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REPORT OF THE 10TH OFCF TUNA STATISTICS AND MANAGEMENT TRAINING COURSE* 2011

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December, 2011

Abstract

This documents contains 4 reports made by 4 trainees who participated in the 10th OFCF tuna statistics and management training course* held in Japan from October 17- November 22, 2011. 4 trainees are from Thailand and Iran (IOTC member countries), IOTC Secretariat and Uruguay (ICCAT member country).

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** Formal name: Leadership Training Course on Fisheries Resource Management (LTCFRM)*

Background of the OFCF training course

This training course has been conducted as the side activity of the IOTC-OFCF joint project to improve qualities of tuna statistics in the IOTC convention area. The IOTC-OFCF project started in 2002 composing 3 Phases, i.e., Phase 1 (2002-2006), Phase 2 (2007-2009) and the current on-going Phase 3 (2010-2012). In Phase 1, participating countries were only from the IOTC as it was the side activity of the IOTC-OFCF project. From Phase 2, those from ICCAT started participating by the request from the ICCAT Secretariat. Box 1 lists the participating countries of trainees in the past 10 years and Box 2 lists names of Organizer, Coordinators, Cooperating Agencies & Organizations and Visiting (tuna) fishing ports & markets to now.

Outline of the 10th training session

Box 3 shows the training schedule in the 10th session in 2011. Box 4 shows the announcement of trainees' presentations (NRIFSF in Shizuoka and OFCF HQs in Tokyo) on tuna fisheries, statistics and managements in their countries and IOTC (for Ms Belona) in the 10th training session in 2011. These presentations are one part of the training curricula to enhance trainees' presentation skills.

Box 1 List of participating countries of trainees in 10 years (23 countries + 38 trainees)

Phase 1 (5 years) (IOTC) (15 trainees)

2002 (2): Indonesia, Thailand
2003 (3): Sri Lanka (2), Thailand
2004 (3): Iran, India, Mauritius
2005 (3): Maldives, Seychelles, Sri Lanka
2006 (4): China, Kenya, Tanzania, Zanzibar

Phase 2 (3 years) (IOTTC + ICCAT) (14)

2007 (5): IOTC (Thailand, Indonesia, Malaysia) + ICCAT (Guinea, Ivory Coast)
2008 (5): IOTC (Sri Lanka, Maldives, Mozambique) + ICCAT (Brazil, Angola)
2009 (4): IOTC (Oman, Comoros) + ICCAT (Equatorial Guinea, Morocco)

Phase 3 (3 years) (IOTTC + ICCAT) (9)

2010 (5): IOTC (Seychelles, Thailand) + ICCAT (2 from Ivory Coast, Ghana)
2011 (4): IOTC (Thailand , Iran, Secretariat) + ICCAT (Uruguay)

Box 2 List of Organizer, Coordinators, Cooperating Agencies & Organizations and visiting (tuna) fishing ports & markets.

Organizer (sponsor) Overseas Fishery Cooperation Foundation (OFCF) of Japan

Coordinators (OFCF) Past Nemoto, Uchida, Ichino, Matsumi and Arisato
Current Waku

Coordinators (OFCF in IOTC)
Past Sakonjyu
Current Fujiwara

Technical coordinator Nishida (National Research Institute of Far Seas Fisheries)

Cooperating Agencies and Organizations (Tokyo)

Fisheries Agency of Japan
Organization for the Promotion of Responsible Tuna fisheries (OPRT)
Japan Fisheries Information Center (JAFIC)
Tokyo University of Marine Science and Technology
Japan tuna Union

Cooperating Agencies and Organizations (other Prefectures)

Fisheries Research Agency (FRA) HQs (Kanagawa)
National Research Institute of Fisheries Science (Kanagawa)
National Research Institute of Far Seas Fisheries (Shizuoka)
Prefectural Statistics Center (Shizuoka)
Yaizu Fisheries Union (Shizuoka)
Environmental Simulation Laboratory Inc. (Saitama)
National Fisheries University (Yamaguchi)

Visiting (tuna) fishing ports and markets

Tsukiji (Tokyo)
Misaki (Kanagawa)
Yaizu and Shimizu (Shizuoka)

BOX 3 Schedule of the 10th OFCF tuna statistics and management training course (2011)

DATE		CONTENTS	
		A M (09 : 30 ~ 12 : 30)	**P M (13 : 30 ~ 16 : 30)**
		LECTURE	**LECTURE**
17-Oct	**Mon**	**Arrival of trainee**	**Arrival of trainee**
↓ General Training [TKC : Tokyo Kensyu Center] ↓			
18-Oct	Tue	Course Orientation and Guidance	Course Orientation and Guidance
19-Oct	Wed	Japanese Lesson	Courtesy Call on OFCF Headquarters
20-Oct	Thu	Japanese Lesson	Japanese ODA in Fisheries Field
21-Oct	Fri	Japanese Lesson	Introduction to Japan's fisheries
22-Oct	Sat	Study Tour: Tsukiji Fish Market	Off
23-Oct	Sun	Day off	Day off
24-Oct	Mon	Fisheries resources in Japan Prt.1	Fisheries resources in Japan Prt.2
25-Oct	Tue	Aquaculture in Japan	Fishery cooperatives in Japan coastal Fisheries
26-Oct	Wed	Japanese Lesson	Satellite data for fisheries
27-Oct	Thu	Visit Fisheries Facilities in KANAGAWA	
28-Oct	Fri	Visit Fisheries Facilities in KANAGAWA	
29-Oct	Sat	Japanese Lesson	Off
30-Oct	Sun	Day off	Day off
31-Oct	Mon	Fisheries Resource Management	Responsibility Works for Tuna Fisheries
1-Nov	Tue	Fisheries Statistics System in Japan Part 1	Fisheries Statistics System in Japan Part 2
2-Nov	Wed	TDL	TDL
3-Nov	Thu	National Holiday	National Holiday
4-Nov	Fri	Japanese Lesson	GIS Introduction
5-Nov	Sat	Day Off	Day Off
↓ Technical Training [NRIFSF : National Research Institute of Far Seas Fisheries] ↓			
6-Nov	Sun		Moving Day to the NRIFSF in SHIZUOKA
7-Nov	Mon	Course Guidance	Course guidance
8-Nov	Tue	Fisheries Resource Management	Fisheries Resource Management
9-Nov	Wed	Fisheries Resource Management	Fisheries Resource Management
10-Nov	Thu	Fisheries Resource Management	Fisheries Resource Management
11-Nov	Fri	Fisheries Resource Management	Fisheries Resource Management
12-Nov	Sat	Day off	Day off
13-Nov	Sun	Day off	Day off
14-Nov	Mon	Fisheries Resource Management	Fisheries Resource Management
15-Nov	Tue	Report Presentation at the NRIFSF	Moving to Tokyo
16-Nov	Wed	Preparation for Report Presentation	Report Presentation at OFCF HQs
↓ Preparation for Return to Home Countries [TKC] ↓			
17-Nov	Thu	Study Tour for historical sites in KYOTO	
18-Nov	Fri		
19-Nov	Sat		
20-Nov	Sun	Day Off	Day Off
21-Nov	Mon	Course Review/Baggage Forwarding	Closing Ceremony at OFCF HQs
22-Nov	Tue	**Departure from Japan**	**Departure from Japan**

Box 4 Announcements of trainees' presentations (NRIFSF in Shizuoka and OFCF HQs in Tokyo) on tuna fisheries, statistics and managements in their countries and IOTC (for Ms Belona) in the 10th training session (2011) (Note: This is one part of the training curricula to enhance trainees' presentation skills).

「イラン・タイ・ウルグアイのまぐろ・かつお漁業・統計・管理 および IOTC 事務局の役割・機能」

OFCF-IOTC-ICCAT 研修生による発表

(同じ内容を下記２か所で発表します)

- 平成２３年１１月１５日（火）午前 10 時 50 分―12 時
  国際水産資源研究所（旧：遠洋水産研究所）**「第 99 回談話会」**本館２階会議室「富士」
- 平成２３年１１月１６日（水）午後　２時 30 分―3 時４０分
  海外漁業協力財団(東京本部)　会議室　**「成果報告会」**

話題提供者: 海外漁業協力財団 水産指導者養成 資源管理コース「第 10 回研修会 研修生」

IOTC インド洋 まぐろ類 委員会	Ms Pierre Lucia Belona (ピエレ ルシア ベロナ) (IOTC 事務局:統計技官)		IOTC 事務局 (セーシェル)	
	Mr Moradi Gholamali (モディ ゴラマリ) (農業省漁業局:漁業技官)		イラン イスラム 共和国	
	Dr Thummachua Smith (スマチュア　スミス) (農業省水産局国際課)		タイ王国	
ICCAT 大西洋 まぐろ類 保存委員会	Mr Forselledo Rodrigo (フォセレド ロドリゴ) (家畜・農業・水産省 水産研究所 研究員)		ウルグアイ 東方共和国	

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Part 1

REPORT
For

Leadership Training Course on Fisheries Resource Management
(LTCFRM) 2011

By

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Content

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Acknowledgement

I. Fisheries of Japan

Fisheries are a pivotal sector for the Japanese economy and society. Starting from coastal areas along the coast, Japanese fishing vessels are rapidly growing and nowadays are operating further in offshore areas and open seas in the Pacific Ocean, Atlantic Ocean and Indian Ocean. In 2008, Japan ranked the fifth nation in the top ten countries which were main producers of fishery products in the world after China, Peru, Indonesia and U.S.A in respectively. Recently catch declines due to the decrease in catch of sardine and from distant-water fisheries.

Table 1 Top Ten Countries Producing Fishery Products in 2008 (1000 ton)

Country	**Capture Products**
China	15,157
Peru	7,376
Indonesia	4,760
U.S.A	4,356
Japan	**4,353**
India	4,105
Chile	3,939
Philippine	2,562
Thailand	2,457
Vietnam	2,087

In 2009, catch declined to 4.15 million tons of which 2.4 million tons taken from offshore. Fisheries in coastal areas and far sea also made significant component in the total production of which 1.3 and 0.44 million tons were coastal fisheries and far sea fisheries respectively. Due to high demand for fish and fishery product when domestic production is insufficient to meet such demand, a large amount of fish are imported each year. In 2009, 2.6 million tons of fish were imported to Japan representing nearly 50

percent of the domestic fishery products. The top five imported fish species are salmon and trout, tuna, prawn and shrimp, squid and cuttle fish, cod and hake.

In 2008, 221,908 fishermen were working in fishery sector. There were 185,465 vessels used for fishing in the year 2008 out of which 5,327, 81,076 and 99,062 vessels were engineless, external engine and internal engine respectively. 1,094 Fisheries Cooperatives were working along the coast.

Numbers of fisheries cooperative/association has reduced through time. During 2004 to 2008, it was disclosed that fisheries cooperative/association working in sea water reduced from 1,637 to 1094. Their activities are stipulated in the Law of Fisheries Cooperative Association (FCA). Fishermen in the areas who are not members are not entitled to fish. The success of these fisheries cooperative/association, unlike anywhere else, has been traced back to fishermen's treasure of relationship with their neighbors and their social responsibility for own area and own community.

Based on the Fisheries Law of 1949, fisheries in Japan are classified into 3 categories as follows:

1. Fisheries based on fishery right governed by local governments
   - 1.1 Set-net fishery right for the area with 27 meter depth
   - 1.2 Demarcated fishery right- culture or fishing allowed in a certain area
   - 1.3 Common fishing right-common or certain area is solely designated for community to fish by using gillnet, purse seine and squid jigging
2. Licensed fisheries
   - 2.1 Minister licensed fisheries: Tuna, large-scale drift gillnet outside 200-mile
   - 2.2. Governor licensed fisheries: Small-scale less than 4-5 meters length, gillnet
3. Free fisheries (Angler)

As fish stocks have declined in the sea around the Japan Islands, the Japanese government has implemented total allowable catch (TAC) system started in 1997 with the view to protection of fishery resources by preventing over-fishing and maintaining reasonable number of young fish and spawning adult fish. The TAC system covers 7 species which are Pacific saury, Pollack, Horse mackerel, Sardine Mackerel & Spotted mackerel, Squid, and Snow crab. The TAC is decided based on the proposed Allowable Biological Catch (ABC) which is generally calculated by the application of scientific

information obtained. The Fisheries Agency submits a proposed TAC to the Advisory Committee for consideration. The decided TAC supplement by social and economic aspects is then approved by the DIET (Japanese Congress). The implementation of the TAC by the Japanese Agency has received well cooperation among national fisheries research institutes, prefecture governments, fishery cooperatives and fishery companies. Total Allowable Effort (TAE) is also being applied in order to limit the maximum fishing effort on fishing days and number of fishing boat at specific fishing ground, type of fisheries and fishing period. TAE system cover 6 species which are red halibut, roughscale sole, Japanese Spanish mackerel, tiger puffer, brown sole and willowy flounder.

In order to enhance fishery resources, each year a large number of seedlings of fish and shellfish are released into coastal areas. The main species of seedlings released are short-necked clam, scallop, chum salmon, prawn, sea urchin, swimming crab, plaice, abalone and greasyback shrimp. The top three released seedlings are short-necked clam, scallop and chum salmon. In addition, artificial reefs are placed on the bottom of the coastal areas to protect spawners and to nurse their eggs and larvae.

Current issues/problems of fisheries in Japan are the following:

- Depression of stock abundance in particular small pelagic fish
- Strict regulations of RFMOs
- Introduction of Total Allowable Catch (TAC) in 1997
- Decreasing No. of fishermen in conjunction with present aging of fishermen (nearly 50 % are than 60 years old)

Age (Yr)	**Percentage**
15-24	2.9
25-39	12.6
40-59	34.8
60+	49.7

- Suffering high price of fuel
- Same level of fish price for the last 10 years

- Impact of environmental and climate change especially occurrence of mass number of giant jellyfish to the sea around Japan

Fisheries Management

The objective is to search for the best methods of utilization of fishery resources. There are 2 approaches to fisheries management which are practical approach (coastal fisheries management and TAE system leading to resources restoration plan) and theoretical approach (offshore and high seas fisheries management and TAC system which needs to have historically biological data/fishing data.

In the past, old regulation was implemented in particular number fishermen and amount of fish allowed but resource decline. This is due to the mind set of fishermen that if they don't catch, somebody will catch anyway and no penalty for violation. In 1997, the government went for TAC which generates gradual increase of fishery resources. Landing data aggregated by government and then be reported to the Fisheries Agency.

How the TAC is set?

- All relevant data (size, catch, effort, etc…) are collected by scientists, administrators, and fishing companies.

- Data are analyzed at national research institutes and evaluation took place to design the state of fish stock (Allowable Biological Catch)

- Estimated TAC go to the Committee for consideration which generally take into consideration other issues as well such as social and economic conditions which then the TAC is identified. Before implementation, the government gets the approval form the Congress.

Issues facing fishery management are climate change effect on fish and fisheries, regime shift in short period of time and change of dominant species in fish composition. The symposium 2 years ago for rising temperature and ocean in Japan concluded that it was too early to attribute these phenomena as it requires long term changes and monitoring. Nevertheless, fishing industry and government authorities must plan ahead to deal with the impact of climate change on fisheries worldwide.

Aquaculture

The objectives are to make supply of marine products stabilized, to increase resources through human activities (including fish farming), to maintain and stabilize income from fisheries business and livelihood. More than 20 fish and shellfish are farmed and can be artificially bred. Some species were introduced and successfully cultured in Japan. 2 methods are used in aquaculture which are feeding and non-feeding system. Research is undertaken to culture fish in the mountain areas using geo-thermal energy to heat up water.

Now Japan can produce Bluefin Tuna by artificial breeding.

- 1979 artificial hatchery and larvae rearing
- 2002 development of second generation (private university)
- 2007 development of third generation
- 2008 shipped to Japan

Japan is working on new technology for eel and lobster artificial reproduction.

Issues for aquaculture and fish farming are as follows:

- Development of techniques to produce mass artificial seeds
- Development of appropriate rearing techniques
- Development of appropriate compound feed nutritionally
- Measures for preventing diseases
- Pursue high survival rate for released seedlings
- Environmental degradation (dead by suffocation and dead by toxin)

Fisheries Cooperative/Association

Based on traditional right to fish in coastal areas and the Fisheries Cooperative Law established in 1948, fisheries cooperative is officially formed. They are entitled for rights to fishing areas in coastal areas and fishermen who exercise such rights within the vicinity shall join with respective fisheries cooperatives. Fishermen in other areas have no right over them. Their home must locate in the jurisdiction of fisheries cooperatives and number of work must be around 90-120 days per year (exact days depending upon individual fisheries cooperative. This organization plays an important role in fisheries carried out within

their purviews/communities. It is widely known that fisheries cooperatives involve in various activities such as fishing, auction (taking 5 % commission), sale, catch distribution, port operation, wholesaler at port, trader & loan provider, and resource enhancement. Common fishing right is given to fisheries cooperatives and sometimes to prefecture federation of cooperatives. Neighboring cooperative can make mutual agreement. 20 fishermen can get together to form a fisheries cooperative. If a fisherman want to stop being the member at the end of the business year, he must notify fisheries cooperative 60 days in advance.

Satellite Data and GIS for Fisheries

Japan has been using data derived from satellite and GIS for the benefit of fisheries development. Data can be used for understanding chlorophyll-a, red tide, sea surface temperature, sea wind and topography. They are used to serve different goals such as identification of good fishing ground for fishermen, monitoring of ocean environment, fisheries management fisheries damage, illegal ship (foreign) detection and monitoring of fishing vessel. Map identifying good fishing ground is sent to fishermen via mobile phones for further usage.

II. OPRT

OPRT stands for the Organization for the Promotion of Responsible Tuna Fisheries. It is a non-governmental organization established in 8th December 2000 with the objectives to eliminate IUU in tuna fishing, reduce excess fishing capacity, promote responsible Bluefin tuna tuna farming and reduce by-catch in tuna fisheries. More than 90% of large scale tuna longliners are registered with the OPRT. As of September 2011, 1,060 large scale tuna longliners are registered. Main members are from prominent producer around the world such as National Ocean Tuna Fishery Association (Japan), National Offshore Tuna Fisheries Association (Japan), Taiwan Tuna Association, Korea Overseas Fisheries Association and China Fisheries Association. Apart from producer, its members also compose of trade and distributor organizations, consumers, and public corporation.

III. OFCF

Overseas Fisheries Cooperative Foundation of Japan (OFCF) was established in June, 1973 with the objective to maintain and enhance amicable relationship in the fisheries field between Japan and

coastal countries concerned by way of extending technical and economic cooperation for the development and promotion of their coastal fisheries and for the effective management of international marine resources conducted by fisheries organization concerned.

Major activities of OFCF are as follows:

1. Cooperation for overseas fisheries development
    1.1 Project for promotion of regional fisheries
        - Technical assistance for restoration of function of fisheries facilities and equipment
        - Restoration of fisheries facilities
        - Fisheries technical extension project
    1.2 Project for the protection of environment and conservation of international fishery resource
        - Resource management
        - Resource development and research
        - Countermeasures against incidental catch
    1.3 Assistance to the Japanese fisheries organizations
        - Dispatching technical expert
        - Provision of equipment, materials and services
        - Dispatching fact finding mission to conduct feasible study for cooperation Project
    1.4 Inviting overseas fisheries trainees
2. Promotion of fisheries personal exchange with overseas countries
    2.1 Inviting key figures
    2.2 Fisheries symposium
3. Registration, recruiting and training of Japanese fisheries technical experts
4. Project finding and evaluation of fisheries cooperation projects
    4.1 Project finding

4.2 Evaluation

4.3 Follow up

5. Loans for overseas fisheries cooperation project

5.1 Non-interest loan

5.2 Soft loan

IV. Study Visit

Tsukiji Wholesale Market

Tsukiji Wholesale Market is one of the 11 Tokyo Metropolitan Central Wholesale Markets established by the Tokyo Metropolitan Government with the aim to assure fresh and safety food to the end consumers. The government administers the construction of markets, maintain and manage the facilities, direct policy and supervise handling at the market for fairness and prompt action. Fish section at the Market was established in 1935.

The auction system is used for buying tuna products after the licensed buyers or intermediate wholesalers inspect the quality of tunas landed. In normal practice, auction for tuna and other seafood products starts around 5.30 a.m. The wholesalers rent the market and set the auction system for selling their products (consignment) derived from fishermen. They need to get permission from the Minister of Agriculture, Forestry and Fisheries. The Tsukiji Wholesale Market operates about 200 tons of tuna each day. There are 3 wholesalers dealing with tuna products. Each day, 10 tons of foam are used for transshipping tunas to the market and later are processed into a plate by heating and exported to China. 2,000 small cars are roaming around to transport fish to the truck. Apart from sale of fishery products captured by the Japanese fishing boats/vessels, seafood are also imported and sold in this market such as octopus from Africa and red snapper from New Zealand.

Supervisors check quality and sanitary of fish products and provide guidance to dealers in the market and to people. Fish are kept as fresh as they are when first caught.

Four categories of fishery products sold at the Tsukiji wholesale Market are fresh fish, five fish, frozen fish and frozen seafood. This market used to receive 2,400 tons of fishery products each day.

However, landing decreased to 2,000 tons during the last 2 years when only 1,952 tons of fishery products came to this market in 2010.

Tuna longliners used to unload catch at the pier, however, they now move to other local ports.

Head Quarter of Fisheries Research Agency (FRA)

Fisheries Research Agency or FRA was established with the objective to conduct varieties of R & D concerning fisheries in order to maintain security of seafood products and for sound development of fishery industry in Japan. It has 9 national research institutes around Japan with its head quarter located in Kanagawa. Fisheries Research Agency is working on 5 tasks stipulated in the 3rd five-year Basic Plan for Fisheries Policy formulated on 1st April 2011 as follows:

- Develop conservation technologies for sustainable use of fishery resources both domestically and internationally

- Develop stock enhancement, rational use of fishery resources, and environmental conservation technologies for coastal fisheries

- Develop productivity improvement and environmentally friendly technologies for sustainable development of aquaculture

- R & D on the development of fishery industry, food safety for fish and fishery products, and maintaining of consumer trust

- Monitoring progress of research activities and pioneering new research

Unloading of Tuna at Shimizu Fishing Port

A carrier named Tehno Maru flagged Vanuatu was unloading catch transshipped from 20-30 Taiwanese and Korean longliners at the Okitsu wharf, Shimizu fishing port- Largest tuna landing site in Japan on 9th November 1011). Tuna species and sizes were identified by different color of ribbon attached to each tuna. The Japanese Fisheries Agency through its branch (under the Fisheries Policy Division) has conducted strict inspection (100%) for Northern Bluefin Tuna and Southern Bluefin Tuna landed as these catches are subject to TAC assigned for certain country each year. This office has 2 main functions which are to check information of carrier or fishing vessels prior to landing the products. The captain or skipper has to submit the declaration form stipulating catch by species and the form stipulating exact date for landing. This document must reach the office 10 days before unloading. The other function is to monitor landing of Atlantic Bluefin Tuna at site. For Northern and Southern Bluefin Tuna, the Ocean where catch was taken needed to be identified. This office also verifies ICCAT catch document. 8 ports in Japan are allowed to land Atlantic Northern Bluefin Tuna and Atlantic Southern Bluefin Tuna, whereas 70-80 % are normally landed at Shimizu fishing port. In addition, DNA analysis was also conducted by the NRIFSF's staffs in order to identify tuna species especially Bigeye Tuna taken from Pacific and Atlantic Oceans. This is carried out due to the fact that some countries attempt to escape the TAC through claiming Bigeye Tuna as the other species. It was disclosed that nowadays landing of tuna catch has declined. By using a kid, species identification of Bigeye Tuna can be made within 6 hours.

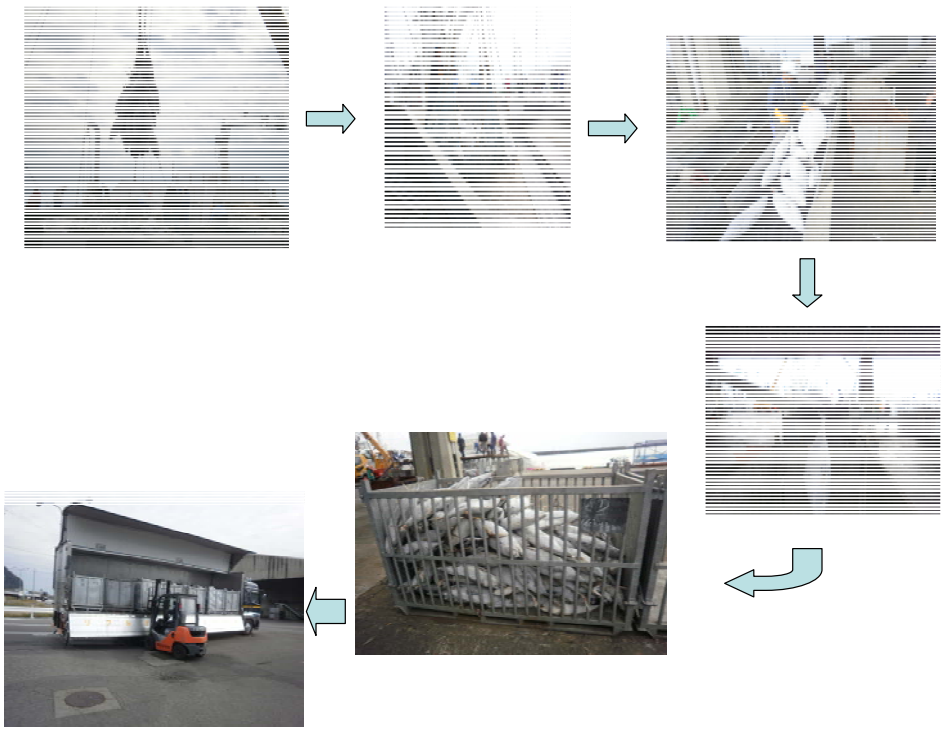
Apart from direct landing by a carrier or a fishing vessels, tunas are delivered to this port through a container which arrived at the Yokohama port and brought here for being kept in deep frozen storages at the warehouse for better price and important events such as Christmas and New Year. In each year, 70 %, 20 % and 10 % of tunas landed at the Shimizu fishing port come from carrier, longliner and container in respectively.

Tuna Landing at Yaizu Fishing Port

The Yaizu Fisheries Cooperative Association at Yaizu city, Shizuoka prefecture manages and provides services for tuna landing at the Yaizu fishing port which is well known for being one of the main tuna landing places in Japan. Today (10th November 2001), a Japanese tuna purse seiner was unloading catches taken from the Pacific Ocean. This vessel is licensed to fish in Papua New Guinea. The Yaizu

Fisheries Cooperative Association also owns tuna fishing vessels. As of December 2007, it possessed 30 tuna fishing vessels composed of 24 steel longliners, 1 steel skipjack boat and 5 steel purse se iners.

Tunas were hauled from well by crane and placed on the platform when many workers were energetically sorting tunas into steel cages. Full cages then were lifted and placed inside the big truck. Some unloaded tunas were placed on the conveyer and sorted by size and species of tunas prior to heading into steel cages and ending at the truck.



V. Application of Knowledge Gained To Thai Fisheries

- Empowerment of National Fisheries Association of Thailand (NFAT) for better and less time consuming data collection
- Strengthening overseas fishing activities through technical assistance by GOV
- Encourage more detail data collection for tunas at ports both domestic and imported products
- Apply ABC and TAC for fisheries management (eg. Indo-Pacific mackerel, longtail tuna)
- Application of satellite and GIS for fisheries development and management through Fisheries Information Center (IFM)
- Enhance fisheries resources by propagation (artificial reef, artificial breeding, seedling release, etc.)

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- Ms. Ofuji (Interpreter)
- Mr. Satoshi Iha (Coordinator)

Part 2

Leadership Training Course on Fisheries Recourse Management

(17 Oct- 22 Nov. 2011)

Gholam Ali Moradi

Chief of High sea Fisheries Affair Group

Iran Fisheries Org.

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2.2- Introduction to Japan's Fisheries (Dr. Kobayashi- OFCF

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2.4 - Aquaculture in Japan (Dr. Kobayashi- OFCF)

2.5- Fishery Cooperative in Japan Coastal Fishery (Mr.Fujii -OFCF)

2.6- Satellite Data(Dr. Saitoh- JAFIC)

2.7- Fisheries Resource Management(Dr.Miyake)

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2.9- Fisheries Statistics System in Japan (Mr Tomato from MAFF)

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3.4- Nihon Katsuo Magura Market Corp.

3.5- Shimizu fishing port.

3.6-Yaizu Fishing Port and local fish market

4- Applications or Improvement from Training

5- Acknowledgments

1-Introduction

OFCF invites and trains the governmental officials and the local fishing company staffs in coastal countries in order to provide the various fisheries technique, skills and knowledge for them in accordance to following training courses.

The Leadership Training Course on Fisheries Resource Management (LTCFRM- 2011) was conducted from 17th October to 22th November. The course organized by the Overseas Fishery Cooperation Foundation in Japan (OFCF) included 4 participants from" I.R.Iran , Uruguay, Thailand and Seychelles" and a Training Course on Fisheries development and administration (LTCFDA-2011) for 3 participants from "(Solomon Islands, R.E.Guinea and Mozambique"

This report provides a summary of the various topics covered during the lectures, brief descriptions of the visit to the different fisheries research offices, markets and ports .It also gives prospects and ideas for used them in my country based on the knowledge acquired from training. Also we had Japanese lesson and learned something like counting number, regarding, introduce our self , culture of Japan people and take some books to study later.

List of Participations

	Family Name	Natuionality	Date of Birth	Occupation	Organisation
1	Pierre lucia Desire Belona	Re. of Seychells	37	Data Management Assistant	IOTC
2	Moradi Gholamali	I.R.Iran	46	Fish &Fishery Affairs	Iran Fisheries Org.
3	Thummachua Smith	Kingdom of Thailand	47	Fisheries Biologist	Ministry of Agriculture & Cooperation
4	Forselledo Rodrigo	Oriental Re. of Uruguey	30	Research Assistant	Ministry of Livestock ,Agriculture &Fisheries
5	Buga Bennie	Solomon Islands	42	Chief Fisheries Office Marleting	Ministry of Fisheries & Marin Resource
6	Olonguema Mangue Jeremias	Re. of Eq. Guinea	39	Fisheries Inspector	Ministry of Fisheries & Enviroment
7	Ariscado Artur Jose	Re. of Mozambique	39	Fisheries Officer	Ministry of Fisheries

2- Lectures

2.1 Overseas Fishery Cooperation Foundation of Japan (Mr. Matsumi- OFCF)

The lecture and video explained the history of the Japanese overseas fishery cooperation, the role of overseas fishery cooperation foundation of (OFCF) which was established in 1973 with the objectives to maintain and enhance amicable relationship in the fisheries field between Japan and coastal countries for development and promotion of their coastal fisheries and for the effective management of international marine resource conducted by the regional fisheries organization concerned Mr. Matakasa also explained the organization chart and out line of major activities of OFCF cooperation for the fisheries development which include:

1- Cooperation for overseas fisheries development, included:

- Project for the promotion of regional fisheries
- Project for the protection of environment and conservation of international fishery resources
- Assistance to the Japanese fisheries organization
- Inviting overseas fisheries trainees (like this training course and 7 training course other.

2- Registration ,recruiting and training of Japanese fisheries technical experts.

3- Project finding and evaluation of fisheries cooperation projects.

4- Promotion of fisheries personal exchange with overseas countries

5- Loans for overseas Fisheries cooperation project.

2.2- Introduction to Japan's Fisheries (Dr. Kobayashi- OFCF)

2.2.1- Situation of Japan fishery in the world

The history and situation of Japanese fishery was presented in this lecture. In term of production, the total quantity of fishery products of the world for 2008 was 159,113,000 tons and Japan production was 5,541,000 tons and was ranks fifth in the world (table 1). As for the yearly personal consumption of fishery products foods, Tokelau was the country which consumed the most fishery product (200 kg/citizen/year), whereas the consumption for Japan was 58,7 kg/citizen/year in the same year and was ranks 16 the in the world (table 2).

Table 1- Top 5 countries of fishery production in 2008(1000 t)			
Country	**Culture products**	**Capture products**	**Total products**
China	42.67	15.157	57.827
Indonesia	3.835	4.76	6.795
India	3.479	4.105	7.584
Peru	43	7.376	7.42
Japan	1.188	4.353	5.541
World	**68.327**	**90.785**	**158.113**

Table 2- Countries wich consume a lot of fishery products foods (2007)			
Country	**Kg/citizen/year**	**Country**	**Kg/citizen/year**
Tokelua	200,0	Seychelles	64,3
Maldives	144,1	Portugal	61,6
Niue	100,0	Korea	57,6
St.Helena	92,7	Cook IS.	57,4
Iceland	90,6	Japan	56,7
Greenland	86,4	Norway	51,9
Faroe Is	85,9	Singapore	48,9
Kiribati	75,1	Fr Polynesia	47,7
St.PierMiquelon	71,9	Samoa	47,5
Palau	67,7	Spain	44,8
China	26,7	**World**	**17,1**

2.2.2-Japanese fishery

Japanese fishery is composed of many fishermen, fishing boat ,ports, and fishermen cooperatives we can see detail this information at table 3, for 2008

Table 3 – Power of fisheries in Japan (2008)

Power Components	Number	
Fisherman (2008)	221,908 persons	
Fishery ships & boats Total 185,465 (2008)	Engineless	5,327
	External Engine	81,076
	Internal Engine	99,062
Fishery harbor (2010)	2,916	
Fisherman Cooperative Total 1,950 (2008)	Sea water area	1,094
	Inland water area	856

The various type of gear used in Japan was introduced. Among 4,147,000 ton wich is the production weight by sea fishery in 2009 ,1,219 000 ton equivalent 29.4 % is caught by purse seine and other information as a detail and compare with 1999 can see in the table 4 .

Table 4- Catch weight in each fishing gear in Japan (2009 & 1999)

Fishing gear	2009		1999	
Purse seine	1219	29.4%	1566	29.9%
Trawl net	1062	25.6%	1433	27.4%
Set net	538	13.0%	588	11.2%
Squid angling	174	4.2%	387	7.4%
Tuna long line	160	3.9%	238	4.5%
gill net	206	5.0%	299	5.7%
Collecting shellfish and sea weed	144	3.5%	197	3.8%
Other	644	15.5%	531	10.1%
Total	4147	100.0%	5239	100.0%

The sea culture sector was also introduced and the various species of marine fish, shellfish and seaweed cultured in Japan which include yellowtail, red sea bream, scallop, oyster, tangle and sea mustard were mentioned. The top five species of catch weight included mackerel, pacific saury, anchovy, scallop and bonito.

The two main structural problems (decrease in fish stock and decrease and aging of fishermen) and the two main environmental problems.

Total Allowable Catch (TAC) which is one of the measures being taken for the purpose of protection of fishery resource and preventing of over fishing.

Numerous seeds of fish and shellfish are produced by official and fisheries cooperative and are released into coastal area every year.

2.2.3- Catch weight and catch sum of each sea fish species

Many spaces of sea fish are caught in Japan. In 2009 , the top 10 species of catch weight ranking, sum and the unit price are shown in table 5 Additionally the data of tuna was shown same as others.

Table 5- Top 10 each weight and catch sum of each sea fish species in Japan(2009 &1999) Weight unit : 1000 t Money unit : 1,000,000 yen

Species	2009			1999		
	weight	Money	Yen/kg	weight	Money	Yen/kg
Mackrel	471	38.352	77	382	39.548	104
Anchovy	342	18.446	54	484	21.867	45
Scallop	320	29.966	94	300	41468	138
Paciffic saury	311	21.916	71	141	28.243	200
Bonito	269	65.846	245	317	63.659	201
Pllack	227	17.583	77	382	22.052	58
Common squid	219	42.651	195	237	57.005	241
Salmon	206	68.62	334	175	66.498	380
Horse mackrel	165	33595	203	211	45.966	218
Atka mackrel	119	6.565	55	169	8.804	40
Tuna	207	135.313	652	329	220.508	670

2.2.4- The sea culture production in Japan

Many species of Marin fish, shellfish and seaweed are cultured in Japan. The representative species of cultured fish and shellfish are Yellowtail, Red sea bream, scallop and oyster. And cultured seaweed are tangle, seam stand and laver. the total culture production weight is 1,202,000 ton in 2009 Among this production weight ,its weight of fish and shellfish is 746 .000 ton and of seaweed is 456,000 ton .By the way . the total culture production weight in 2009 about 51,000 ton less that of 1999 being ten years ago.

2.3 The Management of Fisheries Resource in Japan (Dr. Kobayashi- OFCF)

This lecture was presented by Dr Kobasayshi and was in five Chapters, include

1- Approaches to fisheries management and this involve two methods:

- The practical approaches
- The theoretical approaches

2- Coastal fisheries management in Japan. The three types of fisheries operations are: Fisheries based on fishery right(set-net fishery right, demarcated fishery right and common fishery right) ,Licensed fisheries: Minister and governor approved license fishery and Free fisheries.

3- The principles of theoretical fisheries management and focuses were on the production model, like MSY, MEY.

4- This chapter discussed about the estimation of abundance and the importance of CPUE. and Virtual Population Analysis (VPA).

5- The Total Allowable Catch (TAC) system and Allowable Biological Catch (ABC) in Japan was explained in chapter five. In Japan TAC system used for Sardine, chub mackerel, horse mackerel, pacific saury, common squid, Wally Pollock and snow crab

2.4 - Aquaculture in Japan (Dr. Kobayashi- OFCF)

This lecture was divided into five chapters. Include: “necessity and principles of propagation and culture of aquatic resources, methods of culture production, propagation method through the release of seedling, the propagation through creation of nursery grounds and discussed about coastal area and the fishery regulations”.

Aquaculture plays an important economic and social role in Japan. two systems have been used as `of the cultivation method in Japan. one is non-feeding method s and another is feeding method .Main species that culture by non-feeding are: scallop , oyster,short-neck calm,ark shell,laver,pearl and tangle but eal ,prown,yellowtail,seabream,puffer abalone and carb culture by feeding method. Also value of the countrys total fisheries and aqucultura production are shown in table 6 .

Table 6: Fisheries Production in Japan (2008)

	Weight (103 Tons)
Capture	**4,189 (77%)**
Sea	4,147
Inland	41.7
Culture	**1,243 (23 %)**
Sea	1,202
Inland	41
Total	**5,432 (100 %)**

2.5- Fishery Cooperative in Japan Coastal Fishery (Mr.Fujii -OFCF)

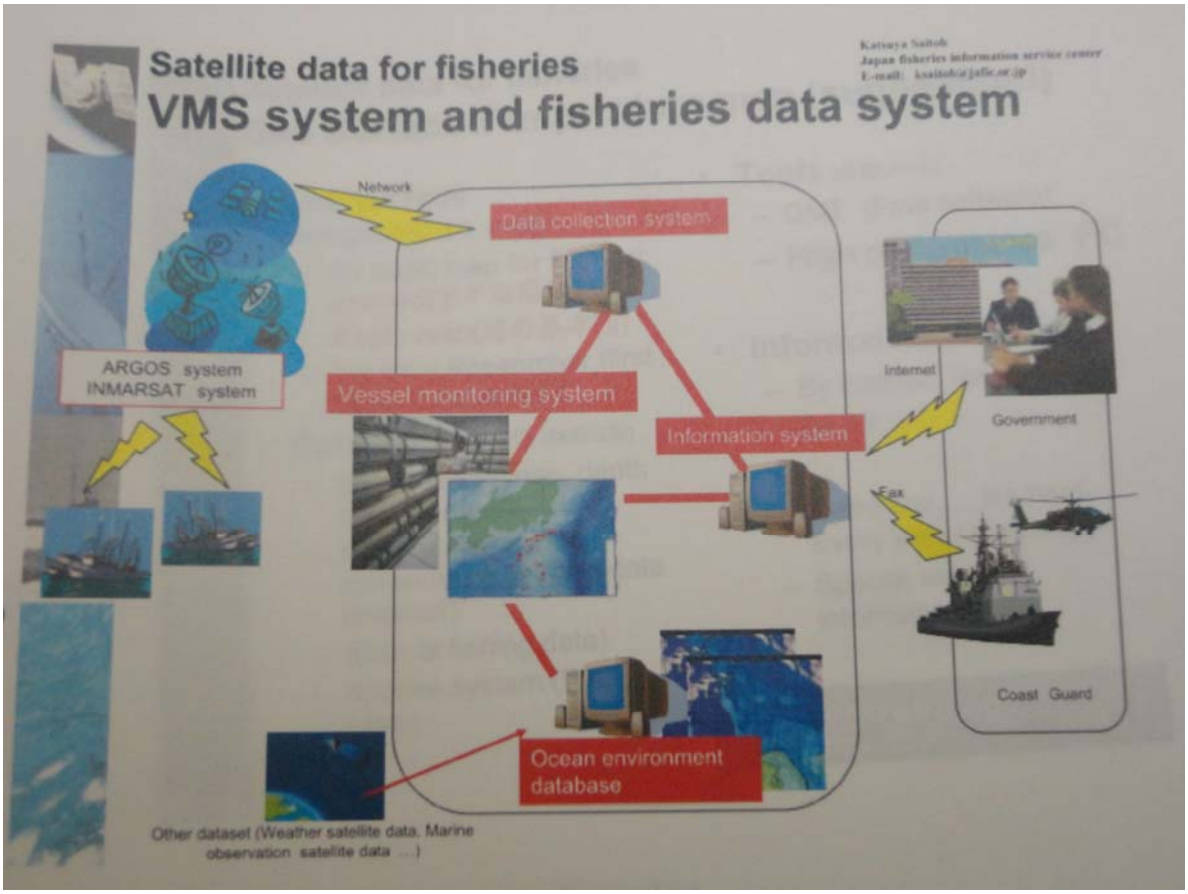
This objective was contents introduce of cooperative , fishery cooperatives ,members and organization chart. table 7 are shown1 Trends in Membership of (Coastal Region) Fishery Cooperatives.

Table 7 Trends in Membership of (Coastal Region) Fishery Cooperatives

	1980	**1989**	**2003**	**2004**	**2005**	**2006**	**2007**
	(71%)	(67%)	(59%)	(59%)	(60%)	(59%)	(56%)
Full Members	411,841	362,294	254,546	246,541	234,542	231,521	223,793
	(29%)	(33%)	(41%)	(41%)	(40%)	(41%)	(44%)
Associated members	166,881	178,374	173,937	170,578	159,459	163,685	173,519
Of which: sport	-	-	(0.07%)	(0.07%)	(0.08%)	(0.08%)	(0.08%)
fishing operators			282	289	305	307	325
Total	578,722	540,668	428,483	417,119	394,001	395,206	397,312

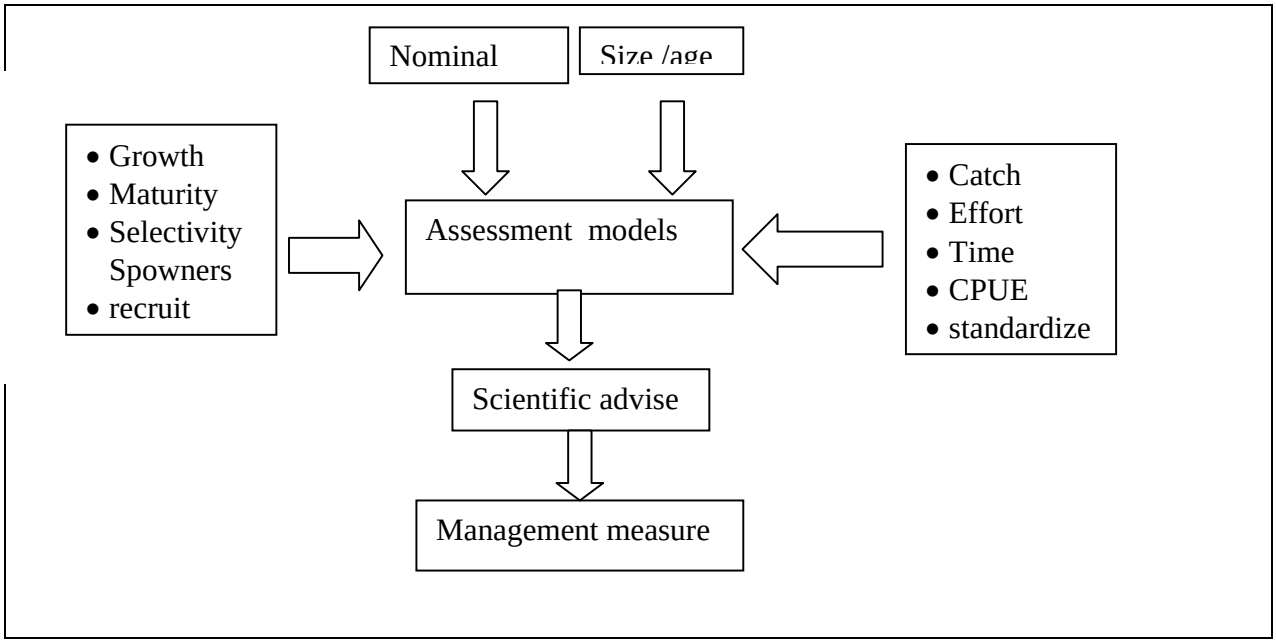
2.6- Satellite Data(Dr. Saitoh- JAFIC)

Dr Saito explained about basic knowledge of satellite ,role satellite for fisheries , oceanography for GIS , environment and …Also he explained data flow in JAFIC(figer1) and steps of used satellite and what to do? Like case study , data collection,tools,analysis and spread it. He has shown some flow chart as example flow chart VMS system and fisheries data system is follow.



2.7- Fisheries Resource Management(Dr.Miyake)

Dr. Miyaka explained about migratory of some fish species .method of catches and he shows some flowchart a bout world tuna catch by kind of gears and conception some country. And after that explained Stokes, MSY, MEY fishing mortality and then Management procedures as following:



2.8- Responsibility Works for Tuna Fisheries (Mr.Tabata from OPRT)

This lecture explained the work of the Organization for the Promotion of Responsible Tuna Fisheries (OPRT), which was established in 2000. This non- government organization main objective are to:

- Eliminate illegal unreported and unregulated (IUU) tuna fishing ,Reduce excess fishing capacity , Promote responsible tuna farming and Reduce by-catch

OPRT represents stakeholders in tuna fisheries, including major tuna fishing operators all over the world. Member organization includes: Japan Tuna Fisheries Cooperative Association, Japan National Ocean Tuna Fishery Association, Taiwan Deep Sea Tuna Long line and some Association in the world. OPRT registered 1063 vessels till March 2011 from 15 countries of the world.

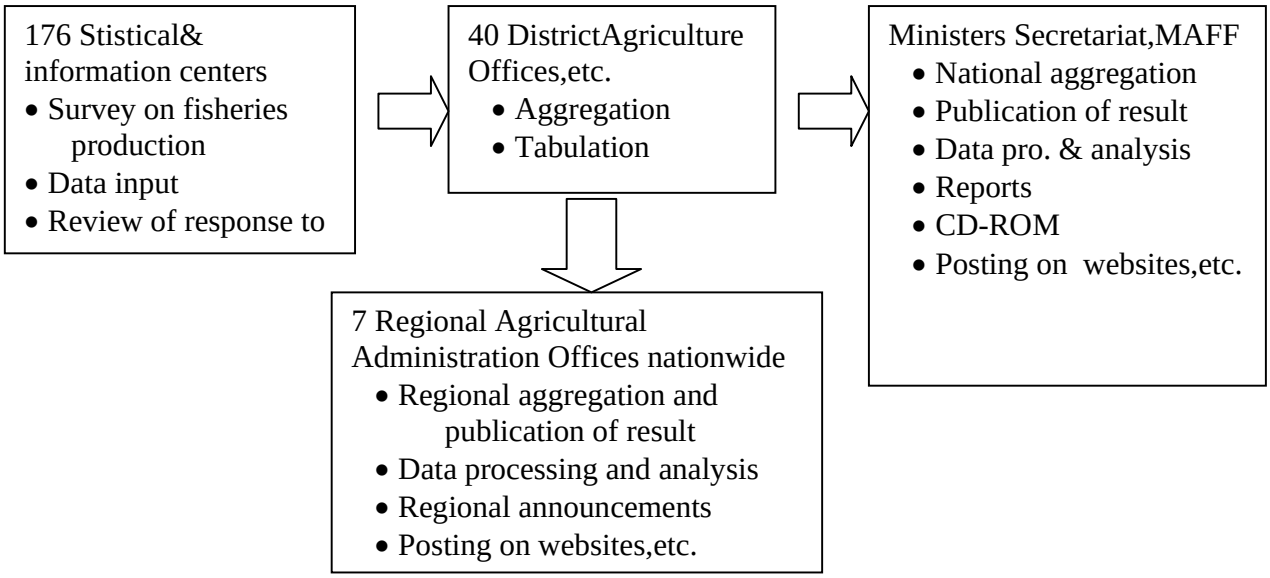
2.9- Fisheries Statistics System in Japan (Mr Tomato from MAFF)

This lecture explained the fisheries statistical system in Japan which is under the Ministry of Agriculture, Forestry and Fisheries (MAFF). An overview of the history of the fisheries statistics from 1945 to date was provided and this was in three sections:

- Start of the fisheries statistics (1945-1950)
- Development of fisheries statistics (1950-1975)

- Increased efficiency and systematization of fisheries statistics (1975- to date).

Also overview of MAFFs statistical processing system shown in follows:



2.10- Fisheries Research Management- Lecture and Discussion (Dr. Nishida from NRIFSF)

Leadership Training Course on Fisheries Resource Management (LTCFRM- 2011) continued in National Research Institute of Far Sea Fisheries (NRIFCF) in Shizuoka City by 4 participant from I.R.Iran , Uruguay ,Thailand and Seychelles" in 7 - 15 November. During that days, the following activities by Dr. Nishida were :

1- Lecture and Discussion about Fisheries Resource Management.

2- Study and Discussion about Tuna Fisheries and Management in the Countries of Participant.

3- Duties, Measures and Resolutions of IOTC.

4- Visit from Shimizu fishing port, Yaizu Fishing Port and local fish market.

5-Prepare of Reports

6- View of some video film about Transshipments

3- Field Study Tour:

3.1- Tsukiji Fish Mrket

Tsukiji market established in 1935 with total area 230,836 m2. The whole produce and supplies are sold by action. The action start around 5 am for seafood, around 6:30 am. For fruit and vegetables, around 7:30 am. For flowers and around 6 am. For meat.

The market opens most mornings with the arrival of the products by ship, truck and plane from all over the world. Particularly impressive is the unloading of tons of frozen tuna. The auction houses then estimate the value and prepare the incoming products for the auctions. The buyers (licensed to participate in the auctions) also inspect the fish to estimate which fish they would like to bid for and at which price. The auctions start around 5:20 a.m. Bidding can only be done by licensed participants. These bidders include intermediate wholesalers who operate stalls in the marketplace and other licensed buyers who are agents for restaurants, food processing companies, and large retailers. Before daily about 2000 ton of fish has

been sold byt know about les than 1000 tones sale. Also about 10 tones of boxes of polleystairen change to the blokes and sending out .photos of bellow shown

Function of the central wholesale market

- Collection : A wide variety of produce in vast quantity from all over the country and from abroad is gathered

- Fair pricing : Price are determined by auction as basic rule, which means the price will be reasonably determined as the highest bid price will be the price of the goods, reflecting the day's supply and demand of the goods.

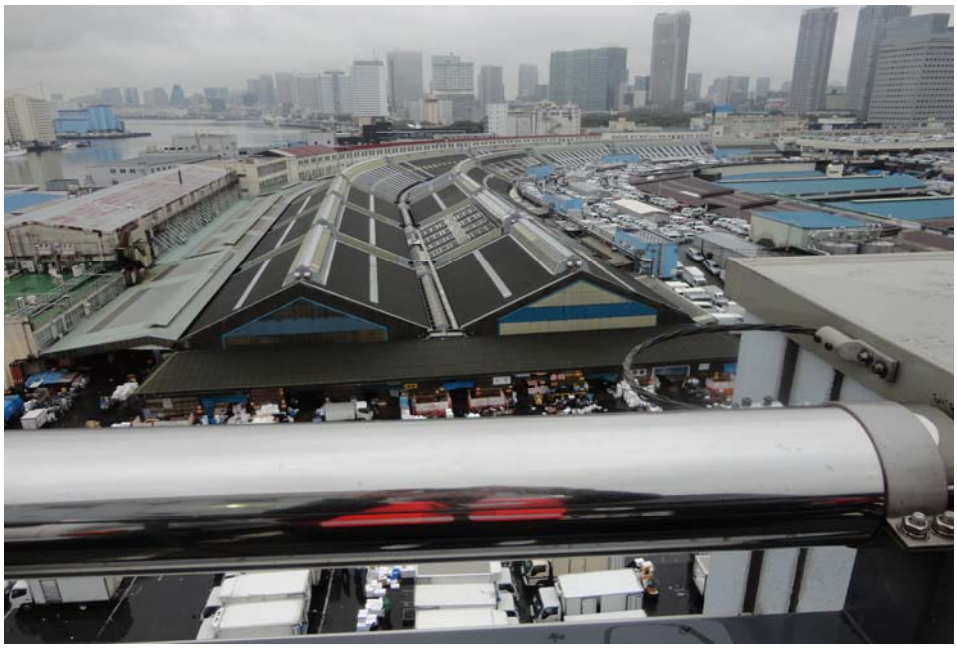
- Distribution : Produce gathered is divided in to smaller quantities and size and sold to a number of stock purchasers.

- Sound settlement of accounts : Payment of charges is made quickly and properly under a fixed rule

- Reduction in distributing cost : By buying and selling goods in large quantities at one place, transportation and other costs incurred in distribution can be reduce.

- Providing information : Prompt information on what and how much farm and marine product and delivered in the market, as well as on the wholesale prices on the day is valuable, avoiding conflation.

- Hygiene inspection : Hygiene checks on the goods are conducted by the Sanitation Inspection Station, and also guidance are given to the dealers to adhere sanitation standard, as required.



View from outside

Tuna Action

Live fish for sale

Unit Press Polymer

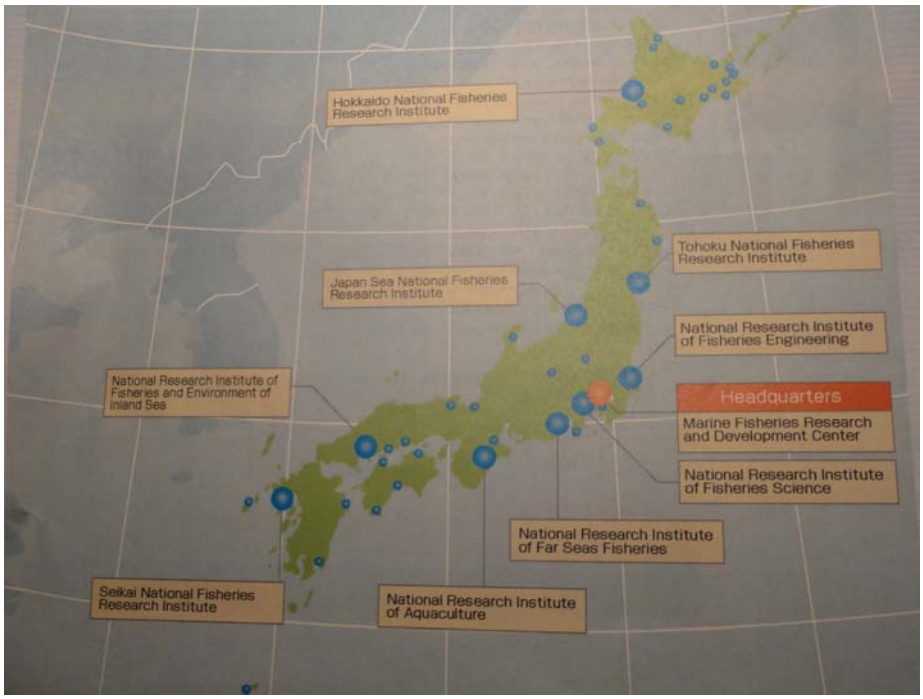
Core retail of fish

3.2- Fisheries Research Agency and National Research Institute of Fisheries Science(Kanagawa)

Headquarters of Fisheries Research Agency (FRA) is in Yokohama.. FRA conducts a wide range of research and development activities from basic and applied science to practical technologies concerning fisheries to secure astable supply of fisheries products and for the sound development of the fishery industry .as stipulated by the basic plan for fisheries policy.

The operating plan of the FRA is reviewed every five years, and is set besed on goals outlined by the MAFF. The roles and some of the plans research component s of the fisheries research agency were explained. Also FRA has 9 research Vessels , also 10 Institute that name and location each of them is below

:.



After that Mr. Hiroyuki explained about “The current Statutes if International Fisheries Resources” His speech was about fisheries in the NW pacific and fisheries for tuna. And then Mr. Mitani explained about Strong and weaks of current fisheries in Japan.

3.3- Kanagawa Prefecture Fisheries Technology Center and Sea Farming association:

This lecture was about history , organization and has explained in detail and example of application of resource management in Japan was given. Also The six division of the institute are General administration included:

- Research planning and management
- Fisheries resource and environment
- Sea-farming technique
- Sagami Bay experiment station
- Freshwater experiment station

After that, Chief of Kanagawa Sea Farming Association explained about importance of sea farming, and also sea bream and Abalone . They have high price in Japan . Throle of this association is produced seed , seed supply ,seed releasing ,seed information also Abalone.

Sea bream

Abalone

3.4- Nihon Katsuo Magura Market Corp:

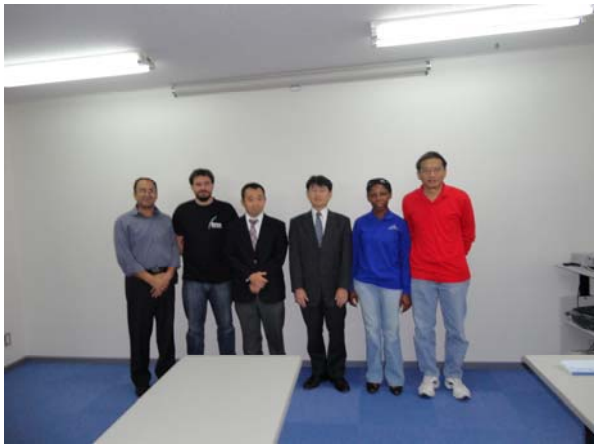
. The market area for frozen tuna was visited. Every morning the tuna are display and the buyers inspect the quality of the fish before they start bidding. Bidding start at 8 in the morning and are repeated every 5 minutes. The fish is then sold to the highest bidder.

3.5- Shimizu fishing port:

The training course on fisheries recourse management continue in" National Research Institute of Far Seas Fisheries" in Shizuoka City for 10 days. During that days we have lecture and discussion about Fisheries and tuna research management in the member countries and we prepared our report about it. Also we had some study field tour and visit from afew fishing port. That there is a brief at continue

We had a tour of the Shimizu fishing port, with Dr. Nishida .Visit started with where we observed the unloading of tuna from a long liner . One of transshipment Vessel (Tenho Miru) was unloading at that port. She had over than 2,000 ton of Blufin Tuna., This port has a big coldstor below -60 degree and two company are active here .(TO UO & TORY Freezer Company).

We then had a briefing lecture about the division which is responsible to provide permission for the operation of the port by Fishery Agency Officer. The other duties includes, Monitoring of landing area and vessel operation ,Collection of sampling data for the southern and blue fin tuna., He shown album of checking fish and some label that used for fish and also some form that fill in by transship Vessels and fisheries Vessels. .



Participants Group and Shimizu fishing port officer

Transshipment Vessel (Tenho Miru)

3.6-Yaizu Fishing Port and local fish market

The visit started with Dr.Nishida about the port yaizu. He also explained that at the port is for unloading of tuna from a purse seine and a pole and line vessel. Once unloaded the tuna are sorted by weight and then transported to -60^{o}C storage facility. From the port .at this port fish unloading by net or rope from crier of vessel on the plat , then some of worker separated kind of fish and directed them on the conveyers and then automatically they go to the boxes. or to the trucks.

Then we went to the local fish market. Actually my opinion it was important and maybe there is few hundred of production from tuna fish . and I get some idea at this market. It was beautiful. for me.

Taking fish on the platform

Conveyers to the truck

unloading fish

4-Application Fisheries in Iran (Based on This Course)

This training course improved my knowledge especially about

- **Management of fisheries resources in Japan / TAC & ABC system**
- **Fisheries cooperative in Japan**
- **Satellite data and GIS for resources management and monitoring of the fishing ground**
- **Aquaculture in Japan specially Sea farming**
- **Transshipment and Unloading of Fish at the Ports.**
- **Auction system used in Japan and also Local fish market**

And think in the future we do some project like bellow:

- **Satellite data and GIS :**
  - **Resources management and monitoring vessels.**
  - **To reduce Fuel and increase benefit fishing vessels**
- **Improvement of fishing fleet**
  - **Replace gillnet fishery to long line or purse seine .**
- **Establish Fisheries cooperative to collect catch statistics.**
- **Auction system and local fish market like in Japan.**
- **Sea farming**

5- Acknowledgments

I would like to thank the Japanese government, also I would also like to thanks OFCF for organizing and financing the leadership training course on fisheries management. Special thanks from Mr Tahara , the president of OFCF, Mr. Nagura Director Training Affairs Division, Mr Waku, Mr. Kobari and Mr. Iha for organizing the logistics Ms. Okoji our translator, Ms Miyuki Japanese Languages Sensie ,Dr Nishida for taking care of us during the technical training and all the lecturers and the fisheries research institute that we visited.

Also, I would also like to thanks the government of I.R.Iran specially Mr. Mojahedi Deputy of Fishing and Fish port for giving me this opportunity to increase my knowledge in the resource management field.

Lastly, I would like to thanks the participants, Ms Pierre **lucia** Desire Belona (Re.of Seychells) Mr. Thummachua **Smith** (Thaliland), Mr.Forselledo **Rodrigo(** Oriental Re.of Uruguey), Mr. Buga **Bennie**(Solomon Islands),Mr Olonguema Mangue **Jeremias** (Re. of Eq. Guinea) and Mr**. Ariscado** Artur Jose (Re. of Mozambique) for making this training a fruitful and interactive one .

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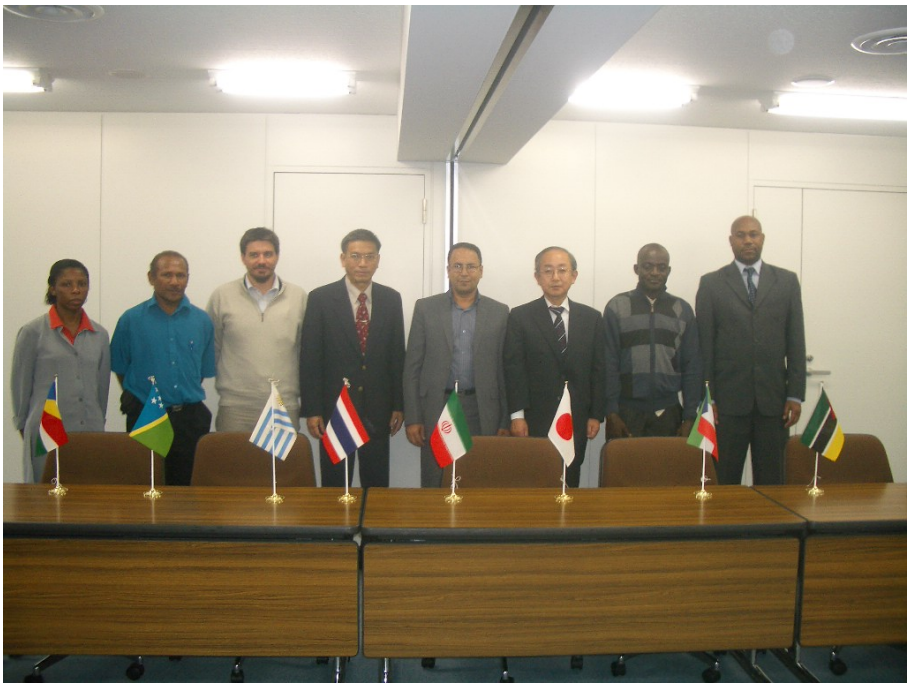
Part 3

LEADERSHIP TRAINING COURSE ON FISHERIES RESOURCE MANAGEMENT 2011



17th October to 22nd November 2011
Sponsored by
Overseas Fisheries Cooperation Foundation (OFCF)

Report submitted by Lucia Pierre
Data Management Assistant
Indian ocean Tuna Commission (IOTC)

Abstract

The Leadership Training Course on Fisheries Resource Management broaden my knowledge about the different stages in Japanese fisheries system and the different management systems exist to ensure sustainable use of the fisheries resources. Japan as a large consumer of fishery products, diversify its fisheries production to meet its demand. Aquaculture and Culture fisheries are increasing to supplement sea production. The principle theories of fisheries management were enlightened and also the concepts of estimation of resource abundance. Management depends broadly on statistics of the fisheries. The statistical system of Japan is a two way system. Fishery industries provide statistical data to research institute and in return the institute can provide quality information on fishing ground to fishery industries, using satellite data and information from fishermen. A fishery system where fishermen are in collaboration through, Cooperative associations are very effective in Japan in the management and development of fisheries.

CONTENTS

1. Introduction to Japanese Fisheries
1.1 Evens in the history of Japan fishery
1.2 Distribution of Fisheries product in Japan
1.3 Structural and Topical problems and countermeasures of Japanese Fishery
2. MANAGEMENT OF FISHERIES RESOURCES
2.1 Characteristics of Coastal Fisheries Management in Japan
2.2 Fisheries Based on Resource Management
2.3 Principles of Theoretical Fisheries Management
2.4 Estimation of Resource Abundance
2.5 The Total Allowable Catch (TAC) System in Japan
2.6 Estimating ABC
2.7 Forecasting the recruitment Abundance
3. Propagation and Culture of Aquatic Resources
3.1 Necessity and principles of the propagation and culture of aquatic resources
3.2 Management of culture production
3.3 Seedling Propagation
3.3 Nursery ground propagation
4 Fishery Cooperatives in Japan
5 Management of highly migratory species
5.1 Management Procedure
6 Responsibility Works for Tuna Fisheries
7. Satellite Information Service
8. Fisheries Statistics System in Japan
9 GIS Introduction

Visits conducted in relation to the Training
I. Tsukiju Market
II. Fisheries Research Agency
III National Research Institute of Fisheries Science
IV the Nihon Katsuo Maguro Market Corperation
V the Kanagawa Prefectural Fisheries Technology Center
VI Kanagawa Sea Farming Association
VII Shumizu Fishing Port and Fishery Agency in Shumizu
VIII Yaizu Fisheries Cooperative Association
Usefulness of the lecture

1. Introduction to Japanese Fisheries

1.1 Events in the history of Japan fishery

Table 1. Main Events in History

Year	Events	Objectives
1946	Mac Arthur Line	To restore fisheries production due to limitation of movement of vessels
1952	Peace Treaty	Abolished of restriction. (Movement of vessels from coastal to open seas)
1977	Convention concerning Territorial Waters	200 nautical miles established

The trend of fisheries catch production of Japan reflects the different stages in history of Japan Fishery. In 1973 the peak of marine catch was around 4 million and in 1989 decline to 0.9 million. The decline reflects the set up of the 200 nautical miles, where many countries were restricting fishing in the fishing areas. Table 1 above shows the main episodes of Japan Fisheries.

Fishing ground depends on different sea current for its productivity. In Japan the Oya-shio sea current, which is the cold current from the north, stream down and mingle with the Kurushio warm sea current, will be a good fishing ground. This is in the North-east Honsyu.

The fishery of Japan is large. In 2008 the statistics shows 222 thousand fishermen, 185 thousand of boats, 2927 landing places and 1950 cooperatives. 84% of the boats with internal engine are less than 10tons. This indicates that a large number of vessels are small scale fisheries.

Table 2. World Production and Consumption

Countries Production		Consumption per capita	
Countries	Production	Countries	Kg/citizen/year
China	57,827	Tokelau	200
Indonesia	8,795	Maldives	144.1
India	7,584	Niue	100
Peru	7,420	St Helena	92.7
Japan	5,541	Iceland	90.6
Philippines	4,969	Greenland	86.4

Fishery products are produced by culture and capture. China is the largest producer. Culture production is 2/3 of total production. For consumption Tokelau is the largest consumer. Japan is 5th largest producers and consumed 56.7 kg per capita.

Japan EEZ is 4470 thousands km2. This covers from Pacific Ocean through to China sea.

Table 3. Trend in Fishery production of Japan

Fishery	2009		1999	
	Production	Value	Production	Value
Fishery Production	5,438	14,730	6,626	19,860
• Sea water	5,349	13,840	6,492	18,568
• Fresh water	83	890	134	1,292

The decline in sea and fresh water fisheries production of Japan (table 3) are reflected in the value of fisheries products, hence fell by 25%

Table 4. Trend in fisheries Production per gear of Japan

Fishing Gear production	2009	1999
Total Production per Gear	**4,147**	**5,239**
• Purse seine	1,219	1,566
• Trawl net	1,062	1,433
• Others	1,866	2,240

Purse seine fisheries, the largest producer, its production over the 10 years period fell by 22% (table 4) The only gear that production increased was pacific saury stick held dip net.

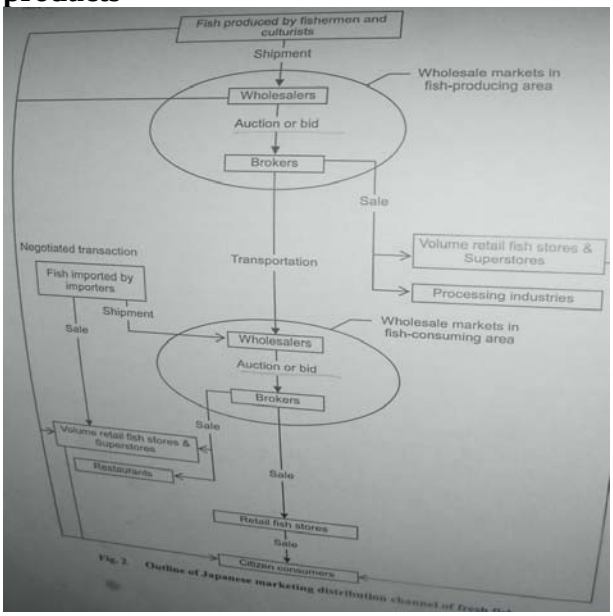
Considering individual species, not only did sea production decline, but the unit price in yen for most species fell. Hence the value by species also shows decrease between 1999 and 2000. However for Atka mackerel the price increased by 27%. Tuna, one of the most valued species, value fell by 38%.

The same case with the culture products, both production and unit price per species reduce over the 10 years. The overall value of this fisheries reduced by 22%. For yellowtail production rose slightly but its unit price fell by 28%.

The share of imported product in Japan market is 30% of total consumed (2595 thousand tons). Most imported species are Prawn and shrimp, 10 times the amount produced.

1.2 Distribution of Fisheries product in Japan

Structure of the Distribution of Fishery products



Auction Market

Products at Consumer Market

Distribution of Fisheries product in Japan to consumers is through a complex channel. In the diagram the channel for distribution is explained. Common distribution is direct between fishermen and consumer, whereas in Japan wholesalers are the focal of the distribution. Before reaching consumer area markets, cooperatives through wholesalers sell to brokers in bidding or auction in fish-producing area markets.

1.3 Structural and Topical problems and countermeasures of Japanese Fishery

The table below listed the major problems of Japan fisheries and measures undertaken to control or to eliminate the problems. Important to note the TAC measures also help to restore stocks of depleted species.

Table 5. Problems and Countermeasures

Problem	Issue	Measures
Decreasing Stock	Species with High Value and high catch; targeted by foreign fleets, species require resource management.	**Total Allowable Catch (TAC).** Consideration of Total Biological Catch, socio-economic
Decrease and Aging Fishermen	Age group above 60 years – 50% of **total** fishermen, depopulation of fishing village	**Promote employment**. (Offering training and aid of management fund)
Giant Jellyfish	Outbreak of the giant jellyfish in the fishing net of the coastal fishery; toxic sting they release injured fish caught and fishermen	**Developed structural fishing gear** which make it possible to discharge them from the net
High Fuel Cost	Strong effect on fishery management cost of the small and medium fisheries	Fishermen **reduced cost** by using low fuel consumption boats or reduced activities.

2. Management of Fisheries Resources

2.1 Characteristics of Coastal Fisheries Management in Japan

Management measures for the coastal fisheries in Japan are laid out in the Fisheries Law established in 1949. It is based on

- **Fishing right** – set-net fishery right, demarcated fishery right and common fishery. Specific fishing areas are set and they have exclusive right.
- **Licensed fisheries** – at the Ministry level, license are for large fishery, operating offshore. At Governor level license for small scale fisheries mainly less than 40m.
- **Free-fisheries** - like angling. This is not sustainable for living

The management is in two different aspects: independent management – manage by cooperative associations (bottom-up system); and system management – manage by government through issuing rights (top-down system) .

2.2 Fisheries Based on Resource Management

The management measures employed to overcome the setback in fisheries was based on adept use of reproductive ability and conducted more stable fishery operations. The main characteristic of this management is that it is run by people engaged in fisheries and the cooperative associations. The management was successful in most cases.

Table 6 Successes of the measures employed in management of coastal fisheries.

Management System	Measure	Success
Reproductive Resource Management Type	Control the spawning biomass	Sand-lance fishery in Ise Bay
Recruit Resource Management plus fish price maintenance	Control fishing recruitment when price is low and increase when the price is high.	Coastal surf-clam fisheries in Fukushima Prefecture
Individual Allowable Catch Management Type plus Injected Effort Management	Setting individual catch quota; minimize days of operation	Small-scale Trawl Fishery pf Squilla by Yokohama City Fisheries cooperative association

2.3 Principles of Theoretical Fisheries Management

There are different models used to evaluate in theory the Fishery management

- Production Model - The principal is about the abundance of resources and natural increment. To maintain the level there should be balance between juvenile and adult population. The resources cannot increase limitless. The ceiling beyond which volume cannot increase is determined by nature, environment, food availability and ecosystem. Where the relationship between the resources abundance and the natural increment gives a declining trend, it is the density effect.
- Maximum Sustainable Yield (MSY) - The point where the natural increment and resource abundance increase to the maximum. However, when the natural increment is negative with increasing abundance, the point of sustainable use of the resources is exhausted. In other word there is a limit to amount of catch that can be taken to maintain sustainable use of the resources. This is call the Maximum Sustainable Yield
- Maximum Economic Yield (MEY) – the concept is base on the cost, catch and fishing effort. The point where increase in fishing effort gives the maximum profit that is, cost is less than catch yield. Beyond this point, the profit gain reduces with increase use of the resources. The point is the Maximum Economic Yield. In principal at the MEY level enterprises will be attracted to the industry. This will be to point where the MSY is met. However, Beyond MSY, the industry will not be sustainable nor profitable, hence there will be reduction of enterprise in operation. Overfishing will occur in terms of economy and biological increasing effort beyond MEY and MSY.

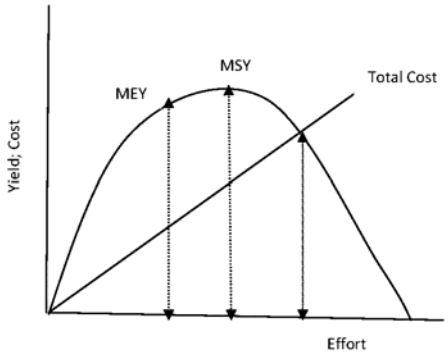


Illustration of MEY, MSY, in relation to effort, yield and cost of production

2.4 Estimation of Resource Abundance

There are various methods use to estimate the fluctuation of resource abundance.

- The De Lury Method – Baseline is using the Catch per unit of Effort (CPUE) to estimating resource abundance. The decline in CPUE with accumulated catch number, the De Lury Method can apply.

- **Cohort Analysis-** Initially use to determine demographic changes in population. In the case of fishery management use to determine the changes in age group. When the natural mortality is known base on catch data by age over a period of time. The method seeks to estimate number of juvenile that have entered the fishing group

2.5 The Total Allowable Catch (TAC) System in Japan

Total Allowable Catch (TAC) was established to conserve the stock of depleted species. Hence prevent overfishing and allow restoration of the stock. In Japan 7 species are under TAC. The basis for calculating TAC is the ABC (Allowable Biological Catch) and researches. The system is call "catch-amount control". Species with high value and high catches; or its resources need management will be place under TAC. Japan adopted TAC following the ratification of UN law of the sea in 1997. The national government takes into consideration the socio-economic situation before setting the TAC. The TAC will be distributed to fishermen through association.

2.6 Estimating ABC

The goal of ABC is to maintain and restore resources to MSY level. The methods to achieve the goal are:

- Constant harvest Rate Strategy – Through fixing fishing coefficient
- Constant Escapement Strategy – Secure fixed spawning biomass and are related to spawning school and reproduction related to sustain biomass
- Constant Catch Strategy – Using MSY as the standard
- Feedback Management Measure – where CPUE is used to adjust ABC base on the trend of CPUE.

ABC by empirical Method is limited in tropical region. This is due to the limitation of availability of information. As the CPUE and catch trends is crucial.

2.7 Forecasting the recruitment Abundance

Forecasting recruitment abundance can be complex using ABC. The main factor is the period of time, which determines effectiveness for the forecast. Forecasting recruitment is effective when analysing past catch data, estimate the reproductive relationship and surveys.

Some recent topics on fisheries management are the Climate change, change of dominant species and regime shift.

3. Propagation and Culture of Aquatic Resources

3.1 Necessity and principles of the propagation and culture of aquatic resources

The necessity of the aquatic is to stabilize fisheries production and to prevent depletion of the natural resources through overfishing. The main principles are raising hatch rate and survival rate of larvae and juveniles to increase volume of resources. Aquatic culture is not only for fish products, but also for plants such as seaweed. Worldwide China is the largest producer of aquatic products.

Aquaculture in Japan is increasing and is vital for socio-economic of fisheries sector. The value share of

Aquaculture nursery ground

aquaculture production in Japan was 32% compare to 68% of the captured value. Characteristic of the selected species are the high value, such products as fish, shellfish and seaweed. Oyster, silver salmon and pearl from sea production are 100% culture.

Methods of culture production system:

- non-feeding - nutrient from natural environment including floating objects;
- Feeding- artificial fed in ponds, demarcated area in sea water and net cage.

3.2 Management of culture production

Aquaculture production as a profitable business also brings negative effect to natural resources.

- **Death of bred fish through disease**. There are rising consumer concerns on amount of chemical use to prevent disease. The methods use to prevent disease are vaccination.
- **Death of bred fish through environment degradation** – harmful phenomena such as red tides toxic plankton and oxygen-deficient can occur when the cleansing ability of water exceed through adding nutrient rich matters.
- **Fish price decline** – demand less than quantity harvest can, hence lower prices and losses for the industry.

3.3 Seedling Propagation

A common propagation method, is releasing of seedlings. The ratio between released and returned juveniles is around 5% in the released ground. Using marking method the percentage of release seedlings in a catch can be calculated, including rate of recapture and its profitability.

3.4 Nursery ground propagation

Propagation can also be through creation of nursery ground. This is mainly to protect marine organism during their growth period. Facilities are by artificial shelters being installed in sea area with few rocks. Or the formation of rock dumps from land.

Propagation can be through conservation of coastal areas and fisheries regulations.

4 Fishery Cooperatives in Japan

Cooperative is unique as it assumes not only business and associative functions, but integrating commercial activities and mutual aid activities. Members are themselves managers and owners and finance the capital. In cooperatives competitors co-exist. Per prefecture numbers of cooperative are declining. Hence, it is becoming more effective as the numbers of fishermen are reducing.

Characteristics of Japan Cooperatives

- Voluntary to be members;
- Decision taken by general assembly;
- Criteria to be member is address within the jurisdiction and its activeness
- Members participate actively in economic aspects
- Surplus are distributed as dividend to members
- Provides insurance policy for loans
- Provide facilities and services such as transportation; storage; fish reefs. Moorages; guidance

5 Management of highly migratory species

Highly migrated species are tunas and sharks. They move within the 3 oceans and from EEZ to high seas. Most the species are commercially important such as tropical tunas, billfish, sharks, and bluefin tunas. They are fast growing, but low spawning and relatively low natural mortality. Catch trend of tunas in the world are increasing. The pie chart shows the share by oceans. The introduction of purse seine fishing using FAD is vital for canning factors, however capture contains many juveniles. High value species like Bluefin tuna are also target.

The fishing industry is very unstable changes in the market of fresh or canned products can change MSY.

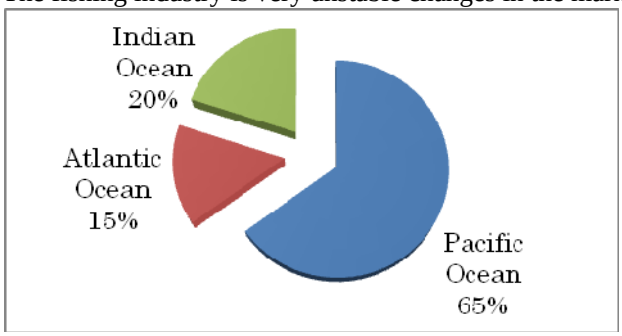
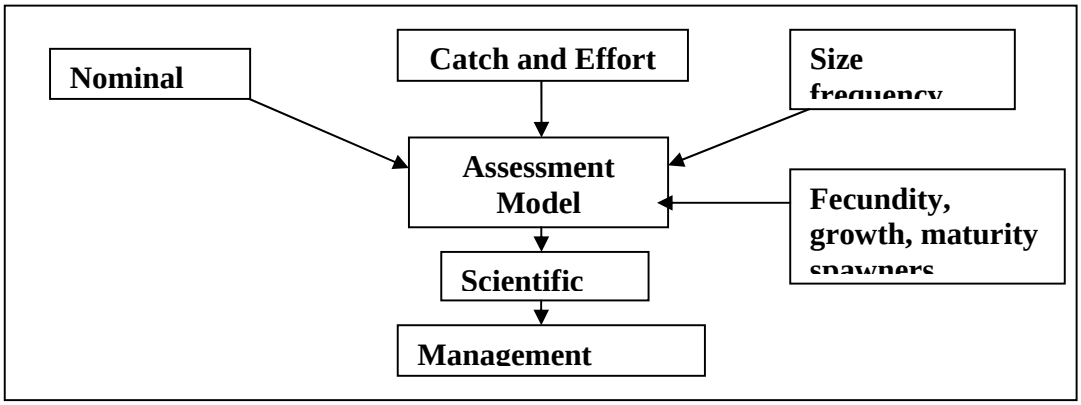


Table7. Migrated species gear used and utilization of the species

Species	Gear use	Product
Southern Bluefin tunas	Longline, purse seine, pole and line	Fresh, Canning
Bigeye tunas	Longline, purse seine, pole and line	Fresh, Canning
Yellowfin	Longline, purse seine, pole and line	Fresh, Canning
Albacore	Longline, purse seine, pole and line, trolline	Fresh, Canning
Skipjack	Purse seine, pole and line	Fresh, Canning
Billfish	Longline, Gill, Spear	Fresh, creation fishery

5.1 Management Procedure

Below is the procedure for setting measures to control fishing. However for Purse seine fisheries CPUE difficult to considered, and for Longline the standardization of CPUE by species. The assessment can be uncertain depending on the availability and quality of information. Biological and catch data are essential for the management of the resources.



Management of the resources at this point are through RFMOs. There are compliance measures, surveillance and choices of regulations as common measures.

6. Responsibility Works for Tuna Fisheries

OPRT (Organization for the Promotion of Responsible Tuna Fisheries) ensure sustainable use of tuna resources through conservation and management measures. With the increase in consumption of tuna's products there are increasing catches in all oceans. Exploitation high in especially in Pacific Ocean due to increasing Fishing Capacity through advance technologies to facilitate storage onboard for lengthen fishing period. OPRT objectives are to eliminate IUU tuna fishing, reduce excess capacity and by-catch. The motivation behind the establishment of the registration of vessels were the increase number of vessels from Taiwan,China and Japan. In 1999, with OPRT and introduction of positive list to control number of vessels operated, many FOC vessels were scrapped both from Taiwan,China and Japan within 2000-03. This reduced IUU vessels to nil. The Positive list initiative is followed by RFMOs. The OPRT Positive list is use mainly to verify the Taiwan/China vessels from Indian Ocean as they cannot be listed. The latest agreement to protect from overfishing, is not to increase number of vessels, but to transfer between members or scrapped old and registered new. However the issue is that new vessels are better equipment and more capacity than old.

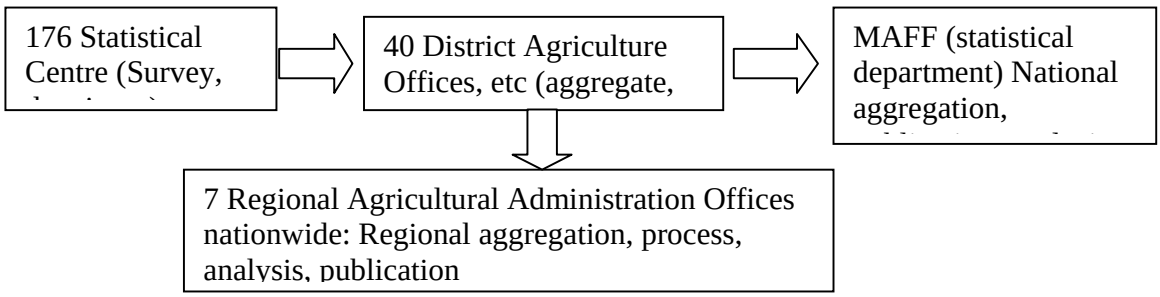
7. Satellite Information Service

Satellite information are use in Japan to forecast ocean environment, market information and most important fishing ground. At Japan Fisheries Information Services Center (JAFIC), apart from providing information services, also have databases of satellite and ocean environment information and conduct research and development. They operate in a similar manner as NOAA.

Satellite data covers wide area, are instant and real time data. However the disadvantage is that the remote sensing is not perfect and are limited to atmospheric condition. The future of satellite data for fisheries will include observation data for forecast. The main users are researchers, fishermen, government and marine users (sport fishing). It also detects illegal fishing activities through VMS communication. The type of data provided are sea surface temperature which is directly related to living environment. Ocean colour which is related to phytoplankton – related to food environment. The flows of data in JAFIC are from satellite, NOAA, JIAXA.

8 Fisheries Statistics System in Japan

Fishery Statistical System of Japan is a Decentralized system. Below diagram illustrate the system.



Data collections in Japan are through surveys and census. Survey is conducted annually and census every 5 years. The two methods have different concept. The Census centered on management, marketing and financial of the sector and is base on the surveys data collected.

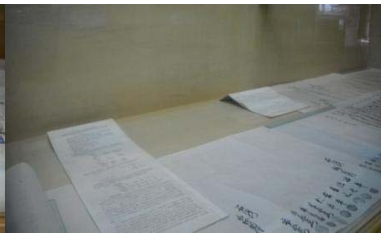
Survey objective is to identify the status of fishery and aquaculture production in Japan and develop materials required for the promotion of fisheries policies.

Table 8 Type of data collected in Survey

Type of data collected		
Number of fisheries unit	Catch production	Market prices
Number of Producers	Stock	Import and export
No. of fishing vessels	Storage	
Income and expenditure	Value of catch (Prices)	

The history of Japan statistics has many stages and marked by surveys and censuses have been conducted in different stages.

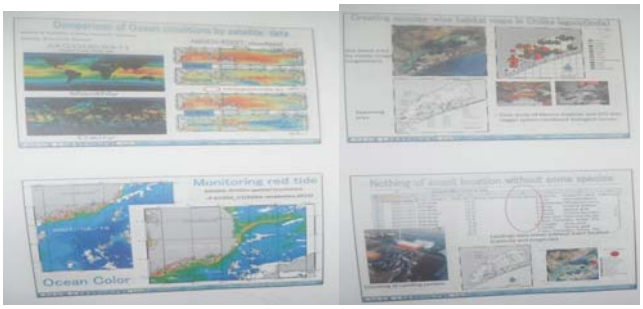
Statistical data collection in the past 400 years ago



Documentation of Japanese fisheries

9 GIS Introduction

Marine GIS or Marine explorer is a system whose concept is menu driven and non programming. The system required wide range of datasets like satellite images, sea conditions and catch data for complete analysis. Its main purposes are processing observer data of research vessels and spatial analysis for fisheries resource management. Modeling and simulation can be used to forecast fishing ground. Data generated are provided to fishermen via mobile phones within coastal area. To forecast the fishing ground a new GPS data-logger on boat are used. The system collects automatically the area, temperature and catch data.



Application of the data are through providing maps, use in fisheries oceanography

Visits conducted in relation to the Training
I Tsukiju Market.

Tsukiju market is one of the largest auction markets in Tokyo and in the world. We managed to watch the 5.30am auction for tuna. Species on auction at that time was frozen yellowfin. On the auction floor only middlemen and the seller are allow to enter.

Process in Auction Market

Firstly prior to any selling supervisors inspect the fish for freshness and other hygiene checks are performed to prevent any violation of the Food Hygiene Law. The market place is also equipped with laboratory facilities. This is followed by inspection by the middlemen and authorized buyers. This guides them in deciding what product and price to bid on.

The fish being auction in this market came from Japanese waters and other part of the world, where Japanese vessels are operating. To sustain the demand for fish product, Japan also imports fish from foreign vessels. The fresh tuna comes from Japan waters only and the frozen are both Japan and other ports.

Within the market place there is also the culture production section. The culture production contains mainly demersal fish and other marine products. Some seedlings are spawning in laboratory, where as some juveniles are caught from sea water and cultivated. The tanks contain sea water and the water temperature are maintain by generators. These products are sold live to wholesalers by auction. The same processes are carried out as for the other products. They are inspected first by the wholesaler prior to auction. We noticed the presence of fish companies' representatives who help to influence the prices as they are not allowed to bid.

We were informed that around 2000 tons of marine products enter the market on a daily basis. Tsukiju market place auctions several other products such as agricultural products and flowers.

The market area also have middlemen shop where they do packaging and processing of some fish products for selling to retailers and other selling agents in smaller quantities.

View of the Market

II. Fisheries Research Agency

Presentation made by 3 speakers on:

- **On the organization outline;**
- **Current status of the international fisheries;**
- **Stock assessment of coastal fisheries;**

Visiting research vessel

Attending lecture at

The agency was established in March 1897.The Fisheries Research Agency of Japan through various research and development activities on fisheries tries to achieve the main policy targets. That is securing stable supply of Fisheries products and promoting sound development of fisheries industries. These policy targets where stipulated in Basic Plan of the Fisheries Policy in 2002.

The third five-year Plan was established in April 2011. This consists of 5 pillars set to achieve the targets.

1. Development Conservation Technologies for the Sustainable Use of Fishery Resources Both Domestically Around Japan and Internationally.
2. Developing Stock Enhancement and Rational Use of Fishery Resources, and Environment Conservation Technologies for the Promotion of Coastal Fisheries.
3. Establishment of Productivity Improvement and Environmental friendly Technologies for sustainable Development of Aquaculture. To maintain the supply of fisheries products to meet the increasing demand of fisheries products, the development of aquaculture is vital.
4. Research and Development for the Development of Fisheries Industry, Safety of Fishery Products and to Maintain Consumer Confidence. Improvement of disaster prevention; maintenance fisheries equipment and infrastructure
5. Monitoring and Basic and Pioneering Research. Task 1-4 through assured implementation of vital Research

The pillars depend on various aspects such as socio-economic, ecosystem and technological development. Vitality of the research can be assured through monitoring at locality, preparation of new technologies and its utilization for industrial purposes.

Table 9. 10 Research Institutions of the Fisheries Research Agency

Institute	Objectives
Hokkaido National Fisheries Research Institute	Developing the sustainable fisheries management by conserving fishery resources and their habitat in the highly productive waters around Hokkaido and adjacent subarctic regions.
Tohoku National Fisheries Research Institute	Promotion of farming and fishery activities and marine resource management in the north-eastern waters of Pacific coast of Japan.
National Research Institute of Fisheries Science	Act as national fishery research center of Japan
National Research Institute of Far Seas Fisheries	Promotes the sustainable use of international fisheries resources
National Research Institute of Fisheries and Environment of Inland Sea	evaluation and conservation of ecosystem functions of coastal seaweed beds and mudflats and forecasting the production of marine life in various sea regions
Seikai National Fisheries Research Institute	promote the fishery industry of the western Kyushu and to support the stable provision of fishery products
National Research Institute of Aquaculture	develop leading marine life breeding technologies to contribute to the fishing industry
National Research Institute of Fisheries Engineering	sound development of the fishery industries and the stable supply of fishery products through engineering
Marine Fisheries Research and Development	Research activities for the rational use and development of marine resources

The Fishing Research Agency of Japan has 9 fishing research vessels (10th institutes). There sizes range between 59 to 900 tons. The vessels perform research in the vitality of research mechanisms behind changes and inner working of an ecosystem to forecast future conditions, development of new fishing ground and improvement of new technologies.

The Agency has major equipments which facilitate the research work. Clam Farming Testing Laboratory; Nuclear Magnetic Resonance Equipment; and Marine Dynamics Basin and are base at different institutes.

We were given an overview of the current status of international fisheries resources by Shimada, Hiroyuki. Hence the importance of China catches in the world. Pollock and sardine are the two main species in the 1970s to 1990s. From the 1990 we saw the increase in catch of Anchovy. For the catch of tuna by fisheries, catches by purse seine fisheries shifted to a high increase from 1980, reaching close to 3millions tons in 2004 showing the impact of using FAD fishing. Catches of skipjack and yellowfin tunas increase steeply For the longline, pole and line and other gears it remain stable. Two third of catches of tuna goes to canning factories. U.S.A was the largest manufacture of canned tunas from the 1976 and in the 1980s Thailand is increase production of canned tuna gradually. Third largest is Spain. Countries like Ecuador, Mexico, Iran, Italy Seychelles, Philippines and Japan are increasing production too.

Finally we have a short overview of Stock Assessment of the coastal species. Stock assessments are conducted on 52 species. The F-coefficient use to estimate TAC and ABC was outline.

III. National Research Institute of Fisheries Science

The National Research Institute of Fisheries Science of the Fishery Agency was established originally in 1929. However the institute has had several locations and functions from its establishment till 2001. There on under the supervision of the Fisheries Agency, the institute has been organized in different division. The latest organization of the divisions was done in 2007. The institute assumed mainly the responsibility of safety research including food processing and preservation, enhancement of fisheries stock. To ensure the sustainable and effective use of marine resources the institute promote fisheries resources management, stock assessment technology and fisheries biology. They have several field stations.

Visiting Satellite section and lecture given at the research institute

Within the organization there are different research centers, each having specific task related to sustainable use of fisheries resources.

- **The Project Management** supports the planning, coordination and promoting of research programs.
- **The Fisheries Economy** which deals with socio-economic relationship between supply and demand and the distribution network of the fisheries section.
- **Fisheries Management** research in the mechanism for attaining allowable biological catches (ABC) for the estimation of stock assessment

- **Fisheries Oceanography and Marine Ecosystem** research in the ecophysiology and ecology of coastal marine organism.
- **Biochemistry and Food Technology** research in technology related to food processing and preservation, and quality control and food safety.
- **Aquatic Genomics** is responsible for the studies on genomes and DNA. They are constructing a database on aquatic organisms.
- Finally they have two research vessels.

At the institute we were enlighten on the report of the "Grand Design of the Fisheries and Resources Management in Japan". The principal of the fishing industries:

- **Resource and environmental policy aspect**. Entail the conservation, harmonization with the environment. These aspect are lack in most developing nation
- **Food Policy aspect**. The promotion in community for fisheries education, science, and international contributions.
- **Industrial and Economic policy aspect**. Responsible for consumer needs, promotion of Japanese products and ensure good working environment.
- **Local and community policy aspect**. The integration of coastal and welfare development within the community.
- **Cultural and science policy aspect.** Promotion of fisheries into the community, leisure and education.

The report also elaborates on the weak and strong points of the Japanese Fisheries.
Merits of the fisheries in Japan are mainly the conditions of nature and geography; food security policies; process in efficient fisheries technology, development of statistical system; sharing of scientific knowledge with fishers.
The problems are mainly excessive dependency of specific resources; high cost; fluctuation in fish prices; inaccuracy of monitoring.

IV. Nihon Katsuo Maguro Market Cooperation

The market is located close at the port. In the vicinity there are cold storage facilities for both middlemen, stored after purchase and cooperatives stored after landing, and stalls for selling fresh and frozen fish products to consumers.

Selling at this market is done through bidding rather than auction. We managed to see bidding for tuna. At Nihon Katsuo Maguro market they handle mainly bigeye tuna. There are 2 wholesaler companies that middlemen can bid from. On the day of the visit there were over 500 tunas for sale. In the past they use to handle around 1000 pieces of fish per day. The commission for wholesalers is set the cooperation. On

arrival the tunas are weight, fat content are check by inserting a knife at the lower part of the fish and they are classified base on the quality of the fish. The tails are cut to see the quality of the fish. Each company has a fish inspector present to examine the fish. Further if a buyer wanted to be sure of the quality of the fish the tail are defrosted in high pressure water. The inspector goes round the fish rows to be accurate on the classification of the fish base on quality. Each row has around 25 fish. After the classification is completed, buyers check the fish and select what they want to buy. For this market each individual buyer has a board (folded). For them to have the board they need to be licensee. The price is written on the board placed in the box where the bidder is. The faster they place their bid is also important. Hence in the case more than 1 higher bid the one that placed it first is the winner. The prices per kilo can be from 600-3000 yen depending on the quality of the fish. The buyers are requested to make payment by the end of the week. All buyers need to have 5 guarantees incase of anything happen and payment are delays.
For the wholesalers, if no customers immediately, rent freezer till they have request.

The tails of the fish also goes for sell. Depending on the quality of the fish the tail can fetch from 600 to 1500yen per piece.

V. Kanagawa Prefectural Fisheries Technology Center

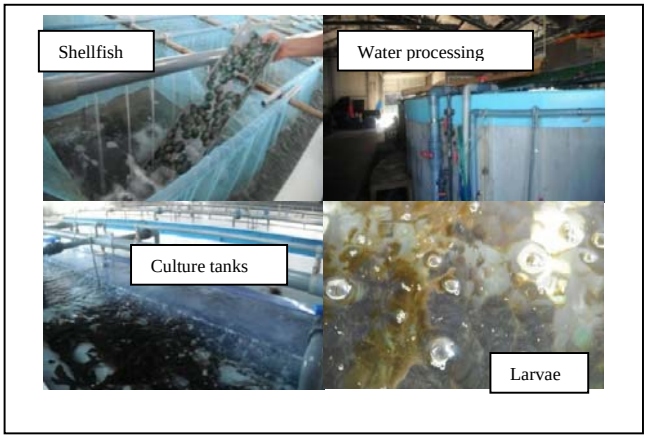
The center was established in 1912 under the name Fisheries Experimental, there on changes twice name and location. The name Fisheries Technology Center was given in 2005. In the beginning the research was targeting set net activities, currently its main target are research and promotion coastal fisheries. The research center conducts activities on regional level. Their objectives, likewise to the national research agency are to promote fishing, enhance stock, promote safe production of fisheries products and the consumption of fish, and the propagation of seaweeds. For their activities to be successful they have to coordinate activities with the involvement of locals especially the fishers.

For the center, Fisheries Management is the proposal of specific method of fisheries, and method of convincing fishermen of the importance of the resources management. As resource management is the theories needed to manage fisheries, no accomplishment if resource management is not possible. Further to this progress will be achieved if fishermen understand the necessity. Involvements of government are not necessary. I find this interpretation of fisheries management relevant for coastal fisheries, where fisheries are main sources of living.

The research carried out in Kanagawa Prefectural with the involvement of the fishermen was on the Management of Conger Eel (Conger myriaster) mainly found in the Sea of Japan. Catches of the species where mainly done using trawler, other gears and longline. The spawning grounds of the species are unknown. Believe the larvae are carried by the Futoshio to Pacific and by Tsushima current to Japan.

VI. Kanagawa Sea Farming Association

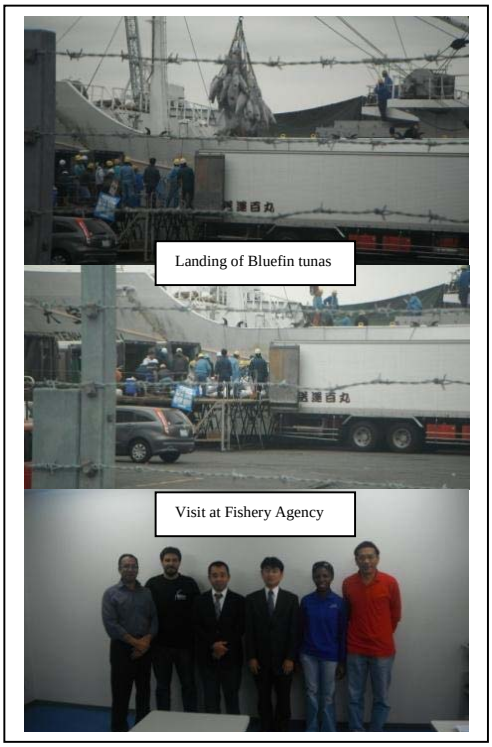
Main objective of the sea farming association is to produce marine products either through full culture in aquaculture or produced seedlings for release. Culturing of marine species in ponds became necessity when resources from coastal decline or changes in the condition of some species. Hence the resource management is stock enhancement. The association is run by fishermen and locals in the community. However the seedlings produced are sold after to fishermen or release at sea. They produced newsletter, brochure leaflet to advertise. For the tanks water are pumped from the sea using generators. The conditions of the water are monitored by researchers. Recovery rate of release are around 10%. The species from artificial can be differential from those in nature, either by tagging or some differences in appearance. Shellfish is the main product at the aquaculture.



VII. Shumizu Fishing Port and Fishery Agency in Shumizu

At the Shumizu (Okisuwah) fishing, main activities are landing of Bluefin tunas from transshipment vessels. The catches come from all oceans. Bluefin tunas of each ocean are marked to indicate. Onboard the vessels fishing there are observers to collect data.

In Shumizu, there is a small office for Fishery Agency. The people based in Shumizu are inspectors that monitored the landing of bluefin tunas in Japan. The sources of the species are vital for the market in Japan. Upon landing the inspector will be on port to monitor that the information reported is correct. Further there are researchers collecting tissues for DNA analysis to confirm the origin of the catch. Unloading takes around 2 weeks for transshipment vessels. Storage facilities are also available at the port. Yellowfin and Bigeye are also present, however these species are of no interest, information from the declaration form only are considered. Prior to landing transshipment vessels will submit declaration forms to port and longliners also submit declaration form to transshipment before transshipped to facilitate the movement of observers onboard. Information on the declaration forms are the quantity, ocean and species. Interviews are conducted to fishermen to know the sea conditions. The tasks of the inspector are not only in Okisuwah ports, but other ports in the region landing bluefin tunas. Note that some landings are carried via freezer containers to the port for inspected.



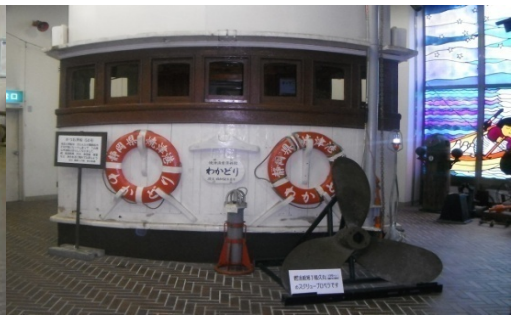
VIII. Yaizu Fisheries Cooperative Association

Yaizu Fisheries Cooperative Association is based in Shizuoka, where the best green tea of Japan are cultivated. We visited the port, where landing from a purse seiner was being carried out. The vessels catch are from Pacific Ocean. Catches were skipjack and yellowfin tunas, and are around 50% each. We were surprised to see the amount of big yellowfin tunas landing. Fish at the port are classified on landing depending on species, quality and size. The port is run by the cooperative association. The association has 400 customer-fishing boats landing in their port.

Landing of yellowfin tunas

Sorting SKipjack

Yaizu Fisheries Museum



Usefulness of the lecture

The training course is vital for countries whose fishery sector is stagnant, no control on marine resources or measures are limited to ensure sustainable management of the fishery resources. Fishery managements of many countries in IOTC area are inadequate. This is reflected in the reporting of fishery data. That are either inaccurate or no form of data collection. As IOTC is promoting data collection in coastal countries through sampling program, the fisheries sector of these countries should be organized to ensure proper collection of data. This can be through

- Promote fisheries association/ cooperation for coordination in relative issue from fishing to marketing of the product
- Empowerment of Fisheries Association by government
- Promote fish processing to add value to fishery products and modernize the sector
- Marketing of fish product in more conducive place
- Researchers and fishers work closer and have direct communication
- Fishers participate more actively in research on new technology
- Promote alternative fisheries production method to prevent overfishing in coastal area
- Promote data collection through surveys at local level

The training had boost-up my knowledge on crucial methodology in assessing resources for management purposes. The cohort analysis and the principles of Theoretical Fisheries Management illustrated how data collected from fisheries sector can be further analyzed for decision making in conservation of fishery resources. Furthermore appropriate management measures depending on the circumstances surrounding the resources, eg. TAC, MSY…)

Acknowledgement

I would like to thank the OFCF President Mr. Tahara for granting me this opportunity to enhance my knowledge in fishery Management. The lecturers from different sector of Japan fisheries for addressing the relevant issues about Fisheries Management
NRIFSF – Mr. Nishida, for dedicating your time in teaching the fundamental of presentation
Special thanks to Mr. Waku, Mr. Kobari and Mr. Iha, for taking care of our welfare duing our stay in Japan. Ms. Ofuji (Translator) and Ms. Sawano , Japanese sensei.

Part 4

Overseas Fishery Cooperation Foundation of Japan

Report of the

"Leadership Training Course for Fisheries Resources Management"

October, 17th to November, 22nd

2011

Rodrigo Forselledo

Dirección Nacional de Recursos Acuáticos

Ministerio de Ganadería, Agricultura y Pesca

República Oriental del Uruguay

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Application of Training……

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INTRODUCTION

The Overseas Fishery Cooperation Foundation of Japan (OFCF) was established in 1973 with the objectives to maintain and enhance amicable relationship in the fisheries field between Japan and coastal countries concerned by way of extending technical and economic cooperation for the development and promotion of their costal fisheries and for the effective management of international marine resources conducted by the regional fisheries organizations concerned.

In this aspect, OFCF recognize the importance of resources management through Regional Fishery Management Organizations (RFMOs), and therefore organize and promote the "Leadership Training Course for Fisheries Resources Management" (LTCFRM). The main objective of this course is to upgrade the capabilities of governmental employees, mainly in developing countries, who are responsible for the formulation and implementation of proper schemes for resources management. At the same time, the training course aims at improving the accuracy of fisheries catch statistics and other data required by RFMOs.

This report presents a resume of the lectures covered during the LTCFRM 2011 as well as description of field study tours to different fisheries facilities, fisheries agencies, and research institutes. Finally, methodologies, technology and research developed in Japan and presented during the training is discussed for its possible application and implementation in Uruguay in order to enhance the country capabilities.

LECTURES

Japanese Overseas Development Assistance in Fisheries Field

Presented by Mr. MATSUMI from OFCF of Japan

Objectives, Organization and Outline of Major Activities of OFCF of Japan were presented.

As already mention, the objectives of OFCF of Japan are maintain and enhance amicable relationship in the fisheries field between Japan and coastal countries concerned by way of extending technical and economic cooperation for the development and promotion of their costal fisheries and for the effective management of international marine resources conducted by the regional fisheries organizations concerned. In addition, OFCF of Japan, through international cooperation, has the objective of contributing to the stable supply of marine fisheries as a fundamental principle of the Basic Law that was promulgated in June 2001.

OFCF is leaded by a President (Mr. TAHARA Fumio) and three Vice Presidents, with the support of an Advisory Committee and a Board of Directors. OFCF is a division of the Fisheries Agency, of the Ministry of Agriculture, Forestry and Fisheries (MAFF). As an important sector of Japan's economic structure, the MAFF has the objective to contribute outstandingly to the development of national economy and stabilization of national life through their role of providing stable supply of foods indispensable to our daily life.

To fulfill the objectives of the organization, OFCF carries out several projects and activities such as:

I. Cooperation for overseas fisheries development. In order to contribute to the development and promotion of the fisheries in coastal countries with whom Japan has a close relationship in the fisheries field, OFCF provides various types of technical cooperation.

    a. Project for promotion of regional fisheries: in order to encourage regional fisheries development, OFCF dispatches fisheries technical experts with equipment and materials to costal nations for the production, processing and distribution of fisheries products and for transfer of techniques to restore functions of fisheries related facilities. This project has been carried out in several countries such as Guinea, Gabon, Mozambique, Seychelles, Peru, Morocco, Kiribati, Argentine, Fiji and more.

    b. Project for the protection of environment and conservation of international fishery resources: in order to contribute to the sustainable use of marine living resources, OFCF

has been extending technical guidance for the resource management, resource development survey and reduction of incidental catch.

c. OFCF provides assistance to the Japanese fisheries organizations carrying out overseas fisheries cooperation projects at the request of the coastal nations. This assistance involves, technical experts' guidance, provision of equipment, materials and services.

d. Inviting overseas fisheries trainees from governmental organizations and local fishing companies' staff to provide the various fisheries technique, skills and knowledge for them.

II. Promotion of fisheries personnel exchange with overseas countries.

a. Inviting key figures officials from coastal countries to deepen mutual understanding with the Fisheries Agency of Japan and the Japanese fishing industries.

b. Promoting exchange of fisheries related personnel through organizing symposium on the fisheries issues.

III. Registration, recruiting and training of Japanese fisheries technical experts.

IV. Project finding and evaluation of fisheries cooperation projects.

V. Loans for overseas fisheries cooperation project.

Introduction to Japan's Fisheries

Presented by Dr. KOBAYASHI from OFCF of Japan

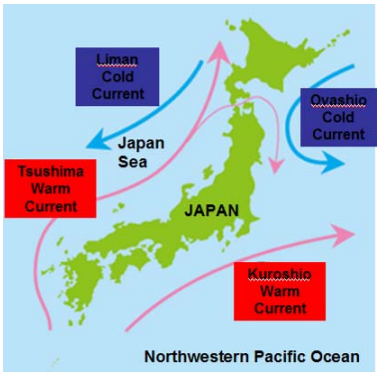
History of Japan fisheries after World War II

- In 1945 the Allied Powers placed Japan under occupied control and completely prohibited the free movement of ships, what caused that same year a reduction of 46% in the production volume of fisheries.

- 1949 Promotion of Fisheries Law which establishes three categories:
    - Fisheries based on fishery right
        - Set-net fishery right
        - Demarcated fishery right
        - Common fishery right
    - Licensed fisheries
        - Minister licensed fisheries
        - Governor licensed fisheries
    - Free fisheries
- With the conclusion of the Peace Treaty with Japan, the postwar restrictions on sea area operation were completely abolished in 1952. As a result, Japan, under a policy of expanding fishing grounds, engaged in a full-fledged revival of open sea fishing in the later half of the 1950s.
- 1977 close to half of the countries in the world established the limits of their fisheries seas areas at the 200 nautical miles adopted by the "Convention Concerning Territorial Waters and Adjacent Sea Areas" under the "United Nations Convention on the Law of the Sea" (UNCLOS), also called the "Law of the Sea Convention" or the "Law of the Sea treaty". As a result, open sea fishing, which had been unrestricted, became subject to the conclusion of an agreement concerning entry into fishing grounds with each country concerned. Therefore, Japan production in 1989 suffers a reduction of 75% of the total captures in 1973.
- 1997 Introduction of TAC system.
- 2007 Promotion of the Act of Preservation and Control of Living Marine Resources.

The sea and fishery grounds around Japan

Japan is form by a group of islands, surrounded by the Japan Sea in its western coast and the Pacific Ocean in its eastern coast. Some big sea currents are found in the surrounding seas, such as the Kuroshio Warm Current, the Tsushima Warm Current, the Liman Cold Current and the Oyashio Cold Current. As these se currents bring abundant fish resources to Japan, high beneficial fishery grounds are formed at the off-shore sea of the Japan Islands.



Although the highly productive area around Japan, total production per year is in a decreasing trend, reaching in 2009 a 45% decrease compared to 1990s production. Main explanations for this reduction are: deterioration of fishing grounds, overfishing leading to depression of stock abundances and environmental changes such as climate change. As a result of this decreasing trend in Japan fisheries production, decreasing changes in self-sufficiency rate of seafood for human consumption are being observed. In 2008 only 62% of the seafood consumed in Japan was produced by Japan, the other 38% was imported.

Power of Japanese fishery

Japanese fishery is composed of many fishermen, fishing boats, fishery harbors and fishermen cooperatives. This Fisheries Cooperative Associations (FCA) are ruled by the Law of the FCA that has the aim to:

- promote the development of cooperative organizations of fishermen and fisheries processors
- plan the increase of the economic social status and the production capacity
- expand the development of the national economy

Some of the business done by FCA

- Management of marine resources
- Guidance on management and improvement of technology related to fisheries
- Loaning of necessary fund of living and business costs
- Selling, transportation, processing, keeping of fishery products
- Welfare, mutual aid

- Prevention and rescue from accident or disaster
- Establishment of facilities needed
- Subsidiary business

The Management of Fisheries Resources in Japan

Presented by Dr. KOBAYASHI from OFCF of Japan

The objective of fisheries resources management is to search for the best methods of utilization of fishery resources, which are shared by all humankind and will benefit our global community.
In Japan, there are two approaches for fisheries management:

1. Practical approach which uses indicators such as CPUE and captures, and is mainly applied in the coastal fisheries management and allow the calculation of a Total Allowable Effort (TAE).
2. Theoretical approach which uses indicators such as number of fish captured per age class. This approach is mainly based in models used in the stock assessment of off-shore fisheries.

Coastal Fisheries Management in Japan: The Total Allowable Catch (TAC) System

TAC refers to the upper limit of the fish catch amount that is permitted to be taken for resource management purposes, and is determined upon taking into consideration governmental administrative, economic and other social conditions based on the Allowable Biological Catch (ABC). Therefore, there are few cases in which TAC = ABC; instead, generally in many cases TAC is set at a higher level than the ABC, because problem would arise in running fishery business if the TAC figure suddenly lowered.
At the present, seven species are managed under the TAC system (saury, walleye, Pollock, jack mackerel, sardine, horse mackerels, snow crab and Japanese common squid). The following criteria were employed to select the fish species to be managed:

1. The species had large catch amounts and high economic value.
2. The species had fallen into a situation in which its resource was in an extremely state and required preservation and management urgently.
3. Foreign fishing vessels operating in the waters surrounding Japan were catching the species.

How is the TAC determined?

First step is the determination of the ABC by the National Research Institute (NRI). Scientist of the NRI analyses the information gathered from different sources, and with the use of models determines the state of the stock and estimate an ABC. Second step, the National Government based on the ABC draft prepared by the NRI and taking into consideration economic and social issues determines the TAC. Finally, the TAC is distributed between, Ministry licensing fisheries, Prefectural licensing fisheries and foreign countries or vessels. The TAC is presented in November and is valid since the first day of January each year.

Examples of two successful cases of coastal fisheries management:

- Sand-lance Fishery in Ise Bay, based in a Reproductive Resource Management Type.
- Resource management of snow crab in Kyoto Prefecture. The TAC set for this species is distributed by areas. Some of the measures applied for the protection of this species are the determination of areas for the protection of juveniles and fries, by the construction of artificial reefs made of concrete blocks. Also, these concrete blocks avoid trawlers to fish in those areas.

Propagation and Culture of Aquatic Resources in Japan

Presented by Dr. KOBAYASHI from OFCF of Japan

Necessity and principles of the propagation and culture of aquatic resources

- Make supply of marine products stabilize
- Increase resources though human activities (including fish farming)
- Maintain and stabilize income from fisheries business

In natural conditions the number of eggs spawned and larvae hatched decline rapidly as they grow as a result of different factors such as food shortage, environmental degradation and overfishing. The principle of the propagation and culture of aquatic resources is that it is possible to raise the hatching and survival rate by protecting eggs, lavae and juveniles in an artificial system to be posterior released into the wild.

Methods and management of culture production

Two methods of aquaculture are being applied in Japan. One is the non feeding method, in which gears such as nets, poles or sea bed are prepared for the settlement of target species and the nutrition and food are provided by the natural environment. This method is mainly used for shellfish and plants.
In the second method, target species are kept in ponds, pen or other facilities so food must be provided. This method is commonly use in fish and crustaceans aquaculture.

Important issues of management

- Fish disease
    - Prevent:
        - Impairment of immune system
        - Introduction of pathogen
        - Worse of environmental conditions
    - Fundamental measures to prevent the invasion and expansion of disease
        - Appropriate control of rearing equipment
        - Prevent the introduction of pathogen
        - Complete disinfection of facilities
        - Treatment with appropriate drugs

Prevent environmental degradation. High levels of nutrients in the water turn the system dangerous for fish, causing death by suffocation and/or by toxins. Therefore it is very important to have a good monitoring system of water condition in order to maintain optimal conditions.

At the present, many species of fish are being subject of aquaculture in Japan. Two examples of successful aquaculture projects are the Yellowtail (*Seriola quinqueradiata*) and the Bluefin tuna (*Thunnus thynnus* and *T. orientalis*), the most expensive tuna species in Japan. At the moment the Bluefin tuna is being cultured from seeds captured in the sea. Results are very positive, as species that were breed in captivity reach a weight three times heavier than specimens in the wild in the same period of time.

Fishery Cooperatives in Japan Coastal Fisheries

Presented by Mr. FUII from OFCF of Japan

Characteristics of a Cooperative

A cooperative has a dual character, is a unique entity different from a commercial enterprise or trade union, in that it assumes both business and associative functions, integrating commercial activities and mutual aid activities.

Members are associated with the cooperatives in three ways:

1) Members are managers: they participate in management by electing officers, exercising voting rights in the general meeting and attending other meetings, among others.

2) Members are users: they support the cooperative, utilize its services, and provide inputs for improvement to receive benefits in return.

3) Members are owners: they provide capital for the cooperative.

Administration of fishery rights

Since production sites are located in the sea, which is a shared property, fishery cooperatives are entrusted with coordination and management tasks to ensure fair utilization of the sea and its resources in a democratic manner (administration of fishery rights).

Cooperative principles

The cooperative principles were born out of practice, as opposed to utopianism or idealism. Hence, the principles are not impractical. Indeed, many of the cooperative principles are incorporated in national laws, including th Fisheries Cooperative Association Law (FCAL) in Japan.

- Voluntary and open membership
- Democratic management by members
- Participation of members in economic aspects (principle regarding the use of surplus)
- Autonomy and independence
- Education, OJT, communication
- Coordination among cooperatives
- Respect for local communities

Services provided by fishery cooperatives

1. Management of fishery resources and propagation of aquatic animals and plants: RESOURCE MANAGEMENT
2. Guidance on the improvement of management and techniques related to fisheries: EXTENSION SERVICE
3. Lending of necessary funds for the business or livelihood of members: CREDIT BUSINESS
4. Acceptance of savings or term deposits of members: CREDIT BUSINESS
5. Supply of necessary materials for the business or livelihood of members: PURCHASING BUSINESS
6. Shared facilities necessary for the business or livelihood of members: JOINT MARKETING BUSINESS
7. Transportation, processing, storage or sale of members' catches and other products: SELLING BUSINESS
8. Facilities for the exploitation of fishing grounds: EXTENSION SERVICE
9. Facilities for moorages, slipways, fish reefs and other equipment necessary for members' fishery operations: USER SERVICE
10. Facilities for the prevention of distress and rescue of members: EXTENSION SERVICE
11. Facilities for mutual ad among members: MUTUAL AID AND INSURANCE BUSINESS
12. Facilities for members' welfare
13. Facilities for education to improve members' knowledge and the provision of general information for members
14. Conclusion of collective agreements for the improvement of members' economic status
15. Arrangements for insurance contracts underwritten by the Fishing Boats Insurance Cooperatives, or for mutual insurance contracts underwritten by the Fisheries Mutual Aid Association or Federations of Fisheries Mutual Aid Associations
16. Service incidental to any of the above

Satellite Information Service for Fisheries in Japan Fisheries Information Service Center (JAFIC)

Presented by Mr. SATIOH from JAFIC

Since the establishment of the Japan Fisheries Information Service Center 39 years ago satellite data has played a very important role in the fisheries management. JAFIC provides information on oceanic and environmental conditions from satellite data, fishing grounds information, market information as well as the analysis of the information to Japan Fisheries Agency.

Satellite data for fisheries

The first application and the most important is the monitoring of the weather and oceanographic conditions. This includes the collection of data very useful in fisheries such as: Ocean Color (chlorophyll concentration), Sea Surface Temperature (SST) and Sea Surface Height (SSH). For example, different species are associated to different water conditions, knowing the oceanic conditions in real time allow fishermen to choose the best fishing grounds an thus a higher probability of good capture.

Management of Highly Migratory Species

Presented by Mr. MIYAKE

Migratory species are generally large size, top predators, pelagic species that travel great distances across EEZs and/or high seas areas. Examples of highly migratory species are tunas, billfishes, sharks and marine mammals.

Highly migratory species of high commercial value are:

- Tropical: Yellowfin tuna (*Thunnnus albacares*), Skipjack tuna (*Katsuwonus pelamis*) and Bigeye tuna (*T. obesus*)
- Temperate: Bluefin tuna (*T. thynnus* and *T. orientalis*), southern Bluefin tuna (*T. maccoyii*), Albacore (*T. alalunga*)
- Swordfish (Xiphias gladius) and billfishes (marlins)

Tuna industry and market

There are three world major markets for tuna: Europe (the most important), Japan and USA (consumption of tuna by USA is much less than that of Europe and Japan).
The two main industries for tuna are: fresh and canning. Fresh market is increasing, but not as fast as canning market. Of these markets, Japan is the most important consumer of fresh fish, USA the second

and Europe the third. Recent data showed that Africa is possibly a big consumer of fresh tuna, but the due to the lack of fishing statistics this can not be proved.
In the canning industry, Thailand is the most important producer (28%) and Spain the second (14%).

What is management?

Generally the objective of management is the Maximum Sustainable Yield (MSY). On the contrary, industry wants the Maximum Economy Yield, what makes very difficult an agreement between all the interested parties (industry, fishermen, scientist and governments).
MSY changes according to fish pattern and/or environmental conditions. As stocks and fisheries are never stable, is very difficult to keep control of the MSY.

Management procedures

Management measures are determined following scientific advice and other socio-economic issues. Scientist, to give advice, work on assessment models based on the different information sources gathered. That information comprises different kind of data such as: nominal catch, catch/effort/area/time, standardized CPUE, size sampling, size frequency, age composition, ageing, fecundity, growth, maturity, selectivity, spawners/recruits.
However, there are several uncertainties in the assessment models that have to be addressed. For example, standardization of CPUE addresses the problem of changes in fishing procedures, efficiency, catchability.
Solutions to reduce data uncertainties:

- Reduce adjustments in logbooks with landings (statistics must be declared at a species level)
- Sampling of species compositions
- Improving in sampling procedures
- Capacity building in costal developing countries
- Standardization and catchability of CPUE (most important)

Management measures

- Choice of regulatory measures: administrators of resources must choose the management model and structure to follow.
- Commissions must be in charge of the recommendations
- Contracting parties of the different commissions must implement the recommendations

Fishing Capacity

- The capability of fishing fleets to catch relative to the stock size
    - Physical capabilities
    - Socio-economic effects
    - Stock size: if stock is large the effect of fishing is low
    - Increase in catchability can not be taken into account
- Tuna fishing fleets are very mobile: capacity management has to be at a global scale
- Capacity control induce IUU fleets
- Controlling fishing capacity alone would not be an effective management measure
- Capacity managements make it easy for contracting parties to accept TAC
- Without control of fishing capacity any other measures are not effective
- Current kind of capacity control:
    - IATTC regional capacity registration
    - Foreign Fishing Association (FFA)
    - IOTC limited entries

Conservation and Management of Tuna and Responsible Tuna Fisheries and OPRT

Presented by Mr. TABATA from OPRT

The Organization for the Promotion of Responsible Tuna Fisheries (OPRT) was established in December 8, 2000, and represents all stakeholders in tuna fisheries, including major tuna fishing operators all over the world, as well as traders, distributors and consumers in Japan. OPRT members jointly and cooperatively work towards the development of responsible tuna fisheries in line with international and social responsibility. Since its inception, OPRT has been making steady progress towards achieving this goal:

- Eliminating IUU tuna fishing: OPRT took full action in eliminating the IUU/FOC tuna longline fishing vessels. In order to prevent IUU fishing, OPRT continuously monitors the state of tuna production through analysis of data on tuna imports from over 70 countries to Japan.

- Reducing excess fishing capacity: OPRT is working to reduce excess fishing capacity of large-scale tuna longline fishing. However, to ensure sustainable tuna resources, appropriate measures need to be taken with regard to other tuna fishing methods, such as, purse sein.

- Promoting responsible tuna farming: OPRT is concerned about the rapid expansion of Bluefin tuna farming in the Mediterranean and supports the effort of ICCAT to introduce responsible Bluefin tuna farming, including using the Positive List Scheme for farming facilities.

- Reducing by-catch: OPRT promotes responsible fishing technologies to reduce by-catch from tuna longline fishing e.g. seabirds (use of tori poles), sea turtles (use of circle hooks) and sharks (OPRT encourages its members to minimize waste and discards from shark catches, and also encourages full utilization of dead sharks).

The OPRT was an initiative of the Japan tuna fishing industry. The reasons of the creation of OPRT is that in 1999 20% of the Japanese large scale longline fishing vessels was scrapped in response to the UN FAO's International Plan of Action for the management of fishing capacity. Effort to restore overfished tuna stocks by the fleet reduction are being nullified by IUU/FOC fishing activities.

Nature of OPRT registered vessels

OPRT called for cooperation among the world's major tuna fishing organizations. More than 90% of large scale tuna longline vessels in the world are now registerd in OPRT to conduct responsible tuna fishing.

- Large scale tuna longline fishing vessels with more than 24m. length. All vessels are equipped with ultra low temperature (-60° C) freezing cold storage. All captures are to supply tuna for the sashimi market.

Serious concerns for the future

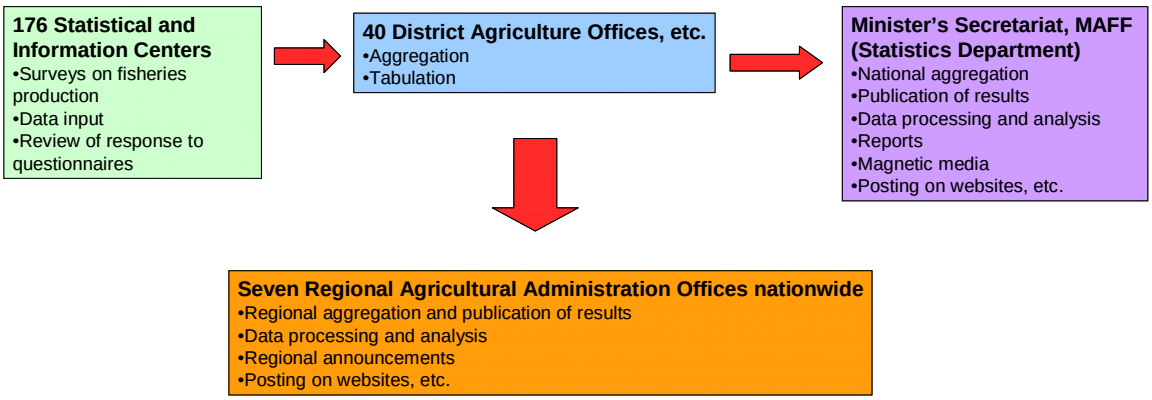
- Sustainability of tuna resources
    - Key issue: overfishing capacity
    - Stop the increasing number of purse seine fishing vessels
    - Impact of FADs' on juveniles

Fisheries Statistics System in Japan

Presented by Mr. TOMITA from Ministry of Agriculture, Forestry and Fisheries (MAFF)

Agriculture, Forestry and Fisheries Statistic in Japan are a decentralized system with each office or ministry conducting surveys on administrative matters within its purview. Statistical surveys within the MAFF are conducted by central and local organs.

Overview of MAFF's statistical processing system:



The objective of the statistical surveys on fisheries and aquaculture is to identify the status of fishery and aquaculture production in Japan and develop materials required for the promotion of fisheries policies for proper management and sustainable use of fishery resources.

To achieve these objectives, the Statistic Department of the MAFF conducts statistical surveys every year and a National Fishery Census every five years. The system and methods of surveys are divided into two categories:

- Survey on Marine Production
    - Survey on marine fishes production
    - Survey on marine aquaculture production
    - Survey on operational capacity
- Survey on Inland Water Fishery and Aquaculture Production
    - Survey on inland water fishery production
    - Survey on inland water aquaculture production
    - Survey on fishery production in three major lakes

Important topics in management and sustainability of fishery resources based in fishery statistic system are:

- Total Allowable Catch (TAC) System aims at adequate preservation and management of marine resources by setting an annual allowable catch for each species. The purpose of the system lays in the management of “catch quantity” in addition to traditional regulations including on catch capacity, so as to ensure sustainable use of fishery resources.
- Stock Recovery Programs, which promotes with regard to a specific species whose stock, requires urgent recovery. In parallel with the implementation of the program, measures are introduced to mitigate the impact of fishing effort curtailment on fishery businesses.

The future vision of the Statistic Department (MAFF) for fishery statistics

- Shift of focus from “statistics for the government” to “statistics as social information infrastructure”
- Development of new statistics in response to the changing industrial structure

- Review of survey methods in response to the changing conditions surrounding statistical surveys
- Timely and stable production and provision of accurate statistics

Introduction to Marine Explorer

Presented by Dr. ITO from Environmental Simulation Laboratory

Marine Explorer is a software developed by the Environmental Simulation Laboratory for data processing such as:

- Efficient management of observation data
- Planning for fishery resources management
- Management of artificial reef and seaweed on the seafloor
- Monitoring ocean condition
- Creating bathymetry map
- Platform for modeling

The information used by the software is obtained from different resources: satellite images (sea surface), echo sounder (mid-depth zone) and side scan sonor (bottom topography).

The program provides to fishermen that request information, immediate analysis and real time delivery map system of ocean conditions, with a vertical profile of echogram and water temperature and salinity. Also, fishermen can have a real time data collecting system using a GPS data-logger on their vessel. This allows the program, based on the data collected and running models, the forecasting of good fishing grounds.

This application is called “Jack Pot Skipper” and the principle of forecasting good fishing grounds is based on this steps:

1. Collect exact catch information (date, position, species, and catch amount)
2. Match up catch and ocean conditions (SST, SSH, salinity, currents)
3. Forecast ocean conditions
4. Overlay good fishing conditions

This application has been tested, and is being in use, in some vessel that target skipjack obtaining very promising results, with accuracy in the forecasting of 40% and in some cases 60%. Although these good results, new version are being tested in order to improve the application. The software is now being improved by using Habitat Suitability Index (HIS) models and a new approach based on the ocean structure (distribution of warm and cold eddies, and effects of El niño y La niña).

FIELD STUDY TOURS

Tsukiji Wholesale Fish Market

The Wholesale market of Tsukiji opened its doors in the year 1935. It's one of the three main fish wholesale markets in Japan, but also sells fruits and vegetables. The market has a total area of more than 230 thousand m^2. The inner area of the market is where the auctions and most of the processing of the fish take place, and where around 750 (200 specialized in tuna) intermediate wholesalers sell their products to stock purchasers and/or consumers.

Some of the functions of the Central Wholesale Market are:

- Collection: a wide variety of products in vast quantity from all over the country and from abroad is gathered
- Fair pricing: price are determined by auction as a basic rule, which means the price will be reasonably determined as the highest bid price will be the price of the goods, reflecting the day's supply and demand of the goods.
- Distribution: products gathered are divided into smaller quantities and sold to a number of stock purchasers.
- Sound settlement of accounts: payment charges are made quickly and properly under a fixed rule.
- Reduction in distributing costs: by buying and selling goods in large quantities at one place, transportation and other costs incurred in distribution can be reduced.

In 2010, Tsukiji Fish Market processed 1952 tons of fish and other seafood products per day. The amount of products processed per year is in a decreasing trend, couple of years ago 2000 tons were processed per day. The only products that are not suffering this decreasing trend are tunas and live fish.

The operation in Tsukiji starts around 3am with the arrival of the products to the market. Then the auction houses (7 authorized) prepare the products for auction. Tunas are divided by species, quality, size, and frozen or fresh. Then, the authorized buyers examine the quality of products in order to choose which ones to buy. In the auction, for example tunas, the auction of each piece takes around 10 seconds and the price can vary from 800 to 10.000 yen per kilo.

In Tsukiji, live fish is also an important part, and it is also sold in auction. The 80% of the live fish comes from aquaculture, and there are more than 40 species of fish, mollusks and crustaceans.

Pictures: View of Tsukiji Wholesale Fish Market and Tuna ready for auction.

Kanagawa Study Tour

Fisheries Research Agency (FRA)

The Role of the FRA

The FRA conducts a wide range of research and development activities, from basic and applied science to practical technologies concerning fisheries, to secure a stable supply of fishery products and for the sound development of the fishery industry, as stipulated by the Basic Plan for Fisheries Policy. The Plan includes five research components:

- Developing conservation technologies for the sustainable use of fishery resources both domestic around Japan and internationally.
- Developing stock enhancement, and rational use of fishery resources, and environment conservation technologies for the promotion of coastal fisheries.

- Establishment of productivity improvement and environmental friendly technologies for sustainable development of aquaculture.
- Research and development for the development of fishery industry, safety of fishery products and to maintain consumer confidence.
- Monitoring, and basic and pioneering research.

The Agency was founded in 1897, and is composed by 10 Institutes all around Japan. Also the Agency has a fleet of 9 research vessels.

National Research Institute of Fisheries Science (NRIFS)

This institute acts as a national fishery research center for Japan and utilizes the latest equipment to aid in the development of fundamental technologies for fishery research. This institute is responsible for three major research categories:

- Regional fishery resources, the marine environment, and stock enhancement along the southern and central Pacific coast of Japan, from Kagoshima to Chiba prefectures.
- Food processing and preservation, fisheries management and economics, genomic studies, oceanographic data, and freshwater fishery biology.
- Fundamental fisheries research applicable throughout Japan.

The NRIFS is organized in 10 major divisions:

- Project Management Division
- Fisheries Economy Division
- Marine Productivity Division
- Stock Assessment Division
- Coastal Fisheries and Aquaculture Division
- Freshwater Fisheries Research Division
- Biochemistry and Food Technology Division
- Aquatic Genomics Research Center
- Marine Environmental Data Integrated Analysis Center
- Research Vessels

Nihon Katsuo Maguro Market Corp. (Miura)

This is also a wholesale market specialized in tuna, and there are two companies authorized to sell the products. In this market all the tuna is frozen because the fish comes from vessels that operate in the far seas. All the fish is sold in auction, but different from the auction in Tsukiji. Here all the authorized buyers make a secret offer for the product, and the highest offer wins. In this market, to examine the quality of the fish, tails are cut and defrost. Price of the fish may vary from 600-700 yen the cheapest ones up to 2.000-3.000 the most expensive ones. The day of our visit, almost 1.200 pieces of bigeye and bluefin tuna were sold.

Pictures: Authorized buyer checking the quality of the fish and fish ready for auction.

Kanagawa Prefectural Fisheries Technology Center

The Kanagawa Prefectural Fisheries Technology Center was founded in 1912 as a Fisheries Experimental Station. One of the main objectives is to develop research activities in order to enhance the stocks and to ensure a safety supply to the residents in the Kanagawa Prefecture.

The Fisheries Technology Center is divided into six divisions:

- General Administration Division
- Research Planning and Management Division
- Fisheries Resource and Environment Division
- Sea-Farming Technique Division
- Sagami Bay Experiment Station and Research Vessel
- Freshwater Fisheries Experiment Station

Resource Management and Fisheries Management

Resource management: provision of theories, but resource management can only be applied through fisheries, so fisheries management and the proposal of concrete methods to fishermen is very important. Progress in management is made when fishermen understand the reasons and the methods. There is no need of government intervention when fishermen agree to participate. A good example of fishermen participation is the fishery of conger-eel. Fishermen participate in the experimental testing of modifications in the fishing gear, and confirmed the good results, so they change their gears to the new methodology without intervention of the government. Also, fishermen from other areas saw the good results, and requested to participate in the experiment to change their gears.

An Introduction to Kanagawa Sea Farming Association Foundation

The Sea Farming Association is conformed by fishermen, local government and fisheries associations. The origin of the Association was due to the need of found a solution to the decreasing trend in the fishery catches mainly caused by overfishing and degradation of the environment. Some of the actions adopted by the association are: prohibition of fishing in some areas and periods, limitation of fishing size, determination of a TAC, releasing of artificial seeds.

At the moment, two of the most important species that are being managed by the concept of stock enhancement are the Red Sea Bream and the Abalone. This last species has a market value of 6.000 to 10.000 yen per kilo.

Pictures: Sea Farming Association facilities at Kanagawa Prefectural Fisheries Technology Center and Aquaculture of Abalone.

Fisheries Agency and Shimizu Port

At Shimizu Port we observed the landings of a transshipment vessel. Landings of these vessels are strictly monitored and controlled by the Fisheries Agency looking for irregularities that may come from IUU vessels.

An office of the Fisheries Policies Division from the Fisheries Agency was established in Shimizu, 16 years ago, to monitor and control these transshipment vessels. These vessels have to send to the Agency two declarations of the fish and the vessels that passed them the cargo ten days prior to their arrival.
The main species that has to be monitored are Atlantic Bluefin tuna and Southern Bluefin tuna. These species have to be declared in weight as well as in number of pieces. Each individual is identified with a specific color tag that corresponds to the species, ocean captured, and even stock for those from the Atlantic Ocean. These species can only be landed in 8 ports all over Japan, and Shimizu receives 70-80% of this landings.

Other species such as Bigeye tuna don't have a strict control as Bluefin tuna, nut some other controls are performed such as genetic analysis to check the stock to which belongs. These studies are performed in collaboration with the National Research Institute of Far Seas Fisheries.
The control duties of the Fisheries Agency are also supported by the presence of international observers, mainly from MRAG (UK), that are hired by the different RFMOs.

Pictures: Transshipment vessel at Shimizu Port and landing of frozen tuna from transshipment vessel.

Yaizu Fishing Port

At Yaizu Port we observed the landings of a purse seiner, with a total capture of around 150 tons, from the North Pacific Ocean. Generally, the captures are composed 50% Skipjack and 50% Yellowfin tuna, in this particular case, most of the captures (around 80%) were Yellofin tuna. All the captures are for the canning industry.

Pictures: Purse seine vessel at Yaizu Port and landing of frozen Yellofin tuna and Skipjack.

APPLICATION OF TRAINING

- Fisheries Cooperatives are one of pillars of all fishing activities in Japan. The administration of fishery rights, the principles of cooperatives, the services they provide are things that have to be analyzed in order to promote the application of some of this aspects in other countries. However, the characteristics of the cooperatives and their success in Japan are mainly due to Japanese culture and these aspects would probably difficult the application and achievement of the same good results in other cultures.

- Japan Statistic System is very strong as it has a very good control all over the country and all kind of fisheries. The census carried out every five years and the surveys conducted every year allow the governmental agencies to have a deep knowledge of the current status of the fisheries in Japan. Aspects of the methods used by the Statistic Department of the MAFF should be analyzed carefully to find out the possible application and improvement in other countries with different characteristics of the fishing industry.

- The development of aquaculture in Japan is very advanced. The concept of Stock Enhancement may have some interesting applications that need to be studied in order to be applied in Uruguay, not for tuna but maybe for some other species for which management measures are being applied.

- The application of the Marine Explorer for the prediction of good fishing grounds, and the good results already observed has to be considered, and maybe tested in order to find out if the application can be used in Uruguay. The prediction of fishing grounds seems to be very difficult as the oceanographic conditions are very variable, studies should be conducted taking in consideration the characteristics of the area.

- The Organization for the Promotion of Responsible Tuna Fisheries (OPRT) work towards the development of responsible tuna fisheries in line with international and social responsibility. The objectives and goals of the OPRT are in line with the working activities that Uruguay has been developing in the last few years, mainly in the reduction of by-catch in longline fisheries. Activities together with the OPRT can be conducted in line with the International Plan of Action for IUU (FAO) in order to eliminate IUU longline fisheries as the Southwestern Atlantic Ocean is a highly fished area for many fleets.

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