منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Organización de las Naciones Unidas para la Agricultura y la Alimentación

COORDINATING WORKING PARTY ON FISHERY STATISTICS

Twenty-third Session

Hobart, Tasmania. 22-26 February 2010

Draft Report of Regional Workshop on Capacity Building Needs for Improving Aquaculture Statistics and Data Collection in Asia (Vietnam, 16-18 November 2009)

Author: NACA

DRAFT

Network of Aquaculture Centres in Asia-Pacific

Report of the Regional Workshop on Capacity Building Needs for Improving Aquaculture Statistics and Data Collection in Asia

(STA Regional WS)

16th to 18th November 2009
Ha Long Grand Hotel
Ha Long Bay, Vietnam

1. Background:

Preparation for the workshop commenced in July- August, when negotiations were conducted between NACA and FAO, culminating in the signing of LoA (PR 42301). Consequent to the agreement NACA, in consultation with FAO (Senior Fishery Statistics Officer, Dr. Sachiko Tsuji) preparatory material for distribution (primarily guidelines for country presentations) to prospective participants were prepared and circulated, a tentative agenda decided upon (**Annex I**).

NACA proceeded to finalise travel arrangements for potential participants, hotel arrangements, internal transportation and general meeting arrangements. In the latter regard, NACA undertook a visit to HaLong Bay, Vietnam, in association with representatives from the Ministry of Agriculture and Rural development, Vietnam (local organizers) to enter into an agreement with the selected meeting venue, Grand Halong Hotel, Ha Long Bay, Vietnam.

Most of the prospective country participants provided NACA with the presentations, which was compiled (unedited) and sent to FAO for information, and hard copies prepared for distribution at the workshop.

2. Workshop

Opening

The workshop convened at 0830 hrs on 16-11-09 and opening remarks were made by:

- Jia Jianasan, Chief, FIMA, Department of Fisheries & Aquaculture, FAO, Rome
- Dr. Sachiko Tsuji, Senior Statistical Officer, FITES, Department of Fisheries & Aquaculture, FAO, Rome
- Mr. Bui Duc Quy, Deputy Director, Aquaculture Department, Ministry of Agriculture and Rural Development (MARD), Government of Vietnam.

Mr. Bui Duc Quy delivered the message from the Honorable Vice Minister responsible for Fisheries and Aquaculture, Ministry of Agriculture and Rural Development, Government of Vietnam and opened the workshop. In his message the importance of aquaculture as one of the fastest growing primary production sector in Vietnam was stressed and recognized the importance of data collection (**Annex II**; translation of Hon. Vice Minister's Message).

The participants introduced themselves and the workshop elected Mr. **Duong Long Tri**, Deputy Director, Fisheries Informatics, Ministry of Agriculture and Rural Development, Vietnam, as the Chair.

Presentations:

The following presentations were made and in order are:

- **Sachiko Tsuji & Xiaowei Zhou (FAO)**:

Strategy and outline plan for improving information on status and trends for aquaculture

The 2 major objectives of the workshop were outlined:

1. Develop an Action Plan to Implement the Strategy (STA).
2. Identify the regional needs for capacity building.

At a more general level, the work of this workshop should be guided by the FAO publication, Strategy and Outline Plan for Improving Information on Status and Trends of Aquaculture (see ftp://ftp.fao.org/docrep/fao/011/i0445t/i0445t00.pdf) and overall the thinking for this work builds on the Code of Conduct For Responsible Fisheries (see http://www.fao.org/docrep/005/v9878e/v9878e00.HTM.

Therefore participants were reminded to relate the needs of their country to the status and trends outlined in this background material.

Data Use and Users: Participants were given a copy of the Fishstat Plus CD summarizing the available material (also available on the web http://www.fao.org/nr/water/aquastat/main/index.stm

- **Sena S. De Silva (NACA):**

  Role of a regional organisation in facilitating aquaculture data collation and reporting:

  In the presentation a brief history of this issue, including the work of NACA as part of the CWP (including earlier meetings/steps that have led to this workshop), was provided. He highlighted the challenges in this work, for instance separation of fisheries and aquaculture statistics given the rapid development of aquaculture. More details on NACA can be found at www.enaca.org

- **Saivason Klinsukhon (SEAFDEC):**

  SEAFDEC and its role collecting fishery statistics:

  The organization and program of work of SEAFDEC was introduced by Ms Saivason with a focus on the past and on-going work of SEAFDEC on fishery statistics in Southeast Asia. This included objectives and activities of SAEFDEC and its member departments. More details can be found at www.seafdec.org including details in the publication SEAFDEC statistics.

- **County Presentations**:
  - Bangladesh (MhdSaha Ali)
  - Cambodia (Ros Kunthy)
  - China (Zhao Wenwu and Xie Yingliang)
  - India (R. Bhatta)
  - Indonesia (Mhohammad Sayefuddin)

- Iran (Seyed Mehdi Samael)
- Lao (Phanthavong Vongsamphanh)
- Malaysia (Arfa Faris)
- Myanmar (U Tint Swe)
- Nepal (Gayatri Raj Wagle)
- Pakistan (Israr Ahmed)
- Philippines (Elymi-Ar Tunacao)
- Sri Lanka (K.B.C. Pushpalatha)
- Thailand (Marina Wiyasilpa)
- Vietnam (Chau Thi Tuyet Hanh)

(A list of participants and the Agenda are provided in Annex IV & V, respectively)

Key points that emerged from country presentations

The country presentation ppts (unedited) are provided in **Annex III**.

1. Country presentations clearly demonstrated the importance of aquaculture in the Asian region as indicated by statistics presented on a national basis. The rapid growth trend data of this sector in the last 20 years added considerable strength to the need for a more focussed program to manage statistics in a regionally consistent manner to allow continued comparisons over time and across various other issues/questions (culture systems, species groups, etc).

2. Data collection systems/methods (e.g. use of log books) were reviewed and a number of difficulties/constraints were highlighted:
   - Data sets: It was apparent that there was a wide range in the levels and efficacy of data collection and reporting among countries. For example the workshop recognised that countries such as China and Indonesia had relatively better organisational structure for data collection.
   - China seems to have one of the most comprehensive data sets, and the government continues to invest on improving statistical collection in fisheries and aquaculture. In this regard China is proceeding to organise training in data collection at all levels of the production chain. It was suggested that the expertise and training provided in China could be effectively used by other countries for improving statistical data collection and reporting.
   - Use/Users: it was difficult to get a clear picture of use and users; mainly govt but farmer organizations (business operation service e.g. in China; it seems that often there is a poor definition and linkage of user needs to the corresponding data collection systems e.g. in India often research agencies do not use the govt statistics but collect their own .

3. Capacity building experiences and needs were reviewed by many presenters: e.g. China and its leading role on this issue were acknowledged by the group. For instance, around data collection approaches, teams, indicators, capacity building and training materials, resources allocated, lessons learned and sharing with other countries in the region e.g. via international training courses. China indicated that it would be willing to provide training to other countries in the region.

4. Legal basis: A number of countries (e.g. China) have put in place new laws/policies that provide a much stronger basis for implementation of strengthened efforts on statistics and data collection.

5. Priorities for allocation of resources for data collection were reviewed but this topic needs revisiting as part of the constraints.

6. The major constraints in data collection and reporting that were recognised by the group were:
   - Difficulties in separating some aquaculture activities from fisheries, and the possibilities of double "reporting"
   - Limited appreciation by governments in the importance of data collection, particularly at the higher levels of policy making and implementation, and consequently not providing adequate resources (funding and staff). The group alsdo noted the exception in the case of China where the budgetary allocation has been increased from approximately 3 milli0n Yuan to 20 million Yuan with a view to improving data collection and reporting.
   - Capacity development in most countries has not yet been defined in a more specific sense; there is a need for a mechanism to provide some priorities perhaps initially on a regional basis for capacity development. An evolving list includes:
     - Use and users definition: work to increase the demand for statistics via a variety of techniques e.g. feedback processes
     - Group countries in terms of data handling and exchange know-how
     - Harmonization of statistical systems in region.
     - New Ideas: cost savings e.g. in Thailand the use of "data by heart volunteers" to collect data

Group Discussions

The workshop recognised eight key areas for further deliberation. Accordingly, the participants were divided into two groups to deliberate on the selected issues, and report in plenary after each discussion. The discussions at these plenaries entailed a lead to the major recommendations of the workshop.

The selected issues for group discussions were:

1. Quality of Data: Review the Wide array of mechanisms for reporting data/statistics to develop a more consistent regional approach.
2. Practitioner Data Use Gap: Farmer avoidance in providing data; accessibility to data concerns and improve the use of this data by farmers (practitioner demand).
3. Capacity building for data collection.
4. Regional cooperation for improvement of statistics collection and reporting; how to make it more effective both within Asia but also inter regionally.
5. Uniformity of data and minimum data sets as part of national management of information systems and sharing of use approaches and lessons learned. Definition of minimum data sets and example or good case study reporting examples. What are the key constraints to effective MIS?
6. Key questions that most data collection systems seek to answer.

7. Coordination of the multiple organizations involved in data collection and sharing.
8. Regional and Inter regional cooperation mechanisms

The final outcomes of the group discussions will be provided in the FAO report of the workshop.

Workshop Recommendations

The workshop recommendations will also be included in the FAO Report of the workshop.

Workshop Closure

All participants were satisfied with the progress and commended the Government of Viet Nam and FAO NACA for organizing the meeting and agreed that this set of issues needs to be pursued in the forthcoming session of the CWP in Hobart, Australia in February 2010 and beyond.

NACA thanked the local organisers for all their inputs, in particular Ms. Nguyen Tam and Dr. Nguyen Dien of MARD. NACA also expressed its thanks to the FAO for facilitating this important activity.

Annex I

(Pre- workshop material distributed to the participants)

Regional Workshop on Capacity Building Needs for Improving Aquaculture Statistics and Data Collection in Asia (STA Regional WS)

16th to 18th November 2009
Ha Long Grand Hotel
Ha Long Bay, Vietnam

Background:

This somewhat detailed background information is placed before you to apprise the steps that have been taken over the last three to four years to meet the growing demand for improvement in aquaculture statistics collection and reporting.

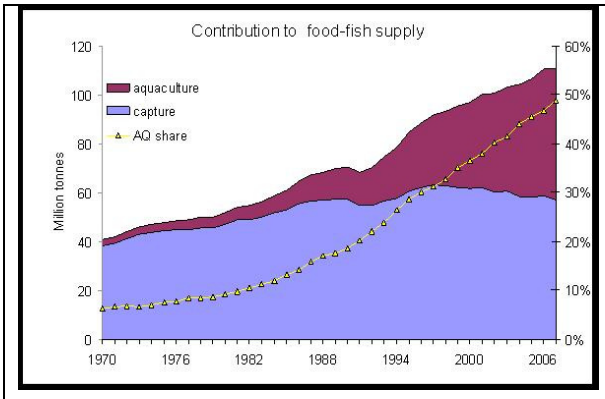


Figure 1. The total global fish production and the contribution from capture fisheries and aquaculture (Freshwater and Brackish+ Marine), years 1975 to 2006 (FAO Fishstat, 2008)

Currently, aquaculture accounts for nearly 50 percent of the global sea food consumption, and its impact on food fish production and consumption has been increasing over the last two to three decades (Figure 1). The aquaculture sector has also been the fastest growing primary production in the past decades, growing approximately at around 8 percent per year.

The global average food fish consumption is estimated at 16.7 kg/ caput/ year. That for Asia is 29 kg/ caput/ year. In the wake of the

traditional food fish supplies, in particular, that from the marine fisheries plateauing over the last decade, aquaculture has to play a dominant role in meeting the future food fish supplies. For example, in the Asia-Pacific, accounting for the population increase and assuming that the current per capita consumption remains static the region will need an extra 30 million tonnes of food fish by year 2050. In the Asian region the aquaculture production has bypassed the capture fishery production already (see Figure 2). Most of the future increase needs of food fish in Asia also has to come from aquaculture. To meet this high demand aquaculture developments have to be better planned and executed. Recognizing the growing importance of the aquaculture sector, the Sub Committee on Aquaculture, of the Committee of Fisheries (CoFI), at its third session in New Delhi, September 2006, recommended that there is a need to review, upgrade and rationalize aquaculture statistics collection and reporting, to enable governments to utilize the information in its development planning of the sector. This decision was endorsed by the CoFI at its 27th Session, Rome, Italy, in xxx 2007.

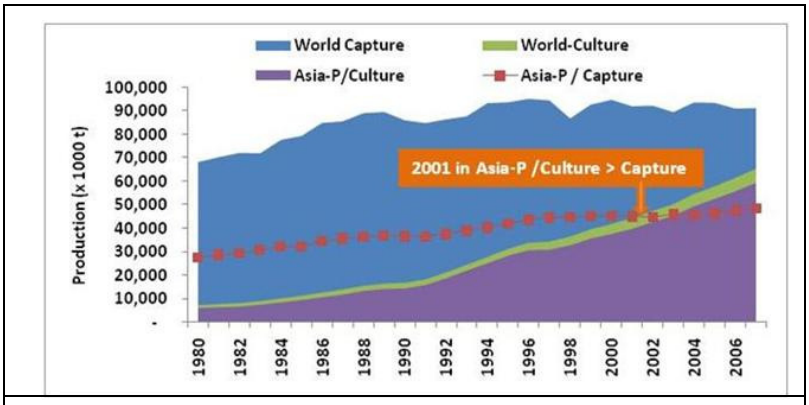


Figure 2. The trends in world capture fisheries and aquaculture and that of the Asia-Pacific region.

Consequent to the approval of the 3rd COFI-AQ (New Delhi, 2006), and the 27th COFI (Rome, 2007) to establish an inter-regional mechanisms for aquaculture similar to the Coordinating Working Party on Fishery Statistics (CWP), an expert workshop was held in Nakorn Nayok, Thailand from 8-10 January 2008. This workshop addressed the need for data and information coordination in aquaculture and objectives, characteristics and structure suitable for the formation of the equivalent of the 'Coordinated Working Party- Fisheries (CWP-F)', which currently has the purview on matters related aquaculture statistics.

The workshop decided that it would be too cumbersome and a lengthy process to form a separate 'Coordinated Working Party- Aquaculture', and that it would be desirable at this stage work within the existing structure as *ad hoc* group on aquaculture. The workshop also recognised the increasing role that regional organizations would have to play in uplifting

aquaculture statistics collection and reporting. As a consequence NACA's application for membership of the 'CWP-Fisheries' was endorsed.

Since these steps were taken every available opportunity was availed of for groups interested in activities of the 'CWP-Aq' to meet and discuss progress and needs. Accordingly, a meeting of the Coordinating Working Party on Fisheries Statistics (CWP), Ad-hoc Aquaculture Meeting was held in Puerto Varas, Chile, 3-4 October 2008, back-to-back with the 4th Session of the Sub-Committee on Aquaculture. At this meeting it was suggested that there is a need to expand the scope of nature of statistical data collected and reported on, to cover more grounds and not be confined to production and value *per se*. Furthermore, the group was of the view that there is an urgent need to harmonize the definitions used in aquaculture statistics collection and accordingly suggest to the CWP-Fisheries to incorporate such revisions at its forthcoming meeting in January 2010. Tasmania, Australia.

The last ad-hoc group meeting was hurriedly held in Rome, April, 2009, when further discussions were held on the scope of the statistical data collection base, and steps taken to achieve the tasks of revising the Statistical Data collection Handbook, which includes definitions of terms, etc. and the manner in which some harmonization could be brought into place to improve statistical data collection and reporting in aquaculture.

Rationale:

One crucial element that emanated from all the deliberations at the above meetings was that improvements in the scope of aquaculture statistics collation and reporting, and the rationalization thereof, has to go hand in hand with appropriate improvements to capacity building in performing the tasks at the coal face, in each of the participating countries. This 'Regional Workshop on Capacity Building Needs for Improving Aquaculture Statistics and Data Collection in Asia (STA Regional WS) is convened for this purpose, and is held back to back with the '*Expert Workshop for Drafting CWP Handbook on Standards of Aquaculture Statistics (CWP Drafting WS)',* to enable a better understanding of the capacity needs in the countries to accomplish the tasks ahead.

Objectives:

The objective of the, 'Regional Workshop on Capacity Building Needs for Improving Aquaculture Statistics and Data Collection in Asia (STA Regional WS)' is to determine the capacity needs to achieve the goals determined by expert consultations to increase the scope of aquaculture statistics collation and reporting and the mechanisms that need to be put in place to achieve these ultimate objectives.

Expected outputs:

A clear indication of the following:

- Current available capacity;
    - what level
    - how many
    - Methods adopted currently in collection and reporting
    - Constraints
- Capacity needs for each country to meet the improvements sought
    - What level
    - Optimal numbers
- How best achieved for each country, e.g.,
    - 'in-country' training programs
    - regional training programs
    - through, simple, dissemination materials
    - potential time-frame

A time table for achieving the set goals, country wise and regionally

Annex II

Message of the

Deputy-Minister Vu Van Tam, MARD Vietnam

(translated from Vietnamese)

Mr. Jia Jiansan: Chief, Aquaculture Service, Fisheries and Aquaculture Department, FAO
Dr. Sachiko Tsuji, Fisheries Statistics Officer
Prof. Sena De Silva, Director General, NACA
Distinguished guests, ladies and gentlemen!

I would like to warmly welcome you to Ha Long city, one of the cities that are considered one of the seven natural wonders of the world.

First of all, on behalf of the Ministry of Agriculture and Rural Development, I would like to welcome representative from international and regional organisations such as FAO, NACA, SEAFDEC and representatives from NACA member governments. I am pleased and delighted that FAO, NACA and SEAFDEC have chosen Vietnam as the host country for this very important workshop on "Capacity building needs for improving aquaculture statistics and data collection in Asia".

Ladies and gentlemen!

Over the last decade, the fisheries sector of Vietnam have significantly developed, reaching a high level of growth in capture fisheries, aquaculture and export; contributing significantly in the growth of the national economy. Contribution of the fisheries sector in have increased over the years and it has become an important economic sector, contributing to changes in rural agriculture structure, poverty alleviation, improving livelihoods of rural farmers in coastal, mountainous and mid-highland areas. In 2008, total fisheries production reaches 4.58 million tonnes, fourfold increase of that in 1990,in which aquaculture production was approximately 2.5 million tonnes.

In the period 1991-2000, average annual growth rate of fisheries production was 7.31%, in which that of capture fisheries and aquaculture sectors were 7.10% and 8.01%, respectively. In 2001-2008,the annual growth was 10.83%, where that of capture fisheries and aquaculture sectors were 4.27% and 21.14%, respectively. Average annual growth of seafood export income was 21.32% and 14.27% in the periods 1991-2000 and 2001-2008, respectively.

Vietnam aquaculture is developing towards industrialisation, modernisation and sustainability. The development of appropriate management policies and development strategies based on timely and accurate data play a very important role such processes. As such, improvement and enhancement of capacity in fisheries and aquaculture statistics

should be prioritised in order to provide timely, adequate and accurate information in all aspects of the sector for relevant users.

I would like to reiterate that statistics in aquaculture specifically, will contribute significantly in the development of strategic plans for effective management and sustainable development of the sector in the long term. As such, aquaculture statistics should be included and prioritised among the activities of the sector.

The organisation of this meeting is an important event not only for Vietnam but also other countries in terms of capacity building in data collection and database development in aquaculture. Adequate, accurate and timely data are important tools for effective management and development of appropriate management strategies for the sector.

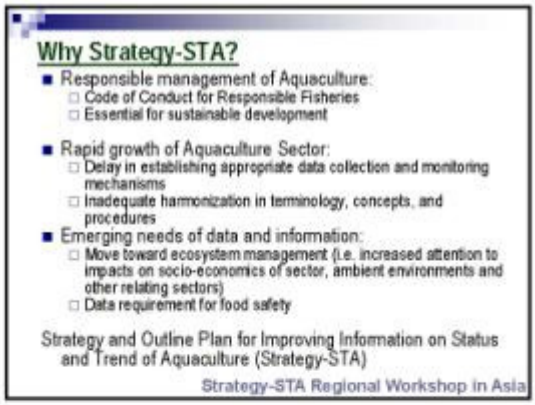
Through this workshop, all participants will be actively involved in the discussion to identify the needs in capacity building in aquaculture statistics. This ultimately will contribute significantly to the sustainable development of the sector.

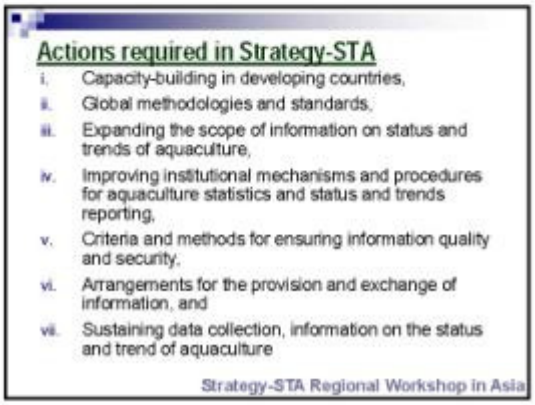
Wishing the workshop a great success and thank you all.

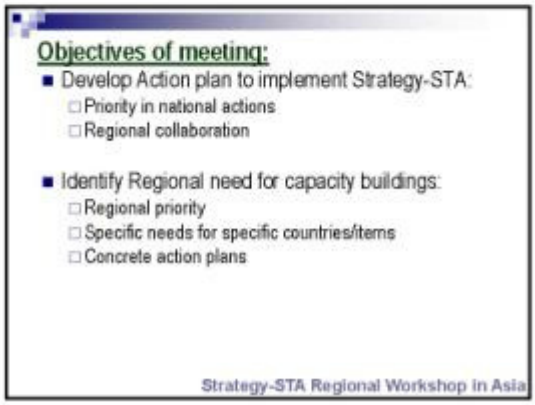
Annex III

(un-edited versions of the ppt presentations made at the workshop)

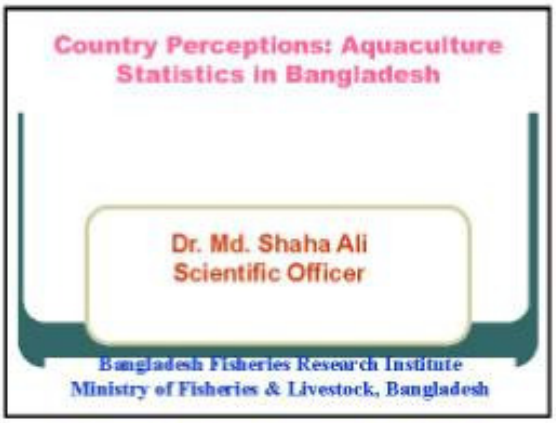
Presentation of Dr. Sachiko Tsuji

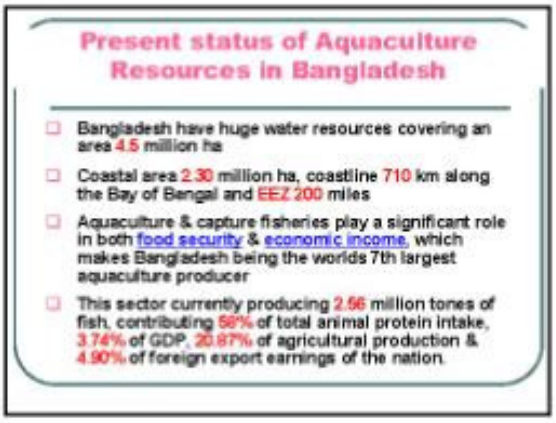


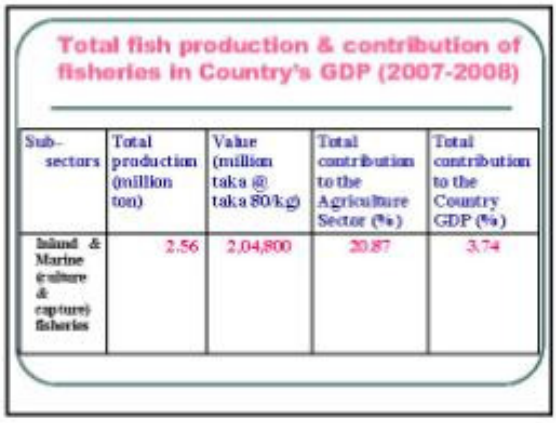


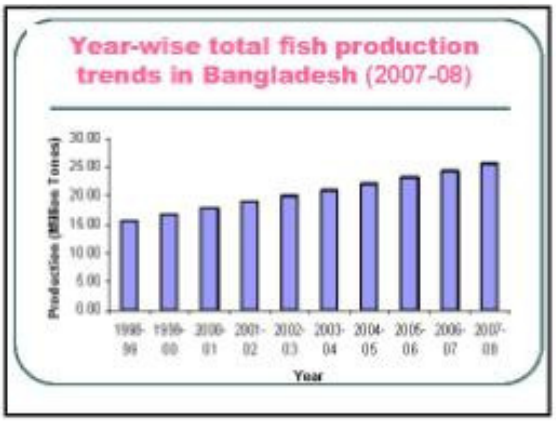


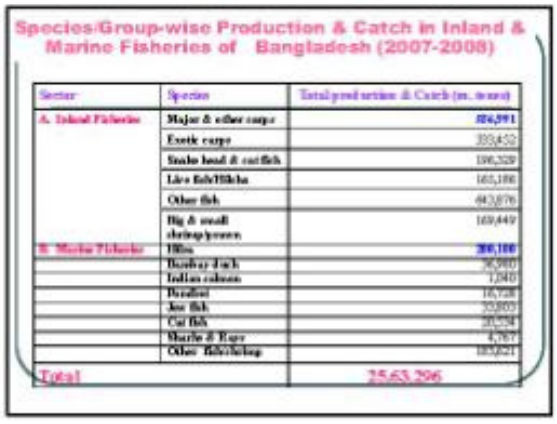
Bangladesh Presentation:



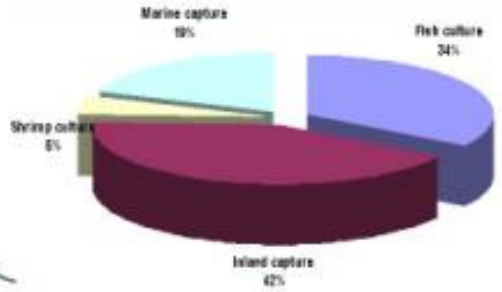








Contribution of fisheries sub-sectors in total fish production in Bangladesh (2007-08)



Export of Fish and Fish-product from Bangladesh (2007-2008)

Fish & Fish Product	Quantity (in. tones)	Value (Crore Taka)
Frozen shrimp/prawn	49907	2863.92
Live Fish	10	0.15
Frozen Fish	23515	495.46
Dry Fish	210	2.67
Salted & Dehydrated fish	658	26.97
Turtles/ Tortoises Crab/Eel	439	4.88
Shark fin & Fish Maws	266	1.81
Others	294	0.41
Total	**75299**	**3396.24**

Major reasons for slow rate of increase in fish production

- Long-term development needs of the sector & were formulated in the absence of a National Fisheries Policy
- Support to institutionalize research for sustainable fisheries development was inadequate
- Due importance was not given to human resource development
- Support in regard to training and credit for rural aquaculture development was inadequate
- Small-scale aquaculture enterprise development as the most potential source of income for rural poor fish farmers was not properly targeted

Major reasons for slow rate of increase in fish production

- **Programs for creation of awareness among the people for conservation and development of fisheries resources were inadequate**
- **Lack of permanent & comprehensive extension programs involving all the stakeholders for total fisheries development**
- **Attempts for alternate livelihood development for closed fishing during peak breeding season for fish conservation were not initiated**
- **Due attention to both inland & marine capture fisheries management & development was not paid.**

Aquaculture development plans/ strategies in Bangladesh

- Extensive resource, favorable climate & expanding global market offer a great opportunity to the country for more employment & income for rural Bangladesh through aquaculture development
- Changing ecological, economical & environmental situation affecting productivity & livelihood in fisheries sector
- In view of harnessing the development, coordinated with all the users involved in water resources development & management for following major goals:
  - ✓ Nutritional food security,
  - ✓ Rural economic security,
  - ✓ Environmental development; and
  - ✓ Fish protection and biodiversity conservation

Strategies & policy supports are needed to be adopted by govt.

- Identify public sector cultivable water bodies & allot them to genuine poor fish farmers for scientific fish culture to help poverty alleviation
- Identity suitable technologies & undertake a countrywide massive demonstration program to convince people of their profitability
- Establishment of fish sanctuary in open water bodies to ensure natural recruitment as natural population still has a dominant share in total landing.
- Improvement & formulation of required new fish protection act, rules & legislation as per provision of Fisheries Policy.

Strategies & policy supports are needed to be adopted by govt.

- Improve utilization of low-value fish
- Identify sources of pollution & develop a cleanup program for improvement of environment
- Massive training of farmers & entrepreneurs on the improved technologies & their adoption
- Establishment of credit lines for farmers & entrepreneurs for industrialization in fisheries & aquaculture
- Develop coordination among all groups partners, & agencies both public and private sectors involved in implementation of rural development
- Conserve fisheries resources & species biodiversity

Strategies & policy supports are needed to be adopted by govt.

- Create and develop infrastructure facilities like communication, electricity, landing centers, processing plants, etc
- Generate employment opportunities in fisheries industries
- Conserve fisheries resources & species biodiversity
- To reduce post-harvest loss of fisheries resources
- To increase the quality of fisheries product for domestic & international markets
- To strengthen fisheries research activities, fish culture, resource management, fisheries extension & training.

Capacity Buildings are needed for Aquaculture Development in BD

- To develop specialized scientific manpower for the fisheries sectors
- To update the knowledge of policy makers, planners & administrators to enable them to formulate appropriate policies, programs, laws & regulations
- To improve & update the knowledge of the extension workers on various developmental & managemental issues

Capacity Buildings are needed for Aquaculture Development in BD

- To develop communication skills of the extension workers for motivation of farmers & entrepreneurs towards fisheries development
- To develop capacity of the scientists in identification, analysis & prioritization of problems & undertaking appropriate studies
- To produce trained manpower for systematic planning, management, evaluation and effective implementation of all types of R & D programs including training in fisheries.

Conclusion

- ✓ In the agriculture sub-sector, fisheries, being economically more remunerative, have been identified as the major means of rural employment generation, poverty alleviation & foreign exchange earning
- ✓ Bangladesh with one of the highest man/water ratio (20 persons/ha water) in the world has tremendous potentialities to grow more fish & create more employment & income for the people & the nation
- ✓ This can be achieved through proper development, management & application of modern technologies. In the context of Bangladesh, the development of rural population actually lies in the development of fisheries.

China PR Presentation:

Strengthen the capacity -building of fisheries statistics and improve the quality of fisheries statistics

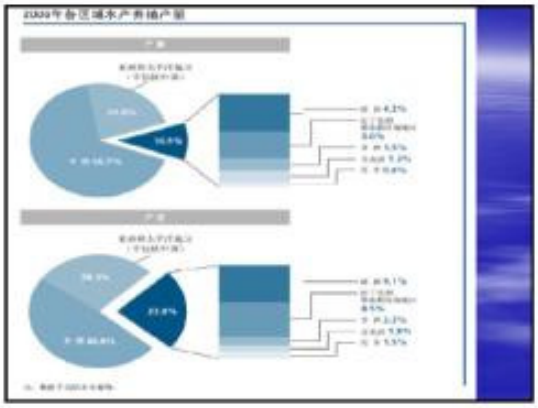
Zhao Wenwu
(China Society of Fisheries)
Xie Yingliang
(East China Sea Fisheries Research Institute,
Chinese Academy of Fishery Sciences)

1 Status of aquaculture production in China

- Aquaculture now accounts for nearly half (45%) of the world's food fish consumption and the ratio is expected to reach 50% by 2015. In the past 10 years aquaculture development in China has made considerable progress.
- The total production from aquaculture operation increased to 34.128 million tons in 2008 from 7.3 million tons in 1990, an increase of 4.7 times, of which the yield of mariculture production was 13.4 million tons and freshwater aquaculture production of 20.7 million tons.

Table 1 the yield by species in aquaculture in China in 2007-2008 (Unit: 0,000 tons)

	2008	2007	%		2008	2007	%
Total yield of inland aquaculture	2072.5	1971	5.1	Total yield of mariculture	1340.3	1307.3	2.5
Fishes	1836.9	1731.1	4.9	Fishes	74.8	68.9	8.6
Crustaceans	177.2	167.4	5.9	Crustacean	96.2	91.9	2.5
Mollusks	23.3	20.7	12.6	Mollusks	1006.1	993.8	1.4
Algae	8.4	9.7	-14.3	Algae	138.6	135.6	2.2
Others	34.5	31.2	10.6	Others	24.7	17.2	43.6
Ornamental Fishes (Million in number)	2293.3	1527.9	115.8				



- In production of inland aquaculture in 2008 the fishes yield accounted for 88% of total yield of inland aquaculture, crustaceans 9%, mollusks 1%, algae 0% and others 2%. See Fig. 1.

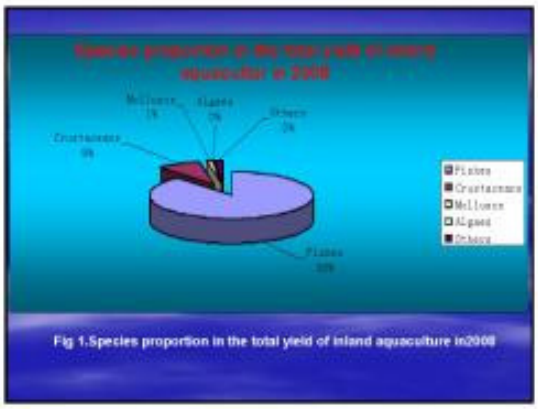


Fig 1.Species proportion in the total yield of inland aquaculture in2008

- In production of mariculture in 2008
- the molluscs accounted for 75% of the total yield of mariculture,
- algae 10%,
- crustaceans 7%,
- fishes 6%
- and others 2%.

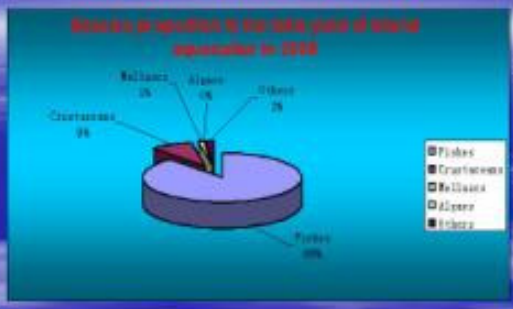


Fig 2 Species proportion in the total yield of mariculture in 2008

- Aquaculture in China tended to be more diversity in the way and China's current approach by waters of freshwater aquaculture division has 7 types, including pond culture, lake culture, and reservoir culture, rive and canal culture, rice fish paddy culture and other culture.
- Mariculture is divided into farming at sea, farming on beach and land-based farming, in addition to large size sea-cage culture and small size cage culture and industrialized culture.

Table 2 The yield by culture types in aquaculture production in 2007-2008 Unit:0,000 tones

Type	2008	2007	%	Type	2008	2007	%
Total yield of inland aquaculture	2872.6	1871.0	5.1	Total yield of mariculture	1340.3	1307.3	2.5
Fish Pond	1498.4	1500.9	0.0	Farming at sea	673.0	674.5	-0.1
Lake	145.6	156.1	-6.7	Farming on beach	616.7	596.3	3.3
Reservoir	241.5	230.4	4.8	Land-based culture	148.9	142.1	5.6
River and Canal	55.9	54.1	3.2				
Others	53.0	63.4	-16.4				
Paddyfield	317.0	316.1	0.3				

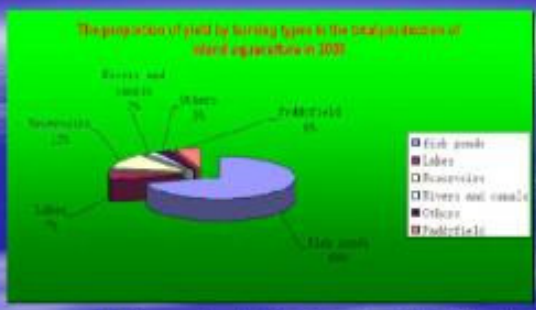


Fig 3 the proportion of yield by framing types in the total production of inland aquaculture in 2008

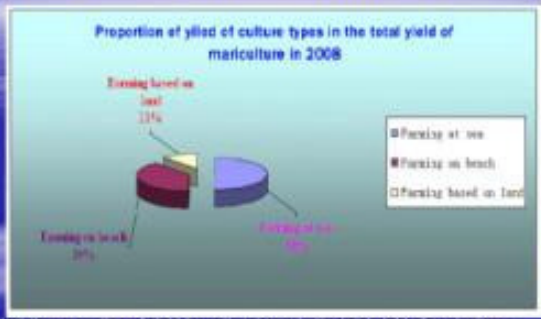
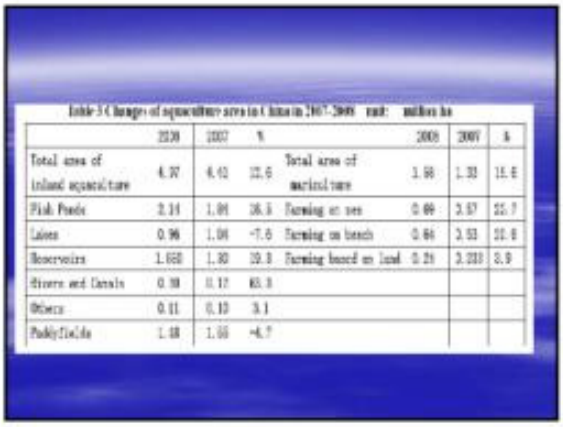


Fig 4 the proportion of yield by culture types in the total yield of mariculture in 2008

Total area for aquaculture

- In 2008 there was as area of 6.55 million ha for aquaculture in China , of which freshwater aquaculture area of 4.97 million ha, an increase of 12.6%, compared with 2007; seawater aquaculture area of 1.58 million ha, an increase of 18.6% compared with 2007.



	2008	2007	%		2008	2007	%
Total area of inland aquaculture	4.97	4.41	12.6	Total area of marine culture	1.58	1.33	18.6
Fish Ponds	2.14	1.91	16.5	Farming on sea	0.69	0.57	22.7
Lakes	0.96	1.04	-7.6	Farming on beach	0.64	0.53	20.8
Reservoirs	1.068	1.00	10.8	Farming based on land	0.25	0.233	8.9
Rivers and Canals	0.18	0.12	65.3				
Others	0.11	0.10	3.1				
Paddyfields	1.08	1.06	4.7				

2. Existing aquaculture statistical system and operational mechanism in China

- 2.1 Objectives of fishery statistics

- The work related to aquaculture statistics is an important function of the National Authority of Fisheries as fishery statistics provide a basis for development of strategies for sustainable aquaculture development; revision of fisheries law and formulation of fishery policy.
- It is also important for National Authority of Fisheries to understand the basic status of fishery production and economic performance of the sector in order to provide appropriate guidance to the sector.

- 2.2 Status of aquaculture statistical system

- The current aquaculture statistical system is basically a complete enumeration of target population by means of the statistical reporting forms. The statistical reports are submitted from lower administrative levels to higher ones and compiled step by step so as to meet the needs of aquaculture development at different administration levels.

- The current aquaculture statistics system covers all activities of Chinese aquaculture production and their achievements; and economic activities of the secondary and the tertiary industries with 509 statistical data items.
- The system involves 31 local governments and the Agriculture Development General Company of China. One of the objectives of the statistics is to meet the needs of data and information required by the fishery line agencies at different administrative levels of China.

- 2.3 Statistical reporting system

- Fishery statistics reported at the national level
- There are three types of fishery statistics that are reported monthly, biannually and annually. Fishery statistical information is disseminated on a regular basis by means of national statistical bulletins, Chinese Fisheries Yearbook, the website of Chinese fisheries and the newspaper of Chinese Fisheries, etc.

- **Aquaculture statistical information reported annually**
- Fishery statistical information reported in the Chinese Fisheries Yearbook covers analysis of the status of national fishery economy, main statistical indicators and their trends, which are reported from 31 provinces/autonomous regions/municipalities, the national fishery technology extension centers and China agriculture development group companies.

Table 4 Types of aquaculture information reported annually

1)	**Aquaculture production**
	• Inland aquaculture production by species, by farming water area, or by culture system; • Marine aquaculture production by species, by farming water area, by culture system
2)	**Area of aquaculture**
	• Cultured area (hectares) of freshwater aquaculture by area and culture system; • Cultured area (hectares) of mariculture by species, by area and culture system
4)	**Aquaculture production per unit of area (yield/ha)**
	• Yield per unit (yield/ha.) of inland aquaculture by environment and culture system; • Yield per unit (yield/ha.) of marine aquaculture by category, by species, by area and culture system
5)	**Production of aquaculture fingerlings**
	• Quantity (number or volume) of fingerlings produced by species; • Quantity stocked by species
6)	**Fishery economy**
	• Production value of marine/inland aquaculture and fingerlings and their annual increment
7)	**Fishery population and labor force**
	• Number of fishing town, village, household; • Fishery population and labor forces; • Number of full-time labor forces by sub-sector; • Number of part-time labor forces
8)	**Income and expenditure of fishing households**
	• Gross income of business a year; • Income of fishery activity and other business in the gross income; • Gross expenditure of business a year; • Expenditure of fishery production cost and other cost in the gross expenditure.
9)	**Investment of fishery capital assets**
	• Quantity of investment from the central, local and other financing sources; • Quantity of investment by aquaculture
10)	**Impacts of disasters**
	• Quantity and value of cultured products lost/damaged by type of disaster; • Number and values of farming facilities lost/damaged by type of disaster; • Number of fisher/farmer's life lost by type of disaster.

- **Aquaculture statistical information reported biannually**
- **The biannual analysis of the status of aquaculture economy is conducted based on statistical information provided from 31 provinces/autonomous regions/municipalities such as:**
- **Value and increment of marine and inland aquaculture and seeds production;**
- **Production of marine and inland aquaculture;**
- **Production by species (some species only);**
- **Production of seeds and stocked amount;**
- **Area (ha.) of marine and inland aquaculture;**
- **Area (ha.) by culture system and by species;**

- **Aquaculture statistical information reported monthly**
- Gross output of cultured products
- Production of marine aquaculture
- Production of inland aquaculture

- **3.Progress on strengthening the capacity building of fishery statistics in China**
- **In the past 10 years, the National Authority of Fisheries of China has paid a great importance to the operation of fishery statistics and has done a lot of works for the purpose of strengthening and improving the quality of fisheries statistics and there are a lot of works to be done in improving the capacity building of fishery statistics in the next period of time.**

- **1) In accordance with "the Statistics Law of P.R.C", the reform of fisheries statistical indicators system, so that statistical information closer to the real situation**

- In 2003 and 2007, the national authority of fisheries carried out two revisions of fishery statistical indicators system. It has also revised the method of data collection, scope of indicator survey and statistical indicators.
- According to China's statistics Law" stipulates , the statistical indicator is necessary to be revised comprehensively every five years. As we have already started on preparing of the revision of fishery statistics indicators in order to fully grasp and understand the actual situation of fishery production, but also more conductive to the promotion of our statistics with interational standards.

- **2) . Conduction of pilot sample survey and continuously explore ways to improve fishery statistics**

- Since 2002 in cooperation with FAO the pilot sample survey on marine capture fisheries in Xiangshan County and Zhoushan, Zhejiang Province, and Haimen City in Jiangsu Province and Laizhou City in Shandong Province have been conducted.
- In 2005 the pilot sample survey on aquaculture was conducted in Shandong, Hubei , Jiangxi and Guandong Provinces.
- The pilot through these projects to verify feasibility of application and extension of a sample survey method in the current fishery statistics-based.
- The sample survey –based fishery statistics the National Authority of Fisheries in China will promote the work after perfection of the pilot

- **3 Standard statistical procedures and establishment of "Regulations of Fishery Statistics**

- In 2004 "the regulations of National Fishery Statistics" was developed. The regulation detailed responsibilities of fishery statistics institutions and statisticians at all levels and identify the procedures and system of fishery statistics.
- In order to realize the institutionalization, standardization and order-oriented for fishery statistical work. Now we are revising and perfecting this regulation and the new "Regulations of National Fishery Statistics will be issued and come into operation in 2010.
- .

- **4). Establish the security system for statistical data quality assessment**

- Based monthly report we will regularly organize the experts to conduct focused surveys for data on volatile statistics.
- Establish 400 monitoring points for monitor the changes of aquaculture production in 10 provinces with main aquaculture operation, including input of feeds, seeds, employments, production and price so as to verify the accuracy of statistical information.

- **5). Training for strengthening the building of statistical team**

- Prepare to set up the information database for statisticians at all levels and the personal information of 6000 fishery statisticians has recorded in the database so as to timely contact with them for understand the information of aquaculture production.
- Intensify the training work and 1or 2 training courses will be organized every year for fishery statisticians at grass-roots level. (100 persons/one course)
- In next step we will strengthen the training efforts of statisticians and by the end of 2012 we will train the fisheries statisticians at level of main fishery counties rotation again so as to improve the overall quality of fishery statistics.

- **6). Strengthen the data analysis effort**

Establish the expert team of fishery statistics

A expert team consisted of 35 people engaged in doing research on statistics, fishery resource, aquaculture, processing and economy has been set up. The workshop will be held two times a year at least for evaluation of data quality.

- **7). Strengthen the survey of farmer/fisher incomes**

- **The survey points of 10000 farmer/fisher households has been set up so as to understand the income level of employments in fishery and aquaculture sectors**

8) Enhance the service function of statistical information

Provide the information on aquaculture production by month to the national authority of fisheries timely and provide a service for policy-making;

Twice very week through information network ,release to communities on aquaculture production and trade exchanges of aquatic products at market for the business operation service.

The data of annual fishery production in time to the FAO

Recommendation

- The reform of fishery statistics has obtained a certain results since 2004 however some have not yet achieved the desired content of the progress. Our country is also developing country and aquaculture operation is in high decentralized management approach so that it has brought certain difficulties for fishery statistics and there are weak statistical agencies at town/village level and the shortage of fund has plagued by fishery statistical work. There is a certain gap in comparison with the needs of aquaculture economic development of China and we want to continue to cooperate with relevant international organizations on together work to reform fishery statistical system and improve the statistical method.

Thank you

Indian Presentation:

An Assessment of Aquaculture Statistics and Data Collection System in India

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Outline

- Contribution of Indian Fisheries to GDP
- Need for catch assessment survey on inland fisheries
- Present methodology
- What has to be done? Methodology
- Discussion

2

Background

- India's contribution to the world aquaculture production has been around 7 percent in terms of quantity and 5 percent in terms of value.
- Freshwater fish production has increased by five times during 1990 -2007 (from 6.57 million tons in 1990 to 30 million tons in 2000) @ 12% growth
- The yield per hectare in carp polyculture ponds was estimated as 3214 kg with a gross return of USD 2125 in 1999 prices
- The contribution of fisheries sector to the GDP, has gone up from 0.46 percent in 1950-51 to 1.47 percent in 2006 (current prices) and 2.50 % of the agricultural GDP

Contribution and growth of fisheries sector in India, 1950-51 to 2001-02

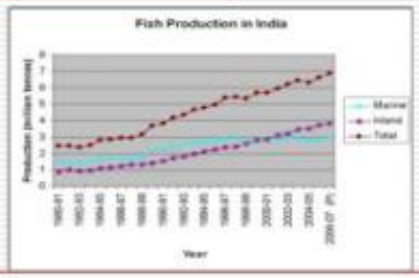
Period	Percent contribution to		Percent annual growth	
	GDP	AgGDP	Fisheries GDP	AgGDP
1950-51	0.46	0.84		
1960-61	0.54	1.18	5.63	2.68
1970-71	0.61	1.37	3.92	1.50
1980-81	0.73	1.98	2.86	1.72
1990-91	0.93	3.00	5.11	2.89
2001-02	1.03	4.01	4.71	3.00
2006-07	1.50	4.06	3.00	1.80
Overall growth			4.31	2.65

Changing Production Profile (million tons)

Year	Marine	Inland	Total
1950-51	0.53 (71.01)	0.22 (28.99)	0.75
1960-61	0.88 (75.86)	0.28 (24.14)	1.16
1970-71	1.09 (61.85)	0.67 (38.15)	1.76
1980-81	1.56 (59.12)	0.89 (40.88)	2.44
1990-91	2.30 (59.96)	1.54 (40.04)	3.84
1995-96	2.71 (54.70)	2.24 (45.30)	4.95
2001-02	2.83 (47.51)	3.13 (52.49)	5.96
2005-06	2.91 (44.40)	4.56 (55.76)	7.47

Inland fish Production in India (tons)

Species	1999	2004	2007	% change 2007 over 1999
Common carp	73400 (4%)	451547 (11%)	-	-
Rohu	[illegible]	[illegible]	370307 (11%)	-21%
Mrigal	469700 (22%)	462700 (15%)	148789 (4%)	-68%
Catla	496300 (24%)	467962 (19%)	2104552 (63%)	324%
Grass carp	137200 (7%)	100646 (4%)	120030 (4%)	-12%
Silver carp	13024 (1%)	163004 (7%)	294672 (9%)	1860%
catfishes	42870 (2%)	42160 (2%)	38212 (1%)	-11%
Snake heads	79984 (4%)	25949 (1%)	27257 (2%)	-21%
Fresh water fishes	140036 (7%)	138970 (4%)	169124 (5%)	18%
Giant river prawn	7000 (0.33%)	30720 (2%)	27262 (1%)	269%
Giant tiger prawn	72700 (4%)	127002 (3%)	8300 (0.24%)	-89%
Indian white prawn	4870 (0.23%)	3218 (0.13%)	4100 (0.12%)	-16%
Total carp production	1712143 (83%)	2136127 (86%)	3048138 (91%)	78%
Total production	2061263	2469134	3347212	35%



GDP from Shrimp Production (value in Rs. Crores)

Estimated value of culture shrimp	3620
Estimated value of cult scampi	414
Total value (a+b)	4034
Value added through processing (Rs/kg of shrimp)	132
Gross value added for product weight	94.1
Total value (c+e)	4128.1
Forward & backward contribution (10% each)	825.62
Gross value (f+g)	4953.72
GDP (Fisheries)	22348
% GDP from cultured shrimp & scampi	22.2 %

Some of the Weak Links

- lack of reliable data base relating to aquatic and fisheries resources
- non-availability of suitable fish yield models for multi-species fisheries for open inland waters
- weak multi-disciplinary approach in fisheries and aquaculture
- in-adequate attention to the environmental, economical, social & gender issues in fisheries & aquaculture
- Inadequate manpower in specialized disciplines and HRD
- Weak linkages between research & development machinery
- weak marketing and extension network for technology transfer
- anthropogenic interventions resulting in loss of biodiversity, decline in fish catch, pollution of water bodies with industrial and domestic effluent
- clandestine introduction and spread of exotic fish species
- contamination of indigenous fish germplasm resources

Fish Catch Data Collection

- No uniformity in the fisheries statistics
- The available data less useful to fishery managers aiming at objective planning
- Ambiguity in the use of concepts and terminologies
- Nomenclature and classification of the diverse nature of resource across regions and organizations

Present method

- Assessment is done for Culture and Natural fish Production
- For culture, estimation is based on number of fish seed stocked, assumed survival, and growth, area developed by private farmers
- For natural production, effective WSA harvested and productivity

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Important assumptions

Fish production by culture

Resource type	Survival of Fish seed	Seed available for harvest		Growth	
		Prev. year	Curr. year	Prev.year	Curr. year
Major tanks and reservoirs	50%	40%	60%	2kg/ seed	1kg/seed
Minor tanks	70%		100%		1kg/seed

2no / acre of area developed in private ponds for current year of estimation

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Natural fish production

Resource type	Effective WSA for Harvest	Productivity
Major tanks	25%	50kg/ha
Minor Tanks	25%	40kg/ha
Small reservoirs (<500 ha)	50%	50kg/ha
Large reservoir (>500 ha)	60%	35kg/ha
Rivers		100kg/km
Estuaries		750kg/ha
Water logged area		10 kg/ha

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Disadvantages

- Seed stocking figures may not be accurate
- Assumptions may not be true in all circumstances
- No model exists to show relation between number of fish seed stocked and quantity of Fish harvested
- Methodology and data derived has not been tested

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New Methodology

- To overcome the problems of the existing methodology Govt. of India launched a programme of developing Inland Fisheries Statistics under centrally sponsored scheme during 1975 with the involvement of
- CIFRI, Barrackpore as the nodal agency for evolving a suitable and statistically sound data collection and estimation methodology.
- Collaboration with Indian Agricultural Statistical Research Institute, ICAR, New Delhi
- Fair-Field-Smith Law to determine the actual number of sampling days in a month

Classification of inland fisheries resources:

Group I

- Water bodies up to 10 ha. Water spread area at full tank level
- Aquaculture ponds and tanks
- Brackish water impoundments
- Water logged areas

Classification of inland fisheries resources: (continued)

Group II
- Large irrigation tanks
- Reservoirs and check dams
- Lakes
- Ox-bow lakes / Meanders / Channel scars

Group III
- Rivers
- Canals
- Estuaries
- Lagoons
- Backwaters

Definitions of water bodies

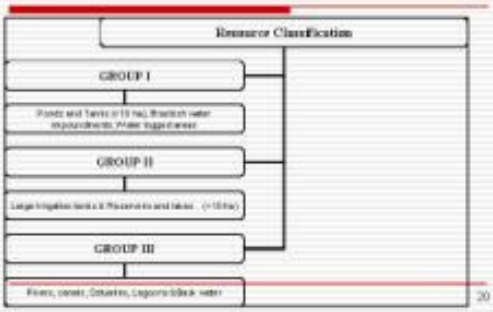
- ***Ponds :*** A small body of water usually earthen, though masonry dykes are included, and shallow made through excavations that represents a restricted environment without continual interaction with populations of neighboring biotopes is included in this category.
- ***Tanks :*** A shallow water unit usually larger than a pond created by constructing earthen or masonry barricades which receives water either from tube-wells or rain. Small excavated community ponds and temple tanks and small irrigation impoundments below 10 ha. of water spread at FTL are included in this category.
- **Large Irrigation Tank :** All those ponds and tanks termed earlier but larger than 10 ha. will fall under this class.

Definitions

- ***Reservoir :*** A large man made impoundment of varying magnitude created by erecting bunds, dams, barrages or other hydraulic structures across streams or rivers serving one or more purposes such as irrigation, power generation, flood control or other water resource development projects.
- For the purpose of production assessment, reservoirs (tanks, lakes and flood plain lakes) are further sub-classified on the basis of area as follows:

Small reservoir	: 50 to 1000 ha of water at FRL
Medium reservoir	: 1000 to 5000 ha of water at FRL
Large reservoir	: Above 5000 ha of water at FRL

CIFRI Methodology



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Sampling Methods

- Separate sampling methods for each of the groups of water bodies for estimation of resource area, fish production and other parameters of importance.
- The problem of identifying a water body uniquely with one of the above names
- There are no uniform criteria adopted by states for the classification of the water bodies
- Definitions of each resource type have been proposed so that uniform criterion could be followed in all states and union territories.

How to collect data?

- Split sampled tanks list into two
- Short term fishing activity
- Fishing is round the year
- Total enumeration by observation and thorough enquiry for each tank sampled where short term fishing is done.
- Data on fish harvested in 4-5 days/month by observation and enquiry, where fishing is round the year.

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Stratification

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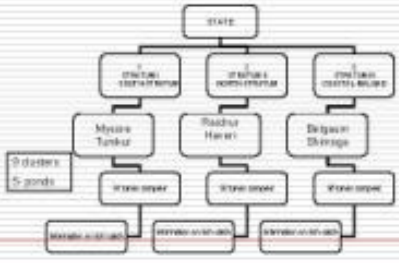
SAMPLING DESIGN
GROUP I (Ponds & Tanks)



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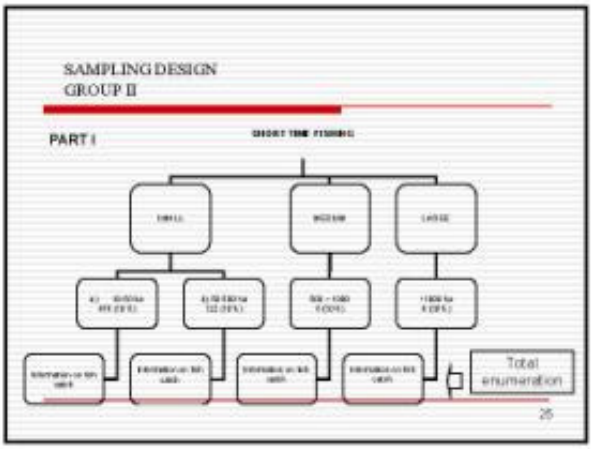
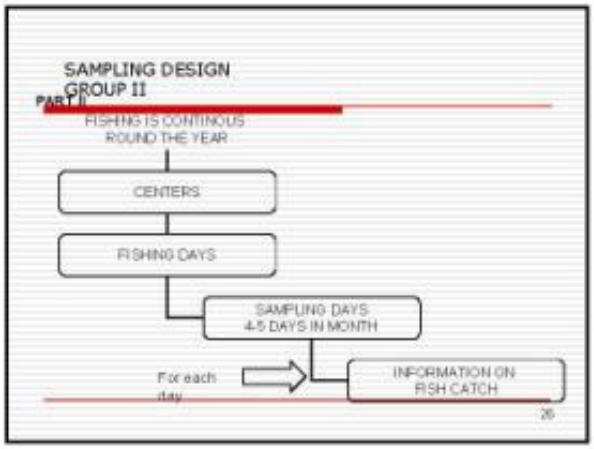
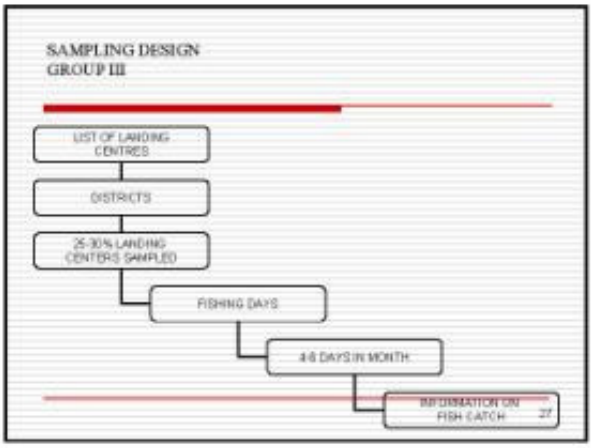






Research and Development Support for Inland Fisheries and Aquaculture

Indian Council of Agricultural Research (ICAR)
- Ministry of Agriculture
- Ministry of Commerce;
- Ministry of Food Processing Industries
- Council of Scientific and Industrial Research (CSIR)
- State Agricultural Universities
- Other Agencies:
- Department of Ocean Development (DOD)
- Department of Science and Technology (DST)
- Department of Biotechnology (DBT)
- University Grants Commission (UGC)
- Indian Institutes of Technology (IITs)
- Indian Institutes of Management (IIMs)
- voluntary agencies/ private industries.

Credit and Development Support

- National Fisheries Development Board, GOI
- The National Bank for Agriculture and Rural Development (NABARD)
- Marine Products Export Development Authority
- Industrial Finance Corporation of India (IFCI), Industrial Development Bank of India (IDBI)
- State Finance Corporations (SFCs) and
- National Co-operative Development Corporation (NCDC)

Conclusions

- Implementation only at pilot level
- Lack of skilled dedicated manpower
- Lack of field level training for implementation
- Widely distributed water bodies, landing centres and hence need for transport and duration
- Administrative inconveniences
- Long gestation period
- Low priority by the administration and staff
- Flexible approach is required

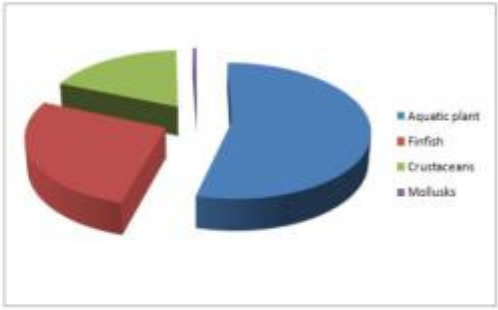
INDONESIAN AQUACULTURE STATISTIC

Presence by
Syaefuddin & Iman I. Barizi

DIRECTORATE GENERAL OF AQUACULTURE
MINISTRY MARINE AFFAIRS & FISHERIES
INDONESIA

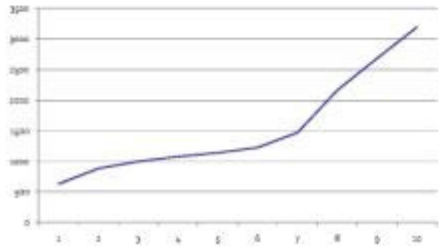
I. BACKGROUND

2. Aquatic plants share 57% from 2007 aquaculture production followed by Finfish (27%); Crustaceans (18%) & Mollusks (0.5%)



I. BACKGROUND

1. Indonesian aquaculture production has grown 20%/year over the last ten year periods (1998 – 2007).



I. BACKGROUND

3. Dominant species belongs to group aquaculture commodities

Group	Dominant Species	
Aquatic plant	Seaweed	*Euchema sp*
Finfish	(1) Common carp	*Cyprinus carpio*
	(2) Milk Fish	*Chanos chanos*
	(3) Tilapia	*Oreochromis sp*
Crustaceans	(1) White shrimp	*Lithopenaeus vannamei*
	(2) Black Tiger shrimp	*Penaeus monodon*
Mollusks	Coloured shell	*Pteria penguin*

II. NATIONAL PLAN STRATEGY ON AQUACULTURE

VISION:

The establishment of competitive and sustainable aquaculture as a mainstay of economic growth.

MISSION :

1. **To produce high quality fish efficiently;**
2. **To develop responsible and environmentally friendly aquaculture**
3. **To create business opportunities and provide employment.**

The policy of the Directorate General for Aquaculture is directed towards 3 (three) programmes, which are the programmes to increase aquaculture production for export (PROPEKAN), to increase aquaculture production for in-country consumption (PROKSIMAS), and to protect and rehabilitate fisheries resources (PROLINDA).

Source: Profile of Directorate General for Aquaculture (2006)

COLLECTING & DATA ANALYSIS FOR AQUACULTURE STATISTIC

Method of collecting data

a. For Aquaculture Companies (AC), the data will take from all AC in District.

b. For Aquaculture Household (AH), the survey will take using sampling in Village sample (VS).

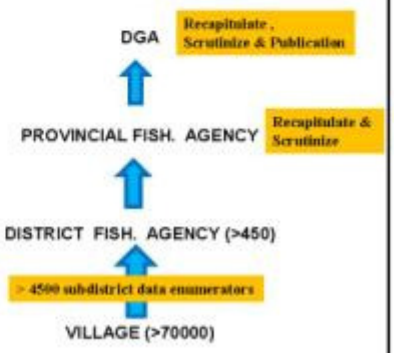
- VS is established by using method of Probability Proportional to the Size (PPS). We take samples from all sub district based on randomize method, AH cumulative numbers and its interval.
- AH is established by Systemic Random Sampling (SRS). We take 10 samples from every AV sample based on randomize method, sequence numbers of AH and interval numbers.

III. SCOPE OF DATA COLLECTIONS

1. SOURCES OF DATA:
   1. Aquaculture Household (AH)
   2. Aquaculture Company (AC)
2. DATA COLLECTION METHODS
   1. Census for AC
   2. Survey for AH
   3. Registration for secondary data (ex.: export – import documents & transaction)
3. SCOPE DATA COLLECTION:
   1. Production of fries/ yield/ Agro -input
   2. Numbers of AH/ Aq. Farmers
   3. Gross & Net areas in used
   4. Value of Production
   5. Size area of Aq. Management
   6. Kind of species, area activitiy(marine/brackish/ freshwater) & media culture (pond/ cage / rice field)
   7. Time (quarter) periods

COLLECTING & DATA ANALYSIS FOR AQUACULTURE STATISTIC

SCHEMATIC DATA COLLECTION



OUTLINE OF SURVEY

1. **POTENTIAL VILLAGE SURVEY.** Some data should be taken related to PVS, such as:
   1. Village characteristic (climate condition, natural sources, infrastructure etc).
   2. Aquaculture and its commodities condition.
   3. Number of Fish Farmers
   4. Total area of aquaculture
2. **REGISTRATION for AQUACULTURE VILLAGE**
   1. Form KB 1 for AV fish hatchery activity
   2. Form KB 2 for AV fish farming activity
3. **REGISTRATION for AH/AC**
   1. Form KB 3a for AH fish hatchery
   2. Form KB 3b for AC fish hatchery
   3. Form KB 4a for AH fish farming
   4. Form KB 4b for AC fish farming

Statistical & Protocol Procedure Form

Aquaculture Activity	Source of Data	Aq. Village	AV sample	Estimation from District	Statistical Report from District	Statistical Report from Province
Fries Production	AH	KB-1	SB 1a	EB 1b	LB 1b	LB 1b
	AC		SB 1b			
	Aq. Inputs Household	KB-1	SB 3a	EB 2b	LB 2b	LB 2b
	Aq. Inputs Company		SB 3b			
	Production from AH	KB-1	SB 5a	EB 3b (software)	LB 3b (software)	LB 3b (software)
	Production from AC		SB 5b			

Statistical & Protocol Procedure Form

Aquaculture Activity	Source of Data	Aq. Village	AV sample	Estimation from District	Statistical Report from District	Statistical Report from Province
Grow out/Farming	AH	KB-2	SB 2a	EB 1b	LB 1b	LB 1b
	AC		SB 2b			
	Aq. Inputs Household	KB-2	SB 4a	EB 2b	LB 2b	LB 2b
	Aq. Inputs Company		SB 4b			
	Production from AH	KB-2	SB 6a	EB 3b (software)	LB 3b (software)	LB 3b (software)
	Production from AC		SB 6b			

Statistical & Protocol Procedure Form

Aquaculture Activity	Source of Data	Aq. Village	AV sample	Estimation from District	Statistical Report from District	Statistical Report from Province
Ornamental Fishes * (not operate yet)	AH	KB-H	SBH 1	EBH 1	LBH 1	LBH 1
	AC		SBH 2			
	Aq. Inputs Household	KB-H	SBH 3	EBH 2	LBH 2	LBH 2
	Aq. Inputs Company		SBH 4			
	Production from AH	KB-H	SBH 5	EBH 3 (software)	LBH 3 (software)	LBH 3 (software)
	Production from AC		SBH 6			

Methods for Collecting Data & Analysis

We use a software for statistical estimation and its report

SB Form

Survey of Sample

- AH at Village sample,
- AC at District

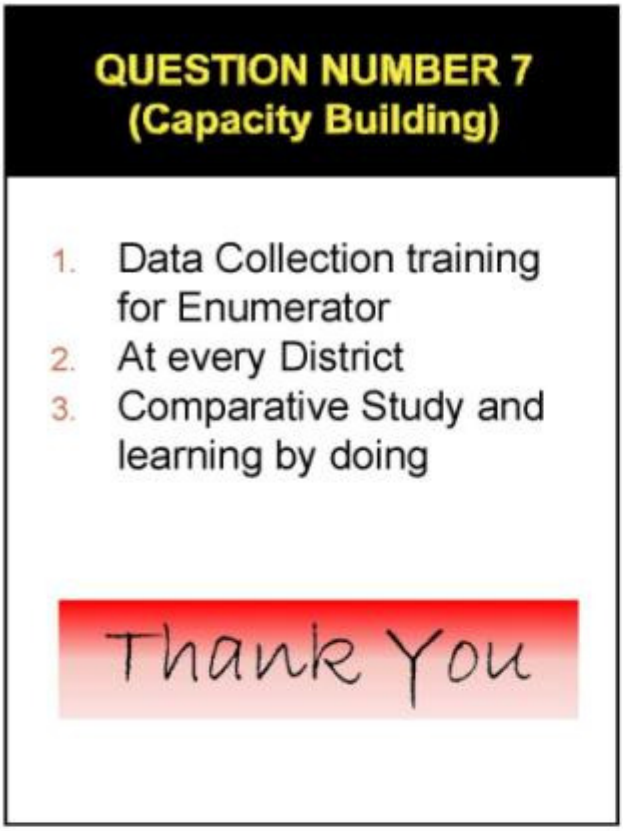
QUESTION NUMBER 5

- Can the scope of data collected be expanded? YES IT CAN
- Note: Many AC tend to reluctant in giving all of their information due to their responsibility to pay the government tax

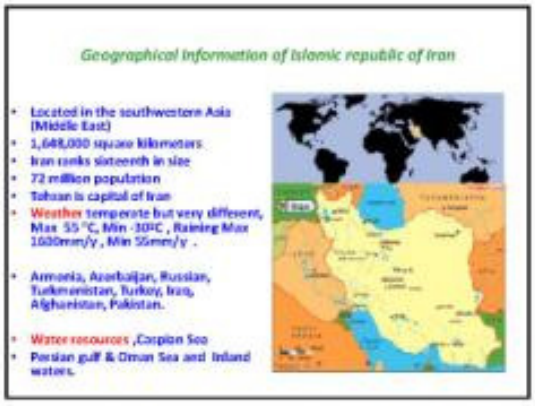
SOFTWARE FOR ESTIMATION & REPORT

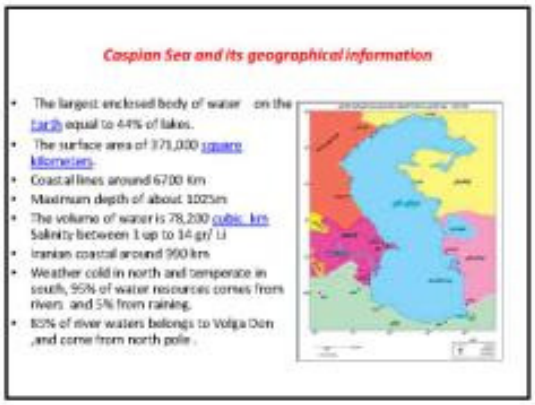
QUESTION NUMBER 6 (Data Collection Constrains)

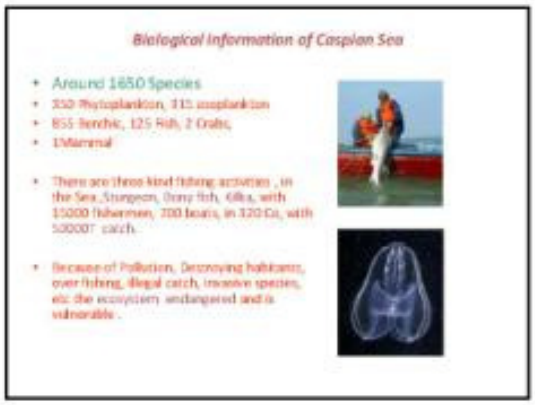
1. In many District, Personal for Data Enumeration are easy to change by District Authority
2. Establishment for Data Enumerator in District by Decree from Director General for Aquaculture (in preparing for 2010)


QUESTION NUMBER 7
(Capacity Building)
1. Data Collection training for Enumerator
2. At every District
3. Comparative Study and learning by doing
Thank You

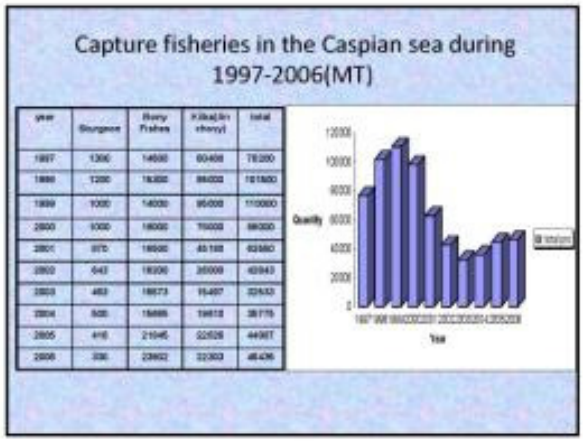
IR Iran Presentation:



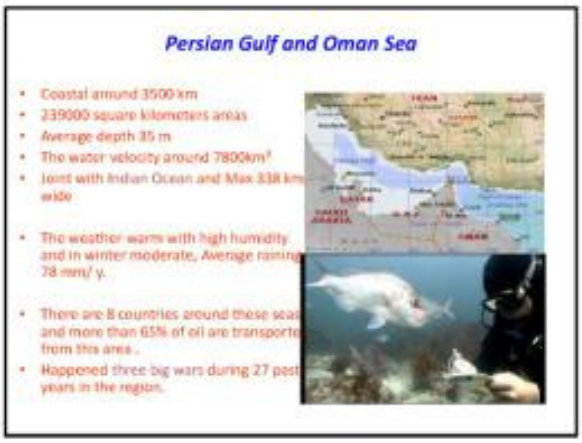




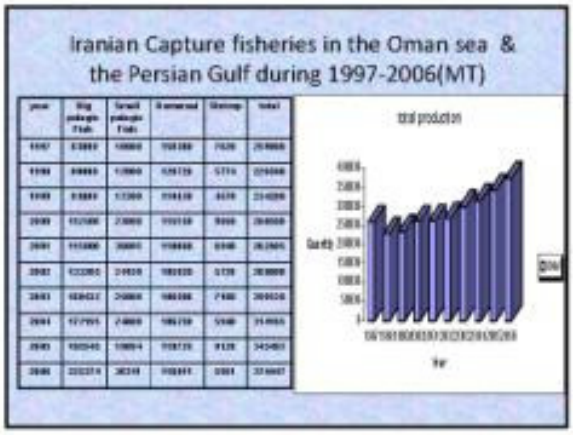

Different Sturgeon species in Iranian Shores
of Caspian Sea
Acipenser persicus
Acipenser stellatus
Acipenser gueldenstaedtii
Acipenser nudiventris
Huso huso

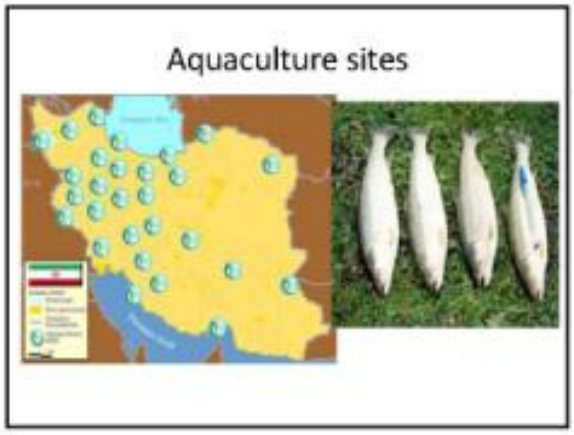

Capture fisheries in the Caspian sea during 1997-2006(MT)
Quantity
Year


Rainbowtrout fish culture

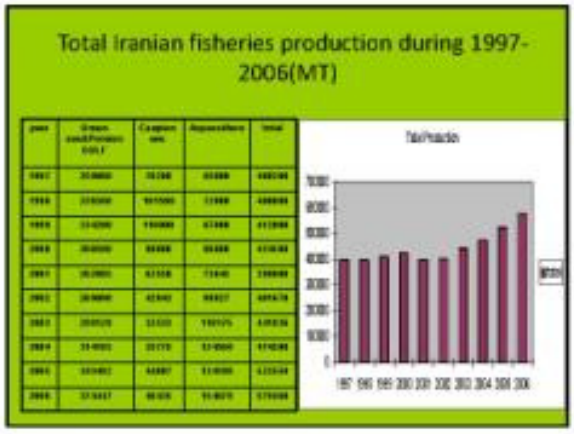

Persian Gulf and Oman Sea
Coastal around 3500 km
239000 square kilometers areas
Average depth 35 m
The water velocity around 7800km³
Joint with Indian Ocean and Max 338 km wide
The weather warm with high humidity and in winter moderate, Average raining 78 mm/ y.
There are 8 countries around these seas and more than 65% of oil are transported from this area .
Happened three big wars during 27 past years in the region.

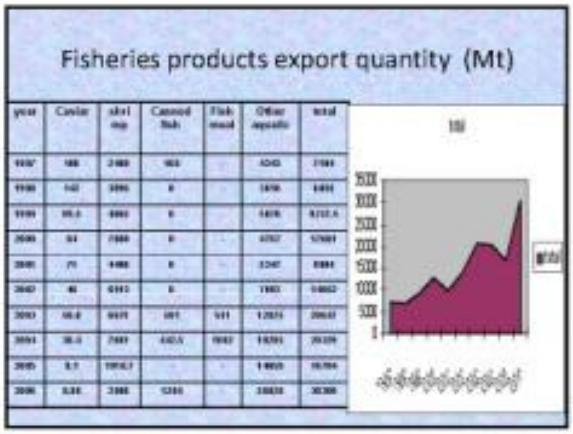

Biological information related to Persian Gulf and Oman Sea
Around 1642 species
There are different fishery activities related with the Sea for demersal fish, Pligic, Mesopligic, Benthic
Also different mammals, Crustacean, Turtles, Sea snakes .
Around 20,000ha Mangrove forest and many thousands ha coral reefs
Around 50 species are caught economically
Around 150,000 fishermen, 12000 boats and ships, in 130 Co, have more than 370,000T catch per year.
Pollution is main concern related to the Sea and it has increasingly trends

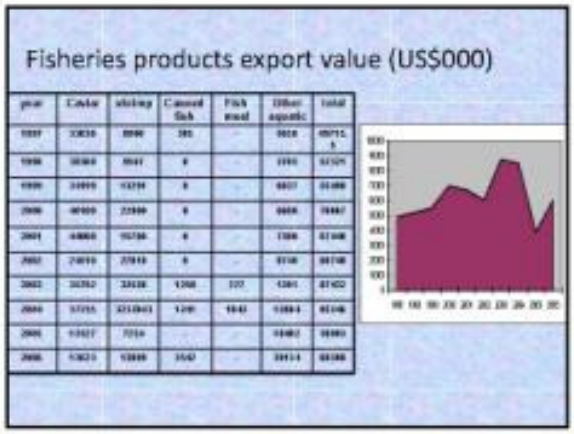

Iranian Capture fisheries in the Oman sea & the Persian Gulf during 1997-2006(MT)
total production


Aquaculture sites


Aquaculture in inland water resources
There are three kind activities related with aquaculture 111000 T production,
Aquaculture in Cold water with 50000T production
Aquaculture in Warm water with 900007 production
Shrimp culture with 100007 production
The total number of farms is around 7000
The total areas of farms is around 100,000ha
The number of fish farmers is around 17000 person


Total Iranian fisheries production during 1997-2006(MT)


Fisheries products export quantity (Mt)

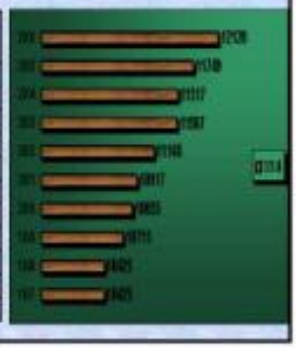

Fisheries products export value (US$000)

Investment in fishery Sector during 1997-2006(US$)

year	Bank Credits	Private saving	Local resources	Public budgets	total
1997					
1998					
1999					
2000					
2001					
2002					
2003					
2004					
2005					
2006					

Number of Fishing Vessels During 1997-2006

year	the Caspian sea	The Oman sea & Persian Gulf	total
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			



Number of Fisheries industry plants During 1997-2006

year	Ice plant	Canning Plant	Fish meal	Coastal cold stores	Freezing unit
1997					
1998					
1999					
2000					
2001					
2002					
2003					
2004					
2005					
2006					

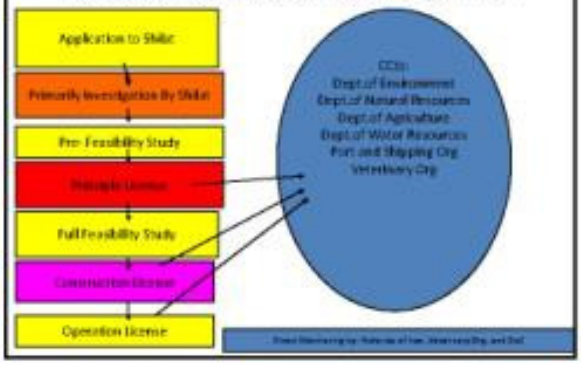
Fisheries industry unit capacity During 1997-2006

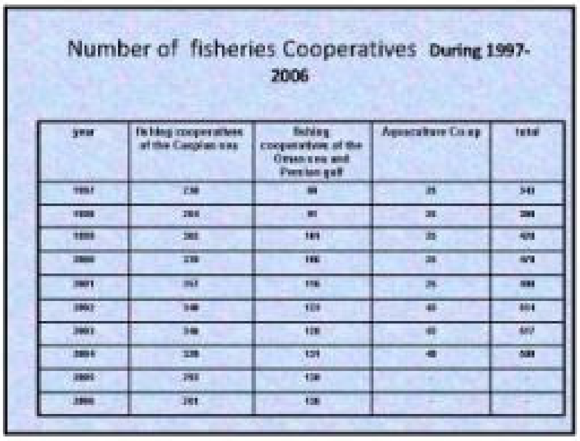
year	Ice plant 1000Mt/day	Canning Plant Million can/year	Fish meal Mt Raw material/day	Coastal cold stores 1000ton	Freezing unit Mt/day
1997					
1998					
1999					
2000					
2001					
2002					
2003					
2004					
2005					
2006					

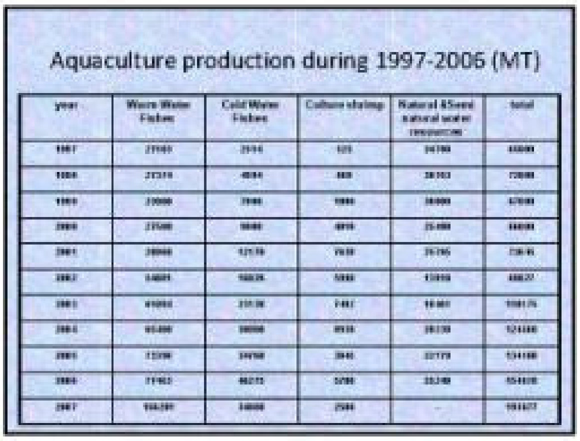
Fundamental roles of Iran fishery (Shilat)

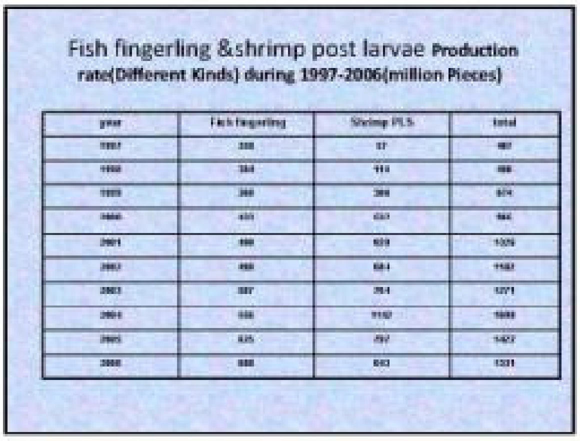
- Contributed to Gross Domestic Product
- Animal protein(fish as food)
- Employment to rural population
- Source of foreign exchange
- Responsible to develop &manage the national fisheries resources
- Enforce the fisheries Act
- develop,manage &conserve aquaculture inland and marine fisheries resource on a sustainable basis
- To carry out fishery research & to train fishermen and Aquaculturist

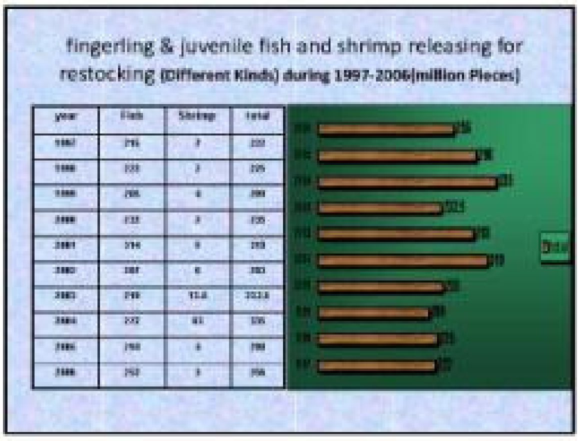
Process of Aquaculture Licensing In Iran

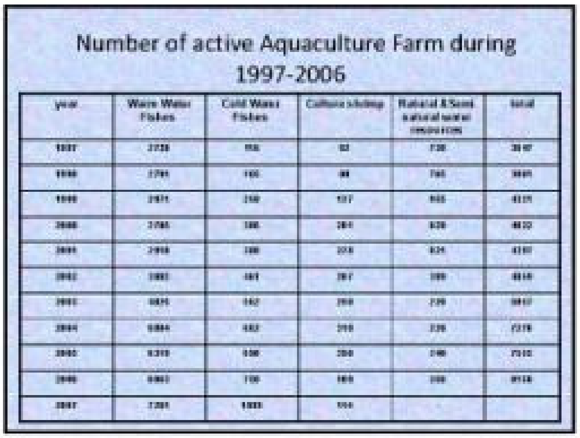


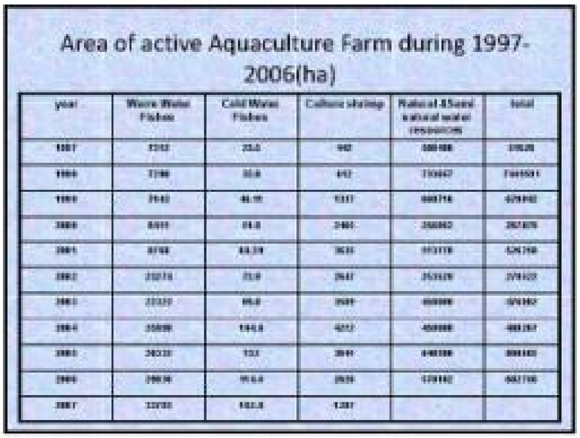

Number of fisheries Cooperatives During 1997-2006


Aquaculture production during 1997-2006 (MT)


Fish fingerling &shrimp post larvae Production rate(Different Kinds) during 1997-2006(million Pieces)


fingerling & juvenile fish and shrimp releasing for restocking (Different Kinds) during 1997-2006(million Pieces)


Number of active Aquaculture Farm during 1997-2006


Area of active Aquaculture Farm during 1997-2006(ha)

Number of employees in fisheries sub-sector1997-2006(1000 person)

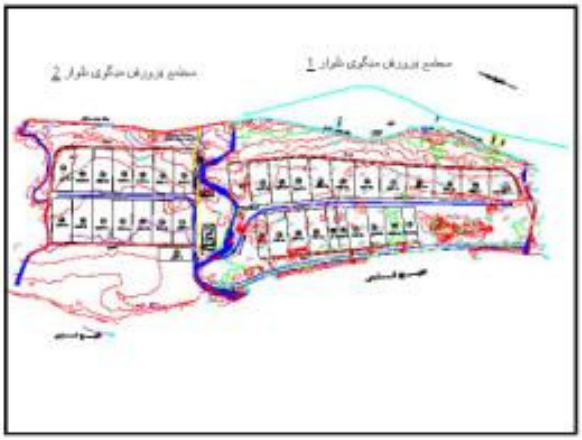
year	Inland water	Fishermen in the Caspian sea	Fishermen in the Persian Gulf &Oman sea	total
1997	55	52	88	192
1998	67	53	93	213
1999	38	54	89	181
2000	35	55	105	195
2001	39	55	109	204
2002	38	55	108	201
2003	57	54	120	231
2004	57	54	128	239
2005	57	53	133	243
2006	35	53	133	221

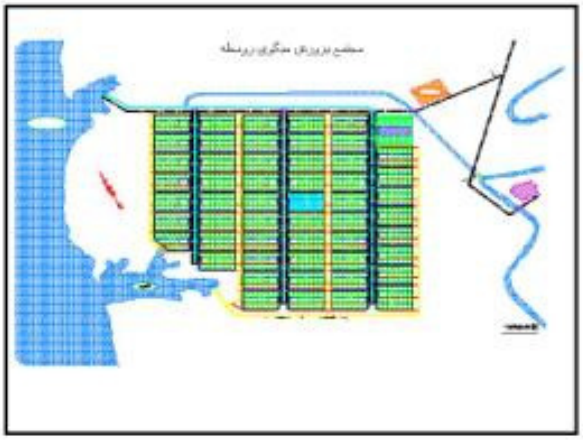
Shrimp culture In Iran

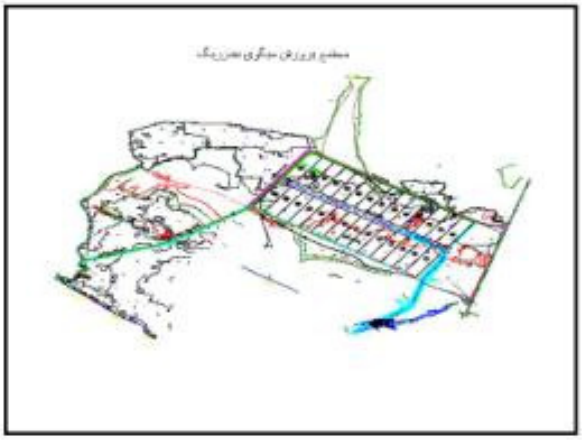
- Shrimp culture in Iran has been starting since1991.
- Primary Study has indicated huge potential for shrimp culture in iran(130,000ha).
- Since 1992 about 45000 ha of coastals land in 4 provinces (south of Iran) and 1 province in the north of Iran (Golestan) are allocated to investors.
- About 12,000 ha of licenses area ready to operation, 10,000 ha under construction and 22,700 ha are under study.
- Shrimp farm size classified in two groups :
- Small farm (Less than 20 ha,33%) and large farm (more than 20 ha,67%).
- Shrimp farming system in Iran is semi- intensive
- Main culture species in Iran is Fenneropenaeus indicus(Indian white shrimp).
- Shrimp hatchery: Total number of shrimp hatchery that are on operation are 43.
- WSSV is the biggest problem of shrimp culture in Iran.

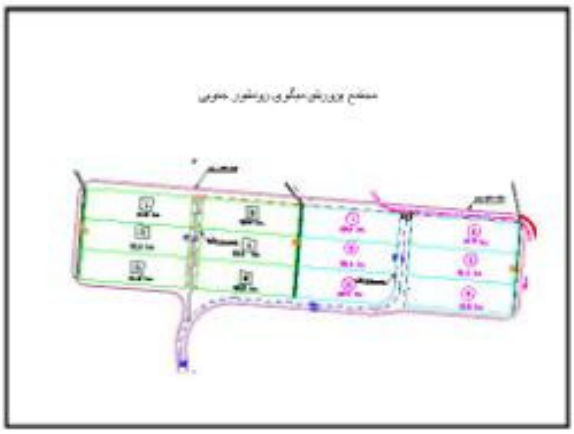
Specification of shrimp farming system in Iran

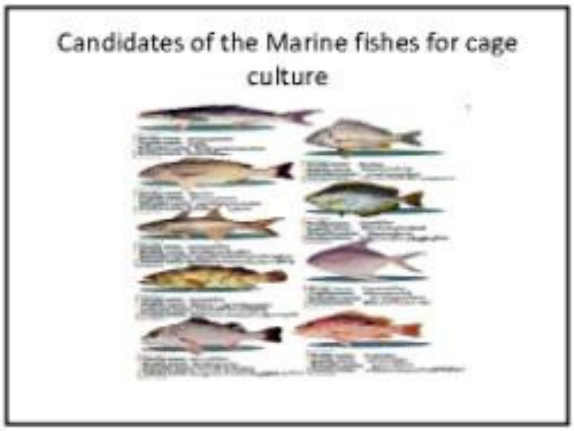
Parameter	Ranges
Pond size	0.25- 1.1 ha
Pond construction	Earthen
Water supply system	Gravity +Pump
Water drainage system	Gravity +Pump
Production (MT/ha)	1.5-2
Stocking density(PL/m2)	12-25
Feed source	Supplement- Natural
Seed source	Hatchery
Days of culture	120
Average body weight	15 to 18
Fully culture	None
Aeration	Natural + aerator
Water Salinity (ppt)	35-45
Survival rate	70%
No. of crop/year	Usually 1 ,some 2
Labor needs /ha	0.8
Production cost (US$/kg)	3.5 to 5
Financial return	Fair










Candidates of the Marine fishes for cage culture

Algae Culture in Iran

- Extensive of natural stocks of algae in Persian gulf &Oman sea.
- More than 300 species of seaweeds was identified.
- Identification of commercial algae species suitable for culture.
  - *Gracilaria*
  - *Gracilariopsis*
  - *Sargassum*
  - *Hypnea*

Gracilariopsis persica

Algae culture into the drainage canal of the shrimp and harvesting

Weighing of harvested products

Method of culture (rope culture)

Biometry

Drying of harvested seaweed under sun light

Weighing of products

GOVERNMENT SUPPORTS

1. Macro planning for Sectoral Development
2. Provide infrastructure/common facilities for cluster development projects
3. Investment incentives (fiscal and non fiscal)
4. Research & Development (R&D) supports
5. Training and Human Resource Development

GOVERNMENT SUPPORTS (continue)

6. Market Access (International promotions)
7. Credit facilities
8. Technical support services
9. Insurance support

DEVELOPMENT STRATEGY

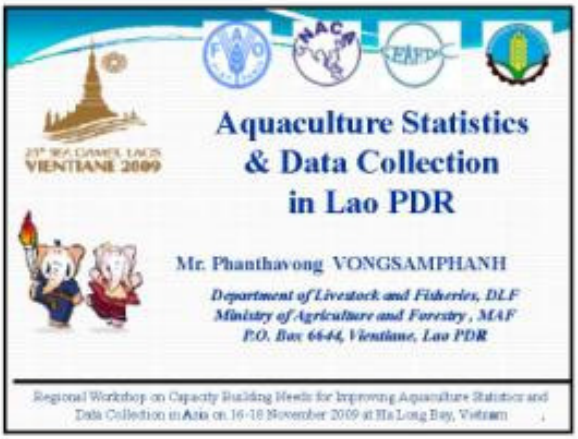
I. Increase existing production units;
II. Development of new area;
III. Cluster development;
IV. Promote export;
V. Expands domestic market;
VI. Good Aquaculture Practices (Sustainable aquaculture/environmental friendly).

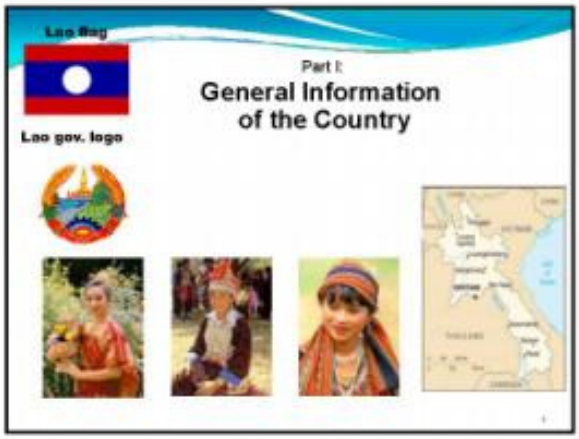
CONCLUSION

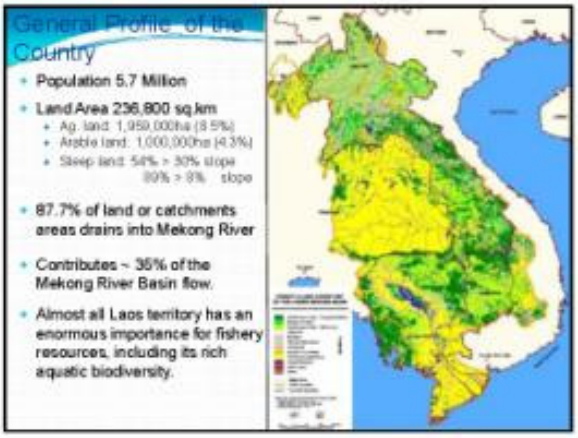
I.R of Iran offers good potential for investment

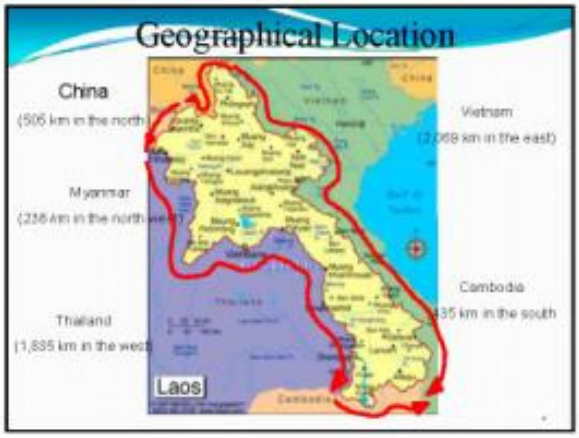
due to good infrastructure, government support, political stability, and availability of abundant natural resources e.g. water bodies and land.

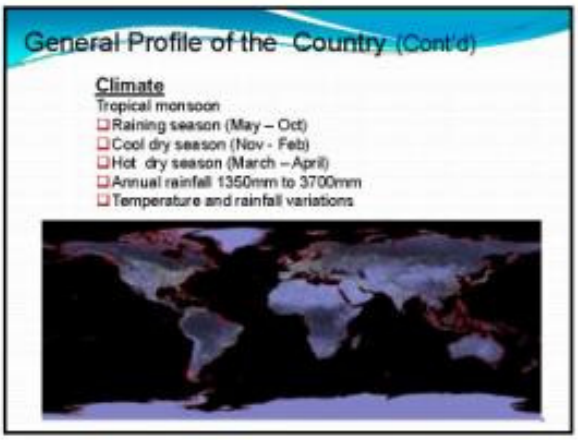
Lao PDR Presentation:

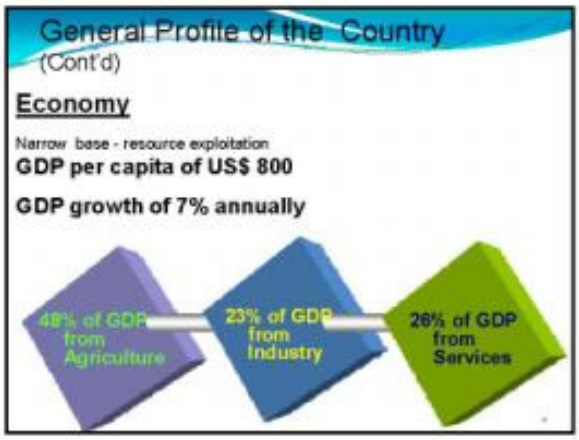












Review of Aquaculture

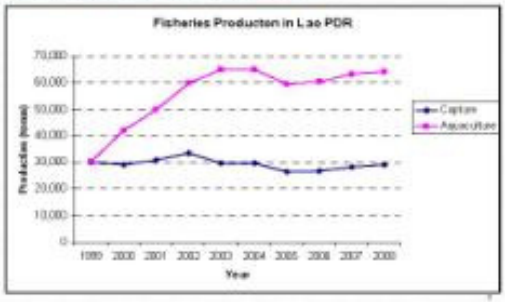
- **1960** USAID -Vientiane ,Savanakhet, Pakse , Sayaboury and Luangprabang.
- 1970 Houaphanh , Xiengkhuang and Uodomexay
- 1987-2000 (FAO/UNDP) 30hatcheries *(17 Gov.13private)*
- 2000 – now 62 hatcheries *(32 Gov. & 30 private)*

Aquaculture Systems

Rice cum fish | Pond Culture | Cage Culture

communal ponds | Integrated system | Hatchery

According to DLF (2008), *the aquaculture production accounted for 64,300 tons in an area of more than 42,000 ha*, including cage culture in the Mekong and some tributaries.



contribution of the major commodities to the total production

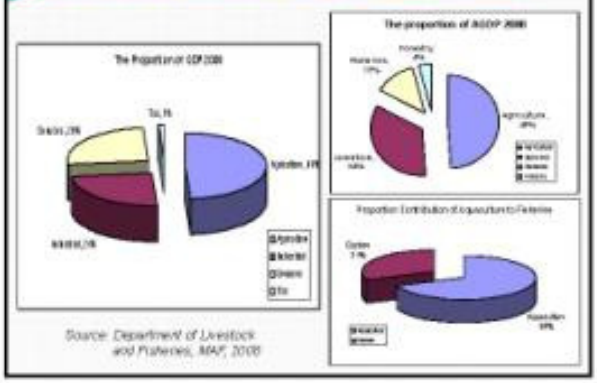
- in Lao PDR has been newly estimated by Hortle (2007) at about *208,503 tons*
  - **(80%) 167,922 tons of fish**
    (85,076 tons of fresh fish and 82,846 tons of preserved fish),
  - **(20%) 40,581 tons of OAAs.**

Fish Species

- More than ***481fish species*** have been identified in Lao PDR including ***22 fish species*** identified as exotic species. About 37 amphibians, 7 species of crabs and 10 species of shrimps have only been recorded for Lao PDR, but these records would cover only about 15% of estimated total.
- A number of indigenous fish species have been found in various types of farming, either from collecting the fry from the wild, artificial reproduction in captivity or the reproduction in fish pond culture of the private farms and some of government hatcheries.

Main Culture Species

Contribution of fisheries to gross GDP, and the proportional contribution of aquaculture to fisheries



Source: Department of Livestock and Fisheries, MAF, 2008

Country Aquaculture Development strategies to year 2020

1. The various types of aquaculture and the management of the development of the land close to rivers

- To assess the value of the various traditional methods of fish rising and to study the potential of the land close to rivers in the different regions by means of agro ecology.
- To look for natural and semi-natural models of fish rising which are locally appropriate in order to provide and disseminate promotional information to the farmers
- To look for methods and techniques for the expansion of the production of fish fry at the village level (such as: the management of fish nurseries and local sales by the joint professional fish farmer groups
- To look for the methods and the real lessons in order to bring about appropriate development support to promote the production of both the rural and urban farming families
- To have methods for the prevention of fish diseases and to control those impacts on society linked to the occurrence of fish disease.
- To upgrade the techniques for the production of fish food, the techniques of feeding fish and the quality of the fish food in many

Country Aquaculture Development strategies to year 2020

2. The management of fisheries in the reservoirs and the natural fish ponds.

- To study, survey and assess the environment in order to create conditions which are suitable for fish breeding places and spawning to compensate for those lost and to promote the raising of fish in nets.
- The management of fisheries in the reservoirs provides new living sites for the people thus giving them the opportunity of participating in the management of the care and protection of and the development of the water sheds in particular, now and in the future including the development of hydro-power dam construction, the development of irrigation reservoirs and the development of the land close to the rivers for fisheries and tourism.

Country Aquaculture Development strategies to year 2020

3. The management of water resources together with various aquatic species

- The study of information including information about the various aquatic species living in natural water sources
- The study of aquatic migrations and habitats of economic importance
- The study of the natural feeding habits of fish in natural water sources including feeding on aquatic vegetation, other aquatic species and the quality of the food.
- To study the biology of those aquatic species which are of economic importance in order to provide mating and breeding sites to compensate for those lost and use these in order to support the fish farmers.
- To raise the people's and to persuade them to join together in the care and protection of the environment and the management of the natural water resources

Country Aquaculture Development strategies to year 2020

4. The production of fish fry and the regulations for the management of fisheries

- To develop and raise the awareness of the people of the techniques for improved village style production of better quality in order to expand the market system for the producers to supply the consumers with fish that present no health problems
- To develop and raise the awareness of the people of the techniques and the methods for the reduction of the losses in yields, production, storage, transportation. the management of trade in the market in order to ensure & be able to control the quality
- To research and to formulate the rules in respect of fishery techniques and for the protection and care of the water resources by building on the background knowledge of the groups of the people

Government management interventions

- the *Fishery Law* which is currently in the process of approval from National Parliament.
- there is no legislation specific yet to fisheries management
- *Agricultural Law 1998, Penal Law 1990* and the Natural Resources and Environment Sector such as *Forestry Law no.125/NA (02 November 1996), Environment protection Law no.09/NA (26 April 1999), Water resources Law no.126/NA (02 November 1996) and Aquatic and Wild animals Law no.07/NA (24 December 2007).*

MAF has developed and endorsed some regulations which are related to the management of fisheries in some respective areas

- *regulation no. 360/MAF-03(08 December 2003), entitled "Management of NBCA, Aquatic and wild animals, Regulation" no.061/MAF(17 June 2008), "Management of fisheries, aquatic animals and biodiversity in NT2 Reservoir"*

The scope of the current data collection

- ***Data on household expenditure and fish consumption*** are collected by the National Statistic Center (NSC)
- Technical fishery management information such as *fishery production, topology of fisheries, number of fishing units, fishing gear, fish price, number of hatcheries, rate of fish consumption, rate of fry survival, fish feed production and type of fish farming* are collected and compiled by the DLF & collaboration

How to collected?

- The HHs expenditure and consumption survey of NSC, which is a *stratified survey through questionnaires and diaries*
- The data of reservoir fisheries collected by LARReC implemented through a *catch and effort monitoring system in one reservoir*

Using sampling survey and reporting method

Main and importance data	←	Objective Survey (Sampling Survey)
Data of household	←	Interviewing and recording
Other	←	Reporting System

Networks and Support

Ministry of Agriculture and Forestry

⇩ ⇧

Department of Livestock and Fisheries

⇩ ⇧

Provincial Agriculture and Forestry Office

⇩ ⇧

District Agriculture and Forestry Office

⇩ ⇧

Kumbane (Commune)

⇩ ⇧

Group farmers/ Small holders/Private owners

Current constraints

Content development:

- Very few detailed study at local level (watershed level, village cluster)
- Insufficiency of meteorological data at local level including weak forecasting on the aquaculture production
- Scarcity of usable data
- Lack of marketing prices information
- Lack of professional technical skills
- Lack of regular update

Cooperation network:

- Lack of effective networking among the internal organization
- Coordination with other line agencies and organizations is still weak

Technical:

- Lack of necessarily equipment and software for information management
- Lack of security hardware and software
- Limit skill of the staff concerned

What are the improvements needed to upscale aquaculture statistics collection?

The fish culture areas need to be monitored and evaluated. But for statistical information purpose, there is a need to search for the common statistical language to appreciate each form of production.

Therefore, before monitoring and conducting a field survey or studies, ***the developed guideline should be adopted.***

There is still need for ***improvement of good system of data collection*** for more reliable information on culture, especially ***pond culture, communal ponds, rice-cum-fish culture and cage culture.***

How to be achieved ?

- Strengthen the data/information collection/dissemination system
- Set up the Aquaculture information networking system
- Strengthening the collaboration between both internal and external partners for the information and experience exchanges
- Coordination with international organization FAO, NACA, ect. on upgrading the meteorological station in the country to get the precise data at the local level which can be a base for the forecasting the aquaculture production
- ***Layout the pilot project*** at the local village cluster/watershed-based/area-based target area along the pipe line. This experience can be integrated to the other watershed-based/area-based on the actual situation

Capacity Building

Short-term

- Operational training on job
- Training
- Regional training
- Study tour

Long-term

- Formal education
- Upgrading qualification of the staff to B.Sc. and M.Sc.
- Development skill of the staff on the MIS

Acknowledgement

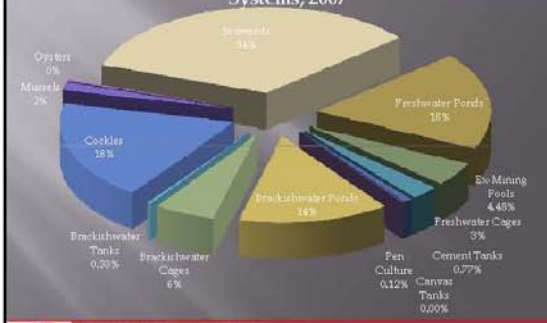
- *The DLF, MAF, Lao PDR would like to take this opportunity to express sincere thanks to NACA, FAO, JICA, SEAFDEC, and other international organization and donors for their kind support and assistance extended to the strengthening capacity for the fisheries and aquaculture statistics in Lao PDR.*
- *DLF and myself personally hope you will continually assistance us on upgrading the meteorological station in the country to get the precise data at the aquaculture statistics at local level*

THANK YOU
FOR YOUR KIND ATTENTION

25th SEA GAMES, LAOS
VIENTIANE 2009

Malaysian Presentation:

Contibution of The Main Aquaculture Systems, 2007



Department of Fisheries Malaysia

MALAYSIA AQUACULTURE DEVELOPMENT PLANS / STRATEGIES

1. Increasing existing productivity through stringent adherence to Standard Operating Procedure, improving and tailoring it to specific farm.
2. Initiating the development and implementation of Aquaculture Industrial Zone (AIZ) and High Impact Project (HIP).

Department of Fisheries Malaysia

3. Industry's potential has to be enhance through R&D .
4. Expand both local and international market in order to absorb the increase in production.
5. The Government have developer and promoted good aquaculture practices to enhance the quality and productivity.
6. Government constructs infrastructures.
7. Introduced 'relief fund' to sustain the industry

Department of Fisheries Malaysia

New Legislation

- FISHERIES (QUALITY CONTROL OF FISH FOR EXPORT TO THE EUROPEAN UNION) REGULATIONS 2009
  - Fisheries Act 1985 (Act 317)
  - Enacted on 26 February 2009

Department of Fisheries Malaysia

DATA COLLECTION

- Sampling Method
  - A listing of every farm in a district was done once a year.
  - Listing requires information as indicated to be collected :
    - Name of culturist
    - Address
    - Race
    - Number of ponds / cages / tanks
    - Ha / m2
    - Average production / year
    - Number of worker
    - Status of production ; tonnes/ha, kg/m2
    - Type of culture; monoculture or polyculture

Department of Fisheries Malaysia

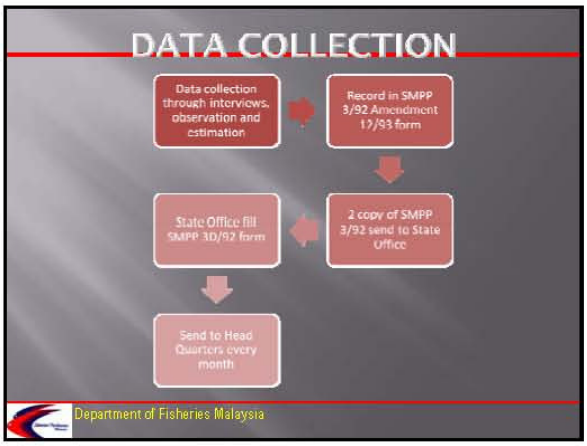
- Sampling Size Determination
  - 10% of the total population is required to be collected for samples.
  - A minimum 10 samples and a maximum 35 samples will be collected.

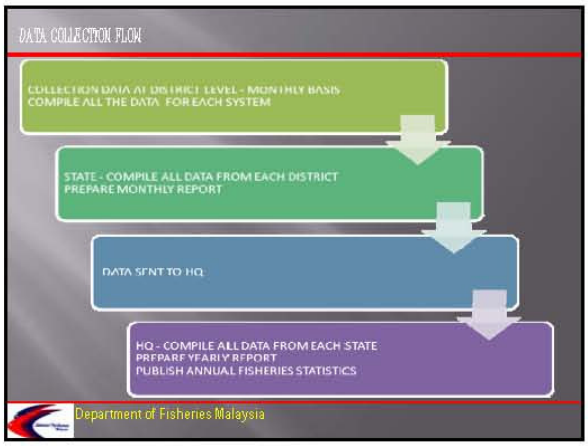
If = N>10
n = N/10 x 100 (10% of sample)

If = N≤10
n = N

N = population size n = sample size

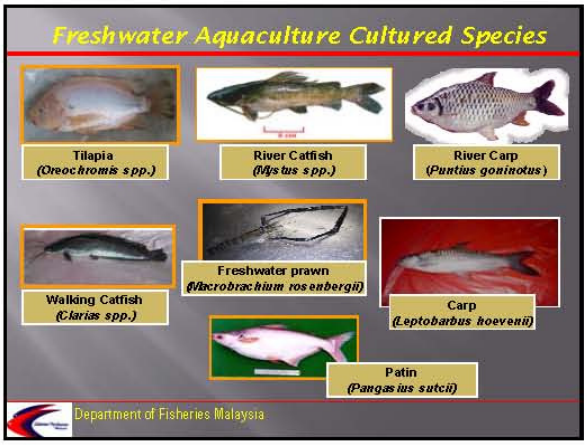
Department of Fisheries Malaysia


DATA COLLECTION
Data collection through interviews, observation and estimation
Record in SMPP 3/92 Amendment 17/93 form
2 copy of SMPP 3/92 send to State Office
State Office fill SMPP 3D/92 form
Send to Head Quarters every month
Department of Fisheries Malaysia


DATA COLLECTION FLOW
COLLECTION DATA AT DISTRICT LEVEL - MONTHLY BASIS
COMPILE ALL THE DATA FOR EACH SYSTEM
STATE - COMPILE ALL DATA FROM EACH DISTRICT
PREPARE MONTHLY REPORT
DATA SENT TO HQ
HQ - COMPILE ALL DATA FROM EACH STATE
PREPARE YEARLY REPORT
PUBLISH ANNUAL FISHERIES STATISTICS
Department of Fisheries Malaysia


Marine Aquaculture Cultured Species
Shrimp
(Penaeus monodon)
Grouper
(Epinephelus spp.)
Red Snapper
(Lutjanus spp.)
Mollusc
(Perna viridis)
(Anadara granosa)
(Gracillaria spp.,
Euchema cottonii and
E. spinosum)
Department of Fisheries Malaysia


Marine Aquaculture Culture System
Pond
Pen
Hatchery
Open sea cage
Marine fish cage
Department of Fisheries Malaysia


Freshwater Aquaculture Cultured Species
Tilapia
(Oreochromis spp.)
River Catfish
(Mystus spp.)
River Carp
(Puntius goninotus)
Walking Catfish
(Clarias spp.)
Freshwater prawn
(Macrobrachium rosenbergii)
Carp
(Leptobarbus hoevenii)
Patin
(Pangasius sutcii)
Department of Fisheries Malaysia


Freshwater Aquaculture Culture System
Cage culture in lake
Earthen pond
Cage culture in irrigation canals
Concrete cement tank
Department of Fisheries Malaysia


Ornamental Fish Species
Guppy
Arowana
Gold Fish
Goudamy
Barb
Department of Fisheries Malaysia


Ornamental Fish Culture System
Arowana cultured in earthen pond
Happa
Cement tank
Department of Fisheries Malaysia


THANK YOU
Department of Fisheries Malaysia

Country Presentation of Myanmar on Regional Workshop on Capacity Building for Improving Aquaculture Statistics and Data Collection in Asia

(STA Regional Workshop 16 to 18 Nov:2009, Ha Long Grand Hotel, Ha Long Bay, Vietnam)

By

Tint Swe (Deputy Director)

And

San Lwin (Assistant Director)

Department of Fisheries

Union of Myanmar

Background

Inland and Marine Resources : Status and Trends

Inland Fisheries: -

Inland water surface area is 8.2 million hectares in Myanmar (FAO, 1996).

The total area of natural lakes, reservoirs, other man-made dams is 1.8 million hectares.

The remaining are seasonally inundated flood plains.

The main rivers in Myanmar are Ayeyarwady, Chindwin, Sittaung and Thanlwin and they flow from north to south into the sea such as eastern part of Bay of Bengal, Gulf of Mottama and the Andaman Sea and a huge network of river systems in the Ayeyarwady Delta.

Table . 1 Principal Rivers and Water Resources in Myanmar

Sr. No.	Rivers	Total Length (km)	Catchments Area (Sq-km)
1.	Ayeyarwady	2,150	111,500
2.	Chindwin	844	44,500
3.	Sittaung	563	13,280
4.	Thanlwin	2,400	61,000
5.	Bago	214	2,165
6.	Rivers in Rakhine State - Kaladan - Attaran - May Yu	 526 71 163	 22,500
7.	Rivers in Tanintharyi Division	368	15,700
8.	Belin	256	3,155
9.	Mekong (Myanmar's Territory)		11,000
Total			**284,800**

Marine Fisheries: -

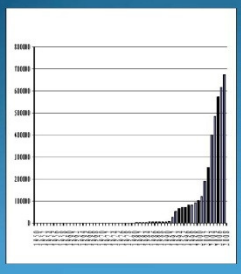
Myanmar has a long seacoast of 2,832 kilometers with the natural resources, such as mangrove forests, wetlands, coral reefs, numerous offshore islands, sand beaches and so on.

These resources come to play and important role in fishery sector, supporting in adequate food fish supply to her people and share the surplus with other countries in the world.

The Maximum Sustainable Yield (MSY) is 1.05 million metric tons.

Aquaculture Production

Aquaculture Production in Myanmar (1950-2008)



The development of aquaculture in Myanmar can be identified into four periods as follows; -

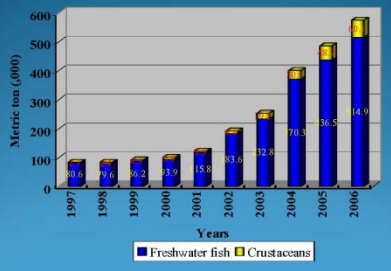
(1)1950 to 1970 : Freshwater finfish culture was initiated with exotic species like Mozambique tilapia from China in 1953, common carp from Indonesia and snakeskin gourami from Thailand in 1954 as well as giant gourami in 1955 from Indonesia in Myanmar. In 1967, there was successfully the induced breeding rohu by Dr. H Chaudhuri and local technicians with the assistance of FAO.

(2)1971 to 1990 : The seed production of common carp and other commercial species was successed in Myanmar and freshwater fish culture became popular among the fish farmers.

(3)1991 to 2000 : The Law Relating to Aquaculture was promulgated by the Government and the development of freshwater aquaculture.

(4)2001 to 2009 : At present, there are 8,000 hectares of fish pond and nearly 9,000 hectares of shrimp pond in Myanmar.

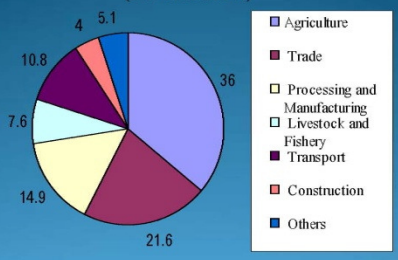
Contribution of the major commodities to the total production



Contribution of the Major Commodities for Aquaculture Exported Products

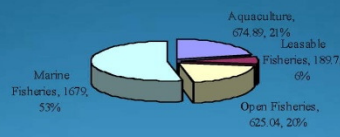
No.	Species	Scientific Name	2004-05		2005-06		2006-07		2007-08	
			Metric Ton (Thousand)	US $ (Million)	Metric Ton (Thousand)	US $ (Million)	Metric Ton (Thousand)	US $ (Million)	Metric Ton (Thousand)	US $ (Million)
1	Rohu	*Labeo rohita*	31.4	23.9	42.8	36.9	59.6	53.5	65.6	73.5
2	Mrigal	*Cirrhinus mrigala*	2.7	3.0	3.8	5.1	4.7	6.3	4.4	6.9
3	Catla	*Catla catla*	1.7	1.8	2.0	2.0	2.6	2.6	3.4	3.6
4	Striped Cat Fish	*Pangasius spp:*	3.3	2.2	2.0	1.6	2.4	2.7	1.6	3.1
5	Common Carp	*Cyprinus carpio*	0.7	0.6	0.9	0.8	1.0	0.9	0.7	0.7
6	Tilapia	*Oreochromis spp:*	0.6	0.6	1.4	2.2	3.5	3.8	2.0	2.6
7	Fillet		1.2	2.0	1.3	2.4	2.3	3.7	0.1	0.2

Sectoral Composition of Gross Domestic Product (2007-2008 GDP%)



Livestock and fisheries sector contributed 7.6% to national G.D.P in 2007-08 fiscal year in Myanmar. The fishery sector is considered as the most important one after the agriculture sector to fulfill the protein requirement of the people of Myanmar.

Contribution of Aquaculture to Fisheries (2007-2008 Fiscal Year) (Unit - Thousand metric ton)



In 2007-2008 fiscal year, the aquaculture production was 0.67 million metric tons which was 21% of the total production of fish in Myanmar and its production may range between 20% and 25% of the total production of fish in Myanmar.

Myanmar Aquaculture Development Plans / Strategies

National Policies in the Fisheries Sector of Myanmar

(1) To promote all-round development in the fisheries sector;
(2) To increase fish production for domestic consumption and share the surplus with neighbouring countries as well as the other countries;
(3) To encourage the expansion of marine and freshwater aquaculture;
(4) To upgrade the socio-economic status of fishery communities;

National Aquaculture Development Plans/Strategies

(1) Planning for supporting to expansion of coastal aquaculture (especially in marine finfish culture such as grouper and seabass);
(2) Expansion of paddy cum fish farming for the development of rural areas in Myanmar;
(3) Mud crab culture development plan;
(4) Implementation of genetic improvement in Rohu (Labeo rohita);
(5) Implementation of Good Aquaculture Practice (GAP) in aquaculture industry.
(6) Provide financial assistance and loans through "Livestock and Fisheries Development Bank".
(7) Planning for public awareness for conservation of fisheries resources.

Legislation

There are four relevant fisheries laws promulgated by the Government of Myanmar to manage the fishery industry and to protect the fishery resources more efficiently.

Act No.	Enacted Date	Name of Fisheries Laws
11/89	2nd April 1989	Law Relating to the Fishing Rights of Foreign Fishing Vessels
24/89	7th Sept 1989	Aquaculture Law
9/90	25th April 1990	Myanma Marine Fisheries Law
1/91	4th March 1991	Freshwater Fisheries Law

After enacted these four fisheries law, the Government of Myanmar promulgated the two amending laws. These are as follows:-

Act No.	Enacted Date	Name of Amending Laws
15/93	25th Oct 1993	Law amending the law relating to the fishing rights of foreign fishing vessels
16/93	28th Oct 1993	Law amending the Myanmar Marine Fisheries Law

Data Collecting

Chart 2. The Status of Fishery Statistics in Myanmar

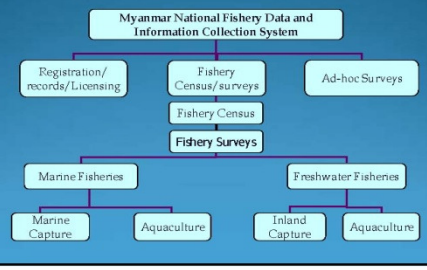
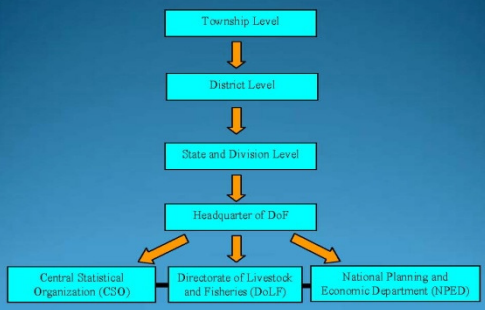


Chart 3. Data Collecting System and Reporting



Can the scope of data collected be expanded? For example, can measure such as farm type and size be included?

The scope of data collected can be expanded in Myanmar. Fishery statistics in necessary in every planning and activity in the field of fisheries so we should do best for best policy in data collection by step by step.

Most of the fish farmers in Myanmar use to their farm by traditional methods for aquaculture and consequently the farms of types and sizes are not the same but they must be registered the areas of their farms to the Department of Fisheries and the Local Authority for land used registrations.

In practically, some of the fish farm's areas are different between the registered areas and the actual operation of farm areas. For knowing the actual operation of farm areas for aquaculture there must be done the field-study in these areas by enumerators and we have already considered how to improve the collection the data on this matter.

Improvements needed to upscale aquaculture statistics collection

For Myanmar, the improvements needed to upscale aquaculture statistics collection are as follows:-

(1) There is a need the aquaculture statistics for brackish water;
(2) More records are needed for aquaculture by species and their production batch by batch and year by year of the firms;
(3) There are needed some infrastructure statistics such as, the difference area between the actual operation of farm's area and the registered area of it;
(4) There is a need for collecting the livelihood statistics for aquaculture;
(5) There is a need for the environmental information and statistics;
(6) There is a need for the training and the other related fishery development programme for the Human Resource Development (HRD) for aquaculture.

Improvements needed and how to be achieved (for Myanmar)

(1) The modernized techniques of fish seeds production for aquaculture development especially for mariculture are needed and consequently the technical assistance and related aid should be considered for Myanmar because the Department of Fisheries implemented two marine research stations to conduct the research experiment on the seed production of grouper and seabass;

(2) There is needed for technical assistance in genetic improvement for fish because of the implementation of genetic improvement in Rohu (*Labeo rohita*) in Myanmar and other species for fish in genetic improvement programme are welcome.

(3) The modernize technique for aquaculture such as mud crab, clam, oyster and so on for the rural development programme and project are needed and requested.

Improvement need to upscale aquaculture statistics collection (For our region)

More coordination and collaboration among Department of Fisheries of Myanmar and other international organization such as FAO, NACA, SEAFDEC and so on in developing more effective and extensive fishery statistics for aquaculture.

Improvements needed and how to be achieved (for our region)

(1) Due to the rapid progress made in communications in today's world, barriers and boundaries in the world has disappeared to such an extent that may now use the term as the "Global Village" to describe the world.

(2) Today, the Website becomes more effective on Information Technology. So, NACA has already set up a network of it member countries in order to promote linkages among all member countries of the NACA. But it is needed to more and more use the website for the programme of education and public awareness on aquaculture as well as our regional fishery data and information for the aquaculture statistics.

Current constraints

(1) Owing to the limited financial resources, there is needed a frequency performance on fishery census and surveys activities;

(2) There is a need of a functional computer based information system;

(3) Training is needed for the statistical personnel from Department of Fisheries and other related agencies as well as NGOs to up-grade their skills in the improvement of aquaculture statistics.

Capacity Building

National Level

(1) Coordination in collecting fishery statistics for aquaculture (fish farmer/ related NGOs/ other responsible authorities such as customs and so on);

(2) It is needed to obtain accurate and reliable data and information in a timely manner as a basis for formulating policies and decisions for fisheries management;

(3) Reviewing the national fishery statistics systems and its performance to identify the need for improvement. (What the strong and weakness is?)

Regional Level

(1) Supporting and upgrading of the regional fishery statistical systems by developing regionally compatible methodologies between national and regional level;

(2) Promoting in technical cooperation such as the development of guidelines and handbooks as well as the training for the collecting fishery statistics for aquaculture;

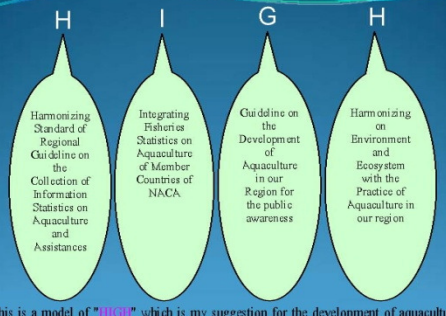
(3) Networking for aquaculture statistics.

Capacity building on improving fishery statistics in Myanmar

The Department of Fisheries reviewed its yearly plans for the development of fishery sector including aquaculture development and made a decision for short-terms and long-term plans.

Moreover, the Department of Fisheries of Myanmar is working closely in collaboration and coordination with FAO, NACA, SEAFDEC, JICA and other regional and international organizations related fisheries in order to strengthen capacity building on improving fishery statistics for the better management of fisheries.

Follow-up Actions



This is a model of "HIGH" which is my suggestion for the development of aquaculture statistics in our region in order to take into account for consideration facts to do a follow-up action.

PRESENTATION ON AQUACULTURE

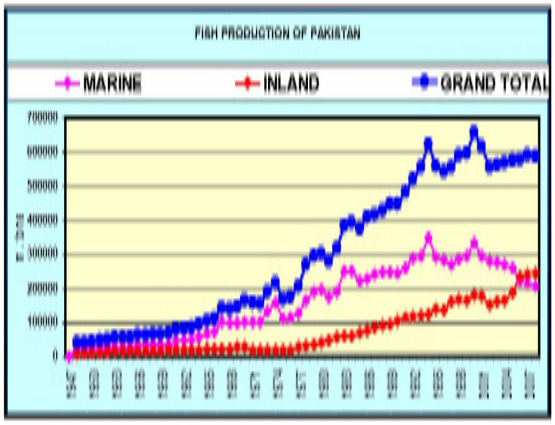
MINISTRY OF FOOD, AGRICULTURE AND LIVESTOCK

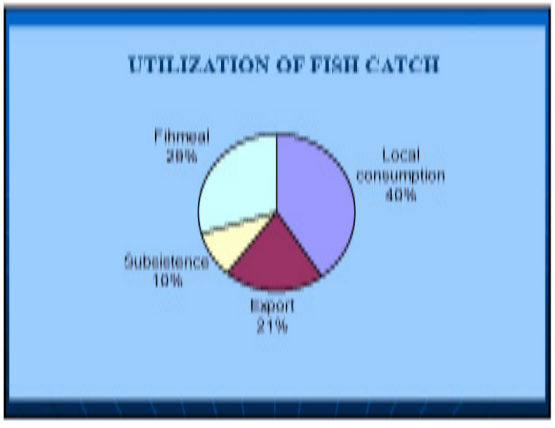
Status of Fisheries
(2003-2004)

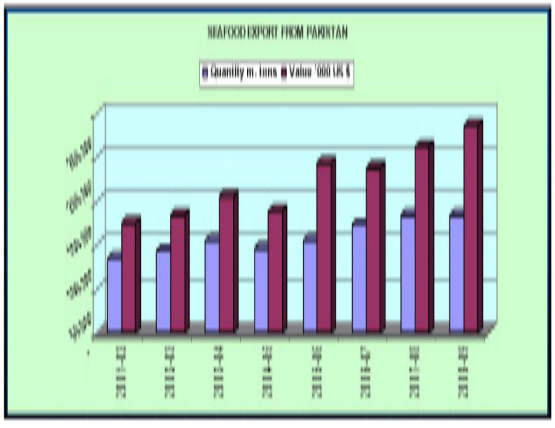
- Total fish production 564,105 m. tons
  - Marine 400,712 m tons
  - Inland 163,393 m tons
- Export quantit 101,000 m. tons
- Export earnings US$ 156.254 millions
- Marine/Inland production ratio 60:40

MAJOR LANDINGS
(2003)

Shrimp	24,411 m. tons
Lobster	749 m. tons
Cuttlefish	7,235 m. tons
Shells	595 m. tons
Crabs	4,619 m. tons
Finfish	362,891 m. tons
Inland	165,703 m. tons
Total	**566,203 m. tons**







AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

- Farming of Indian major carps
- Farming of exotic carps
- Farming of trout
- Farming of other species of fishes
- Farming of freshwater shrimp

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

- Farming of Indian major carps
- Farming of exotic carps
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- Farming of freshwater shrimp

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

- Farming of Indian major carps

Three species are cultured

Rohu (*Labeo rohita*)
Thalla (*Catla catla*)
Mori (*Cirrhina mrigala*)

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

- Farming of Indian major carps
- Farming of exotic carps
- Farming of trout
- Farming of other species of fishes
- Farming of freshwater shrimp

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

Farming of exotic carps

(Four species culture)

- Common Carp
- Silver Carp
- Grass Carp
- Bighead carp

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

- Farming of Indian major carps
- Farming of exotic carps
- Farming of trout
- Farming of other species of fishes
- Farming of freshwater shrimp

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

Farming of Trout

(Two species culture)

- Brown Trout
- Rainbow trout

(In NWFP, Northern Area, Azad Kashmir, Upper Punjab, Balochistan)

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

- Farming of Indian major carps
- Farming of exotic carps
- Farming of trout
- Farming of other species of fishes
- Farming of freshwater shrimp

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

Farming of other species

- Catfishes (Rita, Magur)
- Tilapia
- Snakeheads

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

- Farming of Indian major carps
- Farming of exotic carps
- Farming of trout
- Farming of other species of fishes
- Farming of freshwater shrimp

AQUACULTURE PRACTICES IN PAKISTAN

(EXISTING PRACTICES)

Farming of Freshwater shrimp

Macrobrachium malcomsonii

(in lower Sindh)

AQUACULTURE STATUS

PUBJAB		SINDH		NWFP & OTHERS		TOTAL	
CAPTURE	AQUA	CAPTURE	AQUA	CAPTURE	AQUA	CAPTURE	AQUA
37,300	22,480	46,373	30,498	8,843	900	90,816	73,878
62,40 %	37,60 %	47,07 %	52,13 %	86,66 %	13,34 %	54,79 %	45,21 %

Annex IV

List of Participants

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Annex V

Agenda

Day 1: 16th November

0830-0900:	Registration
0900-1000:	Opening
1000-1030:	Coffee/ Tea Break
1030-1115:	Introduction to the Workshop; the Purpose; Objectives & Expected Outcomes; Election of Chair • *SachikoTsuji, FAO, Rome*
1115-1200:	Brief Introductions to Regional Organizations & and their roles ▪ NACA ▪ SEAFDEC ▪ SPC
1200-1300:	Lunch Break
1300-1500	Country Presentations (20 minutes per country) • Bangladesh • Cambodia • India • Indonesia • Lao • Malaysia
1500-1530:	Coffee/ Tea Break
1530-1740	Continuation of Country Presentations • Myammer • Nepal • Philipines • Pakistan • Sri Lanka • Thailand • Viet Nam

Day 2: 17th November

0830-0930:	Discussion on main points raised in Country presentations; Division into Groups to Address main Issues

0930-1030	Group Discussions
1030-1100:	Coffee/ Tea Break
1100-1230:	Continuation of Group Discussions
1230-1330:	Lunch Break
1330-1700:	Plenary Discussion; Recommendations; Workshop Closure

Day 3: 18th November

0730- : Field Trip (others leave for Hanoi)