15 Steps for Aquaculture Farm Rehabilitation in Aceh, Indonesia

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Regional Brackish Water Aquaculture Development Center, Ujung Batee, Aceh

1. Components in commercial coastal aquaculture
2. Pre-tsunami aquaculture problems
3. Key points for successful aquaculture rehabilitation post-tsunami
4. The “15 Steps” for rehabilitation of aquaculture in Aceh
Components in Commercial Coastal Aquaculture

Wild Brood-stock (Parent stocks) from Capture Fisheries

Hatcheries (Fish Seed/Post-Larvae Production)

Nurseries (Juvenile / Fingerling Supply)

Farms (Grow-out ponds, cages) for Market Production

Product Buyers (Traders/Middlemen)

Processors, Packers for Domestic and International Trade

Farm Input Suppliers
Feed, Fertilizer, Lime, Medicine, Treatments, Private/ Government Laboratories

Ice Supply, Transport, Quality Control
Problems
During Pre-Tsunami Era

- Farmers and supply chain is highly unorganized
- Lack of proper planning and systematic approach.
- Shrimp disease epidemics and crop losses
- No reliable scientific information flow to farmers.
- No proper quality control for farm inputs (seed in particular)
- Risks of food quality problems due to use of internationally restricted chemicals
- Decreasing shrimp price and profit margins
- Too much dependence of farmers on traders/middlemen for technical, financial, farm inputs and marketing
- Environmental problems – mangroves losses
Key Points for Successful Coastal Aquaculture Farm Rehabilitation

- Proper assessment of the tsunami damage and pre-tsunami problems.
- Participatory approach in planning and implementation of rehabilitation work
- Mobilizing farmers to take ownership of rehabilitation and for collective management
- Educating and motivating farmers for implementation of better management practices.
- Rehabilitation of hatcheries and nurseries for supply of better quality and disease free shrimp and fish seed
Key Points for Successful Aquaculture Farm Rehabilitation

- Restore and strengthen extension services and developing cooperation and mutual trust between all stakeholders
- Improving harvest and post-harvest handling practices for better quality and price
- Linking farmers to markets for better market access
- Implement mangrove and coastal resource rehabilitation as an integral part of rehabilitation of aquaculture areas
- Use the DGA/FAO/NACA guidelines for environmentally responsible aquaculture rehabilitation in Aceh and Nias
“15 Steps” for Aquaculture Farm Rehabilitation

STAGE 1
Assessment, Community Mobilization & Planning
1. Village entry & Primary Assessment
2. Rapport Building & Motivating the Farmers
3. Participatory Detailed Need Assessment
4. Farm Mapping
5. Farmer Group Building
6. Participatory Rehabilitation Planning

STAGE 2
Rehabilitation
7. Farm/Canal Repair & Reconstruction
8. Planting Mangroves

STAGE 3
Crop Management & Extension
10. Procurement of Quality Farm Inputs
11. Extension Services
12. Management of Common Water Resources
13. Marketing Farm Produce
14. Monitoring & Evaluation
15. Farmer to Farmer & Wider Sharing of Experience
Step 1: Village Entry and Primary Assessment

- Identify priority villages for rehabilitation by consulting BRR, Dinas Perikanan in respective Districts and FAO, Banda Aceh for information update.

- Visit the prioritized villages to “walk and talk”

- View the tambakak situation
Step 2: Rapport Building & Motivating the Farmers

- Developing mutual trust between farmers and the support team is a long-term process and key to success.
- Starts from day one and continues till the end of the project and beyond the project.
- Participate in local social function on invitation.
- Keeping very close contact with all the farmers, leaders and village head.
- Arranging field trips for farmers to successful farm areas.
- Live in the village on a full time basis.
- Leading a simple life so that local people feel free to talk with the support team.
Step 3: Participatory Detailed Need Assessment

- Organize farmer community meeting at farmer convenient place and time to discuss the damages and needs.

- Collect basic information on farming and tsunami damage from farmers using a checklist.
  - Farmer name, residence village
  - Number of tambaks, total farm area (hectares)
  - Ownership (owned/rented)
  - Dyke length (meter), Dyke damage (Severe/Moderate/slight),
  - Water gate condition (Good/bad)
  - Priority species of culture (Shrimp/Milk Fish/Grouper/Crab/other), stocking numbers/ha
Step 3:
Participatory Detailed Need Assessment (cont.)

- Gather information on farmer expectations
  - Production (kg/ha) of fish/shrimp/crab
  - Size of fish/shrimp/crab
  - Disease prevalence
  - Market price
  - Profit

- Make sure to consider other aquaculture stakeholders, like labourers, small-scale traders, nursery seed suppliers, women and men.

- Develop the rehabilitation plan based on inputs of all stakeholders
Step 4: Cluster Mapping – Mapping the Farm Area

• Draw an approximate map of the ponds, canals, human settlement, road, agriculture field etc in the village. This can be prepared by following 2 methods
  ▪ Farmers draw the map during village meetings
  ▪ Support team staff by walking along farms in the village and drawing the map

• Fix the cluster boundaries - roads, canals, agriculture field etc can form the ideal cluster boundary

• Give three digit unique identification numbers to each pond in each cluster. If possible, use GPS system and GIS maps for precise location of ponds

• Prepare a list of farmers and their pond ID numbers in each cluster
Example of a Cluster Map
Step 5: Farmer Group Formation

• Farmer groups (AquaClubs) should be mobilized and strengthened.

• Farmers in each group should be neighboring farmers in the farming cluster.

• Each farmer group ideally should have 20-30 farmers for efficient self-management of the Group.

• Each cluster ideally has less than 50 Ha of farms consisting less than 100 Ponds to be managed by farmers in one farmer group

• Each group should select its group leader by Consensus
Step 6: Rehabilitation Planning

- Select the beneficiary farmers and the farm area to be rehabilitated
  - DGA/FAO criteria
  - Consultation with Group leaders
- Arrange a village level meeting of farmers and the group and inform the name of the selected farmers
- Discuss and agree on crop activities, Better Management Practices to be followed, mangrove rehabilitation and rehabilitation needs in general
Step 6: Rehabilitation Planning (cont.)

- Estimate the cost of rehabilitation, crop starting and resources needed in consultation with farmer group leaders:
  - Dykes and Water Gate Repair and Sludge Removal from Pond Bottom.
  - Labours, Equipments, Mechanical Excavators etc.
  - Crop Inputs Per ha (Seed, Feed, Lime, Fuel for Water Pump, Water Conditioners/Treatments).
- Estimate and fix the time frame to repair the tambaks, water gates, water supply canals and starting time for crop activities.
- Make a detailed work plan with time frame for each activity.
Step 7: Farm and Canal Repair/Re-construction

- Soil quality assessment and remediation
  - Check for acid-sulphate soils and plan to manage any potential acidity problems
  - Check for sandy soils
- Rebuild the infrastructure firsts:
  - Water gates and water canals
- Rebuild the farms after the infrastructure
- Dispose of any sediment and debris carefully

(See the DGA/FAO/ACIAR/NACA Manual on These Topics)
Step 8: Planting of Mangroves

- On-Site Rehabilitation of Mangroves: Inside the pond in some extensive farming systems, promoting silvofisheries.
- Off-Site Rehabilitation of Mangroves: rehabilitate the green belt to protect the shoreline and farming areas.
Step 9: Crop Planning & Prioritizing the Better Management Practices

• Arrange a farmer meeting before the stocking date, ideally at least 45 days.

• Decide on the dates and duration for pond preparation, seed selection and pre-stocking activities.

• Discuss and develop BMPs with the farmer group for the farming area. Use colorful posters/documentaries/leaflets (see FAO/DGA/ACIAR/NACA Manual on BMPs).

• BMPs should be developed using a participatory/consultation process with farmers.

• Priority BMPs should be agreed to be implemented by all the farmers at an individual level with group discipline.

• Farming Rules and Regulations should be written down on a paper and all the farmers should be signatories on it.
Step 10: Procurement of Farm Inputs

- This includes supply of seed, feed, lime, water and soil treatment chemicals, medicines etc.

- Contract system with reputed manufacturers or local dealers is advantageous.
  - Give sufficient time to suppliers to produce farm inputs as per the given **Quality** standards and supply them in required **Quantity** at **Right Time** and at **Reasonable Price**.
  - Working together increases the bargaining power for the farmer group.

- On-farm nurseries should be promoted which is managed locally by farmers and labourers. This assures better quality juveniles for farm stocking.
Step 11: Extension Services

Provide on-farm technical support

• Showing practical methods of implementation of BMPs
• Measure water quality parameters and advise
• Pond bottom quality check-up and advise
• Health and growth check-ups and advise
• Individual farmer problems and advise for them
• Support farmers in maintaining farm records (farm record book should be given to all farmers at stocking)
• Give moral support by a friendly approach
Step 11: Extension Services (cont.)

Organise farmer group meetings

- On weekly basis (same day, same time) at farm site
- Review the farming situation and problems for the previous one week
- Identify solutions for any problems in farm and farmer management by discussing with farmers
- Forecast the crop and weather for the next week and plan for the activities, BMPs, to be implemented.
- Invite local farm input suppliers, farm service providers, scientists, successful farmer leaders from other clubs/ villages to the weekly meetings. This motivates farmers and increases knowledge
Farmer Service Centres

- Farmer service centres could be established. These can be managed by farmer/leader at Village Level.
- Local Dinas Perikanan should actively participate.
- In every Sub-District promote a “One Stop Aqua Shop” which could be a place for
  - Information and knowledge
  - Feed and Farm Input Storage
  - Water Quality Testing
  - Health Management and Basic Disease Diagnostic Facility
  - Farmer Meeting Centre For Discussing Problems/Solutions
Step 12:
Management of Common Water Resources

• De-silting and repairing canals on a regular basis – a community approach

• When and how to fill the pond so that all farmers can complete filling of ponds without trouble

• Care should be taken when draining pond water to the canal
  ▪ Inform the Neighboring Farmer if it is Normal Water Exchange.
  ▪ Inform all Cluster Farmers if Discharging the Water from Disease Outbreak Ponds
  ▪ No Farmer Intake Water During Disease Outbreak Situation
Step 13: Marketing Aquaculture Farm Produce

- Look for ways to develop supply chains based on market requirements

- Support farmers with market information, e.g., prices, quality requirements

- Explore opportunities for accessing better prices and with dealers who practice fair trade

- Trace-ability of produce should be maintained

- Assure quality of harvested product through proper icing and hygienic practices
Step 14: Monitoring and Evaluation

- Encourage farmers in basic monitoring and record keeping – at farm and group levels.
- Monitoring should be on a regular basis (daily, weekly, crop ending, based on needs).
- Farmer evaluation should be encouraged for self learning by farmers.
- Monitor implementation of management practices by farmers on pond-wise.
- Crop results should be recorded (production, disease, fish/shrimp size, crop duration, profit etc)
- Data should be compiled with farmers to discuss results and analyzed to understand strong and weak points. This will help in future crop planning and fine-tuning future activities.
Step 15: Feedback and Sharing the Experiences

- Arrange regular farmer meetings to exchange experiences.

- Invite other local stakeholders to participate in meetings and encourage dialogue along the supply chain.

- Use meetings to evaluate outcomes and share experiences to encourage uptake of better practices among farmers to improve sustainability.

- Share experiences across farming areas to encourage wider uptake of better farming practices.

- Disseminate information on better farming through to wider audiences through newspapers, television etc.

- Supporting agencies (donors, NGO’s etc) should be engaged to share experiences through available channels.