

## **Experiences from Indonesia – Mangrove restoration along Java's vulnerable coast**

**Budget:** € 25.000

**Funded by:** Royal Netherlands embassy.

**Implementing agencies:** Wetlands International – Indonesia programme, INSTIPER (Indonesian agricultural institute) and local CBOs.

**Objectives:** Restoring biodiversity and ecological functioning of mangroves; improving livelihoods and sustainable practices of poor coastal communities.

**Where:** Pemalang district, north coast of Java.

**Implementation period:** 1999-2004.

### **Rationale & background**

In the 1980s and 1990s huge stretches of pristine mangrove forests have been converted into shrimp ponds, to fulfil the rapidly growing global demand for tropical shrimps. On the short-term, this form of land use seemed highly beneficial as shrimp aquaculture generated significant income for land owners. In the longer term however, this intense form of fisheries proved highly unsustainable as severe diseases wiped out entire shrimp populations, forcing fish farmers to convert yet another stretch of mangroves forest. The total collapse of shrimp stocks as well as the loss of mangrove-related goods, such as fish, shellfish and construction materials have led to widespread poverty among coastal communities. In addition, increased damage from extreme events such as storms and tsunamis and problems with salt water intrusion and coastal erosion have greatly increased vulnerability in these areas. The conversion of mangroves also had a marked impact on coastal biodiversity as many species are dependent on this ecosystem for a significant part of their life cycle.

### **Approach**

The Pemalang coastal restoration initiative aimed to improve the livelihoods of poor communities along the north coast of central Java by restoring the ecology of degraded shrimp ponds and by developing economically viable alternatives to unsustainable practices. Following a stakeholder consultation round with local communities, governmental bodies and local NGOs, small-scale Bio-rights initiatives were developed in several villages throughout the region. Community members received micro-credits and technical support in order to successfully implement income generating activities that could complement their meagre income. The income generating activities were selected by the community itself during a workshop in which different opportunities were presented and discussed. In return the community planted XXX mangroves in order to restore the ecological balance in the area. A 'silvo-fisheries' system was developed by planting mangroves along the edges and in the centre of the shrimp ponds. In addition, a 100 metre wide mangrove and beach forest was planted on the seaside, to protect the ponds against erosion and to provide a safe haven for plants and animals. The micro-credits turned into grants upon successful completion of the restoration measures.

## **Outcome**

Following the financial support, participating communities managed to significantly diversify their sources of income. Besides producing shrimps and milk fish, they amongst others involved in goat farming, shrimp paste production, crab breeding and seaweed production. Particularly crab breeding and seaweed production proved economically highly attractive. In less than 10 years, the mangroves grew to a height of eight metres, leading to a rapid return of mangrove related goods and services: the number of commercially attractive fish species increased from two to six. Crab and shrimp populations recovered significantly, although it proved difficult to catch them between the dense mangrove roots. Community members currently develop new catching methods to accommodate to this. The incidence of shrimp diseases decreased strongly. The coastal belt halted erosion completely. Instead new land is being gained due to coastal accretion. The replanted mangroves are sustainably used for fuel wood and construction. Three that are cut down are replaced by several seedlings. Mangrove branches serve as food for the goats. The ecological circle is completed when their manure is applied on the fields slightly more inland.

Diversification of income and the return of traditional mangrove related services has significantly decreased vulnerability of coastal communities in the project area. It has also led to a 300 percent increase in income, rising from less than € 4 in 1996, to approximately € 12 per person per day in 2007. After termination of the project, community members proceeded independently to sustainably manage their land. On a weekly basis they come together to decide on replanting activities and discuss improvement of production chains.

## **Current & future activities**

An information centre is currently being built in one of the villages to inform other communities and government officials about the opportunities for sustainable shrimp aquaculture and improved coastal zone management. National and international delegations visit the project area on a regular basis. Given the increasing interest in climate change adaptation strategies in coastal areas it is expected that the Bio-rights initiatives in Pemalang district, will serve as best practice examples of how to accomplish such a strategy. A number of community members involved in the project currently work under the Green Coast project in Aceh province, to train local communities on sustainable development and mangrove restoration.