

## JAKARTA FISHERIES UNIVERSITY iPRIDE4fish

### SSNS Training Course 1: Fish Feed Production

#### Background

Fish feed plays crucial role in aquaculture sector, both in larval and growth stage. It contributes more than a half of total expenditure in one production cycle. However, a vast knowledge of cultivated fish nutritional requirement throughout development would contribute to optimize diets and feeding, and thereby improve larval and juvenile quality. It is often a compromise between an ideal formula and practical considerations, whereas formulating the feed one must take into account some considerations such as price, availability of ingredients used anti-nutritional factors and palatability of diets.



The choice of dietary protein to be used in practical rations is an economic decision, which depends on the protein source as well as on the expected returns from fish growth and value. For the improvement of aquaculture and to achieve maximum yields from limited resources, it is important for iPRIDE4fish to provide fish feed production training program for participants with hands-on practice i.e. mixing proper ingredients, by which fish grows rapidly and attains maximum weight in shortest possible time.

#### Learning outcome

- Increasing productivity of fish farmer through saving feed costs
- Expert in calculating the composition of the ingredients for making floating or sinking feed
- Demonstrate skills on making feeds
- Enhanced knowledge of feeding management
- Ability to develop a business plan for fish feed & grow-out farms

**Training period:** 1 week

**Training fee:** 250 euros /participant (exclusive of travel costs)

**Lectures –5 lecture session (5 x 2=10 hrs)**

- Lecture 1: Type of feed
- Lecture 2: Species nutritional requirements
- Lecture 3: Raw materials
- Lecture 4: Nutrient contents of raw materials
- Lecture 5: Formulation

**Practical – 6 lecture session (6 x 4=24 hrs)**

Selection of raw materials, calculation of nutritional value, weighing, mixing, pelleting, drying, packaging and labelling, palatability, fish responses to pelleted diets, feed storage and distribution

**Materials needed:**

- |                        |  |
|------------------------|--|
| Protein source         | : Fish flour, shrimp head flour, soybean meal flour, meat bone meals), trash fish, salted fish.                          |
| Source of fat          | : Fish oil, squid oil, corn oil, palm oil  |
| Carbohydrate source    | : Wheat, pollard, bran, corn, cassava  |
| Source of vitamins     | : Vitamin A, D, E, K, C, B   |
| Mineral Source         | : Mineral premix   |
| Binder                 | : Tapioca, sago, wheat, CMC  |
| Additional Ingredients | : Attractant (squid oil, rebon flour), antioxidant (BHT, DHA and the like), anti-fungal (antimold), antibiotic, hormone. |

**Final report including business plan:** by each participant – max. 4 pages and presentation on the final day.

**Presentation of results by the group of students (Seminar Room)**

- Techniques and lessons learned
- Wrap-up by Instructor (30 minutes)

**Feedback and evaluation by:** students / participants

**Resource persons:** Fitriska Hapsari, M.Si.

## JAKARTA FISHERIES UNIVERSITY iPRIDE4fish

### SSNS Training Course 1: HDPE-lined Shrimp Farming

#### Background

Operation and management of shrimp farming has changed substantially in the past 30 years. This rapid change primarily been attributed to technological advances, high market demand and reduced supplies of wild stocks. After catastrophic shrimp farming loss in late 1990, many commercial shrimp production operations in Indonesia started to adopt management practices emphasizing biosecurity while maintaining profitability and productivity.



High-density polyethylene (HDPE) is well-known pond plastic liners which have been proven to be effective in some countries that face disease, coastal pollution due to water discharge and acid soil problems. Furthermore, this type of pond can prevent bottom deterioration. Not to mention, this approach would lower area needed for aquaculture and increase density in each pond respectively. BAPPL-STP Serang (one of branch campuses of Jakarta Fisheries University) have been adopting this sustainable approach for shrimp farming for almost 14 years (long experience). Thus, iPRIDE4fish provide training program in HDPE-lined shrimp farming for any participant who is interested in shrimp aquaculture, its planning and management.

#### Learning outcome

- Improve the science of vannamee shrimp cultivation
- Demonstrate skills on how to select fries and spread good fry
- Demonstrate skills in how to calculate and feed
- Increase knowledge about sampling procedures
- Increase knowledge about the prevention of pests and diseases
- Demonstrate skills in managing harvest and post-harvest

**Training period:** 1 week

**Training fee:** 250 /participant (Exclusive of living and travel costs)

#### Lectures –11 lecture session (11 x 2=22 hrs)

Lecture 1: Get to know generally about vannamee shrimp cultivation technologists

Lecture 2: General knowledge about the vannamee shrimp biology

Lecture 3: Specific knowledge about cultivation methods

Lecture 4: Land preparation

Lecture 5: Selection of good fries

Lecture 6: How to spread fries  
Lecture 7: Calculation and feeding  
Lecture 8: Management of water quality  
Lecture 9: Handling harvest and postharvest  
Lecture 10: Prevention of pests and diseases  
Lecture 11: Planning of vaname shrimp cultivation

**Practical – 10 lecture session (10 x 3=30 hrs)**

Farm preparation, sampling of fry, fries stocking, estimating, feeding program, water quality monitoring, sampling, biosecurity replicating, harvest preparation and handling

**Materials needed:**

Disinfection, Styrofoam, fry of vaname, bucket, scale, net, water quality checker, feed, basket, trawl, table of grading.

**Final report including business plan:** by each participant – max. 2-3 pages and presentation on the final day.

**Presentation of results by the group of students (Seminar Room)**

- Techniques and lessons learned
- Wrap-up by Instructor (1 hour)

**Feedback and evaluation by:** students / participants

**Resource persons:** Dr. Sinung Rahardjo, A.Pi., M.Si; Suharyadi, S.St.Pi., M.Si



## JAKARTA FISHERIES UNIVERSITY iPRIDE4fish

### SSNS Training Course 3: Seaweed Farming

#### Background

Almost all of aquaculture forms (e.g. shrimp, catfish, etc.) are resource-inefficient and contribute to environmental degradation. Seaweed farming, i.e. marine culture of macroalgae is often considered as the most environmentally friendly form of aquaculture. It requires little or no input of fertilizers or medicines, does not cause any major physical environment alterations and can be used to mediate eutrophication and pollution. Seaweed has been cultured traditionally for decades and probably for centuries in several Southeast Asia countries.

Realizing the potential for commercial extractions, seaweed now has become one of heavily promoted as an alternative sustainable aquaculture practice for local coastal communities in developing countries. Human resources and capability in Indonesia, however, are not fully competent enough to secure this low environment risk mariculture. Thus, iPRIDE4fish deliver training program for any participant who is interested in managing and embarking a seaweed business.

Seaweed is one of the results of aquaculture in the field of fisheries which has a high selling value and can be cultivated in monoculture and polyculture. At present, seaweed is one of the potential commodities of marine and fisheries which is increasingly developing mainly through cultivation activities seen from the planting method to improve quality and productivity.



According to statistical data from the CTF (2017), the volume of seaweed production grew by an average of 11.8% and grew by 3.09% / year. One very important factor is the depth of planting right when seaweed is planted. Appropriate cultivation techniques (such as spacing and depth of seedlings) in the waters will produce high productivity seaweed. This is related to the determination of seaweed cultivation methods used, so that the water column can be used optimally and result in production and quality produced.

#### Learning Outcome

1. Increase knowledge about *Gracilaria* sp. seaweed
2. Build comprehension and skills about *Gracilaria* sp. cultivation
3. Develop skills about *Gracilaria* sp. farming
4. Reach a good quality of *Gracilaria* sp. seaweed

**Training Period** : 3 days

**Training Fee** : 150 /participant (exclusive of living and travel costs)

## JAKARTA FISHERIES UNIVERSITY iPRIDE4fish

### SSNS Training Course 4: Catfish Farming

#### Background



Aquaculturists continue to increase their interest in and use of mixed suspended-growth production systems, also referred to as biofloc system, for culturing various aquatic animals, but emphasizing in catfish farming. This system relies on the living microorganisms in the biofloc (consist of microbial biomass and particulate organic matter) maintained in the water column to assist in ammonia removal via phytoplankton and bacterial uptake and bacterial oxidation. Currently, almost all

catfish production is conducted in earthen-type ponds. In these either pond, phytoplankton will assimilate and reduce ammonia concentrations in the waters. However, microbial biomass in biofloc also act as additional source of protein content beside fishmeal. Composition of the bioflocs is also crucial economically to produce a healthy aquaculture product of high quality at a lower production cost. BAPPL-STP (one of Jakarta Fisheries University branch campuses), however, produces a medium scale of catfish farming using biofloc system for approximately 3 years. After long development, and trial & errors process, we can harvest more than 2 tons catfish from eight 2.0x1.5x0.7 m ponds. Thus, iPRIDE4fish as a Centre of Excellence at Jakarta Fisheries University provide training program for any participants who is interested in producing small up to medium scale of catfish farming.

#### Learning outcome

- Enhanced knowledge on biology, reproduction and nutrition of catfish.
- Demonstrate skills on catfish management production using biofloc system.
- Ability to develop a business plan for grow-out farms.

#### Training period: 5 days

**Training fee:** 250 euros /participant (exclusive of travel costs)

#### Lectures –8 lecture sessions (8 x 2= 16 hrs)

- Lecture 1: Aquaculture: Global Perspective and Catfish Farming: Status and World Wide
- Lecture 2: Catfish Biofloc System
- Lecture 3: Lecture 4: Pond Design and Layout
- Lecture 4: Water Quality Monitoring and Management
- Lecture 5: Feeds & Feeding Management
- Lecture 6: Health Management & Bio-security
- Lecture 7: Conditioning, packing & selling technic
- Lecture 8: Business Plan of Catfish biofloc system

### **Practical – 5 lecture session (5 x 4=20 hrs)**

Pond preparation and treatment, media preparation and treatment (created floc), seed treatment and stocking, feeding and fed management, water quality treatment, packing & selling.

#### **Materials and Utilities needed:**

##### **a. Materials**

- Qualified Catfish seed size 5-6 cm
- Pellet (protein 35-36%, Fat 9.5-10%, Carbohydrate 20-30%, Mineral 1%, vitamin 0.25-0.40).
- Probiotic
- Molase
- Salt
- Dolomite

##### **b. Utilities needed**

- Square tank of 2.1 m<sup>3</sup>
- Blower
- Aeration
- Pump 230 volt
- Balance Scale capacity 50 kg
- Digital Scale capacity 35 kg
- Hose
- Thermometer
- pH meter digital
- Ammonia Test Kit
- Nitrite Test Kit
- Nitrate Test Kit
- Harvesting Net
- Pail
- Imhoff tube
- Microscope
- Preparation glass

**Final report including business plan:** by each participant – max. 3 pages and presentation on the final day.

#### **Presentation of results by the group of students (Seminar Room)**

- Discussion and practice
- Instructor supervision (1 hour)

**Feedback and evaluation by:** students/participants

**Resource persons:** Affandi Saputra S.St.Pi., M.Si.