

Shrimp Farming in Aceh



Shrimp – an important livelihood

Shrimp farming is an important agricultural activity in Nanggroe Aceh Darussalam. Prior to the tsunami, in 2003, Dinas Kelautan dan Perikanan estimate that Aceh produced 10,300 tonnes of shrimp valued at US\$46.5 million. The major proportion of this shrimp production was the black tiger shrimp (*Penaeus monodon*) which made up US\$41.8 million.

Provincial Dinas Kelautan dan Perikanan estimate that there are approximately 15,000 brackishwater farmers in Aceh. However, these figures appear to include only farmer owners or operators and therefore under-estimate the number of people involved as labourers, suppliers of inputs, traders, marketing and service provision. FAO estimates that each hectare of pond provides direct employment of between 1–3 people, depending on location and farming system. Based on recent estimates of pond area for brackishwater aquaculture in Aceh, up to 200,000 people may be employed directly in brackishwater shrimp and fish farming.



Shrimp farming in Aceh

Most shrimp farmers in Aceh are small-scale farmers, with less than 2 hectares of pond area. Land/farm ownership and employment patterns vary, and include owner-operated, rented, contract farming, labour, as well as some ponds owned by the village community.

Shrimp farming in Aceh is typically classified as traditional extensive. Shrimp are stocked at low density (generally <math><5\text{ PL/m}^2</math>). Because of the low density of culture, feed and fertiliser inputs are generally low. Many farmers do not feed for the first month of the crop, relying on natural pond productivity to provide food for the juvenile shrimp. Some farmers may not feed until close to harvest time. Because of this, environmental impacts from nutrient release are mild, and wild fish consumption in the form of fish meal and oil is low.

The farmed shrimp reach harvest size (20 – 30 g) in 3–4 months. Most shrimp produced in Aceh are exported, via Medan.

Shrimp species farmed in Aceh

Black tiger shrimp

The black tiger shrimp (*Penaeus monodon*) is the species most commonly farmed in Aceh. It has the following advantages:

- ✓ production technology (hatchery) well established
- ✓ grow-out technology well established
- ✓ rapid growth



- ✓ good tolerance of varying environmental conditions (salinity, temperature)
- ✓ good market demand

The quality of black tiger shrimp broodstock in Aceh is excellent. Aceh broodstock shrimp are in great demand both within Indonesia and internationally. The black tiger shrimp broodstock in Aceh are an important resource for brackishwater aquaculture in Indonesia and need to be conserved.

White shrimp (*indicus*)

‘White shrimp’ in Aceh generally refers to *Penaeus indicus*, a local shrimp species that is being developed for farming by the Balai Budidaya Air Payau (Centre for Brackishwater Aquaculture Development) at Ujung Batee. To date, little is known about the suitability of this species for aquaculture in Aceh.



‘Flower King’

The shrimp species known locally as ‘Flower King’ (possibly *Penaeus merguensis*) shows considerable promise for aquaculture in Aceh. It is a large, fast-growing shrimp, similar to *P. monodon*. This species is also being developed for farming by the Balai Budidaya Air Payau Ujung Batee.



White shrimp (*vannamei*)

Litopenaeus vannamei is not native to Indonesia, but

was originally introduced to Asia from South and Central America. Unfortunately, because its introduction to Asia was not carefully controlled, it brought with it a range of new shrimp diseases, most notably Taura Syndrome Virus (TSV). Although it is cultured in other parts of Indonesia, it is not yet well established in Aceh.

L. vannamei is not suitable for brackishwater aquaculture in Aceh for the following reasons:

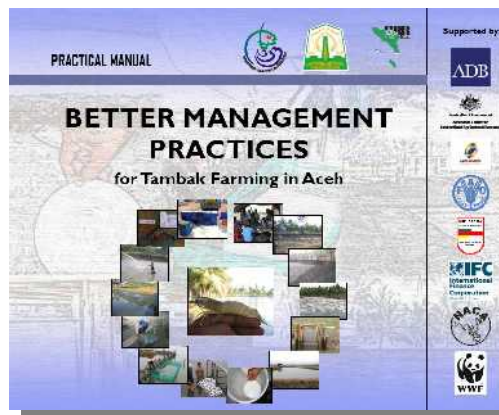
- x *L. vannamei* requires intensive or super-intensive production systems to be financially viable. Because of the high level of investment required to implement intensive or super-intensive systems, these culture systems are not accessible to traditional small-scale farmers. The development of such culture systems may thus exclude small-scale farmers.
- x Intensive and super-intensive culture systems have increased environmental impacts. Because of the high levels of nutrient inputs (feed, fertiliser) required to sustain intensive and super-intensive production, there is considerably more production of nutrients which are released into coastal waterways.
- x There is greater international market competition for *L. vannamei* markets. In 2004, China alone produced more than 735,000 tonnes of *L. vannamei*. In comparison, in 2004 Indonesia produced 53,000 tonnes of *L. vannamei*. In the short term, global production of *L. vannamei* is predicted to increase.
- x Prices for *L. vannamei* are lower than for black tiger shrimp. In 2004, Thailand produced 276,600 tonnes of *L. vannamei* valued at US\$791 million. Indonesia earned almost as much (US\$685 million) from only 131,000 tonnes of black tiger shrimp.



- x Prices for *L. vannamei* have decreased and appear to have been stabilised at around EU5 /kg. In comparison, prices for black tiger shrimp are predicted to stabilise or even increase.

Improving sustainability of shrimp farming in Aceh

Many organisations are working to improve the sustainability of shrimp farming in Aceh by increasing the consistency of production. The approach being taken focuses on the implementation of Best Management Practices (BMPs). BMPs are based on the International Principles for Responsible Shrimp Farming which cover farm siting, farm design, water use, broodstock and post-larvae, feed management, health management, food safety and social responsibility. These principles are being adapted specifically to suit shrimp farming in Aceh. The introduction of BMPs to traditional shrimp farming in other parts of Indonesia has seen both production reliability and farm profitability increase.



Environmental issues

In the past, shrimp aquaculture in Aceh has developed without adequate assessment of its impacts on the environment. In particular, the siting of farms in the coastal zone has had negative impacts on mangroves and other coastal ecosystems.

Shrimp farms should not be developed in mangrove areas because:

- x Mangrove soils have high levels of acid production which can adversely affect shrimp production. Although this can be compensated in production ponds, it is better to build ponds in good quality soils, not in mangrove soils.
- ✓ Mangroves are important ecosystems for the production of juvenile fish, shrimp and other aquatic animals. Their destruction can adversely affect production of many species, including those that are commercially fished.
- ✓ Mangroves are important in preventing land erosion in the coastal zone, and in reducing the effects of tidal waves and even tsunamis.

Produced in collaboration with:



Donors:

