries. The following is the summary of his presentation:

In about a decade ago, Korean-flagged distant water fishing vessels were required to collect basic fisheries data such as catch/effort, landing and transshipment data in paper-based, conventional formats and send them back to the Overseas Fisheries Association and NFRDI

within 30 days (home-based) or 60 days (foreign-based) of the completion of fishing trip, and then the Association and NFRDI provided the data to the government separately. Under this system, the timeframe was not timely enough, database was not strong enough and data did not cover other important areas such as biological measurements. To address these shortcomings, and to meet the ever-increasing data requirements of RFMOs, necessary improvements have recently been made in terms of the types of mandatory data, the area of coverage, submission timeframes and formats, and now the Association and NFRDI cooperate with each other to provide the data to the government. Also, the NFRDI has improved fisheries database systems and data cross-checking systems. Though there has been some progress, there is still a long way to go in improving statistical data in terms of quantity and quality.

Following his presentation, Dr. Miyake congratulated that Korea was taking necessary actions to address weaknesses.

Side Session--Fisheries Data Management from the Perspective of Developing States

29. Four presentations were delivered from the perspective of developing states. Mr. Stephen Mambi from the Ministry of Economic Development of Curacao provided an overview of the country's history and its economy and fisheries. The following is the summary of his presentation:

Curacao became an autonomous nation after the dissolution of the Netherlands Antilles, within the Kingdom of the Netherlands. The Island has constitutional ties with the Netherlands, using the country's passport. It also has special arrangements with the EU that are designed to develop the economy of Curacao, where the fisheries sector is contributing significantly to the livelihood and food securities of the Island. The fisheries of Curacao are divided into two categories, one being artisanal fisheries and the other being industrial fisheries. As of 2010, the artisanal fisheries were operated with around 350 vessels, but the number of full-time fishers was only a handful. These fishermen operate coastal waters, mainly using simple gears such as hand lines, trolling lines, traps and gillnets. They target pelagic and demersal species such as wahoo and snappers. The industrial fisheries are operated by four vessels, three of which are purse seiner and one is a processing vessel. These vessels operate in distant waters catching tuna and other species and make landings at overseas ports, and make transshipments mainly at the port of Abidjan. Catches from these vessels are exported to the EU market, Spain in particular. Curacao has institutional framework in place to manage these two types of fisheries, and the government has an aspiration to develop the international fishery sector and is moving towards that direction.

30. Mr. J.A.D.B. Jayasooriya from the Ministry of Fisheries and Aquatic Resources Development of Sri Lanka provided a presentation on the general information on the fisheries of Sri Lanka. The following is the summary of his presentation:

In Sri Lanka, the fisheries sector has been playing an important role. However, three-decades of internal conflicts hampered the growth and development of the fisheries sector. Fortunately, after dawn the peace, the sector is rapidly growing in recent years in terms of increasing the per capita fish consumption, production and stabilizing the prices. Accordingly, the fishers' communities are enjoying enhanced social and economic status. To keep this drive, the Sri Lankan government is employing various strategies, including the implementation of fleet development plans, improving the current fisheries infrastructure, modernizing and expanding local market network and facilitating investments. In tandem with this development, Sri Lanka is making efforts to improve its fisheries management systems, putting strong statistic and data collection systems in place. Parts of Sri Lanka's fisheries are being managed under the management regime of the IOTC and there has been some progress in terms of managing large pelagic fisheries but coastal small scale fisheries are difficult to manage with the same tool as large-scale fisheries since the former is usually multi-geared and multi-species. For small scale fisheries, data collection systems need to be improved to fulfill data requirements for sound resource management systems.

As a result of war, the gender participation in fisheries and female headed households are very high in North and East regions of the country. The last Census of Fisheries was in 1972 and therefore, large gap in economic and social statistics in Sri Lanka, especially to cover the North and East parts of the country.

His presentation was followed by questions from Dr. Soh (WCPFC). Referring to the number of agencies related to the collection of fisheries data (slide #9), he asked the source of funding support, whether by government or from abroad. He also questioned about the weak points in data collection as listed in his slide which should have been resolved at the first stage of foreign assistance program.

Mr. Jayasooriya answered that in the past, FAO provided reconstruction supports when the country's fisheries were devastated by Tsunami in 2004. However, there has been no such support from international organizations in recent years. Due to many constraints, the quality of fisheries data is low and data cross-checks are not being thoroughly conducted. To tackle the problem in large scale fisheries, the country has requested assistance to the IOTC, but there is no assistance on the way for coastal small scale fisheries. Regarding the question of production increase, he said Sri Lanka would shift its focus to aquaculture, while at the same time seeking to improve other areas of the country's fisheries. He added that since Sri Lanka was still recovering from the devastation inflicted by long internal conflicts, support and assistance from international and regional fisheries organizations would be much needed.

31. Mr. Nadif Mohamed et M'kacher Houda from the Ministry of Agriculture of Tunisia provided a presentation on the country's fisheries management system. The following is the summary of his presentation:

The fisheries sector has a great social and economic significance in Tunisia. Legal and institutional framework for the country's fisheries management was formed in the early 1990s, on which the fisheries management of Tunisia is based. Recently, Tunisia is making efforts in fisheries research/development and management activities with assistance with development partners. For example, the Tunisian government and the Japanese government conducted a joint project that deployed artificial reefs (2005-2010), and the project will continue until 2016 with the Tunisian government's own funds. Other management tools include Vessel Monitoring Systems (VMS), which enable the tracking of vessels' location, travelling speed and directions and their areas of operation. Tunisia is currently actively joining RFMOs' efforts in combating IUU fishing, in particular by fully implementing resolutions adopted by ICCAT. Tunisia also has fisheries statistics and data management systems in place, whereby relevant data are collected, analyzed, processed and disseminated. However, the country is also faced with technical and financial difficulties in terms of improving VMS control systems and fisheries/aquaculture statistics and data management systems.

32. Mr. Paul Odartei Bannerman from the Ministry of Food and Agriculture of Ghana provided a presentation under the title of "*Challenges in Fisheries Data Collection and Management in Ghana.*" He gave a brief overview on Ghana's fisheries and then outlined the challenges faced by the country in terms of fisheries data management. The following is the summary of his presentation:

Ghana's fleet is mainly composed of purse seiners (13), pole and line vessels (21), canoes (120) and semi-industrial vessels. As the country also has abundant inland water resources, fishing industry is based on resources from both marine and freshwater including coastal lagoons and aquaculture. Given this, data are collected from various types of fisheries—artisanal, semi industrial, industrial, aquaculture and inland. The data requirements include catch by species, fishing effort, prices and value of fish, number of ports and landing sites, type and numbers of fishing units by gear category, biological parameters and environmental data, etc. Currently, 38 technicians are covering 52 landing sites along the coastline of Ghana, but the inland (freshwater) sector lacks adequate technicians to cover the areas. Data coming from tuna purse seiners are collected by observers trained through on-board observer programs. The number of observers is still not enough, but in 2008 NOAA & SWIFT organized a 4 week's practical training for all research and MCS staff. Although some progress has been made in recent years, Ghana is still faced with many challenges such as inconsistent and poor data quality, lack of funds, logistics and manpower, lack of quality check and control systems, under-reporting of catches, no VMS to monitor fishing vessels, lack of data storage systems.

To a question from Mr. Herrera (IOTC), concerning the time it would take for ICCAT to hand over full responsibilities for data collection and reporting to the Government of Ghana. Mr. Bannerman noted that the process is still on-going, and full transfer of responsibilities is expected to occur within the next 3 to 5 years.

Dr. Soh from the WCPFC asked how long the process had been taking place so far and Mr. Bannerman answered that it started in 2005 with new software provided by ICCAT, but there were two rounds of technical problems in 2006 and 2008 that involved bugs and language.

33. Indonesia, Morocco, the Philippines, Mauritius and Mauritania also offered to provide presentations, but no additional time was available for the participants to benefit from their experience and expertise.

Discussion on Addressing Data-related Issues and Possible Way Forward

34. Dr. Zang-guen Kim of the NFRDI Korea moderated the general discussion on Day 2 as the panelists (Dr. Vogel, Mr. Herrera, Dr. Soh, Dr. Ramm and Dr. Miyake) shared their thoughts on the pertinent topic.

35. Dr. Vogel said that database systems should be simple so that when technical assistance is given it could be easy to learn and maintain the system, depending less on outside aid sources.

36. Mr. Herrera noted that RFMOs have adopted standards for the collection and reporting of data that may differ and make it difficult for countries that have fleets operating within the area of competence of two or more RFMOs to collect and report the data requested in each case. He noted that tuna-RFMOs, following recommendations from the tuna-RFMO meeting in Kobe, have been working towards harmonization of data collection and reporting standards for species under their mandate with some progress made in this area. In particular, he noted that, unlike CCMLAR, the majority of tuna-RFMO Secretariats does not have full access to operational catch and effort data (i.e. fishing logbooks) from the fisheries in their regions, and data are generally submitted very late, noting that this compromises the ability of RFMOs to validate data reports and use recent information for the assessments. In addition, Mr. Herrera stressed the importance of socio-economic data, noting that although the majority of RFMOs have provisions to collect such data, the amount of data available is still very low. Finally, Mr. Herrera stressed the need for RFMO Members that receive assistance with their statistical

systems to make the necessary arrangements so as to ensure that government institutions take over the funding and monitoring of all activities implemented through capacity building programs once that foreign support is discontinued.

37. Dr. Soh said that he fully recognized the special requirements of developing states based on his experiences with PICs and especially with the WPEA participating countries. He also emphasized that while advanced countries kept on providing assistance to developing countries, developing countries should also take the initiative to join the international efforts on data collection and take responsibility to maintain what has been achieved through assistance.

38. Dr. Ramm made three points. i) identifying the types of data in fisheries management seems to be well understood and well established so it would be an area of less priority ii) developing and implementing data collection programs is still a challenging and outstanding issue iii) the industry has a big role to play in assisting collecting required data.

39. Dr. Miyake emphasized the importance of putting what we already knew into practice. He also reiterated that harmonization among RFMOs was also important, and the Kobe process was working towards that direction, and this harmonization could be extended to cover data collection. He noted that there were still many difficulties in the capacity building of developing countries and suggested that scientists from developing countries should be able to participate in science work such as stock assessments with their more experienced peers from advanced countries.

40. Mr. Eugene Pangelinan from FSM expressed concern that with the establishment of the WCPFC, small island developing countries in the Pacific region, which were already having problems in meeting regional data requirements, ended up bearing even heavier burdens. He also noted that the WCPFC, FFA and SPC had supported SIDSs in many ways at the regional level, but the assistance did not duly address the need of SIDSs to use fisheries data at the national level, not just for the benefit of RFMOs. He also emphasized the need for seeking additional funding sources since the success of capacity building depended on the constant inflow of funding.

Appendix 1

List of Participants

No.	First Name	Last Name	Country	Affiliation	E-mail
1	Joon-suk	Kang	Korea	Distant Water Fisheries Bureau, MIFAFF	
2	Chang-Ik	Zhang	Korea	Pukyong National University	cizhang@pknu.ac.kr
3	Kevin Ray	Piner	USA	NOAA/National Marine Fisheries Service	Kevin.Piner@noaa.gov
4	Makoto	Miyake	Japan	National Research Institute of Far Seas Fisheries	p.m.miyake@gamma.ocn.ne.jp
5	Ross M.	Walness	South Africa	BirdLife International	gsp@birdlife.org.za
6	Emmanuel	Schneiter	France	SPC-OFP	EmmanuelS@spc.int
7	Miguel	Herrera	Spain	IOTC	miguel.herrera@iotc.org
8	Nickolas W.	Vogel	USA	IATTC	nvogel@iattc.org
9	Sungkwon	Soh	Korea	WCPFC	sungkwon.soh@wcpfc.int
10	David	Ramm	Australia	CCAMLR	david.ramm@ccamlr.org
11	Sungil	Lee	Korea	NFRDI	silee@nfrdi.go.kr
12	Robert Anthony	Robinson	Belize	Belize Fisheries Department	robertrbz@gmail.com
13	Karlene Deanna	Williams	Belize	Belize Fisheries Department	karlenelw89@gmail.com
14	Bernal Alberto	Chavarria Valverde	Costa Rica	Ministry of Agriculture and Livestock	bchavarria@lsg-cr.com
15	Richard	Cardose	Curacao	Ministry of Economic Development	richard.cardose@gobiernu.cw rcardose@scarlet.an
16	Stephen	Mambi	Curacao	Ministry of Economic Development	stephenmambi@yahoo.com

17	Azza Abdel Hamid Mohamed Ahmed	El Ganainy	Egypt	National Institute of Oceanography and Fisheries	azzaelgan@yahoo.com
18	Atif Salah	Megahed Osman	Egypt	General Authority for Fish Resources Development	atifsalah_msm@yahoo.com
19	Eugene R.	Pangelinan	Federated States of Micronesia	National Oceanic Resource Management Authority	Eugene.pangelinan@norma.fm eugenep@mail.fm
20	Yvonne	Falieapiy	Federated States of Micronesia	National Oceanic Resource Management Authority	Yvonne.falieapiy@norma.fm
21	Christian	Ngwe Assoumou	Gabon	Fisheries and Aquicultura Department	cngwassoumou@yahoo.com
22	Jean Noel	Bibang Bi Nguema	Gabon	Fisheries and Aquicultura Department	jeannoel_b@yahoo.com

No.	First Name	Last Name	Country	Affiliation	E-mail
23	Nill Amasah	Namoale	Ghana	Ministry of Food & Agriculture	namoale@live.com
24	Hugo A.	Alsina	Guatemala	Directorate of Normativity for Fisheries and Aquaculture	hugo@aslina-et-al.org
25	Maria Rachel	Rodas	Guatemala	Directorate of Normativity for Fisheries and Aquaculture	ashadud@yahoo.es
26	Camara Youssouf	Hawa	Guinea	Ministere De La Peche Et De L'Aquaculture	youssoufh@yahoo.fr
27	Camara	Sény	Guinea	Direction Nationale De La Peche Maritime	senytowel@yahoo.fr
28	Riana	Handayani	Indonesia	Ministry of Marine Affairs and Fisheries	daya139@yahoo.co.id
29	Sri	Indrastuti Retno Handayani	Indonesia	Ministry of Marine Affairs and Fisheries	indrastuti@kkp.go.id
30	Teeteu	Moriti	Kiribati	Ministry of Fisheries and Marine Resources Development	teeteum@mfmrd.gov.ki
31	Ometa	Tauro	Kiribati	Ministry of Fisheries and Marine Resources Development	ometat@mfmrd.gov.ki
32	Haye Ould	Didi	Mauritania	Ministry of Fisheries and Maritime Economy	hayedidi@gmail.com hdidi@peches.gov.mr hayedidi@yahoo.fr
33	Pradeep	Neermul	Mauritius	Ministry of Fisheries	pneermul@mail.gov.mu

34	Anwar	Sheik Mamode	Mauritius	Ministry of Fisheries	asheik-mamode@mail.gov.mu
35	Grichat	Hicham	Morocco	Ministry of Agriculture and Marine Fisheries	grichat@mpm.gov.ma hgrichat12@gmail.com
36	Dhyar	Mouloudi	Morocco	Ministry of Agriculture and Marine Fisheries	mouloudi.dhyar@mpm.gov.ma mdhyar@yahoo.fr
37	Ibrahina Angelica	Blandon Bojorge	Nicaragua	Instituto Nicaragüense de la Pesca y Acuicultura	iblandon@inpesca.gob.ni
38	John Stek	Joseph	Papua New Guinea	Morobe Fisheries Management Authority	jstekjoseph@gmail.com
39	Vakuru	Bola	Papua New Guinea	National Fisheries Authority	vbola@fisheries.gov.pg vyczor@gmail.com
40	Foungnigue	Traore	Republic of Côte d'Ivoire	Aquaculture and Fisheries Directorate	tfonie@yahoo.fr
41	N'goran Emile	N'drin	Republic of Côte d'Ivoire	Aquaculture and Fisheries Directorate	ndrinngoranemile@yahoo.fr
42	Netani	Tavaga	Republic of Fiji	Fisheries Department	stone_domain@hotmail.com
43	Hilda	Lobendahn	Republic of Fiji	Fisheries Department	hilda2000fj@yahoo.com
44	Terence	Amram	Republic of Nauru	Nauru Fisheries and Marine Resources Authority	tamramnr@yahoo.com terry.amram@naurugov.nr
45	Karlick	Agir	Republic of Nauru	Nauru Fisheries and Marine Resources Authority	Karlick.agir@naurugov.nr

No.	First Name	Last Name	Country	Affiliation	E-mail
46	Gladys Sara	Cardenas de Pellon	Republic of Peru	Pelagic Resources Investigation	gcardenas@imarpe.gob.pe gcardenas7@hotmail.com
47	Omar Ricardo	Rios Bravo de Rueda	Republic of Peru	General Direction of Extraction and Fishing Processing	orios@produce.gob.pe omrios35@hotmail.com
48	Lucille	Aukusitino	Samoa	Ministry of Agricluture and Fisheries	lucille.aukusitino@maf.gov.ws lucytino@gmail.com
49	Mahmoudane Ndiawar	Diop	Senegal	Directorate of Maritime Fisheries	ndiawardiop6@yahoo.fr
50	Lamine	Mbaye	Senegal	Directorate of Maritime Fisheries	lamine.mbaye67@gmail.com
51	Robert	Maneiria	Solomon Islands	Ministry of Fisheries and Marine Resources	rmaneiria@fisheries.gov.sb

52	Alan Kirk	Aba	Solomon Islands	Ministry of Fisheries and Marine Resources	akirk@fisheries.gov.sb
53	Dingiri Banda	Jayasooriya Arachchillage	Sri Lanka	Ministry of Fisheries and Aquatic Resources Development	stat@fisheries.gov.lk b.jayasooriya@yahoo.com
54	Ambalangodage Ariyasena	Fernando	Sri Lanka	Ministry of Fisheries and Aquatic Resources Development	ariyasenafdo@yahoo.com
55	M'kacher Epouse Zouari	Houda	Tunisia	Ministry of Agriculture	houda.mkacher@yahoo.fr
56	Mohamed	Nadhif	Tunisia	Ministry of Agriculture	nadhif.mohamed@apip.com.tn
57	Rodrigo	Forselledo	Uruguay	Pelagic Resources Laboratory	rforselledo@gmail.com
58	Raul Chiu	Millana	Philippines	Bureau of Fisheries and Aquatic Resources	millanaraul@gmail.com
59	Mayumi	Sato	Japan	BirdLife International	sato@birdlife-asia.org
60	Klaas	de Vos	The Netherlands	International Sustainability Unit	klaas.devos@royal.gsx.gov.uk
61	Paul Odartei	Bannerman	Ghana	Ministry of Food & Agriculture	paulbann@hotmail.com

Appendix 2

MINISTRY OF FISHERIES

Overview Fisheries Policies and Structure

Information Paper - Mauritius

P.Neermul[1], A.Sheik Mamode[2]

Mauritius is very dependent on the sea and its resources mainly for its fisheries and tourism industries. The fisheries sector has always contributed to the nation's socio economic development, generated national income and foreign exchange and most importantly, it has been an indispensable source of animal protein for the people and contributes to food security.

Mauritius including its outer islands of Rodrigues, St Brandon, Agalega, Tromelin and Chagos Archipelago has an Exclusive Economic Zone (EEZ) of around 1.9 million km^2, along with an extended Continental Shelf area of 396,000 km2 conferred jointly to Mauritius and Seychelles. However, it has a limited shelf around the islands except for larger shelf areas on certain banks situated far to the north. The lagoon area around the main island of Mauritius is 243 km2.

Description of the Fisheries Sector

The EEZ of Mauritius has a reasonable stock of various fish, including pelagic and demersal species. Fisheries resources exploited include the island-based artisanal fisheries (lagoon and off-lagoon), Fish Aggregating Devices (FADs) fishery (off-lagoon), the offshore demersal fishery of the banks of the Mascarene Plateau and the Chagos Archipelago, and the tuna fishery in the Western Indian Ocean (industrial fisheries). The Government of Mauritius is promoting marine aquaculture. The

[1] Scientific Officer
[2] Scientific Officer

Mahebourg Fish Farm started operations in 2002, farming mainly red drum (Scyanops ocellatus) and the sea bream.

Economic outlook of the Fisheries Sector

- Turnover in fisheries sector –Rs. 19.85 billion
- Fish processing industry contributes some - Rs. 7.8 billion
- 700 calling fishing vessels in the port sector generate some Rs. 8 billion
- Local production of fish and fish products – Rs. 1.7 billion
- Licences and Import Permits – Rs. Rs. 51 million
- Import of fish and fish products – Rs. 7.8 billion
- Export of fish and fish products Rs. 10.1 billion (re-export – 2.3 billion)
- Trade balance – Rs. 2.3 billion
- Export of Fish and fish preparation constitutes 16.3% of the national export.
- Total active employment : 11,900
- Per capita consumption of fish: 23.4 kg.

Seafood Hub

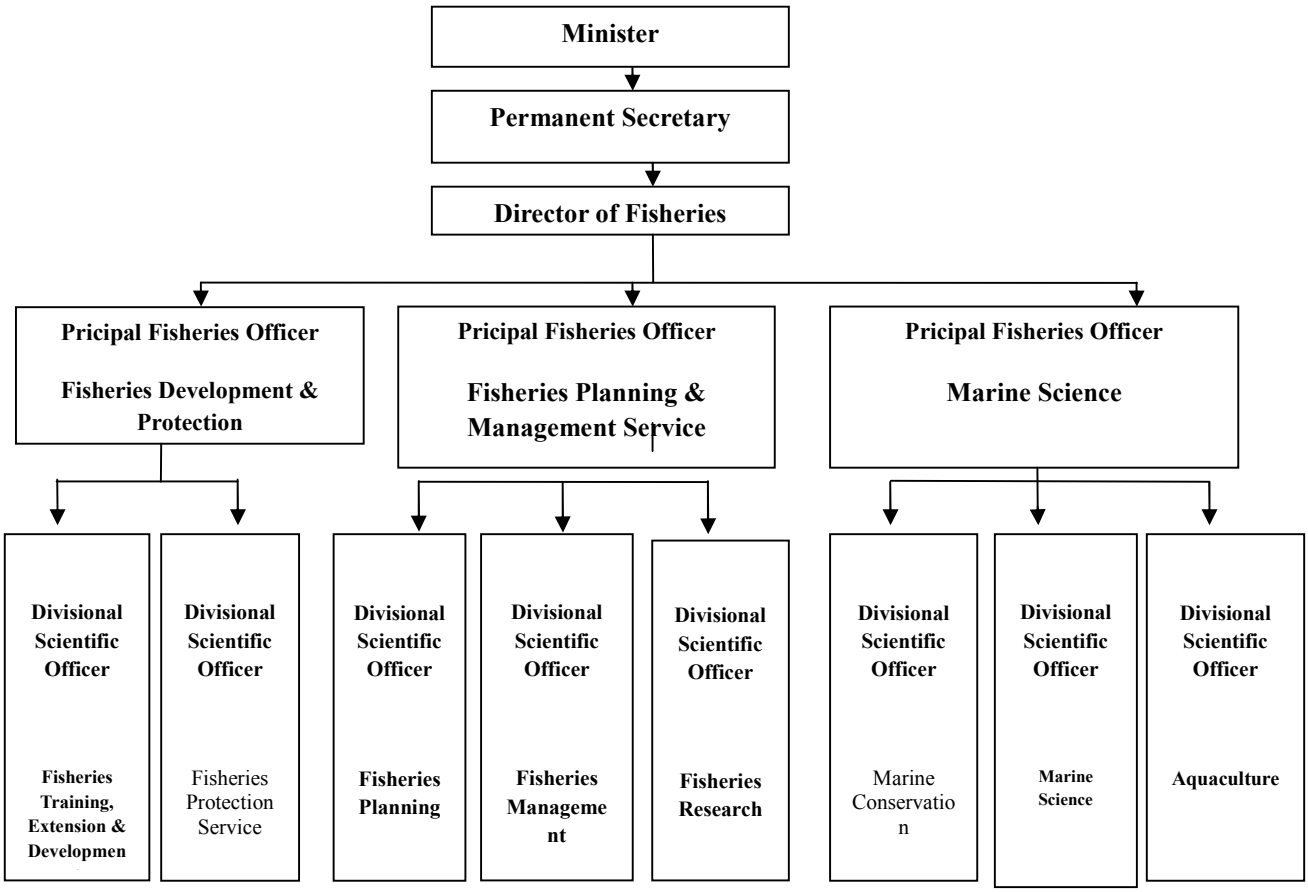
Joint Public Private sector initiative for policy action. It provides for a One Stop Shop service to facilitate the administrative procedures for loading/unloading/export of fish and fish products. Access the entire value chain of the Mauritius Seafood Hub: Port & Logistics. Ancillary facilities: Dry docking, Ship Handling, Bunkering, Ship& net repairs. Tuna Canning/loining where export of tuna constitutes about 95% of the total export value of fish and fish products from Mauritius.

INSTITUTIONAL ARRANGEMENTS

Responsibility for fisheries matters is under the Ministry of Fisheries. The Ministry has the responsibility for management and policy advice, as well as development of near-shore and offshore fisheries and aquaculture. It acts as a facilitator and a catalyst for promoting fisheries production, development, processing and export through the provision of legal backup and institutional support to enable realization of Government Programmes. The technical side, headed by a Director, operates three main departments responsible for Management, Research and Training and Protection through 8 Divisions. The key goals for fisheries management are to develop and manage the fisheries and marine resources for an optimum sustainable yield, to facilitate import and export of fish and fish products and to provide a rapid and efficient service to fishing vessels, implement port state measures and to

monitor fishing vessels operating in the EEZ. Research is carried out by the Albion Fisheries Research Centre, set up in 1982 by the Government. The protection of the marine resources is under the Fisheries Protection Service that works closely with the National Coast Guard (NCG) in Monitoring Control and Surveillance. The FD also works in constant coordination with the Board of Investment (BOI) and private sector, within the framework of government strategy to create a center of excellence in the area of trade, services and processing related to fish and fish products.

Organigram of the Technical and Scientific Division of the Ministry of Fisheries



Policy

The Fisheries Sector is driven by the strategy of Government with the objective of increasing its contribution to the GDP of the country in the coming decade to the extent possible. The Policy encompasses amongst others; fisheries legislation, International legal instruments and a number of financial instruments for fisheries development.

It hinges upon:

- Sustainable fisheries development and management;
- Ecosystem approach to fisheries;
- e food security and increase fish production;
- at Illegal, Unreported and Unregulated Fishing (IUU) for sustainable opment;
- city building and empowerment in support of fisheries development and gement;
- capacity development/Stake-holding capture in Fisheries;
- Investment opportunities
- Fisheries Infrastructure Development;
- Fisheries Management and
- Market access (sustainability, traceability, eco-labeling)

Divisional Scientific Officer

Fisheries

2. The main legal instruments are: the *Fisheries and Marine Resources Act* of 2007, the *Fishermen Welfare Fund Act* of 2000, the *Fishermen Investment Trust Act* of 2006, *the Marine Protected Area Regulations* 2001/2007, the *Export of fish and fish products Regulations* of 2006, *Toxic fish Regulations* of 2004, Prohibition of removal of coral and sea-shell 2006, *Fishing of Sea Cucumbers Regulations* of 2009, the *Vessel Monitoring System Regulations* of 2005 and the *Undersized Fish Regulations* of 2006. In addition a National Plan of Action to prevent, deter and eliminate Illegal, Unregulated and Unreported
been prepared, approved by Government in 2

3. The Mauritian Government has adhered to the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas; and the Agreement related to the Conservation and Management of Straddling and Highly Migratory Fish Stocks of the United Nations Law of the Sea (Fish Stocks Agreement) of 1995. Other relevant instrument is the Code of Conduct for Responsible Fisheries.

4. Mauritius is also a member of the Indian Ocean Tuna Commission (IOTC); Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR); and South West Indian Ocean Fisheries Commission (SWIOFC). Being a member of these organisations, it implements all their fishery conservation and management measures. It has also signed the Southern Indian Ocean Fisheries Agreement (SIOFA).

5. Mauritius is presently developing its fisheries management plans for lagoon and off-lagoon based on the Ecosystem Approach to Fisheries. The management tools utilized for the control of the lagoon fishery include marine protected areas, closed seasons (for large nets and gillnets), gear size and gear type restrictions, minimum size restrictions (of common commercial fishes) and limitation on number of nets licences. The closed period of five months in summer coincides with breeding periods of different populations of commercial fish species. The marine protected areas (where nets are not allowed to operate), provide additional protection to the adult as well as the juvenile fish populations throughout the year. Other measures include relocation of fishing effort from the lagoon to the outer lagoon areas with the establishment of a Fish Aggregating Device (FAD) programme.

6. In the banks fishery, the following management tools are utilized: limited number of licences, limited entry, and total allowable catch (TAC).

- A limited entry system has been established in the banks fishery whereby all fishing vessels operating on the shallow water banks are licensed.
- A quota system is also in place in the banks fishery with a TAC of 3 800 tonnes.
- 18 boats are involved in the chilled fish fishery. All vessels are licensed and quotas are being allocated.
- An interim management plan is in place in the deep-water snapper fishery (slopes of the banks) where only 15 vessels are allowed to fish for a total catch of 500 tonnes

7. In June 2005 a Vessel Monitoring System (VMS) was set up to monitor the fishing activities in the EEZ. All licensed fishing vessels must be equipped with an operational VMS on board before embarking on a fishing campaign.

8. One of the main challenges of illegal fishing is transshipment on the high seas by fishing vessels. Transshipment is not allowed in the maritime zones of Mauritius except in a port or with the written Authorization of the Permanent Secretary.

9. The Competent Authority responsible for subject of fisheries and marine resources of the Ministry ensures that all sea food processors operate in accordance with international seafood norms and standards (HACCP, SPS & EU Regulation). All sea food processors operate in accordance with the highest international standards including EU norms and requirements.

10. Mauritius ensures Port State Measures as described in the FAO Model Scheme [advance notification of vessels, denial of access, cooperation with other States and Regional Fisheries Management Organisations (RFMOs) and port inspections]. A unit based at the port has been set up to monitor the activities of all fishing vessels calling in the port and ensures the implementation of all resolutions of RFMOs to which we are party. With regard to trade related measures (Market Access) Mauritius abides with IOTC and the International Commission for the Conservation of Atlantic Tunas (ICCAT) Statistical Document Programmes for bigeye and swordfish respectively; the CCAMLR Catch Documentation Scheme for patagonian toothfish; and EU/IUU Catch Document besides many other supporting actions.

11. During the past years, a number of conservation and management measures have been taken to ensure the protection of the marine environment and conserve fisheries resources. Some of the measures are:

(a) banning the removal and sale of corals and shells;
(b) prohibition of mining of corals for production of lime;
(c) prohibition of underwater fishing;
(d) tight control on import, storage and utilisation of dynamites;
(e) reduction of large net and gill net fishing under a buy-back programme;
(f) prohibition of lagoonal sand removal as from September 2001 in order to protect the lagoon resources from adverse environmental effects;
(g) propagation of mangrove plants in appropriate coastal areas in order to increase nursery and feeding grounds and fish productivity;

(h) requirement of an Environment Impact Assessment under the Environment Protection Act for undertaking any project in the coastal zone and marine environment; and
(i) Mooring of buoys have been placed in one Marine Park and near dive sites to reduce damage on corals.

12. A major step to safeguard marine ecosystems has been the proclamation of two Marine Parks on 11 October 1997 under the Wildlife and National Parks Act, 1993. Subsequently the two marine parks and six fishing reserves were proclaimed under the Fisheries and Marine Resources Act, 1998 in 2000 and regulations for the management of the marine parks have been passed in 2001 and 2008.

13. One of the main achievements of the government to protect the marine ecosystem was the declaration of the Blue Bay Marine Park as a Ramsar Site in April 2008. It thus makes more provisions to further strengthen measures for the protection of the coastal zone and the marine ecosystem.

14. Several marine mammals are sighted in the waters of Mauritius. The Fisheries and Marine Resources Act makes provision to protect the marine mammals and turtles. Thus, fishing of these marine mammals and turtles is prohibited.

15. MPA have been established to meet several goals, including conservation of biodiversity and habitat, increased scientific knowledge, Provide control sites for research and ecological benchmarks, educational opportunities, enhancement of recreational activities, maintenance of ecosystem services, protection of cultural heritage, and managing fisheries.

16. Through the development of ecosystem-based MPA management plans, the Ministry of Fisheries is supporting the implementation of Integrated Coastal Zone Management ICZM Strategy for the Republic of Mauritius in terms of protection and management of ecosystem function of important, essential and vulnerable coastal/lagoonal/marine habitats such as seagrass beds, coral reefs and mangroves ecosystems.

17. Aquaculture Master Plan 2007

- 21 potential sites identified
- Barachois for 'ecotourisme aquacole'
- Inland fish farming
- Annual production estimates
    - 29,000 t in the medium term
    - 39, 000 t in the long term

18. Fisheries Master Plan

The plan has a 10 year strategic horizon and a 5 year action plan which encapsulates and supports the principles and values of 'Sustainable Mauritius'. **The overriding conclusion reached is that the Master Plan** is in line with global trends of integrated management, addresses the issues of the broader seafood sector, including the entire value chain from production of both capture fisheries and aquaculture to distribution and processing through to marketing issues. It contains some 21 projects. A multi-sectoral committee is studying all the recommendations and assessing the implications thereof.

Appendix 3

OVERVIEW OF SOLOMON ISLANDS FISHERIES RESOURCES

Introduction

Solomon Islands is located at Lat 5 degrees and 12 degrees South of Equator and Long. 152 degrees and 163 degrees East. It has a land mass of 28,370 Km^2 with 200 miles Exclusive Zone covering approximately 1.34 million Km^2. It has a population between 550,000 to 580,000 with more than 80 % dwell in the rural area involving subsistence cultivation, and fishing to support their livelihood. The annual birth rate is 4.4%. The Fisheries sector's contribution to the National economy is 20% and average fish consumption rate was 32 kg / person for the entire country.

Government Policy.

> "The sea is one of the Solomon Islands main sources of livelihood and the Government aims at maximizing national income through the harvesting of marine resources emphasis will be placed on effective management and rational sustainable use of Marine living Resources."
>
> This needs amendment of the Fisheries Act and now is its final stage of review 2012,

Offshore / Tuna Fisheries

Foreign fleets under bilateral arrangements including foreign fleet under charted agreements and domestic (local) vessel paid license fees for commercial tuna fishing. The three main gear used is purse seine (PS) , longline (LL) and pole and line (PL) see (fig 1.0 and Fig 2.0)

Fig 1.0 Fleet composition 2007 – 2010

	FOREIGN FISHING VESSEL			DOMESTIC FISHING VESSEL		
YEAR	PS	LL	PL	PS	LL	PL
2007	115	190	2	5		
2008	113	213	20	4		
2009	114	235	14	8	1	1
2010	117	227	15	5		0
2011	108	260	15	4		3

Fig 2.0 Fleet Size / Gross Tonnage

FLEET BY SIZE AND GROSS TONNAGE					
PS		LL		PL	
Length (M)	GTR	Length (M)	GTR	Length (M)	GTR
58 -89	240 - 2300	11 - 58	169 - 700	28 - 66	60 - 500

The targeted tuna species are skipjack *(Katsuwonus pelamis),* yellowfin tuna *(Thunnus albacores),* bigeye tuna *(T. obesus),* and albacore *(T. alalunga) whiles* sword fish, blue marlin, striped marlin and black marlin are also caught by the long line vessel Fig 2 shows the catch by fleet. Foreign fleet dominated tuna catch and overall catch composition by comprises of skipjack 71%, yellowfin 24%, Bigeye 2%, Albacore 2% and others 1%.

Fig 3.0 Catch by fleet

	CATCH BY DOMESTIC VESSEL] (MT)			CATCH BY FORIEIGN VESSEL. (MT)				COMPARE CATCH %	
YEAR	PL	PS	LL	PL	PS	LL	Total (mt)	Domestic %	Foreign %
2007	2,762	15,094	1,836	35	61,227	10,860	91,814	21	79
2008	1,340	15,072	-	990	77,480	105TFR,805	105,687	16	84
2009		17,801			57,653	18,469	93,923	19	81
2010		12,967			65,710	15,817	94,494	14	86

The economic benefit from the tuna fisheries is very minimal. Besides license fees, transshipment, fines for illegal fishing, payment for vessels day scheme (days shared for fishing) contributes to Government's revenue. The tuna catch by foreign fleet are landed in foreign ports and very minimal fees of USD2/mt for purse seine and USD12 for tuna longline are charged for transshipment in local ports. Only domestic fleet lands part of catch for the cannery, loining and fishmeal for production and exports rest as frozen tuna. The maximum raw tuna for cannery production is 70 mt / day. The raw tuna to process canned tuna is insufficient according to Cannery supervisor report.

Frozen tuna are exported mainly to Thailand, Canned tuna and fishmeal are exported to Pacific Islands countries, smoke tuna to Japan , Tuna Loin to Italy.

Fig 4.0 Tuna Products.

SUMMARY OF TUNA PRODUCTS EXPORTS 2007-2011 (SBD)						
Year	Frozen fish	Canned fish	Smoked fish	Fishmeal	Loin	Total (SBD)
2007	107,481,223	13,764,508	3,237,525	528,335	72,031,913	197,043,504
2008	201,866,170	16,549,246		1,785,938	73,460,076	293,661,430
2009	52,981,769	12,171,298		320,743	65,471,526	130,945,336
2010	28,906,428	2,971,363		73,171	16,606,465	48,557,427
2011	81,003,170	14,514,537		1,546,427	176,656,265	273,720,399

Solomon Islands gains very little benefit from the Tuna Industry. The government has taken step to improve this. Tuna Development Policy shift 2006 and is adopted by the current government.

- Foreign Vessel to overload certain percentage of tuna caught in Solomon waters for local tuna cannery.
- Retain by catch and under size tuna from foreign fishing vessels transshipping in port for local processing.
- Increase the fees for transshipment for both Purse seiners and Long liners and review all fees
- Restrict fishing in the main group agepelago waters (MGA)
- Review the Tuna Management plan, Development plan and investment policy
- Encourage Onshore development and processing of tuna products like (tuna loin, canned fish, fishmeal and smoke tuna,

Inshore Fishery.

The rural population depend on the coastal resources for their sustenance. These resources however are under threat due to increasing population, in appropriate use of land, impacts from climate change, overharvesting due to cash economy, impacts of logging and coastal development

Marine products such as bech d mer, gold lip, brown lip, green snail are now over exploited. If proper management is not put in place then soon trochus, clam shell, coral and small fish for aquarium trade will be exploited. The government is committed to ensure that

- Develop Management plan for the inshore resources
- Encourage Aquaculture development - especially mariculture (sea weed, tilapia, clam, bech dmer, and other types of farming for subsistence and commercial

development and to encourage conservation of marine resources to ensure sustainable harvesting.

- Proper Market infrastructure is place , assist with sea transport of products to urban centre.
- Assist local fishers with adequate resources in the development fishery industry
- Provide assistance to empower resources owners to manage and enforce law over their resources.

Data Management.

The Statistics and Information unit in response to translates Government policy with goal of providing *timely information on the Marine sources.*

Regional Logsheet reports from all fishing vessels are received by fax, email, surface mail, collected by authorized officers boarding fishing vessels coming to port . License condition states logsheets must be send to Fisheries after 15 days in port, and original logsheet after 45 days trip or landing. Other important report received by email and fax is Entry, weekly, departure and trip completion report. Transhipment form, Vessel Day scheme (VDS) is updated by FFA and Fisheries office is informed accordingly. Vessel Monitoring System (VMS) is used to monitor the vessel location. Logsheet , weekly reports, transshipment data are entered into TUFMAN Database which is a Tuna Management system developed by Oceanic Fisheries Programme (OFP).

Solomon Islands is member of the FFA, South Pacific Community (SPC), and Western Central Pacific Fisheries Commission (WCPFC). A member of Parties to Nauru Agreement (PNA) which was formed in 1981. The 8 members countries comprising of PNG, Tuvalu, Palau, FSM, Marshall Islands, Nauru, Kiribati and Solomon Islands all located in the Western Central Pacific Ocean which has the largest remaining tuna stock in the world.

Solomon Islands and member countries has an obligation to provide tuna data to SPC , WCPFC and PNA that helps to come up with Tuna management measures to avoid overfishing of tuna stock. Some control measures now implemented are :

- Closure of international waters (pocket) between member states.
- Closure of FADs (July – Sept)
- Introduction of vessel day scheme. (VDS)
- Improve of vessel monitoring by (100 percentage coverage, on purse seiners, Use of VMS to tract vessel)
- Reduction of number of vessel

On the other hand the inshore resources data held at MFMR showed that important marine product such as bech d mer as example is over exploited.

The Ministry encounters some problems with Data which include the following.

Data Gaps.

1. Delay in logsheets / reports to enter
2. Lack of manpower for data entry.
3. Lack of technical knowledge and skill in analyzing these data
4. Inconsistency of logsheet (some vessels use different version)
5. Difficulty to read logsheets because of poor writing
6. Difficulties in reconciling or comparing different data sets.
7. Difficulties in getting good inshore data to enhance developing proper management plan for Inshore fishery.

FISHERIES ORGANISATION STRUCTURE

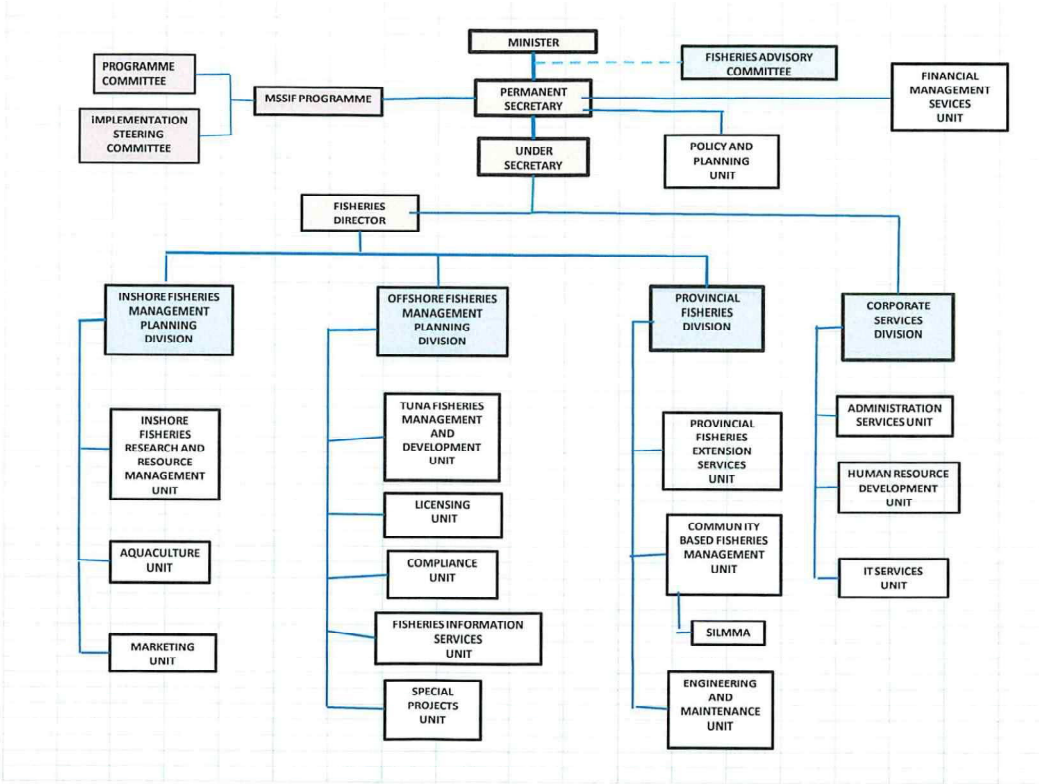


Figure 1 Proposed MFMR Organisation Structure

27

The MFMR organization structure has five Divisions, Policy Services Unit and Financial Management Services Unit:

- Inshore Fisheries Management Planning Division
  - Inshore Fisheries Research and Resource Management Unit
  - Aquaculture Unit
- Offshore Fisheries Management Division
  - Tuna Fisheries Management and Development Unit
  - Special Projects Unit
- Provincial Fisheries Division
  - Provincial Fisheries Extension Services Unit
  - Community Based Fisheries Management Unit (+ SILMMA)
  - Engineering and Maintenance Unit
- Fisheries Operations Division
  - Licensing Unit
  - Compliance Unit
  - Fisheries Information Services Unit
  - Marketing Unit
- Corporate Services Division
  - Administration Services Unit
  - HRD Unit
  - IT Services Unit
- Policy and Planning Unit
- Financial Management Services Unit

Conclusion:

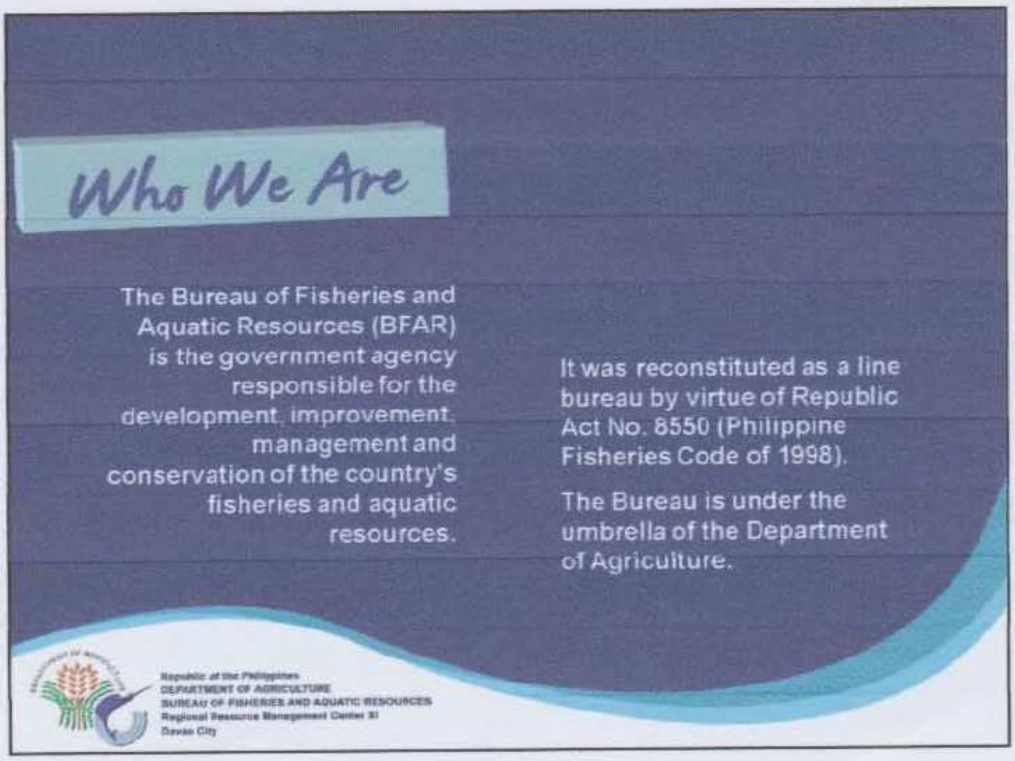
The government policy encourages conservation, sustainable harvesting and management that will ensure maximizing benefit for the marine resources. In response to government policy MFMR has taken step to work on Offshore and Inshore fisheries strategies , reorganizes its organizational structure and will work closely with its stakeholders which include the NGOs, donor partners , regional organization , agencies and communities to achieve government's National fishery policy.

Appendix 4

Fisheries Policies and Structure for BFAR

Mr. Raul C.Millana , BFAR XI, Davao City, Philippines


the Organization
Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City


Who We Are
The Bureau of Fisheries and Aquatic Resources (BFAR) is the government agency responsible for the development, improvement, management and conservation of the country's fisheries and aquatic resources.
It was reconstituted as a line bureau by virtue of Republic Act No. 8550 (Philippine Fisheries Code of 1998).
The Bureau is under the umbrella of the Department of Agriculture.
Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Vision

A modernized fisheries that is technologically advanced and globally competitive.

Its transformation is guided by sound management practices of resource sustainability, the principle of social justice and strong private sector participation.

Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Mission

- Conserve, protect and sustain the management of the country's fishery and aquatic resources;
- Alleviate poverty and provide supplementary livelihood among municipal fisherfolk;
- Improve aquaculture productivity within ecological limit;
- Utilize optimally the off-shore and deep-sea resources; and,
- Upgrade Post-Harvest technology

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BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Functions

As a line bureau, BFAR has the following functions:

FOOD SECURITY

- Prepare and implement a comprehensive National Fisheries Industry Development Plan;
- Formulate and implement a Comprehensive Fishery Research and Development Program;
- Coordinate efforts on fishery production undertaken by the primary fishery producers, LGUs, FARMCs, fishery and organizations/cooperatives;
- Coordinate with LGUs and other concerned agencies for the establishment of productivity enhancing and market development programs in fishing communities.

Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Functions

CONSERVATION & MANAGEMENT

- Establish a corps of specialist in collaboration with the Department of Local Government, Department of Foreign Affairs, for the efficient monitoring, control and surveillance of fishing activities;
- Formulate rules and regulations for the conservation and management of straddling fish stocks and highly migratory fish stocks;
- Issue identification cards to fish workers engaged in commercial fishing;

Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Functions

CONSERVATION & MANAGEMENT

- Monitor all laws, rules and regulations governing the conservation and management of fishery resources;
- Enforce all laws, rules and regulations governing the conservation and management of fishery resources;
- Issue licenses for the operation of commercial fishing vessels;

Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Functions

GLOBAL COMPETITIVENESS

- Advise and coordinate with LGUs on the maintenance of proper sanitation and hygienic practices in fish markets and fish landing areas;
- Develop value-added fishery products for domestic consumption and export.
- Implement an inspection system for import and export of fishery/aquatic products and fish processing establishment consistent with international standards to ensure product quality and safety;

Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Functions

SUPPORT SERVICES

- Provide extensive development support services in all aspects of fisheries production, processing and marketing;
- Assist the LGUs in developing their technical capability in the development, management, regulation, conservation and protection of the fishery resources.
- Establish and maintain a Comprehensive Fishery Information System;
- Provide advisory services and technical assistance on the improvement of quality of fish;

Republic of the Philippines
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Regional Resource Management Center XI
Davao City

Our Service Pledge

Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Resource Management Center XI
Davao City

Service Pledge

We, the officials and employees of the
Bureau of Fisheries and Aquatic Resources XI
do pledge:

to perform and deliver tasks and services to our stakeholders with promptness, efficiency and transparency;

to implement programs, projects and activities tailored to the needs of our stakeholders;

to impart appropriate knowledge, skills and expertise that upholds utmost standard of integrity in our work;

to anticipate new challenges and opportunities, and respond to these aptly and constructively;

Service Pledge

to maintain a dynamic and output-oriented workforce striving for professionalism and continuous advancement;

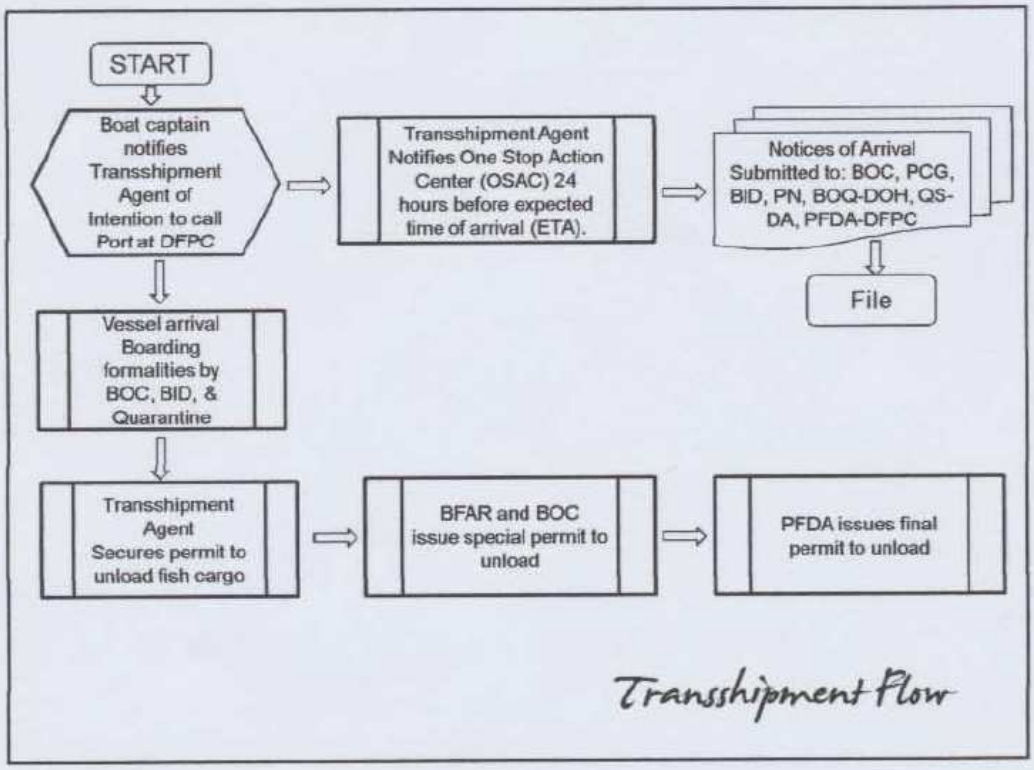
to keep strong linkages among our co-workers, partner project implementers and stakeholders, and work with them in spirit of reciprocated regard and trust; and

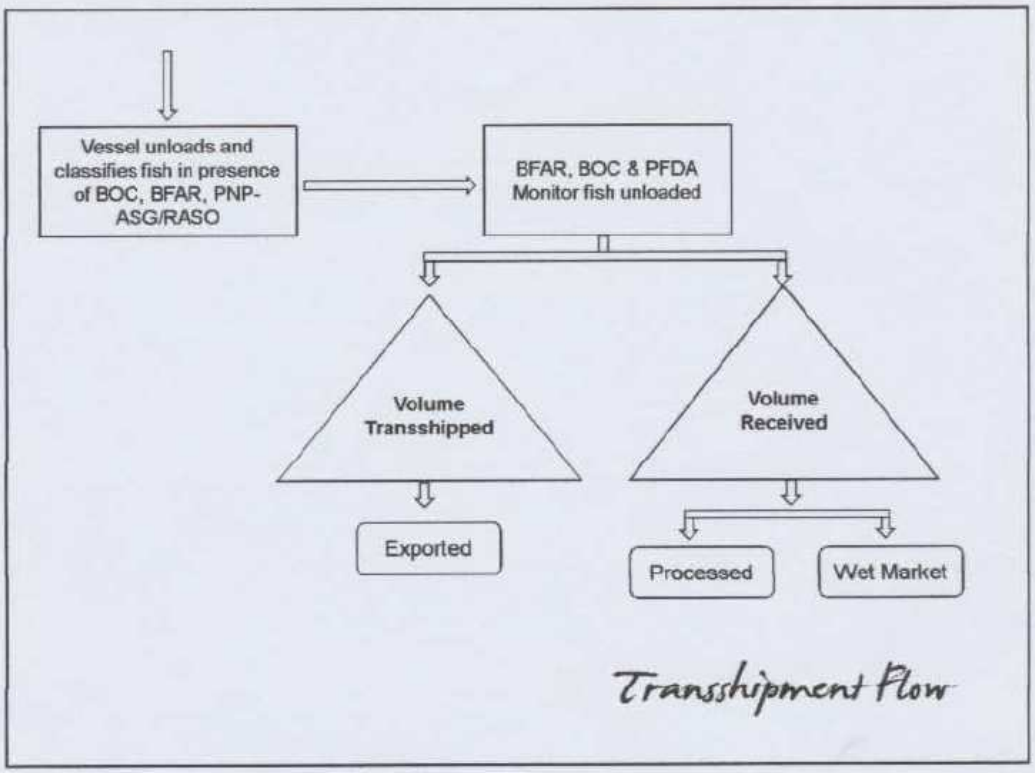
to offer the best public service in a most rewarding manner by taking part in our respective roles for the sustained development of the fishery sector in the pursuit of food security, conservation and management, global competitiveness and support services.

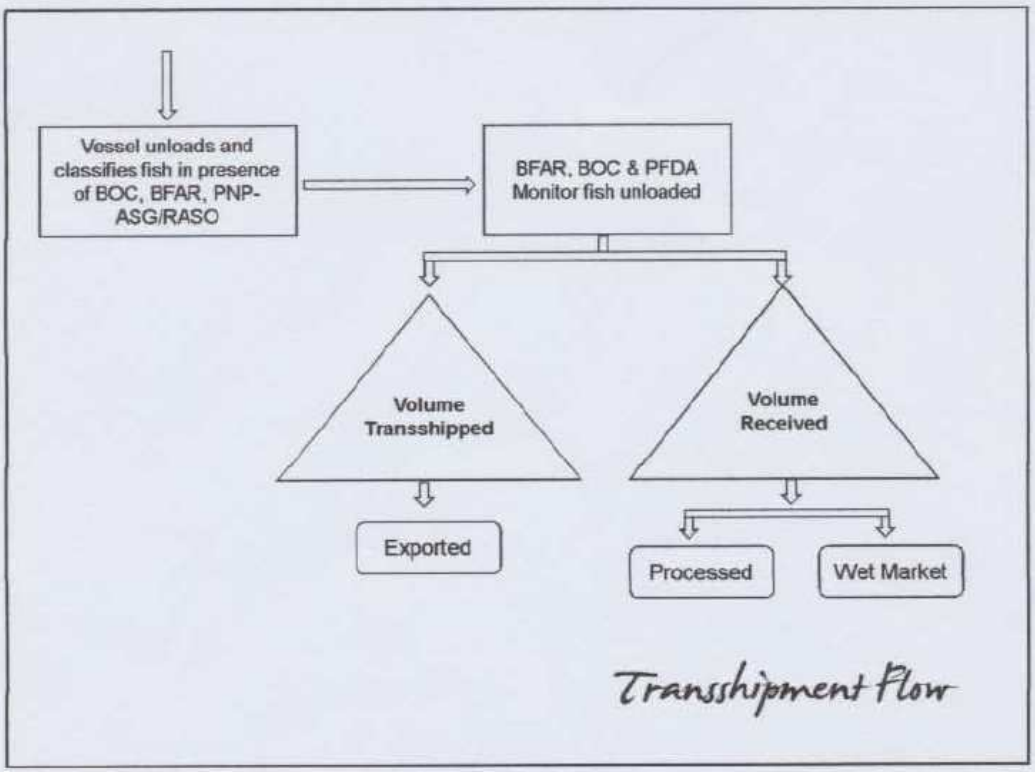
Our Frontline Services

Our Other Frontline Services

Transshipment Flow




Vessel unloads and classifies fish in presence of BOC, BFAR, PNP-ASG/RASO
BFAR, BOC & PFDA Monitor fish unloaded
Volume Transshipped
Volume Received
Exported
Processed
Wet Market
Transshipment Flow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Volume Transshipped
Volume Received
Exported
Processed
Wet Market
Transshipment Flow

The Stock Assessment Program

The Bureau has the mandate to conduct continuous stock assessment of the major fishing ground of the country to:

Provide scientific information on the current status and future trends in abundance and productivity of exploited marine resources.

Provide technical basis for setting annual fishery quotas and other fishery management measures that will achieve optimum yield from the fishery while avoiding overfishing and ecosystem harm

Serves as primary source of data feed into mathematical models that represent the demographics of the harvested fish stock and produce estimates of relevant fishery management factors.

The Stock Assessment Program

Generate reliable data for the formulation of policies for the management and conservation measures of the Region XI marine resources for the attainment of sustainable development in marine fisheries.

Determine the seasonal distribution, relative abundance, size and species compositions of the major marine resources in Davao Gulf.

Provide estimates of population parameters of the major marine resources in Davao Gulf.

Our frontline services

Fish Health Management and Quality Assurance

1. Laboratory Analysis and Molecular Diagnosis
2. Fish Disease Surveillance
3. Fish Kill Investigation
4. Water Quality Monitoring/ Plankton Identification
5. Residue Monitoring
6. Farm Registration *(for suppliers of export to EU)*
7. Shrimp Hatchery and Grow-Out Farm Accreditation
8. Seaweed Health Monitoring
9. Harmful Algal Bloom (HAB) Monitoring *(Red Tide and Ciguatera)*

Our frontline services

Chemistry Analytical Laboratory

Chemical analysis on fresh frozen or processed fish and fishery products:

1. Histamine
2. Moisture
3. Trace heavy metals: Mercury, Lead, Cadmium, Copper
4. Tri-methylamine
5. Total Volatile Base-Nitrogen

Microbiological Examination

Microbiological analysis on fresh, frozen, chilled fishery products; ice, water used in processing plants:

1. Aerobic Plate Count
2. Staphylococcus aureaus
3. Salmonella
4. Shigella
5. Escherichia coli
6. Coliform

Other Services:

- Yeast count
- Mold count
- Enterococci

Our frontline services

Fish Inspection and Quarantine Services

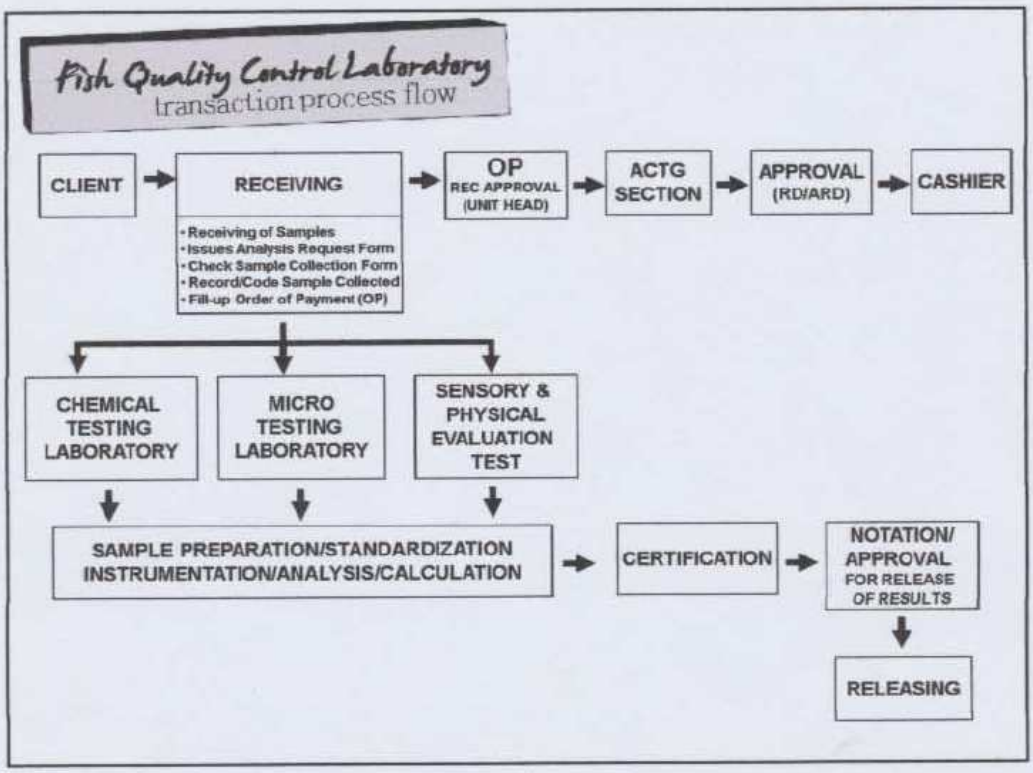
1. Issuance of Domestic Clearance
2. Issuance of Commodity Clearance
3. Issuance of Export Permit
4. Issuance of Import Permit
5. Inspection/Monitoring of Incoming/Outgoing Domestic and Foreign Vessel and Aircraft
6. Administrative Support and Product Certification (ASPC)

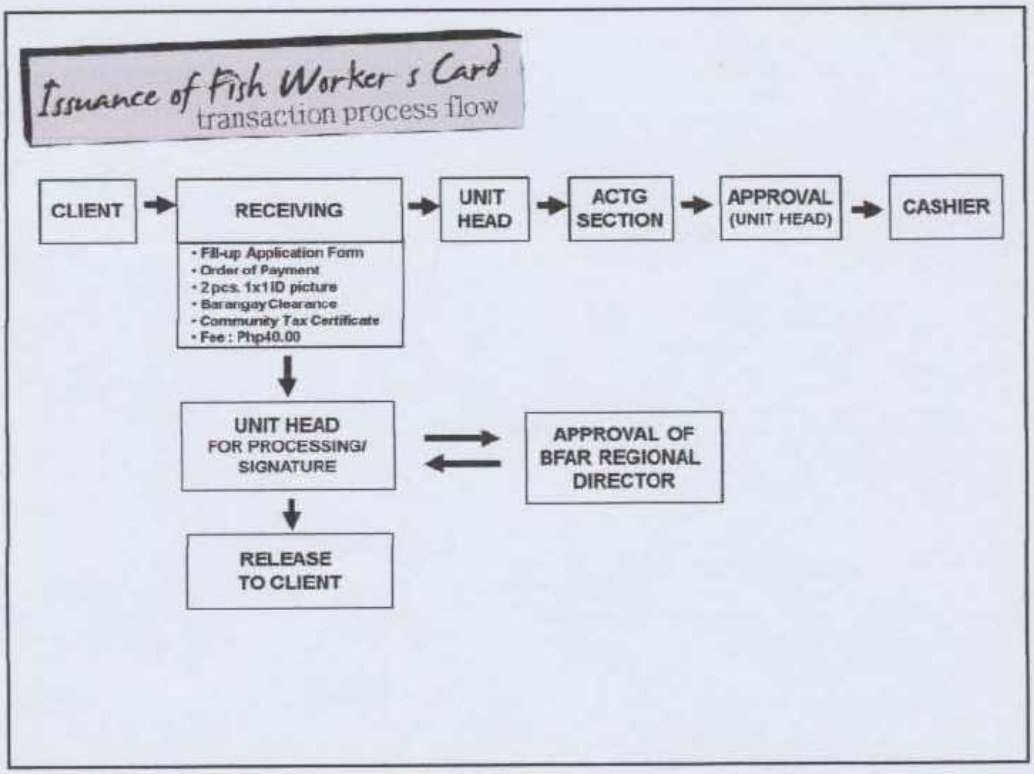
Leasing and Licensing

1. Processing/Issuance of Commercial Fishing Vessels and Gears License (CFVGL) (new and renewal)
2. Issuance of Fish Worker's Card
3. Processing of Fishpond Lease Agreement (FLA)

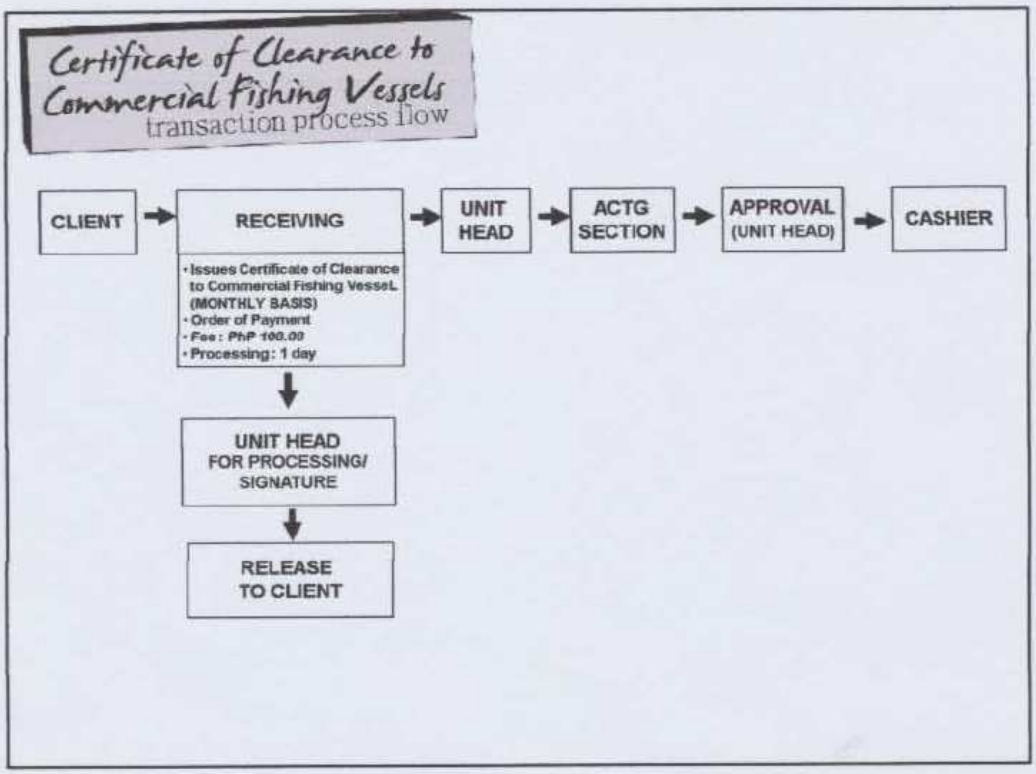
Transaction Process Flow

DIAGRAM format

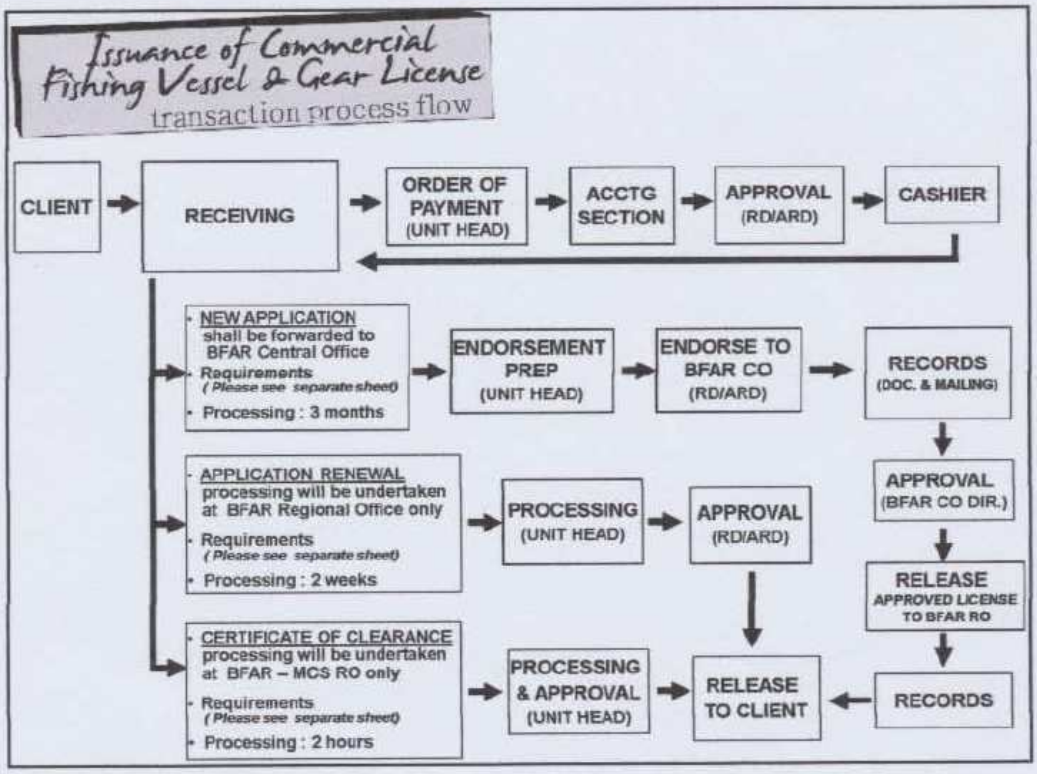

Fish Quality Control Laboratory
transaction process flow
CLIENT
RECEIVING
• Receiving of Samples
• Issues Analysis Request Form
• Check Sample Collection Form
• Record/Code Sample Collected
• Fill-up Order of Payment (OP)
OP
REC APPROVAL
(UNIT HEAD)
ACTG SECTION
APPROVAL
(RD/ARD)
CASHIER
CHEMICAL TESTING LABORATORY
MICRO TESTING LABORATORY
SENSORY & PHYSICAL EVALUATION TEST
SAMPLE PREPARATION/STANDARDIZATION
INSTRUMENTATION/ANALYSIS/CALCULATION
CERTIFICATION
NOTATION/
APPROVAL
FOR RELEASE
OF RESULTS
RELEASING

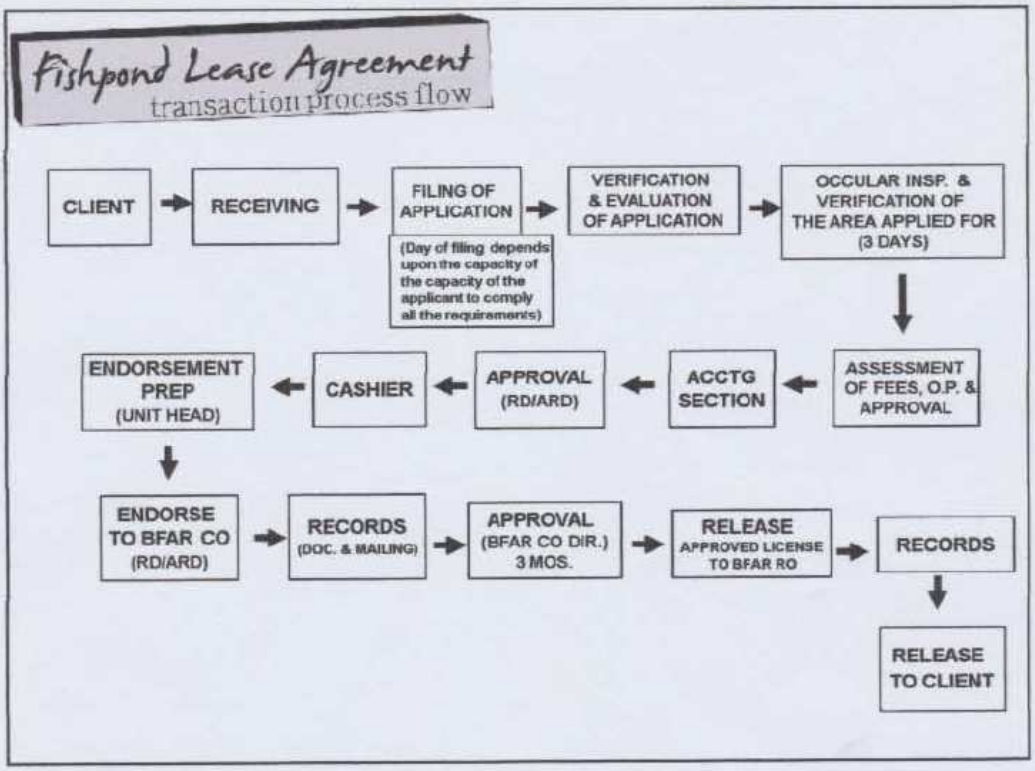

Issuance of Fish Worker's Card
transaction process flow
CLIENT
RECEIVING
• Fill-up Application Form
• Order of Payment
• 2 pcs. 1x1 ID picture
• Barangay Clearance
• Community Tax Certificate
• Fee : Php40.00
UNIT HEAD
ACTG SECTION
APPROVAL
(UNIT HEAD)
CASHIER
UNIT HEAD
FOR PROCESSING/
SIGNATURE
APPROVAL OF
BFAR REGIONAL
DIRECTOR
RELEASE
TO CLIENT

Certificate of Clearance to Commercial Fishing Vessels
transaction process flow



Issuance of Commercial Fishing Vessel & Gear License
transaction process flow





Daghang salamat!