Status of Aquaculture in the Philippines
A. The Philippine Fishery Resources at a Glance

**MARINE RESOURCES**
- Total Territorial Water Area 2,200,000 sq. km.
- Shelf area (Depth 200m) 184,600 sq. km.
- Coral Reef Area 27,000 sq. km.
- Coastline (Length) 36,289 km

**INLAND RESOURCES**
- Swamplands 246,063 ha
- Brackishwater Fishpond 253,854 ha
- Other Inland Resources 250,000 ha
<table>
<thead>
<tr>
<th>COMMON WATER BODIES (HAS)</th>
<th>Areas devoted for Aquaculture and other fishery activities (10% of the total area)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td><strong>Inland</strong></td>
<td></td>
</tr>
<tr>
<td>- Swamplands</td>
<td>496,063</td>
</tr>
<tr>
<td>- Lakes</td>
<td>246,063</td>
</tr>
<tr>
<td>- Rivers</td>
<td>200,000</td>
</tr>
<tr>
<td>- Reservoir</td>
<td>31,000</td>
</tr>
<tr>
<td><strong>Coastal</strong></td>
<td>26,600,000</td>
</tr>
</tbody>
</table>

**Total**

27,096,063

2,709,606.3
B. The Philippine Fisheries Sector in the Global Context

- Ranked 5th in fish production. The 5.16 million MT production of fish, crustaceans, mollusks, and aquatic plants (including seaweeds). constitutes 3.06% of the total world production of 168.4 million metric tons (FAO website).

- Ranked 10th in aquaculture production of fish, crustaceans and mollusks contributing 1.24% share to the total global aquaculture production of 59.87 million MT. The country’s aquaculture production amounted to over 1.58 billion dollars (FAO website).

- Top 3 largest producer of aquatic plants (including seaweeds) having produced a total of 1.80 million metric tons or nearly 9.48% of the total world production of 19.01 million metric tons (FAO website).
The annual performance of the fish industry was attributed to the production of the three (3) sectors.

- The aquaculture sector posted an increase with 52.4% (2.608 million MT)
- followed by the municipal sector with 26.8% (1.33 million MT), and
- the commercial sector with 20.8% (1.03 million MT).

The growth in aquaculture, however, underscores the importance of the sector in maintaining the supply of fish.
C. Contribution to the National Economy

Fisheries contribution to the Total GDP
- Constant Prices = 2.1%
- Current Prices = 1.8%

Fisheries contribution to GVA in Agriculture, Fishery and Forestry
- Constant Prices = 18.6 %
- Current Prices = 15.4 %

Employment
- Aquaculture - 226,195 operators
- Municipal - 1,371,679 operators
- Commercial - 16,497 operators

Balance of Trade
- Fishery Exports = 214,055 MT = PHP37.5B
- Fishery Imports = 214,330 MT = PHP9.4B
- Trade Balance = (275 MT) = PHP28.08B
## Five Year Fish Production, Trend 2007-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantity (MT)</th>
<th>%increase/ (Decrease)</th>
<th>Value (‘000 P)</th>
<th>%Increase/ (Decrease)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>4,973,588</td>
<td>(3.6)</td>
<td>224,695,079</td>
<td>1.6</td>
</tr>
<tr>
<td>2010</td>
<td>5,159,459</td>
<td>1.6</td>
<td>221,050,850</td>
<td>2.5</td>
</tr>
<tr>
<td>2009</td>
<td>5,079,977</td>
<td>2.3</td>
<td>215,582,068</td>
<td>(0.1)</td>
</tr>
<tr>
<td>2008</td>
<td>4,966,889</td>
<td>5.4</td>
<td>215,813,503</td>
<td>19.5</td>
</tr>
<tr>
<td>2007</td>
<td>4,711,252</td>
<td>6.9</td>
<td>180,545,128</td>
<td>10.5</td>
</tr>
</tbody>
</table>
Five Year Fish Production, Trend 2007-2011

Quantity (in '000 MT)

Year

2007
2008
2009
2010
2011
2012 Volume of Production (mt)

Aquaculture, 2,541,965
52%

Commercial, 1,035,213
21%

Municipal, 1,280,917
27%

Volume = 4,858,097 mt
2012 Value of Production (‘000 P)

- Aquaculture, 92,289,924.68 (39%)
- Commercial, 65,348,504.85 (28%)
- Municipal, 79,529,725.42 (33%)

Value = 237.17 Billion Pesos
Aquaculture

- Is the farming of aquatic organism, including fish, molluscs, crustaceans and aquatic plants.

- Classified in three major environments
  - Freshwater
  - Brackishwater
  - Marine Areas
<table>
<thead>
<tr>
<th>Species</th>
<th>Environment</th>
<th>Culture Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tilapia</td>
<td>Freshwater, Brackish Water, Marine</td>
<td>Cages, Pens, Ponds, Tanks</td>
</tr>
<tr>
<td>Common Carp</td>
<td>Freshwater</td>
<td>Ponds, Pens, Cages</td>
</tr>
<tr>
<td>Freshwater Ornamental Fish(Koi, Guppy, Goldfish)</td>
<td>Freshwater</td>
<td>Tanks, Water Receptacles</td>
</tr>
<tr>
<td>African Catfish</td>
<td>Freshwater</td>
<td>Tanks, Ponds</td>
</tr>
<tr>
<td>Bighead Carp</td>
<td>Freshwater</td>
<td>Ponds, Cages</td>
</tr>
<tr>
<td>Milkfish</td>
<td>Freshwater, Brackish Water, Marine</td>
<td>Pen, Cages</td>
</tr>
<tr>
<td>Fish Type</td>
<td>Habitat</td>
<td>Water Type</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Seabass</td>
<td>Marine, Brackish Water</td>
<td>Cages, Pens, Ponds</td>
</tr>
<tr>
<td>Grouper</td>
<td>Marine, Brackish Water</td>
<td>Cages, Pens, Ponds,</td>
</tr>
<tr>
<td>Pompano</td>
<td>Marine</td>
<td>Pens, Cages</td>
</tr>
<tr>
<td>Rabbit Fish</td>
<td>Marine</td>
<td>Cages</td>
</tr>
</tbody>
</table>

**Aquatic Plants**

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>Habitat</th>
<th>Aquaculture Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seaweeds</td>
<td>Marine</td>
<td>Floating lines, Stakes,</td>
</tr>
<tr>
<td>Mud Crab</td>
<td>Brackish Water</td>
<td>Pond, Cages, Pens</td>
</tr>
<tr>
<td>Shells and Crustaceans</td>
<td>Freshwater, Brackish Water, Marine</td>
<td>Pens, Cages, Ponds</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Giant Freshwater Prawn</td>
<td>Freshwater</td>
<td>Tanks, Ponds</td>
</tr>
<tr>
<td>Oyster</td>
<td>Marine</td>
<td>Stakes, Lines, Rafts</td>
</tr>
<tr>
<td>Mussel</td>
<td>Marine</td>
<td>Stakes, Lines, Rafts</td>
</tr>
<tr>
<td>Tiger Prawn</td>
<td>Brackish Water</td>
<td>Ponds</td>
</tr>
<tr>
<td>White Shrimps</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Philippine fisheries employed the following culture culture technologies:

a. **Extensive Culture System**
   
   receive no nutritional inputs but depend on natural food in the culture facility, including that brought in by water flow e.g. currents and tidal exchange, such as plankton, detritus, benthos and drift.
b. Semi-intensive Culture System
depends largely on the natural food which is increased over baseline levels by fertilization and/or use of supplementary feed to complement natural food.
c. Intensive Culture System
depends on nutritionally complete
diets added to the system, either
fresh, wild, marine or freshwater
fish, formulated diets usually in dry
pelleted form.
Aquaculture production, 2011

This includes production from the following:

- Brackish water fishpond
- Freshwater fishpond
- Fish pen and fish cage in fresh and marine waters
- Mariculture of oyster, mussel and seaweeds
<table>
<thead>
<tr>
<th>Species</th>
<th>Quantity (MT)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seaweeds</td>
<td>1,840,832.86</td>
<td>70.58</td>
</tr>
<tr>
<td>Milkfish</td>
<td>372,580.80</td>
<td>14.29</td>
</tr>
<tr>
<td>Tilapia</td>
<td>257,385.44</td>
<td>9.87</td>
</tr>
<tr>
<td>Shrimps/Prawns</td>
<td>50,158.55</td>
<td>1.92</td>
</tr>
<tr>
<td>Others</td>
<td>87,162.19</td>
<td>3.34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6,385,052.68</td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Laws and Policies Related to Aquaculture Common Water Bodies

  Covers the protection and preservation of fresh, marine and brackishwater resources with its main objectives:
  I. Bring the control of pollution waters.
  II. Development of an integrated water quality management framework
III. Great for short and long term impacts of pollution

IV. Environment friendly enterprises

The Laws also defines beneficial use of water to include aquaculture activities.
RA 9147 - Wildlife Act (2001)

RA 8435 – Agriculture and Fisheries Modernization Act (AFWA) 1997


RA 7586 – National Integrated Protected Area System (NIPAS) Act 1991
RA 8550 – Philippine Fisheries Code of 1998

Chapter II. Article III. Aquaculture

Section 45. Disposition of Public Lands for Fishery Purposes.

Section 47. Code of Practice for Aquaculture.

Section 51. License to Operate Fish Pens, Fish Cages, Fish Traps, and Other structure for the Culture Fish and Other Fishery Products.
Section 53. Grant of Privileges for ages, Corrals/Traps and similar structures.

Section 54. Insurance for fishponds, fish-cages, and fishpens
Section 55. Non-obstruction to navigation.

Section 56. Non-obstruction to Defined Migration Paths.
Chapter III. Article II. The Fisheries and Aquatic Resources Management Councils (FARMCs)

Section 68. Development of Fisheries and Aquatic Resources in Municipal Waters and Bays.

Section 69. Creation of Fisheries and Aquatic Resources Management Councils (FARMCs)

Chapter IV. Fishery Reserves, Refuge and Sanctuaries

Section 81. Fish Refuge and Sanctuaries.
Chapter VI. Prohibition and Penalties

Section 86. Unauthorized Fishing or Engaging in Other Unauthorized Fisheries Activities.

Section 102. Aquatic Pollution

Section 103. Other Violations.

b. Failure to Conduct a Yearly Report on all Fishponds, Fish Pens, Fish Cages.

d. Obstruction to Navigation or Flow and Ebb of Tide in any Stream, River, Lake, or Bay.

e. Construction and Operation of Fish Corrals/Traps, Fish Pens and Fish Cages.
FISHERMEN ADMINISTRATIVE ORDERS

FAO No. 196 – Guidelines on the creation and Implementation of Fisheries and Aquatic Resources Management Councils (FARMCs)

Sec. 2. Development of Fisheries and Aquatic Resources in Municipal Waters and Bays.

Sec. 3. Creation of Fisheries and Aquatic Resources Management Councils (FARMCs).
Sec. 7. The Municipal/City Fisheries and Aquatic Resources Management Councils (M/CFARMCs).

Sec. 9. Function of the M/CFARMCs.

a. Assist in the preparation of the municipal fisheries development plan and submit such plan to the Municipal Development Council.

b. Recommend the enactment of municipal fishery ordinances to the sangguniang bayan/sangguniang panlungsod through its Committee on Fisheries.
c. Assist in the enforcement of fishery laws, rules and regulations in municipal waters.

d. Advise the sangguniang bayan/panlungsod on fishery matters through its Committee on Fisheries, if such has been organized.

e. Perform such other function which may be assigned by the sangguniang bayan/panlungsod.
f. The FARMCs shall be consulted by the LGU in:

1. the management, conservation, development, protection, utilization and disposition of all fish and fishery/aquatic resources within their respective municipal waters;

8. the designation/establishment of zones for the construction of fish pens, fish cages, fish traps and other structures for the culture of fish and other fishery products.

11. recommending to the Department that portion of the municipal waters for declaration as fishery reserves for special or limited use, for educational, research and/or special management purposes; and
12. the establishment and designation of areas for fishery refuges and sanctuaries

- **FAO No. 214** – Code of Practice for Aquaculture
- **FAO No. 215** – Insurance for aquaculture crops/stocks.
- **FAO No. 216** – Obstruction to Navigation Streams, Rivers, Lakes, and Bays
- **FAO No. 217** – obstruction to Defined Migration Paths
- **FAO No. 218** – Yearly Report on Aquaculture Projects
ISSUES AND PROBLEMS

Siltation from deforested upland areas

- Destructive fishing practices (muro-ami, cyanide fishing, blastfishing, use of fine mesh nets)

- Pollution
ISSUES AND PROBLEMS

- Uncontrolled shoreline development
- Overharvesting of mangroves
- Damage from anchors, divers, tourists, collectors
- Lime extraction and sand quarrying
8. Proliferation of illegal fish pens/cages in rivers and lakes
9. High fish stocking densities in fish pens/cages that causes mass mortality
9. High fish stocking densities in fish pens/cages that causes mass mortality

10. Poor management practices such as overfeeding, etc.
Government and Private Sectors

Programs

Government

- Resource Protection
  - Strengthen patrolling capacity
  - Procurement of patrol boats/multi-mission boats
  - Provision of training and deputization of Fish Wardens
  - Creation/organization of Fisheries Resource Protection and Law Enforcement Unit-Quick Response Team (QRT)
  - Monitoring, Control and Surveillance
  - Operation/maintenance of Laboratories
Resource Enhancement

- Mangrove habitat rehabilitation
- Operation of existing multi-species hatcheries for fingerling production and for stocking in communal waters
Production Enhancement

- Livelihood Programs
  - Implementation of the National Payao Program
  - Fish Cage-for-Livelihood Program (DA-BFAR will construct fish cages in every mariculture parks established and award the same to qualified fisherfolk groups)
Provision of environment-friendly fishing gears such as gill nets, multiple hook and line, fish pots and fish corrals, etc.
Seaweeds Development Program

- Establishment of seaweed nurseries
- Establishment/maintenance of Seaweed Tissue Culture laboratory
- Provision of seaweed farm implements
- Technical assistance and/or Hand-on training
Other Regulatory Services (Issuance of permits/licenses for the construction, establishment and operation of fish pens/fish cages)

Research and Development

Private Sector

Resource Enhancement

Resource Management
Thank you