

TERMS OF REFERENCE (TOR)
Accelerating the Recovery of Aceh Post-Tsunami through
Sustainable Coastal Aquaculture

[AWF-WAS-YSI Sustainable Coastal Aquaculture Project]

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MINISTRY FOR MARINE AFFAIRS AND FISHERIES
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INTRODUCTION

Background

The aquaculture sub-sector in Aceh is socially, economically and environmentally important and represents a significant portion of the livelihoods of many coastal people. The main farming system is in a brackishwater pond (locally known as a tambak). Most of the pond farming in Aceh Province is by traditional methods and low input. Farms producing shrimp and milkfish in polyculture and monoculture are situated along the north-east coast. Semi intensive and intensive shrimp farms are also present, but in a small proportion (probably less than 20%) of the total numbers of ponds and area covered. Most traditional farmers are small-scale farmers (<2 ha). Land/farm ownership and employment patterns vary, some are owner operated, others are rented, contract farming, labour, as well as some ponds owned by the village community. The varied ownership patterns and beneficiaries have made the post-tsunami recovery very complex.

Aquaculture in Aceh is a highly significant livelihood activity for many people. According to Provincial Dinas Perikanan statistics, there were 14.859 brackishwater farmers. Each hectare of pond is estimated to provide direct employment of between 1 to 3 people/ha, depending on location and farming system. Subject to further verification, 94,000 or more people may be directly employed in 47,000 ha of ponds. Particularly along the north-east coast, pond farming provides a high incidence of the employment in coastal villages. With significant numbers of unemployed in north-east coastal areas following the tsunami, there is a strong social justification and increasingly urgent need for support to rehabilitation of aquaculture.

The shrimp culture industry was in decline prior to the tsunami. Damage to the mangrove ecosystem and intensification of farming had reduced water quality and led to frequent disease outbreaks. Proliferation of ponds, reusing effluent from one pond to the next, along with the degradation of water quality from competing uses of aquatic resources, had further exacerbated the situation. Restoration of the aquaculture industry, which has been an identified goal by the government and by most non-governmental organizations, should be encouraged.

Moreover, most governmental and non-governmental organizations have recognized that the current situation provides an opportunity for a new outlook that would allow the industry to be restored using better technical and ecological principals. Several groups and agencies are eager to collaborate to achieve this restoration in a sustainable manner. The basic concept is to utilize ecological concepts to construct a production system that uses plants and animals (seaweed, fish and shrimp) to produce marketable products in a manner that will not pollute the environment.

Seaweed is one aquaculture commodity which has been well developed in some parts of Indonesia (Sulawesi, Nusa Tenggara Barat, Bali) since 1987. Seaweed has a big potential market, so the development of seaweed cultivation has a good prospect. Aceh Province is one of the Indonesian parts surrounded by the sea, with various type of coastal ecosystem. Some of them

are suitable for seaweed culture. Seaweed culture has been established by rural coastal communities by simple techniques, marketable with feasible price and labour intensive. Cultivation period of initial stock is about 45 days for normal harvest. Post harvest treatment before trading is just direct sun drying. In many countries, direct consumption of *Gracilaria* is also popular and can contribute a low-cost and nutritious food item to the local diet. This farming does not need imported materials or sophisticated techniques. Finally, seaweed cultivation of *Gracilaria verucosa*, in particular, has been a source of pharmaceutical and food grade agars.

The development of technology has further shown that the seaweed could be cultivated with shrimp and milkfish in the same pond (*polyculture* system). For the shrimp, the surrounding of the seaweed plantation could filter the water removing nitrogenous and phosphorus compounds as fertilizers. Beside that, it could be used to produce organic shrimp for international markets.

The restoration of the shrimp industry is also dependent on the restoration of the shrimp hatchery infrastructure in the province. Several hatcheries have already been supported by AwF funds and technical assistance. Collection of local broodstocks, as opposed to importation of possibly compromised breeders from remote locations, is critical to the bio-security of the industry. Collection of wild breeders and development of captive broodlines that would supply local farms is much preferable to importing shrimp from remote hatcheries or local harvest of post-larvae from the wild.

Finally, several governmental and no-governmental agencies have already begun aggressive mangrove restoration efforts. The aquaculture sector should embrace this effort and recognize the benefits of integrating their aquaculture with the mangrove ecosystem instead of replacing it. Mangroves are important as biofilters and physical protection of tambaks. Mangrove – friendly aquaculture is being practiced across Southeast Asia and Aceh should be the leading demonstration site in Indonesia.

AwF has already collaborated with the government and several NGO's to conduct a series of training activities and demonstration efforts towards sustainable coastal aquaculture. The department wishes to further these efforts with more direct support of seaweed culture and biosecurity of shrimp hatcheries.

PROJECT DIGEST
Accelerating the Recovery of Aceh Post-Tsunami through Sustainable Coastal Aquaculture

1. **Project Title** : Accelerating the Recovery of Aceh Post-Tsunami through Sustainable Coastal Aquaculture
2. **Location** : Province Nangroe Aceh Darussalam
3. **Executing Agency** : Directorate General of Aquaculture (DGA)
Ministry for Marine Affairs and Fisheries
4. **Objectives** :
 - a. Short-Term Objectives :
 - To share and explain concept of sustainable coastal aquaculture to tambak farmers;
 - To increase the understanding of the need for biosecurity and captive broodstocks and increase knowledge and skill of shrimp collectors;
 - To select the most suitable site for *Gracilaria* culture program;
 - To introduce the seaweed culture technique by demonstration of commercial scale pilot project;
 - To supply the seed of seaweed from nursery culture and distribute to farmers and hatchery operators;
 - b. Long-Term Objectives :
 - To increase biosecurity of all aquaculture in NAD;
 - To provide training and job creation for the Tsunami victims along coastal areas which would also reduce pressure of illegal fish and coral collection
 - To assist the development of certified organic shrimp production in NAD;
 - To work with international groups offering to market organic shrimp;
 - To increase the quality of community welfare.

Funding

Funds for this project are being provided from the World Aquaculture Society (WAS) Tsunami Relief Fund, supported by a donation from YSI Inc. and routed through Aquaculture without Frontiers (AwF), which will monitor the progress of the work.

Scope of the Project :

Phase 1:

Training Program for Tambak farmers and NGO's

The staff at Ujong Battee, possibly assisted by international volunteers, will hold short workshops to explain the biosecurity and polyculture aspects of sustainable coastal aquaculture to tambak farmers impacted by the tsunami. Representatives from interested NGO's who are supporting aquaculture restoration will also be invited.

Phase 2:

Development and Management Nursery of Seaweed (*Gracilaria* sp.) Culture Shrimp Hatcheries.

This program will work with the Ujong Batte lab and a private hatchery to produce sporelings for growout. Also, a pond at Ladong will be used for demonstration of growout techniques in a tambak. This pilot project will produce the superior seeds of seaweed (sporelings) that will be used for Polyculture (in Phase 3).

Phase 3 :

Polyculture Pilot Project

This program is to develop polyculture technique among seaweed (*Gracilaria* sp.) and shrimp culture in the same pond. There are 4 locations which will be used in the pilot project; Bireun, Aceh Utara, Pidie and Aceh Besar. Each location consists of 1 ha area which belongs to a group of fish farmers and it will be managed by them self.

Phase 4 :

Monitoring, Evaluation and Reporting

The project will be monitored and evaluated to determine the number of farmers adopting sustainable techniques and the success of this program. Reporting will be used to improve and develop the whole program based on the experiences in the fields.

DGA will provide the following reports to the AwF Chairman, Michael New:

- brief regular progress reports
- A final report containing 'before and after' photos at the completion of the project.

All reports will be sent by email attachment to michaelnew339@btinternet.com

5. Implementation: Fiscal years 2006

6. Project cost : Aquaculture without Frontiers (AwF) grant aid US\$ 25,000

7. Amount proposed for commitment :

a.	Sustainable coastal aquaculture training/workshop	US\$ 3,000
b.	New equipment for shrimp broodstock collectors	
	- Double mesh gill nets	US\$ 1,000
	- Live tanks	US\$ 1,500
	- Battery operated air blower and oxygen tanks	US\$ 2,500
	- Activated carbon, tris buffer	US\$ 2,000
	- Collecting boat	US\$ 1,000
c.	Development and Management of Nursery Seaweed (<i>Gracilaria</i> sp.) Culture in the Pond.	
	- Seeds	US\$ 1,000
	- Seeds transportation (Jakarta - Aceh)	US\$ 1,000
	- Collecting boat	US\$ 1,000
	- Cage materials (netting, PVC pipes and glue)	US\$ 2,000
	- Microscope and slides	US\$ 2,000
d.	Polyculture in the Pond (Seaweed & Shrimp):	

- Water pumps (4)	US\$ 2,400
e. Shrimp feed	US\$ 1,600
f. Monitoring, Evaluation and Reporting	US\$ 2,000
g. Miscellaneous and contingency	<u>US\$ 1,000</u>
TOTAL	US\$ 25,000

TERMS OF REFERENCE (TOR)

I. Project Digest

1.1 Project Title :

Accelerating the Recovery of Aceh Post-Tsunami through Sustainable Coastal Aquaculture

1.2 Location :

Province of Nangroe Aceh Darussalam

1.3 Expected Funding Source and/or Assistance :

- a. Internal technical assistance
- b. External funding

II. Term of Reference of the Project

2.1 Institutional Frame Work

The Directorate General for Aquaculture, Ministry for Marine Affairs and Fisheries will be the executing agency, while the Directorate of Seed Development will be the project coordinator. The project coordinator in the implementation of this project has been collaborating with Aquaculture without Frontiers (AwF).

2.2 Government Follow Up

After the completion of the project, the Directorate General of Aquaculture will continue to maintaining and improving the existing development of sustainable aquaculture in NAD. If possible, it would be disseminated to the other areas that have the similar condition to increase the quality of community welfare

2.5 Scope of the Project

Based on the socio-economic condition of the coastal and marine communities, the government of Indonesia planned to launch program for rehabilitation of aquaculture in Aceh Province, which is consist of an organized plan for sustainable coastal aquaculture that would have the support of NGO's, multinational development agencies and international seafood marketing companies that are willing to contract for seafood from sustainable sources.

2.6 Propose Schedule of the Project

Items	2006			
	Sept	Oct	Nov	Dec
- Training and workshops				
- Polyculture Pilot Project				
- Shrimp broodstock collecting				
- Monitoring, Evaluation and Reporting				