

DEVELOPING OUR COASTAL AND OCEANIC AQUACULTURE FOR FOOD SECURITY AND LIVELIHOOD GENERATION

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WE LIVE IN A “BLUE PLANET.”



THE OCEANS

- Cover 71% of the Earth's surface
- Source of minerals, seafood, pharmaceuticals, energy, etc.
- Primary source of protein for 3 billion people
- “Lungs of the Earth” producing about 70% of our oxygen supply and absorbing more than 50% of carbon dioxide from man-made sources

- Transport route for 80% of world's goods
- Provide many ecological services - climate regulation, ocean energy, tourism, etc.



“The last and most unexplored frontier on Earth”

WORLD FISHERIES PRODUCTION

- 167.2 million metric tons in 2014
 - 59% of production from capture fisheries (inland and marine) and 41% from aquaculture (UNFAO, 2016)



- Production of finfish (46%), aquatic plants (25%), mollusks (15%), crustaceans (6%), and other aquatic animals (7%)
- 90% of world's wild fish stocks fully overfished
 - 31.4 % exploited at “biologically unsustainable level”

- Aquaculture – the “fastest growing food-producing sector in the world”
 - Average growth rate of 8.8% annually
 - Expected to overtake capture fisheries production by 2020

Peter Drucker – Management Guru/Economist:

“Aquaculture, not the Internet, is the most promising investment opportunity in the 21st Century.”

PHILIPPINE FISHERIES

The Philippines – an archipelago with more than 7,000 islands, coastline of 18,500 km, 26.6 million hectares of coastal (inshore) waters , 193.4 million hectares of oceanic (offshore) waters and 30 million hectares of land



- Philippine fisheries production
 - 4.317 million metric tons in 2017
 - 51.9% from aquaculture and 48.1% from capture fisheries (inland and marine)
- Major aquaculture products: seaweeds (62.5%), milkfish (18.6%), tilapia (11.9%), tiger prawn (2.0%) oyster (1%), and mussel (0.08%)



- Fish is the primary source of animal protein in the diet of Filipinos with per capita fish consumption of 34.1 kg.
- There is high poverty incidence of 39.29% among the more than 1.5 million coastal fisherfolk in the country.
- Aquaculture contributes to our food security and livelihoods of our coastal communities.



PHILIPPINE COASTAL AQUACULTURE OR MARICULTURE

- Contributes 73% of total aquaculture production in the country



Mariculture Park – a concept similar to an Industrial or Science Park on land

- First mariculture park introduced by DA/BFAR in 2001 in the coastal waters of Samal Island (Davao del Norte) with demonstration of floating cages for milkfish culture



- Panabo City Mariculture Park (PCMP)
 - Established in 2006 with partnership of City Government of Panabo (Davao del Norte) and DA/BFAR
 - LGU provides local governance and regulations; BFAR provides technical/advisory services.
 - Infrastructure facilities and support services are provided to attract private investors.
 - For sustainability, only four cages (100 sq.m. each) are kept per hectare and regular monitoring of bottom sediment is done.
 - Multi-trophic culture system of milkfish and rabbit fish

PANABO CITY MARICULTURE PARK

a joint and collaborative project of the DA/BFAR XI, Davao City and LGU - Panabo City, Davao del Norte
in cooperation with other concerned agencies and stakeholders

5 YEAR STRATEGIC PLAN 2011 - 2016

Vision "Towards a globally competitive Mariculture Park generating job employment, food security and sustainable development through dynamic private-public partnership for the benefit of the stakeholders".

Annual Target (Economic Benefits)

Number of cages: 302 cages (as of March 18, 2013)
target 2013: 30 new cages

a. fisherfolk - 36 cages
b. locators/investors - 255 cages (46 investors)
c. BFAR demo project - 11 cages

Job Employment: 600 fisherfolk families/local residents

Contribution to Food Security:

Bangus - 2,000 MT (Existing - 1,500 MT; new 500 MT)

a. fisherfolk - 10% or 200 MT
b. locators/investors - 90% or 1,800 MT

High Value Species/Lapu-lapu/ Danggit - 1.0 MT

Income Generation/Gross Sales: P170.0 M (Bangus),
and P500,000.00 (Lapu-lapu and other HVS)



LAND-BASED SUPPORT FACILITIES (temporary at coastal road/area)

- Existing Facilities**
- Operation Center (Office, Conference Room & QRT)
 - Training & Convention Center
 - Multi Species Hatchery
 - Bagsakan Center
 - Live Fish Holding Facility
 - Feed storage/Van
 - Docking Area
 - Cage Construction /Maintenance Area
 - Unloading Area of Fingerlings
 - Ice Storage
 - Pontoon
 - Service Boat repair Area
 - Mooring Blocks
 - Construction Area



Program Components

1. Livelihood Development (marine fish cage, seaweed, processing, mud crab, and marketing etc)
2. Infrastructure support facilities:
 - Floating Station/Training Center
 - Physical Markers buoys (boundary & navigational lane)
 - Mooring System
 - Docking Area for Service Boats
 - Fish Landing/Bagsakan Center/Market Area
 - Post harvest/cold storage
 - Fish Processing
 - Fisherfolk Livelihood Center
3. Program Management and Administration
4. Manpower development and training
5. Water Quality Monitoring
6. Promotion and investment Center
7. Conservation and Regulations
8. Research and Development
9. Marketing Support
10. Financing or Credit Support
11. PMP QRT (Disaster, Security & Law Enforcement)

MARICULTURE PARK ZONE
Revised Survey (Sept. 2011)
Total Area: 617 Hectares

- Total Investment Cost (2006-2013)- PhP467.6M
 - BFAR Seed Money (PhP35.5 M)
 - LGU (PhP21.5 M)
 - LBP Davao (PhP72.0 M)
 - Private Investment (PhP340 M)

- Socio-economic Impact (2006-2013)
 - Contribution to food security (8,389.59 mt with a value of PhP 839M)
 - Jobs provided (514)



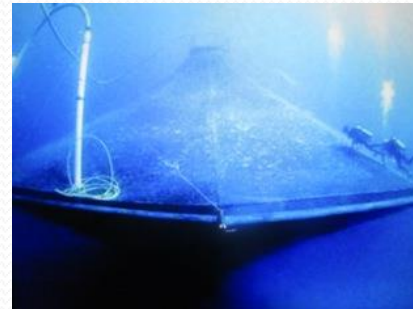


- Limitations of Coastal Aquaculture

- Lack of fingerlings (mainly milkfish) for culture in cages
- High cost of commercial feeds for fish production
- Pollution of shallow coastal waters with poor water circulation that causes “fish kills”
- Competition with navigation, tourism, etc.

OCEANIC AQUACULTURE

- Open ocean aquaculture (farming in oceanic or offshore waters) is an option for the future.
 - Environmental impact of large-scale commercial farming can be avoided with stronger currents in the high seas.
 - Limited by high cost of investment, exposure to storms, piracy and obstruction of shipping lanes



RECOMMENDATIONS

- (1) A comprehensive and integrated program for the development of coastal and oceanic aquaculture in the country is needed.
- (2) Policy for National Mariculture Program is recommended.
 - The NAST is advocating for the creation of a Department of Fisheries and Oceans to fully harness our coastal and oceanic waters.
- (3) Major R & D areas:
 - Setting up of more hatcheries for production of fry/fingerlings for culture
 - Development of commercial feeds that are efficient and cost-effective using fish meal/soybean alternatives
(Substitution of land-produced feedstuffs with sea-produced feedstuffs by 50% in 2025?)

OUR MOST IMPORTANT AND VALUABLE RESOURCES

- People
- Land & Water
- Oceans (seas)

