



**Regional Fisheries Livelihoods Programme  
for South and Southeast Asia (RFLP)**

## Case study

### Mangrove replanting in Indonesia

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#### Introduction

The Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) has worked with communities in Kupang District in Indonesia's Nusa Tenggara Timur (NTT) Province to replant mangrove areas as part of an initiative to rehabilitate and build better awareness of the coastal environment. In total some 110,000 seedlings were replanted between November 2011 and October 2012 in three communities. The initiative took place in two phases, the first of which was in collaboration with the United Nations World Food Programme (WFP). This pilot has shown that the potential success of mangrove replanting efforts is heavily reliant upon ensuring full community buy in and participation during every stage of the process.

#### Key lessons learned

- Don't 'Stop and drop' – Fully involve and mentor the community in every step.
- Strong community leadership is vital, without it the initiative will not work.
- Communities need to understand how replanting will benefit them.
- The use of local village regulations can play an important role in formalizing the need to protect mangroves.
- People are unlikely to destroy what they have created through their own sweat and effort.

## Context

The cutting of mangroves for firewood and to make fences has contributed to a considerable loss of mangrove cover from the coastline around Kupang Bay in Indonesia's Nusa Tenggara Timur (NTT) Province in recent years. Loss of mangroves has apparently contributed to a reduction in small fish and crab catches. This has resulted in a number of villagers relying less on fishing and turning more to farming and/or animal husbandry. The reduction of mangroves has also led to coastal erosion in certain areas. For example, in the community of Kelapa Tinggi of Mata Air village, encroachment by the sea was threatening a large rice farming area upon which large numbers of people in the area depend.

## The initiative

RFLP conducted field assessments in six villages along Kupang Bay. Three villages in Kupang District were selected as target areas for replanting namely Pitay Village, Pantai Beringin and Mata Air. Selection took place in collaboration with the Provincial Environmental Body (BLHD Provinsi). Key criteria included areas in which there had previously been substantial mangrove cover and where village governments showed interest in participating. Some villages were not selected as they have maintained heavy density mangrove forest while others were natural breeding places for crocodiles.

### ***Building awareness and understanding***

From the outset RFLP sought to build a close relationship with communities so that they fully agreed with, and understood the need for mangrove replanting and the steps necessary to maximize success.

RFLP approached village leaders to ensure that they were fully supportive of the initiative. It was important that they had a common

understanding of how the mangrove replanting would be done, what the roles of villagers, RFLP and village government would be, tentative schedules and how mangrove seedlings would be collected and handled.



Following this, RFLP held meetings with community group coordinators to further build awareness of the importance of mangroves. In Pitay Village an expert from a local university was brought in to sit and talk with community leaders and coordinators. The participants were not lectured to, instead they were encouraged to discuss their ideas while the RFLP facilitator and university expert could answer any questions they had and listen to their ideas. The head of Pitay Village also always sat in on these meetings.

By involving the leaders it made it easier to subsequently convince other villagers to join and support the replanting. A number of



training sessions were organized for village members delivered by alumni of RFLP's marine and coastal environment training course, most of whom were teachers from various local schools.

Four separate classes were organized in each community over a period of two days. Teachers rotated between classes to cover different topics relating to the coastal environment and the importance of mangroves. Scientific content was avoided and interactive teaching methods were used along with pictures and other easy to understand material. The participation of women and children was also high.



*Mangrove seedlings ready for planting. They are being protected from animals by a fence.*

### ***Collecting and planting seedlings***

Once the awareness raising stage was completed the process of preparing for the replanting could begin. Neighborhoods within

each community coordinated the collection of the seedlings which were collected by community members from various mangrove areas around Kupang Bay.

Once collected, the seedlings were placed in plastic bags and then nurtured for a couple of months until they had germinated and produced at least 2-3 leaves. They were then moved to a planting area. Through the entire process no seedlings were purchased and the only material input provided by RFLP were plastic planting bags.

Domestic animals pose a major threat to mangrove seedlings. Goats eat the seedlings while cattle can trample and destroy them. The communities therefore adjusted their village regulations to clearly define which areas were to be used for mangrove planting and which were for animals to graze. The reasons why animals could not graze or roam freely were explained to the villagers and fences built along the coastline to prevent animals straying into planting areas. The village leader played an important role in this process so that communities did not feel that regulations were being imposed by outsiders.

A first phase of mangrove replanting then took place in the three communities in November-December 2011. This saw 60,000 seedlings planted covering an area of approximately 6 hectares. A second phase took place in April 2012 in only Pitay Village while in October 2012 a further 50,000 seedlings were planted in Mata Air. The staggered times were due to a scarcity of seedlings that could be collected in the local area. It was therefore necessary to wait for mangrove seeds to be produced through natural processes in August before they could be planted in October.

The planting involved a wide number of community members from 433 households in the communities. School children were also encouraged to participate so they could put into practice what they had learned about during

classroom sessions they had attended on protecting the coastal environment.

### ***Incentives for communities***

For the first phase of the mangrove replanting, RFLP worked alongside the United Nations World Food Programme (WFP).

WFP recognized the long-term nutritional benefits that healthy mangrove forests can provide coastal communities in terms of diversifying income opportunities through fisheries and aquaculture as well as reducing vulnerability to disasters and threats such as erosion. As an incentive for each participant, WFP therefore provided 27 kg - 50 kg rice per household under its Food for Assets program. The rice was used for household consumption. A number of communities in the area also make salt, which they then usually barter for rice. By providing free rice, the communities could then sell or exchange the salt for other items they may need. This was an extra incentive for villagers to participate and helped create increased enthusiasm.

For the second phase of the replanting, RFLP supported communities by helping finance some of their village development priorities. For example in Pitay village a public area was renovated while in Kelapa Tinggi (part of Mata Air) a wooden bridge was renovated that provides access to the community and which for some time had been impassable to larger vehicles. Funding provided to development priorities was calculated based on the number of mangrove seedlings collected by communities and monetized at Rp. 2,000 per seedling (approx USD 0.2).

### **Results/impact**

In total, 110,000 mangroves were planted: 50,000 in Pitay village; 24,000 in Pantai Beringin village; and 36,000 mangroves in Mata Air village (Kelapa Tinggi).



*Mangroves being planted.*

Although it is still too early to have clear data, the survival rate of the mangroves planted appears to be higher than that recorded by previous replanting efforts.

Animals have been successfully kept away from the replanting areas while the efforts to engage villagers have resulted in them appearing keen to visit replanting areas to check progress.

Following its participation in this initiative Pitay villagers agreed to carry on the process by having each household collect another 100 seedlings that would also be planted (without any support from RFLP). The village also developed a village regulation specifically prohibiting the cutting of mangrove wood with a heavy penalty of Rp. 5 million (approx USD 500) imposed for those who are caught doing so. In addition, after learning about the importance of coral reefs during the coastal



environment awareness raising sessions the village also included provisions for the protection of local coral reefs in its village regulation.



*All members of the community were involved in replanting*

## Lessons learned

- Full community commitment and involvement in every step of the process is vital. A major contributing factor to the poor success rate of previous replanting schemes was their 'stop and drop' nature. Trust must be built with communities and their understanding of the importance of mangroves enhanced.
- Good village leadership is key to success. For example, the head of Pitay village understood the needs of the people and that this initiative would have a long-term impact that may take many years to fully realize.
- Let the head of the village be the one who is talking to the community to avoid mixed messages and to improve the sense of cooperation between the villagers and their village government.
- Communities where the head of village does not attend meetings or where villagers show a lack of interest in cooperating should be dropped from any initiative as without their full backing success is unlikely.
- Incentives can be important but what is more important is that the communities themselves see and understand the benefits of replanting.
- Do not provide incentives directly to individual households as it may send the signal to villagers that to develop their village somebody from outside should pay them to do so.
- The use of local village regulations can play an important role in formalizing the need to protect mangroves, keep animals away etc. This can make a major contribution to the success of the initiative.
- People are unlikely to destroy what they have created through their own sweat. Villagers spent a lot of time and energy learning about, collecting and planting the mangroves. As a result, 'man-made' problems are unlikely.
- Local mangrove seedlings are more likely to have a better chance of survival once planted than those from areas

where the environmental conditions may be different.

- Each mangrove is planted in the plastic bag in which it has been nurtured. The use of bio-degradable materials like jute sacking would be more environmentally friendly.
- Villagers are eager to learn yet information must be provided in a manner that they can understand and digest.
- Efforts should be made to ensure the full participation of women and to include children and young people in all stages of the process.
- It is important to ensure consistent and timely support to the villagers to maintain their trust.
- Do not limit the creativity of villagers as long as what they want to do is not clearly wrong.

Marvel Ledo, the RFLP national consultant in Indonesia who coordinated the community mangrove replanting was one of 23 participants who attended an RFLP funded regional *Training of Trainers Course on Mangrove Ecosystem Health*, conducted in Preah Sihanouk province, Cambodia, 2-8 December 2011. This was delivered by trainers from the University Network for Wetland Training in the Mekong River Basin and the International Crane Foundation (ICF), Baraboo, Wisconsin, USA.

## Recommendation

The results of these pilots should be monitored further and this process replicated in areas which exhibit the right environmental and community characteristics.

### About RFLP

The Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) sets out to strengthen capacity among participating small-scale fishing communities and their supporting institutions in Cambodia, Indonesia, the Philippines, Sri Lanka, Timor-Leste and Viet Nam. By doing so the RFLP seeks to improve the livelihoods of fisher folk and their families while fostering more sustainable fisheries resources management practices. The four-year (2009 – 2013) RFLP is funded by the Kingdom of Spain and implemented by the Food and Agriculture Organization of the United Nations (FAO) working in close collaboration with the national authorities in participating countries. For more information about the Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) see [www.rflp.org](http://www.rflp.org) or contact the Regional Information Officer [Steve.needham@fao.org](mailto:Steve.needham@fao.org)