

### **Expected Results**

- Crop cultivation practices that are most successful will be combined into the integrated platform of Crop cultivation technology, and into the Prima Tani Program (business model for agriculture) which is currently being promoted by the Government of Indonesia, especially the Ministry of Agriculture.
- Strategies and line instruction developed will be a model that can be utilized by the national rice program to facilitate the implementation of increasing rice production practices in the farmer community.
- Indonesia marketing of rice is influenced by the government rice market (BULOG) and the free market price. If farmers have started to implement improved practices of rice cultivation, they will be able to benefit from a very low price margin even for better-quality rice.

### **Partner institutions in this Project**

- The International Rice Research Institute, (IRRI), Philippines
- Institute for Agricultural Technology, Indonesia Provinces that are being the center of the rice or the rice farm expansion planned by the Local Government.
- Center for Rice Research, Indonesia in Sukamandi.
- Balitklimat, Center for Research and Development of Agricultural Land Resources, Ministry of Agriculture.
- The joint research team of the provincial education staff to develop expertise and knowledge of agriculture instructors on natural resource management in the rice production system.

### **Budget**

- First year's budget: Rp. 1.75 billion
  - For pilot-plant of 200 Ha Rp 750 million  
(Calculation based on the assumption of Rp. 3.7 million/Ha for land preparation)
  - Financial counseling for 4 (four) villages Rp. 1 billion.
- Second year's budget: Rp. 2.2 billion for the expansion of the 240 farmers to 6000 farmers
- Third year's budget: Rp. 1 billion to fund agricultural instructor's assistance.

Total budget for this project will be Rp 4.95 billion

### **b. Floating Net Cage (KJA) Milkfish Cultivation**

Objective: to increase the fish production by the utilization of floating net cage method fish cultivation

#### **Introduction**

The consumption of fish, as one of the protein sources, has rapidly increased along with the increasing of population in Indonesia.

In the fishery is commonly known 2 kind of cultivation, which are Capture and Aquaculture cultivations. Capture fishery is heavily depended on weather, which now days effecting by climate change, therefore aquaculture need to be boosed up by implementing innovative approaches or technologies.

Eventhough Indonesia has the second longest coastline in the world (81,000 km) after Canada, which mean Indonesia has a great potential in fisheries, particularly in mariculture, but the fish production is declining from time to time. As of present day Indonesia has sea cultivation area of 2.5 million Ha, and it is being utilized approximately 0.67 million Ha only.

As an illustration, mariculture in China proved to significantly contribute to the food security, provide employment and global climate change, i.e. the reduction of carbon gas (CO<sub>2</sub>) and eutrophication (Fang, 2009). In food security, mariculture in China has contributed 15 million tons of seafood to human and provided 1 million jobs. In addition mariculture have also been able to reduce 1.37 million tons of carbon and 96 000 tons of nitrogen which are absorbed by the oyster and seaweed cultivation. Hence the concept of IMTA (Integrated Multi Tropic Aquaculture) introduced by Chopin in Fang (2009) by performing the oyster and seaweed cultivation around floating net cages for fish farming is an environmentally friendly fish farming concept that needs to be adopted.

Fish cultivation has long been recognized by the fish farmers and has grown in almost all Indonesian waters, namely by using brackish water and tidal

Cultivation of fish found not only thrive in brackish water only but currently was also developing in freshwater or marine using Floating Net Cage (KJA) systems. Cultured fish as a commodity has several advantages compared to other aquaculture commodities, among others are:

- Breeding technology has been well mastered so that the supply of seeds is no longer dependent on the seasons and the seeds from the wild.
- Cultivation technology in both the ponds and in cages has been well controlled, technically easy to apply and be economically advantageous.
- Able to tolerate salinity changes ranging from 0-158 ppt so that the area of cultivation is quite extensive ranging from freshwater to the ocean waters.
- Able to live in crowded floating net cages (100-300 fish/m<sup>3</sup>).
- Rapid growth (1.6% / day).
- Efficient in utilizing feed FCR from 1.7 to 2.2.
- Commercial feed for this fish is available in sufficient quantities even on the countryside.
- Market for the fish is still wide open for both in Indonesia and overseas.

The use of floating net cages for milkfish farming in the sea has several advantages including:

- Efficient use of land
- Easily in both selective and total
- Easily monitored and does not require special water management as in ponds
- High productivity (350-400 kg/cage 6m<sup>3</sup>/planting period of 6 months)
- Scale can be adjusted to capital by utilizing locally available materials

Furthermore milkfishes produced by using floating net cage would have export quality because of its:

- Clean and shiny scales
- No smell of mud
- The content of Omega-3 fatty acids is relatively high compared to milkfish produced in farms/ponds
- Chewy meat with a distinctive smell.
- The fish size can reach 600-800 g/fish in accordance with the market demand

Fishery including mariculture is believed to be one important solution to improve food security in many countries including Indonesia. Therefore, increased productivity in fisheries sector can also keep the world from the food vulnerable situation. However, in order to reduce the negative impacts of mariculture development in this case milkfish farming in the floating net cages against environmental degradation, the concept of IMTA has been widely practiced in various countries urgently need to be applied.

### **Goals of the Project**

The purpose of this project is to develop and promote aquaculture technology, milkfish farming in particular (Chanos) in an environmentally friendly floating net cages (KJA) to support food security program in order to anticipate the negative impact of global climate change.

### **Methods**

The methods used in the project include:

- Coordination with stakeholders (KKP, Related Service Institutions, The Fish Breeders/ Fishermen, entrepreneurs, funding sources, etc.).
- Planning of technical detail, financing and implementation of project activities.
- Survey for location to place KJA to be used as a means of training and production.
- Establishment of fish farmers' group KJA system.
- Training and socialization of milkfish cultivation techniques in the environmentally friendly KJA Application of technology in various regions in Indonesia.
- Evaluation
- Materials or facilities needed in the implementation of this project include:
- Tools to survey the location of the environmental impact assessment.
- Pilot cultivation unit of milkfish in KJA.
- Support for training and monitoring activities.

### **Phase of activity**

#### **First year**

- Create a pilot unit of KJA as production facilities and training on fish farming technology in the KJA.

#### **Second year:**

- Create a pilot unit of KJA as production facilities and training on milkfish farming technology in KJA using environmentally friendly Multi Tropic Integrated Aquaculture (IMTA) method to a group of fish breeders.
- Establishment of skilled groups of fish farmers.

#### **Third year:**

- Establishment of several milkfish production centers in environmentally friendly KJA technologies in several areas in Indonesia including Jakarta, Riau Islands and South Sulawesi.

### **Expected results**

Technology development of Mariculture of milkfish in Floating Net Cage (KJA) in Indonesia is implemented in the format Cooperative Management that is the government together with

the community to carry out the planning, implementation and evaluation of development programs together.

### **Budget**

The total budget for this project, which will be implemented in 3 years is US\$ 7.5 billion, which can be broken down as follows:

First year : Approximately US\$ 2.6 billion  
Second year : Approximately US\$ 1.4 billion  
Third year : Approximately US\$ 3.5 billion

### **c. Cattle farming using integrated breeding center village pattern and crops-livestock system**

Objective: to develop a system toward the production of free deases livestock

### **Introduction**

Farm development is a part of an important national development. The objective of livestock development is to improve of the excellence human resource quality, increase farmers income and welfare, environmental protection and increase state revenues. An ecologically, economically and sustainably sound farming system is developed for food security and poverty alleviation, especially for the facility limited farmers and community, with the development opportunity given to large-scale farming industry as well. The challenge of livestock development is more because of an economy globalization, which will become a threat if Indonesia continually importing farm products and technologies. At the same time globalization is also an opportunity for the livestock industry if we can produce high quality, clean and healthy livestock products and free from diseases.

Based on Livestock Statistics in 2005, Indonesia's exports grew by 17% per year. The Islamic world also expects Indonesia as a livestock exporter in accordance with the Islamic rules. Dependency on imports will be a threat if the independent productive effort, move the production process to meet the needs, can not be met domestically.

Factor in the country which have obstructed the growth of the livestock sector, among others are:

- The structure of the livestock industry that largely remains in the form of community business which are characterized by low education and income levels of farmers, management practices and technologies that are still conventional, widespread farm location, business size is relatively small, and procurement of main inputs namely HMT Forage Livestock Foods (HMT) are still dependent on season, availability of family labor, as well as a limited tenure for HMT.
- Availability of good quality seeds that are not accessible by farmers because the research on livestock breeding that have been carried out on a large scale have not been socialized. This was due to communication failure of the R & D with the rancher, and also with both Research Agency of the Ministry of Agriculture and Higher Education. In addition, farmers also have no incentive to adopt new technologies that will be accompanied by an increase in costs