AN ASSESSMENT OF LESSONS LEARNT FROM THE "GREEN COAST PROJECT"

in Nanggroe Aceh Darussalam (NAD) Province and Nias Island, INDONESIA

(Period 2005-2008)

FINAL REPORT

Iwan Tri Cahyo Wibisono and Ita Sualia

WETLANDS INTERNATIONAL

Green Coast

For **nature** and **people**
after the tsunami

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Desember, 2008

WETLANDS INTERNATIONAL

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(Period 2005-2008)

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Preface

Tsunami yang terjadi di penghujung tahun 2004 telah menyebabkan lebih dari 200.000 korban jiwa dan menghancurkan ekosistem pesisir di Propinsi Nanggroe Aceh Darussalam (NAD) dan Pulau Nias. Selain itu, bencana ini juga bertanggung jawab atas hancurnya mata pencaharian penduduk yang tinggal di wilayah pesisir. Sehubungan akan kejadian tersebut, Wetlands International Indonesia Programme (WIIP) telah bekerjasama dengan WWF Indonesia dalam menyelenggarakan suatu proyek rehabilitasi pesisir yang dikaitkan dengan penciptaan alternatif mata pencaharian atau disebut proyek "Green Coast". Berbeda dengan proyek-proyek lainnya yang pada umumnya lebih mengarah pada berbagai pembangunan infrastruktur dan tindak darurat, Green Coast (GC) justru lebih mengarah pada upaya-upaya perbaikan ekosistem pesisir dan pemberdayaan ekonomi masyarakat yang terkena dampak Tsunami. Melalui pendekatan "Bio-rights", Green Coast memberikan kesempatan yang luas kepada masyarakat korban Tsunami (melalui kelompok atau difasilitasi oleh LSM lokal) untuk bersama-sama merealisasikan rehabilitasi ekosistem pesisi, sementara di sisi yang lain mereka juga memperoleh kesempatan untuk memperbaiki mata pencahariannya melalui pemberdayaan ekonomi. Untuk menunjang pelaksanaan kegiatan di lapangan, proyek juga melakukan upaya-upaya khusus dalam ranah kebijakan (*policy*), monitoring dan evaluasi, peningkatan kapasitas (*capacity building*) dan peningkatan kesadaran lingkungan (*awareness raising*).

Dalam pelaksanannya di lapangan, proyek dilakukan melalui dua tahap yaitu GC fase 1 (Juli 2005 – Maret 2007) dan GC fase 2 (April 2007 – Maret 2009). Setelah hampir empat tahun berjalan, proyek telah berhasil merehabilitasi sekitar seribu hektar wilayah pesisir dengan sekitar dua juta tanaman bakau (*mangrove*) dan tanaman pantai (*beach plants*). Tingginya prosentase tumbuh dari kegiatan rehabilitasi pesisir (rata-rata sekitar 65% - 85%) menunjukkan bahwa kegiatan ini terlaksana dengan baik. Dari aspek yang lain, proyek juga telah berhasil mendorong masyarakat untuk membuka peluang-peluang ekonomi dan merintis kembali kegiatan mata pencahariannya.

Meskipun demikian, dalam penyelenggaraannya, proyek juga menghadapi berbagai kendala dan faktor pembatas. Dalam tingkatan tertentu, kendala-kendala tersebut menyebabkan terganggunya kegiatan di lapangan sehingga proyek perlu bekerja keras untuk

mengatasinya. Beberapa kendala umum yang dijumpai antara lain kurangnya kesadaran masyarakat atas lingkungan, kurang matangnya perencanaan dalam kegiatan ekonomi, kurang optimalnya pemeliharaan tanaman rehabilitasi, dan konflik kepentingan. Terlepas dari hal-hal tersebut, proyek mendapatkan suatu pengalaman dan pembelajaran yang sangat penting dalam menunjang program-program serupa di masa mendatang.

.Kajian pembelajaran ini secara khusus digali dari berbagai informasi dan data-data lapangan yang terkait selama proyek berlangsung. Dengan demikian, hasil dari kajian ini diharapkan dapat menyajikan informasi yang memadai mengenai realisasi proyek

Terlepas dari berbagai kekurangan dan keterbatasannya, proyek berharap bahwa hasil dari kajian ini dapat bermanfaat bagi pihak lain, baik pemerintah maupun non pemerintah, terutama yang berkepentingan dengan program-program serupa.

Penyusun,

Bogor, Desember 2008

Glossary and Abbreviation

ADB:	Asian Development Bank
BAPPEDA:	Badan Perencanaan dan Pembangunan Daerah (Regional Planing Board)
BAPEDALDA:	Badan Pengendalian Dampak Lingkungan Daerah (Regional Environmental Impact Management Agency)
BKSDA:	Balai Konservasi Sumberdaya Alam (Natural Resources Conservation Agency)
BP-DAS:	Balai Pengelola Daerah Aliran Sungai (Watershed Management Authority)
BRR Aceh-Nias:	Badan Rehabilitasi & Rekonstruksi Aceh Nias The Agency for Reconstruction and Rehabilitation for Aceh Nias
CBO:	Community Based Organization
DAS:	Watershed
Dephut:	Departemen Kehutanan (Forestry Departement)
DKP:	Departemen Kelautan dan Perikanan (Marine and Fisheries Departement)
GC:	Green Coast
IPB:	Institut Pertanian Bogor (Bogor Agricultural University)
IUCN:	International Union for Conservation of Nature and Natural Resources
Kab.:	Kabupaten (district)
Kec.:	Kecamatan (sub district)
KK:	Kepala Keluarga (house holds)
KSM:	Kelompok Swadaya Masyarakat Community Based Organization/ CBO)

LIPI:	Lembaga Ilmu Pengetahuan Indonesia (Indonesian Institute of Sciences)
LSM:	Lembaga Swadaya Masyarakat (Non Government Organization/ NGO)
Monev:	Monitoring and evaluation
NAD:	Nanggroe Aceh Darussalam
NGO:	Non Government Organization
Panglima Laot:	traditional leader for maritime affair in Aceh Province
PHKA:	Perlindungan Hutan dan Konservasi Alam (Forest Protection and Nature Conservation)
PPI:	Pelabuhan Pendaratan Ikan (Fish Landing Place)
Prov.:	Province
SD:	Sekolah Dasar (elementary school)
SDM:	Sumber Daya Manusia (human resources)
SGM:	Small Grant Manager
SMA:	Sekolah Menengah Atas (Senior High School)
SMP:	Sekolah Menengah Pertama (Junior High School)
Sea defense:	Consultant from Netherland for reservoar construction in Teluk Pusong Lhokseumawe
Tk I:	Provincial Level
Tk II:	District Level
TPI:	Fish Auction Place
UNSYIAH:	University of Syiahkuala
WALHI:	Wahana Lingkungan Hidup
WIIP:	Wetlands International Indonesia Programme
WWF-I:	The World Wildlife Fund for Nature Indonesia

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1

Introduction

1.1. BACKGROUND

The Tsunami disaster of 26 December 2004 swept away everything along 800km of the coast of Nangroe Aceh Darusalam, causing the deaths and loss of 167 thousand people, while more than 500 thousanad others lost their homes and livelihoods. By December 2005, as many as 124 international NGOs, 430 national NGOs, tens of donor and UN organizations, a variety of Government institutions and military institutions had been recorded, together with the community, to be working on rebuilding Aceh (BRR,2005).

The first step in the reconstruction effort focused mostly on the emergency response, particularly with regard to fulfilling the victims' need for basic items such as food, clean water and general infrastructure. As conditions in the field began to improve, the emergency gradually subsided and work moved to other sectors, such as the rehabilitation of the coastal areas impacted by the Tsunami. This was undertaken by a variety of organizations, both government and non-government, through activities such as the planting of mangrove and other beach plants.

Green Coast (GC) is one among tens of coastal rehabilitation programmes in NAD Province and Nias. Funded by Oxfam Novib (Netherlands), its goal is the recovery of coastal ecosystems and livelihoods in the five countries hit by the Tsunami, i.e. India, Srilanka, Thailand, Malaysia and Indonesia. Four institutions are involved in its implementation; these are Wetlands International (WI), The World Widelife Fund for Nature (WWF), Both Ends and the International Union for the Conservation of Nature (IUCN). In Indonesia, the GC Programme is managed by Wetlands International Indonesia Programme (WI-IP) together with WWF Indonesia and was carried out in two phases. Phase one started in July 2005 and finished in March 2007, while phase two began in April 2007 and is due to finish in March 2009. The four main activities are: (1) Coastal ecosystem rehabilitation; (2) Building environmentally friendly livelihoods; (3) Drawing up of village regulations that support environmental conservation efforts; (4) Environmental education campaign.

Since the start of the project, GC has facilitated 60 local NGOs and Community Based Organizations (CBO; *Kelompok Swadaya Masyarakat*) to train and assist Tsunami victims in rehabilitating the coastal ecosystem and at the same time restoring or creating alternative livelihoods in Aceh and Nias. In order to achieve active participation by the community, the local inhabitants were involved directly in the planning, preparation, planting and nursing of the seedlings. By March 2009 no fewer than 893 ha of Aceh's and Nias' coastland had been rehabilitated through the planting of mangroves (1.6 million seedlings) and beach plants (250,000 seedlings), and the conservation of coral reef.

The community's active participation in this rehabilitation effort was rewarded in the form of collateral-free, interest-free "loans" of business capital to the CBOs involved. This fund could then be used to build alternative livelihoods. All the conditions (the CBO's rights and obligations) pertaining to the provision of the business capital tied to rehabilitation success are contained in a work contract witnessed by community leaders. In principle, the purpose of this contract is to motivate the community to maintain the highest possible survival rate of the seedlings planted in the rehabilitation activity (above a target threshold of 75%). If this target was not met, then the business loan already given would have to be repaid (proporsioannaly with the number of survival rate/SR of trees). Conversely, if the target was achieved or surpassed, then the "loan" would be converted into a grant. This approach –known as *biorights* approach- proved to be very successful, as reflected by the high survival rate.

Implementation of Green Coast activities in Aceh-Nias was assisted by an Advisory Committee (AC) comprised of one representative each from BRR, Dinas Kehutanan (Forestry Service), Bapedalda (Regional Environmental Impact Management Agency), Panglima Laot Provinsi and an adviser on social and gender issues. The Advisory Committee took part in the selection of proposals submitted to the project by the various local NGOs and CBOs, and supplied input/guidance towards improving activities in the field.

During almost four years of implementation in the field, this project faced a variety of constraints. Aside from these constraints, the project acquired much valuable experience and many valuable lessons. On this basis, an assessment is needed to identify the various experiences and lessons which can inform those parties concerned with implementing coastal rehabilitation in Indonesia.

1.2. A CLOSER LOOK AT GREEN COAST

"Green Coast" was developed as an active response to the 2004 Tsunami disaster that took hundreds of thousands of lives and caused incalculable damage to infrastructures and environments in several Asian countries. Together with WWF, IUCN and Both ENDS, Wetlands International developed a programme for coastal rehabilitation (such as mangroves, beach forest, lagoons and coral reefs) combined with alternative livelihoods development in those areas impacted by the Tsunami. (such approach, in which rehabilitation is combined with livelihoods, is known as Bio-rights, see Box 1).

The main aim of GC is to help restore the people's livelihoods and the coastal ecosystems. In Indonesia (Aceh and Nias), the programme (using a Bio-rights approach) is carried out by the local inhabitants themselves in the form of groups (each group may consists 15 – 25 individuals). As a token of appreciation in return for their rehabilitation works, they receive business capital and technical support to enable them to re-establish their livelihoods.

Figure 1. *Bio-rights programme was first developed by WI-IP at the Pesantren village, Pemalang District, Central Java in 1998. The programme has combined the re-greening of the ponds dikes and the beach (left) with livelihoods such as goat farming (right)*

Box 1:
What is Bio-rights?

*Bio-rights is an innovative financing mechanism targeted at reconciling poverty alleviation and environmental conservation. Through provision of micro-credits for sustainable development, the approach supports local communities to refrain from unsustainable practices and to actively involve in conservation and rehabilitation of the environment. Micro-credits are converted into definitive payments upon successful delivery of conservation services after termination of a contracting period. Being an integration of market-driven instruments and more traditional conservation and development measures, Bio-rights offers a novel approach in which global stakeholders pay local communities for the provision of ecosystem services such as carbon sequestration, fresh water supply and biodiversity. As such, the approach unites the conservation and development aspirations of NGOs, governments, private sector and local communities alike. Projects in the field have demonstrated that Bio-rights can serve as a powerful tool towards addressing the major environmental challenges of our age including climate change and biodiversity loss. In the light of major efforts in relation to REDD (*Reducing Emissions from Deforestation and Degradation*) development and the Millennium Development Goals (MDGs), Bio-rights offers huge potential for translating global objectives into concrete action.*

Unlike many other coastal rehabilitation projects in Nanggroe Aceh Darussalam (NAD) province, this project adopts one principle, which is that the rehabilitation and management of coastal ecosystems should actively involve the community in enriching the biodiversity and improving/building the livelihoods of coastal communities. There are three inter-related main components in its management, which are: **1) Environment and social-economy Assessment**, **2) Community Based Rehabilitation of Coastal Ecosystems and Livelihoods through the Small Grant Facility**, and **3) Policy Development.** These are explained in more detail below.

a. Environment and social-economy Assessment

The Environment and social-economy assessment is a technical assessment of various aspects of the Tsunami's impact relevant to the coastal ecosystem rehabilitation to be done. Specifically, it encompasses an evaluation of the Tsunami's impact on the environment, identification of the types of wetland impacted, assessment and analysis of the potential/ prospects for the ecosystem rehabilitation programme. Besides this, the assessment also collects other information concerning the constraints and limiting factors related to the implementation of coastal rehabilitation. As the community is both the target and the main actor, this assessment also covers economic, social and cultural matters. Thus, the pattern of empowerment and the form of community partnership in the programme can be determined appropriately. The role of women (gender issues) also receives attention in the assessment. The themes discussed focus on the role of women in ecosystem management, preferred types of livelihoods, and roles in decision making.

The assessment team comprised an ecologist, economist, rehabilitation specialist, sylviculture specialist, soil scientist, biodiversity specialist, and limnologist. Besides carrying out a comprehensive technical assessment, the team also recommended various options for undertaking coastal rehabilitation and livelihood improvement.

In detail, this assessment provides basic information on many issues: What was the condition of the environment before the Tsunami? At which sites has the coastal ecosystem been destroyed or damaged? What do the people affected by its impact need? What is the local community's attitude towards coastal ecosysytem rehabilitation? What are the community's rights in coastal rehabilitation (what benefit can the community get from coastal rehabilitation)? Is it possible to rehabilitate or start up livelihoods? What options can be provided in coastal rehabilitaion? How can livelihoods be restored without damaging nature or the environment?

Conducting an assessment also means talking with the community and discussing rehabilitation activities with local decision makers. What do they need? How can their knowledge of coastal rehabilitation be utilised? What are their ideas about the recovery of livelihoods? How can they benefit from coastal rehabilitation?

A comprehensive assessment is always conducted at the beginning of an activity, prior to activity in the field. In this case it was conducted twice: first in August – December 2005 (under **Green coast 1**) and then August – November 2007 (under **Green coast 2**). Further information on these can be found in the next chapter.

b. Community Based Rehabilitation of Coastal Ecosystems and Livelihoods through the Small Grant Facility

As the Tsunami not only devastated coastal ecosystems but also ruined people's livelihoods, GC took the approach that community involvement and empowerment was the key to success in the rehabilitation of coastal ecosystems and livelihoods. The implementation and management of this were carried out by WI-IP.

The "bio-rights" approach to the community based rehabilitation of coastal ecosystems and recovery of livelihoods was applied through the facilitation of small grants. Coastal rehabilitation was combined with economic empowerment. With this approach, the community received business capital to start or revive a livelihood. In return, they had to give their services to the environment by undertaking coastal rehabilitation. [*Explanation regarding Bio-Rights can be read in the " Eijk, P. van & R. Kumar, 2008. Bio-rights in theory and practice. A financing mechanism for poverty alleviation and environmental conservation. Wetlands International, Wageningen, the Netherlands*].

The mechanism for this was to provide capital loans to those members of the community prepared to take part in rehabilitating the coastal ecosystem. If their efforts were judged successful, in that at least 75% of the trees were still living after one year, then the loan would be converted into a grant. If fewer than 75% survived, then part of the loan would have to be repaid, equivalent to the proportion of trees that had died. This approach also raised the community's sense of responsibility towards the rehabilitation work they were doing.

c. Policy Development

One of the missions within this component was to convince and encourage the government, donor institutions, the private sector and various other parties involved in carrying out environmentally friendly reconstruction. The rebuilding of Aceh is expected to bring as much benefit as possible to the coastal communities. More, it can also provide momentum for rebuilding better than before. Of course, this can only be done if rebuilding is carried out conscientiously, takes into account all related aspects and is supported by clear, appropriate policies. In this context, development and guidance on policy is needed.

Development and guidance (facilitation, giving input and support throughout the process of formulation) were needed in order to direct policy towards environmentally friendly or "green" reconstruction. This component specifically influenced policy on coastal resources management at district, provincial and national levels.

The development and supervision of policy was done through dialogue with government and a number of institutions involved in coastal rehabilitation. It was also supported by sustained communication through a variety of media, to promote the "Green Reconstruction Guidelines" and other guidelines to encourage sustainable coastal reconstruction. Communication was directed mainly at raising community awareness of the importance of coastal resources.

Activities connected with policy were implemented by WWF in coordination with WI-IP and other relevant parties. In certain matters, WI-IP provided technical assistance to support the development of policy.

Besides the three main components above, the project also included measures to support activities in the field. **Monitoring and evaluation (monev)** was conducted periodically by project management with the assistance of a technical monev team to monitor developments and the implementation of the project in the field. To improve the capabilities and technical capacities needed by the community and the local partner (NGO) for the rehabilitation work and for economic empowerment, the project provided training, exchange visits and comparative studies to coastal areas in Aceh (even to Java) packaged within a **Capacity Building** component. Another target was to raise community awareness through the **Awareness Raising** component. A range of awareness materials such as leaflets, posters, booklets were produced and an environmental campaign conducted. The **Communication and Networking** component dealt specifically with coordination and communication between project management and their partners in the field, as well as parties outside the project.

1.3. AIMS AND OBJECTIVES OF THE ASSESSMENT OF LESSONS LEARNT

The aims and objectives of assessing lessons learnt from the implementation of this project are as follows:

1. To supply sufficient general information concerning the project, including its concept, approach, aims, objectives and target.
2. To obtain data and information related to implementation throughout the duration of the project
3. To document the processes applied during implementation in the field
4. To identify the stakeholders and their individual roles in project implementation in the field
5. To identify the constraints, challenges and obstacles in project implementation
6. To summarise experience acquired during project implementation both from management and from the local partner in the field
7. To summarise valuable lessons obtained during project implementation
8. Make recommendations and suggestions for improved project management in the future.

2

Realization and Achievements of Green Coast 1

At the start of Green Coast project phase 1 (GC 1: July 2005 – March 2007), a comprehensive (bio-physic & social -economy) assessment was carried out by the assessment team along the coasts of Aceh and Nias Island that had been impacted by the Tsunami. Its purpose was to bring to light a variety of data and information from the field as a basis upon which to develop options that could be applied in the project. This comprehensive assessment was one of the main components of GC 1.

The information and options derived from this assessment formed the basic wherewithal for proceeding to the next component "the rehabilitation of coastal ecosystems and livelihoods through small grants". In this regard, a unique approach was taken, subsequently termed "Bio-right". This approach enabled the community (through groups or facilitated by a local NGO) to participate in ecosystem rehabilitation and at the same time have the opportunity to rebuild their livelihood through the "small grant" facility. A detailed explanation of the Bio-right approach is given in a separate chapter.

To optimize results in the field, the project paid special attention to the local partners, by providing technical training, awareness raising and conducting regular monev. To ensure that the rehabilitation and reconstruction currently in progress in NAD Province and Nias Island (both within GC and without) continued to be carried out, the project made special efforts which were accommodated in the policy development component. This represented the project's commitment to continuous, environmentally oriented reconstruction and rehabilitation. Besides developing several policy documents, the project also facilitated the formation of a network of local NGOs and was active in holding a variety of discussions.

2.1. COMPREHENSIVE ASSESSMENT (AUGUST – DECEMBER 2005)

The assessment was made in the area impacted by the Tsunami disaster, which covered most of the coast of NAD (east, north and west coasts), Simeleue island and Nias island in North Sumatera province. For the purposes of the assessment, this was divided into six (6) regions, as follows:

- Region I: the villages (Desa) Alus-alus and Labuhan Bakti in the Teupah Selatan Sub-district of Simeulue District
- Region II: Desa Cot Rambong, Kuala Trang and Kuala Tuha in Kuala Sub-district of Nagan Raya District, Desa Pucok Lueng and Lhok Bubon in Samatiga Sub-district, all in Aceh Barat District
- Region III: Desa Lham Dingin and Desa Tibang in the Syiah Kuala Sub-district of Banda Aceh urban district; Desa Neheun and Desa Lham Nga in the Darussalam Sub-district of Aceh Besar District.
- Region IV: Desa Moawö, Desa Siheneasi and Desa Lahewa in Lahewa Sub-district, and Desa Onolimbu in Sub-district Boawolato Sub-district, all in Nias District.
- Region V: Desa Pasi Rawa and Desa Pasi Peukan Baro in Kota Sigli Sub-district and Desa Kupula in Simpang Tiga Sub-district, all in Pidie District.
- Region VI: two (2) districts/urban districts, which are: Kota Lhokseumawe urban district, Sub-district Sub-district Muara Dua, covering two villages (Desa Menasah Mee and Desa Cut Mamplam); and Aceh Utara District with four (4) sub-districts covering twelve villages.

Figure 2. *Sites for comprehensive assessment for* ***"Green Coast"***

This assessment took four (4) months from August to December 2005 and was done in 4 stages as follows:

- Stage I, from 30 August to 27 September 2005, encompassing regions I to IV
- Stage II, from 22 December 2005 to 6 January 2006, to recheck and make an additional survey of the lagoon in Regions II and III
- Stage III, 24-25 September 2005, conducted by the CPSG (Campus Professional and Scientific Group) team for the sites within region V, Kabupaten Pidie district
- Stage IV, 19-22 December 2005, covering Region VI (conducted by the Survey Team from Unsyah, with technical support from WI-IP) for the sites in Kota Lhokseumawe urban district and Kabupaten Aceh Utara district.

In this assessment, the team collected a variety of data and field findings, and researched the potentials and other information relevant to the project. Based on the results of this assessment, the team submitted their input and recommendations to the project manager for the purpose of accomplishing activities in the field. Below are several important points made as a result of the comprehensive assessment:

a. Identification of wetlands impacted by the Tsunami

A large part of NAD's wetlands were severely damaged. In Banda Aceh and Aceh Besar, almost all the coastal ponds (*tambak*) were so badly ruined that they could not be made to function again. The mangrove forest in that area suffered the same fate. On NAD's west coast, the wetlands impacted by the Tsunami were lagoons, swamp forests, rice-fields and peat land/forest.

b. Changes to the coastal landscape

The earthquake followed by the Tsunami changed the landscape of Aceh's west coast and the islands of Simeulue, Banyak and Nias as a result of the up and down movement of the Earth's crust. Along the west coast of Aceh almost the entire coastline experienced subsidence with the result that the sea advanced inland up to 200 metres. Meanwhile, on the south coast of Pulau Simeulue island the coastline was uplifted, thereby raising the coral reef which then died as a result. A similar thing happened to Nias island, where the north coast was uplifted and the south subsided. The illustration below shows the alterations to the landscape in NAD province and Nias caused by the earthquake/Tsunami.

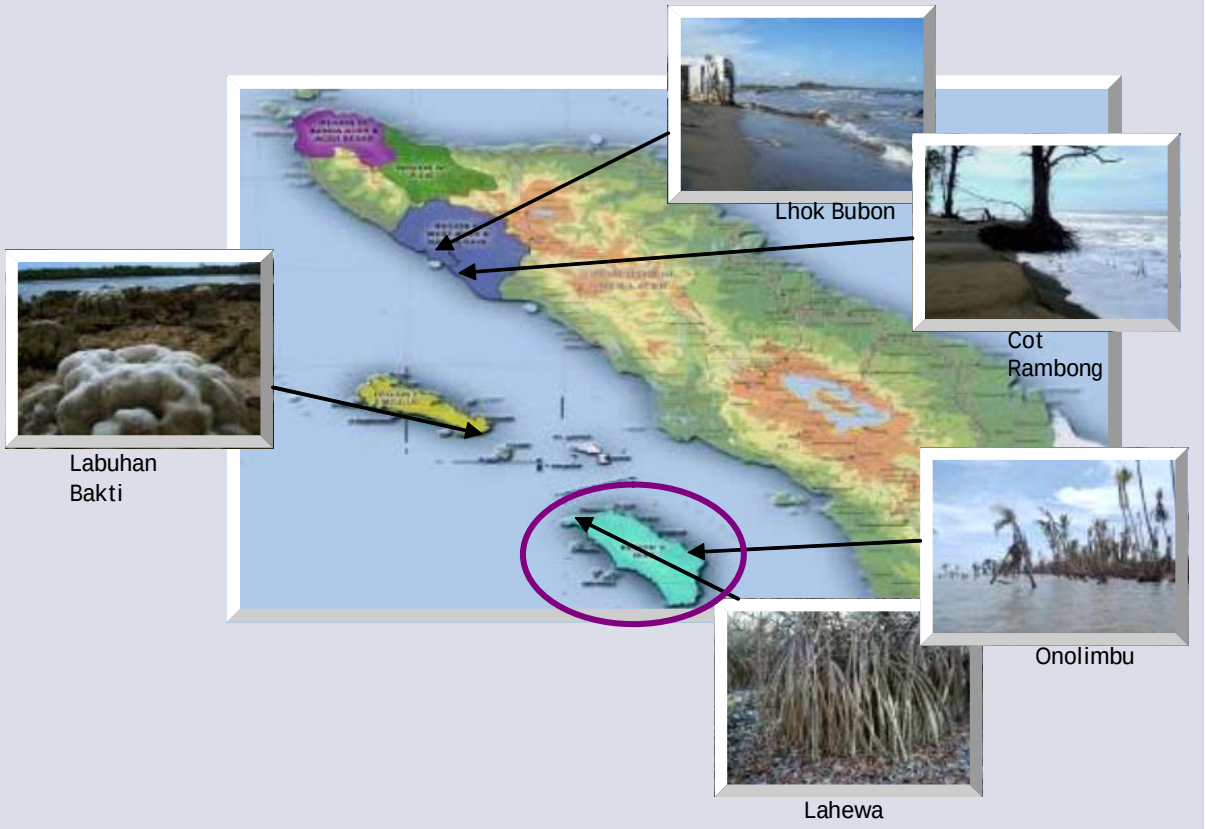


Figure 3. *Changes to the coastal landscape in NAD province and Nias as a result of the earthquake and Tsunami*

The main issues arising from these changes to the coastal landscape changes are as follow:

- The loss of mainland also means the loss of people's land, and the process of acquiring a new site as a replacement is not easy. This issue received full attention as it was a problem that GC would have to face.
- As regards land availability, this loss of terrain also means a reduction in the amount of potential land for rehabilitation as well as livelihood development activities.
- Uplifting has increased the area of raised coastland. Field observation shows that this appearance of new lands has potential to cause conflict of interests considering that there is as yet no clarification of its ownership status or use. This is also a matter requiring attention in order to prevent future problems.
- From the viewpoint of pedogenesis, this newly emerged land is still at an early stage of soil formation on the coral reef flats exposed. The question of land suitability, both physical and chemical, will therefore be a significant constraint.

c. Identification of rehabilitation options for sites impacted by the Tsunami

In this assessment, the team identified a variety of prospective sites for rehabilitation with mangrove or beach plants. In Banda Aceh, Aceh Besar, Aceh Jaya, Nagan Raya and Aceh Barat, the coasts had been especially severely devastated by the direct impact of the Tsunami, whereas in Lhokseumawe and Bireun the impact had been much lighter. In Nias and Simeulue islands, however, the Tsunami had not been felt so much. On these two islands, it was land subsidence and uplifting that had caused the most damage to the coast. To identify options and sites for rehabilitation, the team carried out an in depth analysis and evaluation of the land's carrying capacity at several locations impacted by the Tsunami. Based on this evaluation, the team identified the following options for rehabilitation:

- **Planting mangrove**

  This aimed to repair the mangrove forest degraded by the Tsunami, as well as several other areas suited to mangrove. The activity would comprise intensive planting and enrichment planting. Intensive planting was the alternative for rehabilitating truly devastated areas (where most of the vegetation had been lost or killed) the condition of whose substrate and hydrology was, nevertheless, suitable for mangrove. Thus, mangrove would once again grow in these areas. Enrichment planting was intended for locations where damage had been light and part of the mangrove stand still remained but biodiversity was poor.

  Prospective sites for planting mangrove were:

  - Degraded mangrove lands
  - Ruined and abandoned *tambak* pond lands
  - Riversides
  - Along water channels/canals
  - Mudflat areas and river estuaries

- **Rehabilitation of sandy beaches**

  Rehabilitation of sandy beaches was by planting species of beach plants wherever possible. Nevertheless, not all parts of the beach possessed good prospects for rehabilitation. Particular sites to avoid included sandbanks and beaches periodically submerged by seawater. Rehabilitation is best done on beaches that are stable. Two types of location recommended for rehabilitation were:

  - Pes-capreae formations indicated by pioneer vegetation cover such as Katang-Katang (*Ipomea Pes-capreae*) and Kacang Laut *(Canavalia marina)*.
  - Barringtonia formations characterised by more diverse cover, not just pioneer herbs but also several tree species, in particular Putat (*Barringtonia asiatica*), Ketapang (*Terminalia cattapa*) and Nyamplung (*Callophyllum inophyllum*).

- Regreening around the village includes roadsides, empty public lands, and gardens. Species to be planted should be Multi Purpose Tree Species (MPTS) or others such as Candlenut/Kemiri (*Aleurites moluccana*), Belimbing Wuluh (*Averhoea bilimbi*) and Mango (*Mangifera indica*). Besides these, planting can also be directed towards species with specific aesthetic and shading functions such as Mahoni (*Swietenia mahagony*) and Ara (*Ficus spp*).

d. Options for economic activities

During the field survey, the team made an inventory of the range of economic activities pursued by the community prior to the Tsunami and evaluated the Tsunami's impact on various types of livelihood. By combining livelihood history, prevalent conditions in the field, constraints and opportunities in the future, the team then formulated several options or recommendations for the types of livelihood that could be developed, including: fish farming, fish capture, small businesses (fish trading, etc.), animal husbandry, poultry farming, and small enterprises. Nevertheless, decisions on the choice of livelihood must be in accordance with the community's needs, capabilities and willlingness.

2.2. COMMUNITY BASED REHABILITATION OF COASTAL ECOSYSTEMS AND LIVELIHOODS THROUGH SMALL GRANTS

The GC 1 project, which was the first phase, required several months for socialisation and coordination with stakeholders in Aceh, which included identifying and achieving cooperation with potential local partners. More thorough socialisation was carried out to ensure that the prospective local partners truly understood the Bio-right concept. Project management took this opportunity to give them (local NGOs, CBOs, and the public) the chance to develop proposals for activities which combined coastal rehabilitation and livelihoods with the Bio-right approach. The following are some of the main criteria required in proposals developed by local partners.

- The proposed site should be Tsunami-damaged coastal wetland in the NAD-Nias region
- The ecosystem rehabilitation activity proposed must combine ecosystem rehabilitation with livelihood building
- The project does not fund ecosystem rehabilitation done through physical construction
- The project does not fund livelihood building whose implementation is not environmentally friendly and is based directly on natural resources
- The institution has good credibility and strong motivation in community empowernment
- The maximum time limit for the proposed activity is one and a half years with a maximum budget of ± Rp 500 million or • 50,000. In this regard, the project specifically divides the Small Grant fund into three categories: type A: d" • 5,000, type B: • 5,000 - • 15,000, type C: • 15,000 - • 50,000. (at that time 1 • was equal to Rp 10,000)

The proposal selection process was in three stages: 1) submission of proposals to the GC project management; 2) evaluation of proposals; and 3) decision making. To ensure transparency and professionalism in the selection of proposals, the project formed an advisory committee made up of representatives from elements/institutions/organisations concerned with reconstruction and rehabilitation in NAD, who were: BRR, Panglima Laot of Aceh Province, national NGO (WALHI), Regional Environmental Impact Control Board (Bapedalda), Provincial Forestry Agency and adviser from women and gender organization.

The selection was conducted in four waves. The project finally approved 59 proposals comprising 14 proposals of type A, 41 of type B and 4 of type C, distributed through districts in NAD Province (Nagan Raya, Aceh Barat, Simeulue, Sabang, Banda Aceh, Aceh Besar, Pidie, Bireun, Lhokseumawe, Aceh Utara), Nias and Nias Selatan. In total the approved proposals involved 50 local partners, comprising 39 local NGOs (LSMs) and 11 Community Groups (CBOs). These local partners were scattered through 12 Districts/Urban Districts in NAD province and Nias-Sumatera Utara. In all, the number of rehabilitation activities carried out by local partners in the field totalled 59 (note: there was 1 local partner managed more than 1 site). The greatest concentration of rehabilitation activities was on the north coast of Aceh, which numbered 22 and absorbed 45% of the total funding.

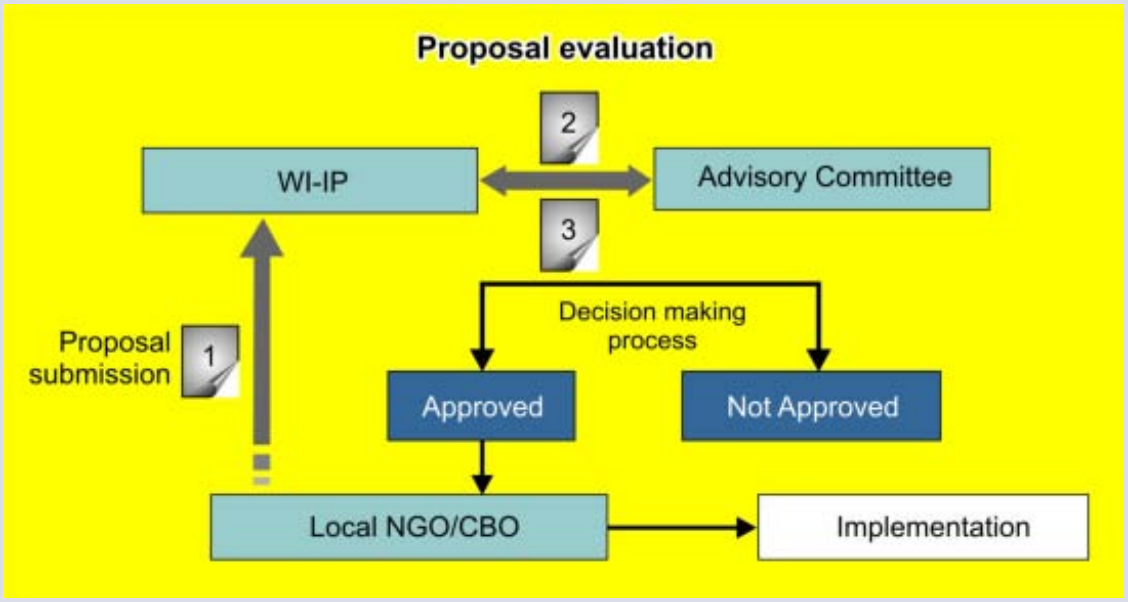


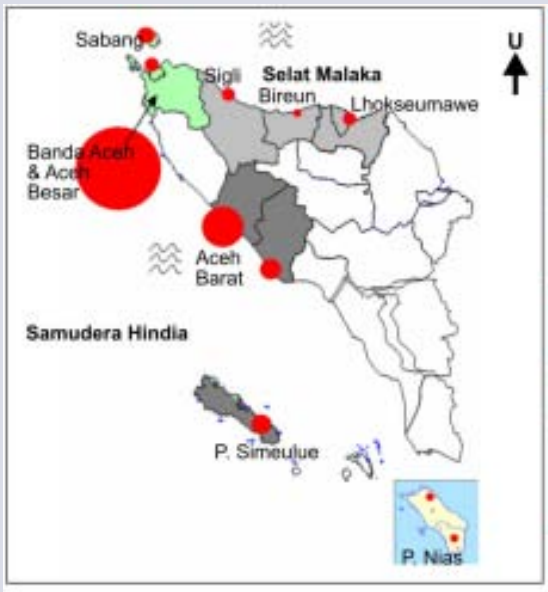
Figure 4. *Flow chart showing the proposal selection mechanism from submission to approval*

Table 1. Summary of proposal selection process; numbers submitted and numbers approved in Green Coast 1

Category	Wave 1		Wave 2		Wave 3		Wave 4		TOTAL	
	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved
Type A (< IDR 5 million)	15	9	2	1	8	4	0	-	25	14
Tipe B (IDR 50<X< 150 million)	9	6	29	21	12	6	8	8	58	41
Tipe C (IDR 150<X< 500 million)	0	0	12	2	7	1	1	1	20	4
TOTAL	24	15	43	24	27	11	7	9	103	59

a. Realisation and achievements of GC 1 – an overview

The largest volume of activities was on the north coast of Aceh, where there were 22 activities with a total allocation of IDR 3,756,000,000. Ranking second and third by volume were Aceh's west coast (12 activities, fund allocation IDR 1,726,000,000) and east coast (10 activities, fund allocation IDR 1,330,000,000). On Pulau Simuelue island there were 6 activities with total fund allocation of IDR 470,000,000. The smallest volume was on Nias island with 4 activities and an allocation of IDR 380,000,000.



Stretch and Number of Activities	Fund allocation (Rp)
1. Simeulue (6)	470,000,000
2. West Coast (12): Nagan Raya & Aceh Barat	1,726,000,000
3. North Coast (2): Sabang, Banda Aceh, Aceh Besar	3,756,000,000
4. East Coast (10): Pidie, Bireun, Aceh Utara, Lhokseumawe	1,330,000,000
5. Nias (4): Nias, Nias Selatan	380,000,000
6. Activities at Provincial level (capacity building, technical support & environmental awareness programme	772,650,000
Total (59)	8,434,650,000

***Figure 5**. Map showing distribution of activities under Green Coast phase 1 (area of red circles indicates number and volume of activities in each region) and the table (right) showing the total amount of fund distributed in each region (in iDR)*

The total fund distributed by GC 1 in field activities was IDR 8.43 billion. Of this, IDR 5.11 billion was used to realise the coastal rehabilitation programme, and IDR 2.56 billion to run the economic empowerment programmes. The remaining IDR 0.77 billlion was used to support capacity building and awareness raising activities.

The funds were distributed to the local partners in each stretch to achieve the target set. The size of the fund in each stretch was strongly influenced by the number of local partners involved and the condition/potential of the coast to be rehabilitated. As shown in Table 2, the funding required for ecosystem rehabilitation was greater than for livelihood activities.

Table 2. Distribution and allocation of funds for each stretch

Stretch	Total (million rupah)	Livelihood	Rehabilitation
1. Simeulue	470	180	290
2. West Coast (Aceh Barat, Nagan Raya)	1.726	640	1.086
3. North Coast (Banda Aceh, Sabang, Aceh Besar)	3.756	1.191	2.565
4. East Coast (Pidie, Bireun, Aceh Utara, Lhoksemawe)	1.330	440	890
5. Nias	380	105	275
Other: Capacity building and environmental awareness raising programmes	772	-	-
Total	8.434	2.556	5.106

From the table above, it can be seen that the rehabilitation component required a larger portion of the funds compared to livelihood. The north coast absorbed the most funds (total IDR 3.75 billions) for both ecosystem rehabilitation (IDR 2.56 billion) and livelihood building (IDR 1.9 billion), while Nias absorbed the least: total IDR 0.38 billion with IDR 0.275 billion for rehabilitation and IDR 0.105 billion for livelihood building. The diagram below compares the budget for livelihood and rehabilitation activities for each stretch, in percentages.

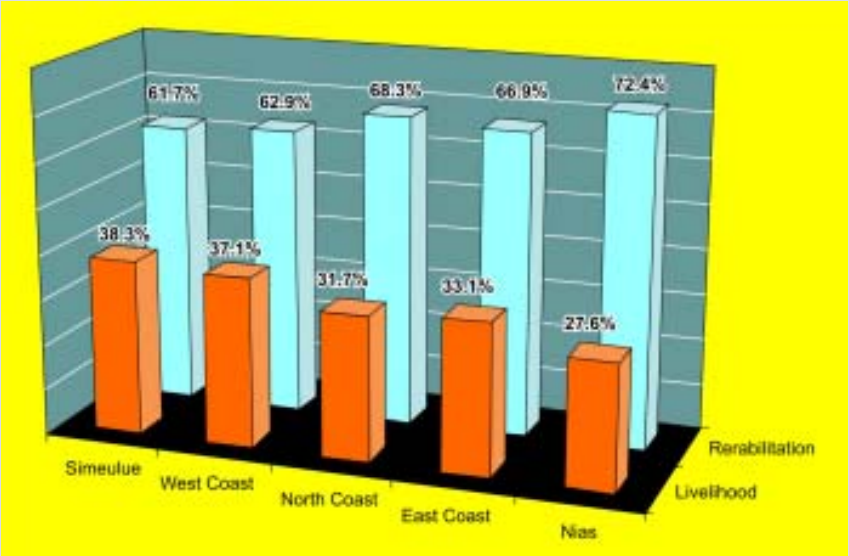


Figure 6. *Percentage allocation of funds for each stretch*

The allocation is larger for ecosystem rehabilitation than for livelihood building because of the outlay required at each stage of rehabilitation, such as the costs of supplying seedlings, purchasing materials, transportation, labour, planting, fencing the plants and nursing them. For livelihood building, the allocated funds were managed directly by the group, through an internal mechanism thus enabling the members to manage the funds themselves for their own economic activity.

To support implementation in the field, the project management undertook coordination at provincial and district levels by supplying routine information on activity developments to BRR, provincial government (Pemda Tingkat I), district government (Pemda Tingkat II) and relevant government offices, in particular the district Regional Environmental Impact Management Agency (Bappedalda Kabupaten/Kota). Project management also asked the local partners to coordinate/ communicate in a similar way with the regional government in their own work area.

b. Realisation and achievements of coastal ecosystem rehabilitation activities

- **Volume of activities**

The main form of coastal rehabilitation undertaken in the field was the planting of mangrove (see table 4) and beach plants (see table 5) like Coconut (*Cocos nucifera*), Sea-pine (*Casuarina equisetifolia*), Nyamplung (*Callophyllum inophyllum*) and Ketapang (*Terminalia cattapa*). Other forms of rehabilitation were also found, such as the designation of Marine Protected Areas (Daerah Perlindungan Laut) and facilitation of the drawing up of Rural Regulations (Peraturan Desa) to protect coastal areas.

From the 59 activities implemented in Aceh and Nias during the period of GC 1, overall the project succeeded in rehabilitating a total area of 638 hectares. Of this, 206 hectares were planted with 1,004,000 mangrove seedlings and 394 hectares with 187,600 seedlings of other assorted species. In addition to planting, the local partner in Sabang also developed a policy that gave protection to 38 hectares of marine and coastal ecosystems.

Table 3. Summary of activities realised under **Green Coast 1**

Stretch	Area rehabilitated/protected						
	Mangroves		Beach plants		Area protected	Total	
	Seedlings	ha	Seedlings	ha	Ha	Seedlings	ha
1. Simeulue	68,000	14	21,500	35	-	89,500	49
2. West Coast (Aceh Barat, Nagan Raya)	60,000	12	87,500	177	-	147,500	189
3. North Coast (Banda Aceh, Sabang, Aceh Besar)	501,000	105	66,300	152	38	567,300	295
4. East Coast (Pidie, Bireun, Aceh Utara, Lhoksemawe)	275,000	55	11,300	28	-	286,300	83
5. Nias	100,000	20	1,000	2	-	101,000	22
Total	1,004,000	206	187,600	394	38	1,191,600	638

Details of mangrove planting

The largest planting of mangrove in GC 1 was on the north coast of Aceh, where 105 hectares were planted with 501,000 mangrove seedlings, constituting almost half of the total project volume for this activity. On Aceh's east coast, 55 hectares were planted with 275,000 seedlings. On Nias island, the local partner succeeded in planting 100,000 mangrove seedlings on an area of 20 hectares. On Simuelue island and the west coast of Aceh respectively, planting was successfully carried out on 14 hectares (68,000 seedlings) and 12 hectares (60,000 seedlings).

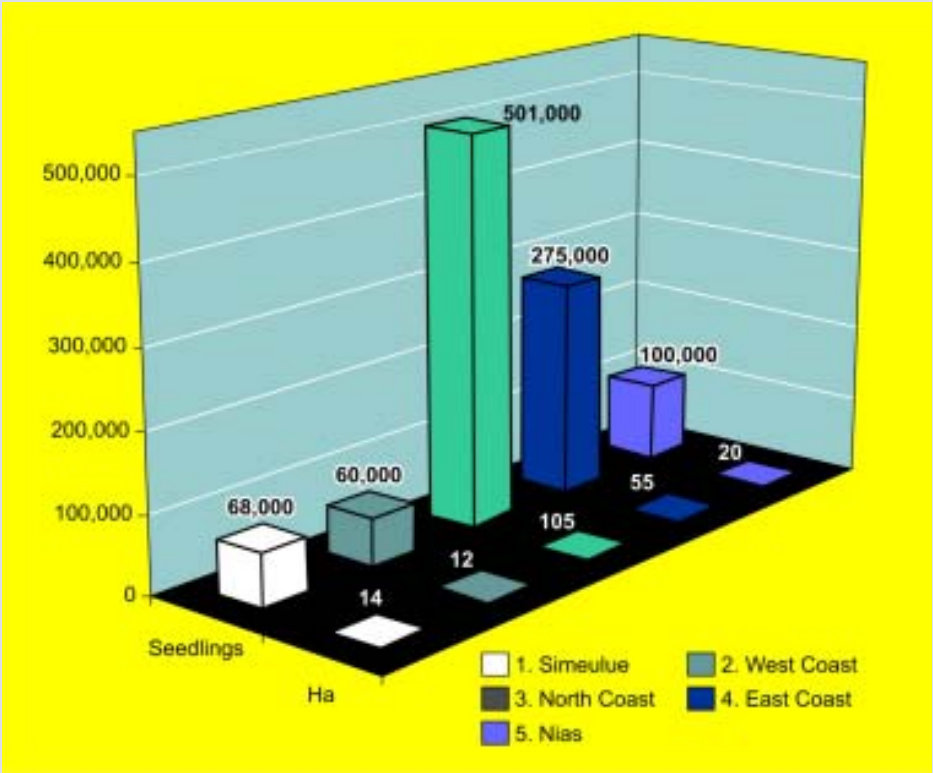


Figure 7. *Mangrove planting achieved (area, number of seedlings) during the period of GC 1*

The data above indicates a strong/close relationship between the volume of mangrove planting and the availability of land as well as the environmental carrying capacity in each region. The volume on Aceh's north and east coasts is higher because both sites possess muddy shores and extensive *tambak* pond lands. In contrast, Aceh's west coast is dominated by wide sandy shores and only a very small area is suitable for mangrove.

Most of the mangroves planted were of the species *Rhizophora mucronata*. This species was chosen because:

- The propagules are easy to obtain
- It is cheap
- It is easy to handle
- The chances of it growing successfully (survival rate) are high

A few local partners and villagers also had experience of planting two other species of Rhizophora (*Rh. apiculata* and *Rh. stylosa*) and some other species of mangrove such as *Bruguiera gymnorrizha*, *Ceriops spp*., *Avicennia spp*, *Xylocarpus spp*, and *Sonneratia spp,* even though this had been in very limited numbers. The following Table lists species of mangrove planted in the field during GC 1.

Table 4. Mangrove species planted during Green Coast 1

No	Local name	Scientific name	Family	Abundance
1	Bakau kecil	*Rhizophora apiculata*	Rhizophoraceae	++
2	Bakau kecil (banci)	*Rhizophora stylosa*	Rhizophoraceae	+++
3	Bakau besar	*Rhizophora mucronata*	Rhizophoraceae	+++++
4	Tancang	*Bruguiera gymnorrhiza*	Rhizophoraceae	+
5	Bogem	*Sonneratia sp*	Sonneratiaceae	+
6	Api-api	*Avicennia sp*	Avicenniaceae	+
7	Buta-buta	*Excoecaria agallocha*	*Euphorbiacae*	+
8	Tingi	*Ceriops sp*	Rhizophoraceae	+

Planting of beach plants

The largest volume of sandy beach rehabilitation achieved was on the west coast of Aceh, where 177 hectares were planted with 75,500 seedlings. On the north coast, 152 hectares were planted with 66,300 seedlings. On Simeulue island, the local partner succeeded in planting 21,500 seedlings over an area of 35 hectares. On Aceh's east coast and Nias island respectively, planting was achieved on 28 hectares (11,300 seedlings) and 2 hectares (1,000 seedlings). In general, these beach plants were spaced well apart at a distance of 3m x 5m or 5m x 5m.

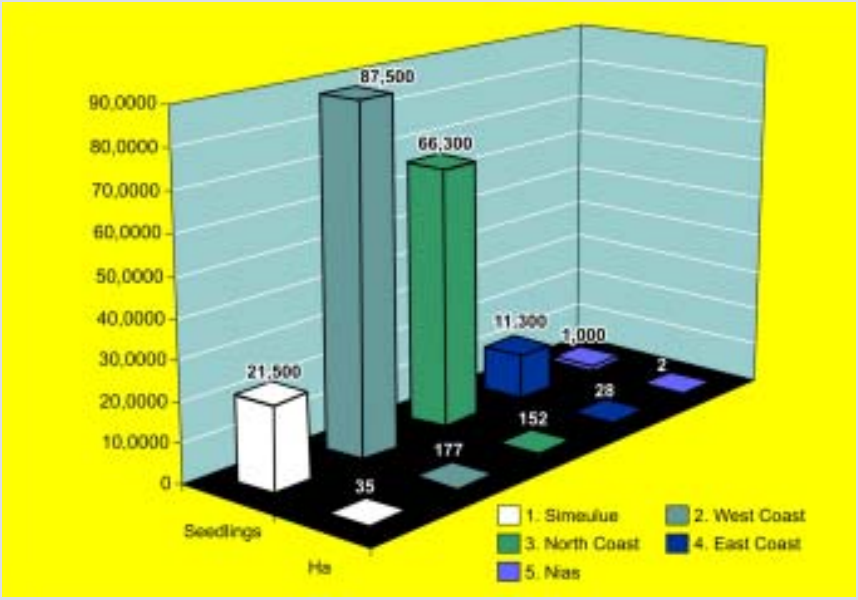


Figure 8. *Beach plant planting achieved (area, number of seedlings) during the period of GC 1*

The species most frequently chosen by the local partners for sandy beach rehabilitation was the sea-pine Cemara Laut (*Casuarina equisetifolia*) because of its high resistance to open beach conditions, even in quite extreme conditions. Ketapang (*Terminalia cattapa*) and Nyamplung (*Callophylum inophyllum*) were also widely planted because of their pioneer characteristics, ranking as second choice after Cemara Laut. In addition to these species, the local people are very familiar with Kuda-Kuda (*Lannea caromondalica*) as it is easy to grow from simple stem cuttings

Table 5. Species of beach plants commonly planted on the beach

No	Local name	Scientific name	Family
1	Cemara laut	*Cauarina equisetifolia*	Casuarinace
2	Kelapa	*Cocos nucifera*	Arecaceae
3	Ketapang	*Terminalia catappa*	Combretaceae
4	Bintaro	*Carbera menghas*	Aponynaceae
5	Mimba	*Azaracta indica*	Meliaceae
6	Pandan Laut	*Pandanus tectorius*	Pandanaceae
7	Waru	*Hibiscus tiliaceus*	Malvaceae
8	Sukun	*Arthocarpus communis*	Moraceae
9	Beringin laut	*Ficus retusa*	Moraceae
10	Bayur laut	*Heritieria littoralis*	Sterculiaceae
11	Putat laut	*Baringtonia asiatica*	Lecythidaceae
12	Ulim	*Eusideroxylon zwageri*	Lauraceae
13	Beringin	*Ficus benyamina*	Moraceae
14	Bunot	*Calophyllum inophylum*	Guttiferae
15	Pinang	*Areca catechu*	Arecaceae
16	Asam jawa	*Tamarindus indica*	Fabaceae
17	Jamlam/ Juwet	*Eugina cumini*	Myrtaceae
18	Bambu	*Bambusa sp*	Poaceae
19	Kuda-kuda	*Lannea coramondalica*	Anacardiaceae
20	Rambutan	*Nephelium lapaceum*	Sapindaceae
21	Mangga	*Mangifera indica*	Anacardiaceae
22	Coklat	*Theobroma cacao*	Sterculiaceae
23	Nangka	*Artocarpus heterophyllus*	Moraceae

- **Plant survival rate**

The success of the rehabilitation activities in this project is indicated by the percentage growing (survival rate) in the field during the project period. This figure compares the number of surviving seedlings with the total number planted in the field. This percentage was calculated after counts were taken of the plants during monitoring and evaluation.

From field observations, it can be seen that the percentage survival rate varied from one location to another, ranging from 30% to 99%. Collective data analysis indicated that the overall average survival rate for mangrove seedlings was relatively high at 74.3%, with a slightly lower rate of 73.3% for beach plants. These values were calculated by the technical team on the basis of Monev conducted at the end of the GC 1 project, in February 2007. The table below lists the percentage survival rates derived from the technical team's monitoring.

Table 6. Percentage survival rates from rehabilitation activities during GC 1

No	Stretch /Local partners	% Survival	
		Mangroves	Beach plants
A	Simeulue		
1	Yayasan Bangkit Simeulue (YBS), Simeulue	-	70
2	Kelompok Tani Alafan Bahari, Simeulue	-	70
3	Kelompok Tani Pantai Sibinuang	-	70
4	Yayasan Manjago Vano, Simeulue	70	
5	Yayasan Simeulue Lestari	-	20
6	Kelompok Tani Penghijauan Pantai Samotalindungi	70	
B	West Coast		
7	Pusat Pengembangan Potensi Pesisir dan Lautan, P4L, Meulaboh	-	75
8	Forum Komunikasi Generasi Muda Aceh Barat, FK-GEMAB, Meulaboh	-	75
9	Yayasan Peduli Lingkungan, YPL, Meulaboh	-	90
10	Yayasan Pekat Indonesia (Pekat), Nagan Raya	-	75
11	Lembaga Ekonomi Masyarakat (LEM) Maju Bersama , Aceh Barat	-	95
12	Lembaga Ekonomi Masyarakat (LEM), Suak Seukee, Aceh Barat	-	75
13	Lembaga Ekonomi Masyarakat (LEM) Ingin Makmur, Aceh Barat	-	90
14	Aceh Partnership Foundation, APF, Banda Aceh	-	75
15	Yayasan Pembela Petani dan Nelayan (PAPAN), Meulaboh	20	20
16	JIKMTs Kecamatan Kuala Kabupupaten Nagan Raya	-	92
17	LEM Karya Mandiri Desa Suak Panteubreuh Kec. Samatiga Kab. Aceh Barat	-	95
18	LEM Karya Tabina Desa Kampong Cot Kecamatan Samatiga Kabupaten Aceh Barat	-	95
19	Yayasan Gajah Sumatera (YaGaSu), Banda Aceh	90	-

No	Stretch/ /Local partners	% Survival	
		Mangroves	Beach plants
C	North Coast		
20	UKM MIPRO Fakultas Kedokteran Hewan Unsyiah	*50*	*75*
21	Yayasan Gajah Sumatera (YaGaSu), Banda Aceh	90	-
22	KSM TUANKU, Banda Aceh	-	90
23	Yayasan Karya Bersama (Yasma), Banda Aceh	80	80
24	Yayasan Hijau Semesta (YHS), Banda Aceh	70	70
25	Pemerintah Desa Kajhu, Aceh Besar	75	95
26	Yayasan HIKMAH, Kuta Alam Banda Aceh	0	-
27	Yayasan Lahan Ekosistem Basah (Lebah)	99	80
28	Kelompok Masyarakat Kecamatan Pulo Aceh Kabupaten Aceh Besar	-	-
29	Lembaga Hukum Adat Laot/ Panglima Laot Aceh	60	60
30	Lembaga Hukum Adat Laot/ Panglima Laot Aceh	60	60
31	KM Dusun UjungBlang Desa Lam Ujung Kecamatan Baitusasalam	80	-
32	KM Dusun Deungah Desa Lam Ujung Kecamatan Baitusasalam	90	-
33	LPPMA, Banda Aceh	90	75
34	WI-IP, Aceh Nias Representative Office	80	80
35	Fasilitator Dusun Ule Jalan Desa Lam Ujong Kecamatan Baitussalam"	90	-
36	Fasilitator Dusun Ujung Blang Desa Lam Ujong Kecamatan Baitussalam	90	-
37	Lhok Nga Community Group	-	60
38	Yayasan Peduli Sabang, Sabang	70	50
39	Yayasan PUGAR	-	72
40	Aceh Coral Conservation, Sabang	-	-
D	East Coast		
41	Campus Professional and Scientific Group (CPSG), Banda Aceh	80	80
42	Citra Desa, CDI, Sigli	80	0
43	Kelompok Masyarakat Kecamatan Muara Tiga Pidie, Pidie	0	-
44	Jaringan Aliansi Ekonomi Pendidikan dan Lingkungan Hidup (JADUP), Bireun	17	80
45	Lembaga Informasi Masyarakat Independent (LIMID), Lhokseumawe	90	-
46	Lembaga Informasi Masyarakat Independent (LIMID)	90	-
47	Lembaga Pembela Lingkungan Hidup (LPLHa), Lhoksemawe	75	-
48	Lembaga Pembelaan Lingkungan dan Hak Azasi Manusia (LPLHa)	75	-
49	Aceh Partnership Foundation (APF)	75	-
50	Yayasan Gajah Sumfedra, Banda Aceh (YaGaSu)	50	-
51	Yayasan Holi' Ana'a, Nias	50	-
E	Nias		
52	Lembaga Pengelola Sumberdaya Terumbu Karang (LPS-TK) Muawo, Nias	70	-
53	Lembaga Pengelola Sumberdaya Terumbu Karang (LPS-TK) Sawo, Nias	70	-
54	Lembaga Pengembangan Pesisir, Pulau-pulau Kecil dan Laut, Nias	70	-

Notes:

* Number "0" indicating none of trees survive

** Symbol "–" indicating the area with no planting activities for mangrove or beach plant

c. Realisation and achievements of livelihood recovery activities

Prior to the Tsunami, the coastal people had pursued a wide variety of livelihoods, from marine-based activities such as capture fishery, intertidal activities such as net-fishing, shellfish harvesting, aquaculture *tambak* ponds, agriculture and salt production, to land-based activities like agriculture in the foothills and the gathering of wood and non-timber natural resources (e.g. rattan). This variety of livelihoods was closely linked to the variety of natural conditions and topography of NAD's coast, from the ocean to the sloping coastline, to the hills behind the settlements. This combination of landscapes is clearly seen in the Sub-district Jaya sub-district of Kabupaten Aceh Jaya district and in the area around Pelabuhan Malahayati harbour in Kabupaten Aceh Besar district.

Due to this variety in the coastal topography, local conditions and seasonal variation, the coastal communities of Aceh tend not to be tied to just one type of livelihood. In general, each family has one primary livelihood plus other additional income generating activities. According to the findings of the economic assessment, fishing at sea was the main economic activity for most of Aceh's coastal communities, while agriculture and animal husbandry were additional to this. At family level there was division of labour. The husband usually went to sea and his wife managed the fields and/or livestock. At certain times in the farming cycle, the husband played a major role in land clearing, planting and harvesting. The combination of *tambak* aquaculture and sea-fishing was rare, because aquaculture requires an intensive allocation of time. A promising daily source of additional income for *tambak* fish farmers was the harvesting of mangrove crabs and wild shrimps.

GC 1 has facilitated several activities to rebuild livelihoods. According to the results from analysis and routine monitoring during the project, the activities carried out by all the local partners during phase 1 of the project have benefited at least 43,000 people in the regions covered by the project. The types of economic activity developed were matched to the needs of each region; examples include horticulture in Aceh Barat, marine fishing in Simeulue, Banda Aceh and Aceh Besar, fresh and brackish water fisheries in Banda Aceh, Aceh Besar, the east coast and Nias, and cattle and goat farming in almost all regions.

- **Capital Management and Type of Business**

  The allocation of funds from the total contract budget was in the following proportions: maximum 30% for rehabilitation activity, minimum 40% for livelihood and maximum 30% for institutional management. The exception was for type C, where the proportion for institutional management was maximum 25% and livelihood 45%. As regards activity development, the management of business capital varied from one group to another. This was based on the agreement reached between the group and the facilitator. Four models of business capital management were identified as being in use by project partners:

  - Model 1 : The business capital is managed by individuals and does not revolve (the capital stays with the individual in the group)

- Model 2 : The business capital is managed jointly by the individuals within the group and does not revolve.
- Model 3 : The business capital is managed by individuals and revolves to non group members.
- Model 4 : The business capital is divided into two types of management, combining models 2 and 3.

Monitoring in the field revealed that the most common form of capital management was jointly managed by the individuals within the group (Model 2) and the fund was non-revolving (46%). This model was commonly practised by CBOs in Simeulue who developed cattle farming together and purchased a sampan boat plus motor, CBOs in Aceh Barat who developed cattle and goat farming directly by the group, and a women's Tsunami victims group mentored by Yagasu (Yayasan Gajah Sumatera). 32% of partners applied model 1, in which business capital is managed by individuals and not rotated. Only a few rotated the business capital (Model 3); these included activities facilitated by the local NGO LPPMA and the foundation Yayasan LEBAH. The table below shows the proportion of Green Coast partners applying each model of business capital management.

Table 7. Percentage of GC partners applying each type of business capital management

Model of Business Capital Management	Number	Percentage
Model 1	19	32
Model 2	27	46
Model 3	6	10
Model 4	2	3
Not developed livelihood activities	5	9
Total	59	100

- **Types of activity**

Through monitoring, the team identified 73 unit economic activities facilitated through the Small Grant Facility. These were divided into five main categories: 1) fisheries, covering capture fishery and aquaculture, 2) Agriculture, covering horticulture and secondary crops, 3) animal husbandry, comprising poultry and ruminants, 4) small scale business such as trading, sewing, *tempe* production, and 5) ecotourism. The table below presents the types of activity and their percentage developed by Green Coast partners in the field.

Table 8. Livelihoods developed by Green Coast 1

Category		Region	Total
Fishery	Capture fishery	Pulau Weh, Aceh Besar, Aceh Barat, Simeulue	13
	Aquaculture	Aceh Utara, Lhokseumawe, Sigli, Bireun, Aceh Besar, Aceh Barat	13
Agriculture	Secondary crops and horticulture	Aceh Barat, Aceh Besar	12
Animal husbandry	Poultry farming	Aceh Barat, Aceh Besar, Pidie	4
	Ruminants/cattle	Nias, Sigli, Bireun, Aceh Besar, Aceh Barat	19
Small scale business	Trade, home industry	Aceh Besar, Aceh Barat	9
Ecotourism	Ecotourism	Aceh besar	3
	TOTAL		73

From table 8 above and figure 9 below, we can see that the livelihood most commonly developed by these communities was the farming of mammals (26%), comprising goats, cows, buffalo and pigs. Next came capture fishery and aquaculture (18% each). Capture fishery is fishing in the open sea, while aquaculture is fishery on land as in the culture of shrimps and milkfish in ponds. Agriculture and small scale business ranked third and fourth at 16% and 12 % respectively. The most commonly chosen type of agriculture was the growing of secondary crops and horticulture, while the most popular small scale businesses were trading, dressmaking and the production of *tempe* soybean cakes. The smallest percentages were for poultry farming (5%) and ecotourism (4%).

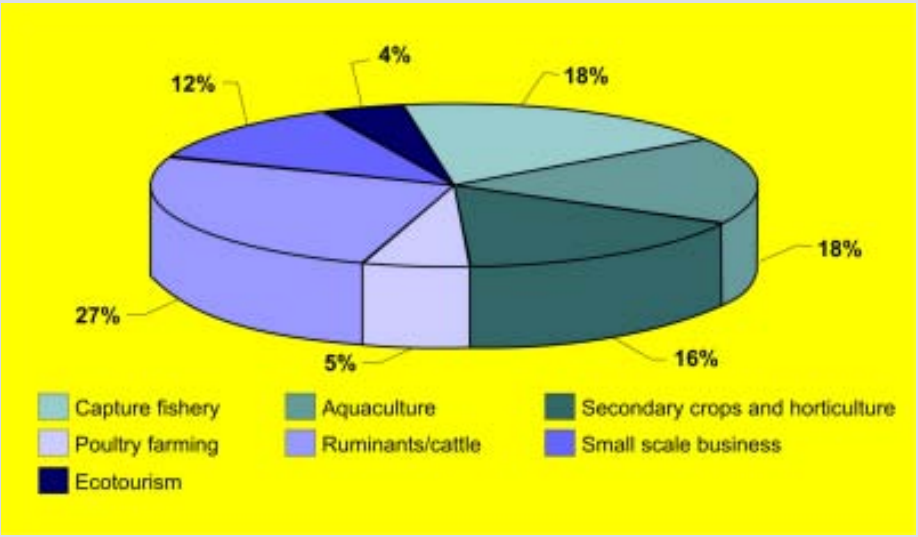


Figure 9. *Percentages for choices of livelihoods developed in GC 1*

Figure 10. *Fruit cracker production (left) and Souvenir shop (right) at Sultan Iskandar Muda airport (Banda Aceh) by the Tibang women's group, facilitated by YAGASU*

Figure 11. *Provision of motorboat in Kahju village, facilitated by Yayasan LEBAH foundation (left) and Duck farming in Lham Ujong village (Photo: Wahyu Hermawan, Iwan Tri Cahyo Wibisono)*

3

Realization and Achievements of Green Coast 2

In April 2007, Oxfam/NOVIB approved additional funding to extend the Green Coast activities in Aceh until December 2008. This extension was termed Green Coast phase 2 (GC 2). With subsequent developments this was further extended until March 2009. Besides enhancing performance and quality of activities in the field, GC 2 also focused on the formation of a number of demo sites which, it is hoped, will demonstrate a number of options and alternatives for integrated, sustainable management of coastal ecosystems (see annex 1 and 2). This also has the mission to reduce/overcome further coastal degradation. As in phase 1, the activities in phase 2 in Aceh Province and Nias island have been implemented together by WI-IP and WWF Indonesia. In this phase, the project wishes to achieve three particular targets, which are:

- To improve the resilience of coastal ecosystems and the sustainability of community livelihoods in Aceh through the formation of 16 demo sites (however only 11 sites were appropriate as demosites) in the coastal areas of Aceh and Nias. This is intended to provide tangible benefit to the local communities through the rehabilitation of livelihoods and coastal ecosystems. The rehabilitation activities are also hoped to enhance the function of the buffer zone in coastal areas.

- o prevent further environmental degradation as an impact of the rehabilitation and rehabilitation activities carried out by related parties in NAD province and Nias. It was also hoped that GC could contribute through various activities, provide alternatives / promote various options for achieving sustainable development. Another expectation was that an Aceh Green Coast network would be formed to improve the flow of information on threats to coastal ecosystems and reconstruction plans. Also, the capacity of local traditional institutions would be strengthened to enable them to play a bigger role in sustainable coastal development. Communication and coordination through a variety of dialogues and meetings with BRR and key parties concerned with coastal recon-

struction would also colour the implementation of phase 2. Input would also be given to technical design and activity development to avoid any negative impact from rehabilitation and reconstruction activity in NAD province and Nias island.

- To disseminate documents on the experience and lessons learnt and Best Management Practice from the rehabilitation activities carried out in the **Green Coast** project.

The strategies and approach employed in the implementation of GC 2 in the field were similar to those in phase 1. Guided by previous experience, several improvements were made in phase 2.

3.1. ENVIRONMENTAL AND SOCIAL- ECONOMY ASSESSMENT

In phase 1, the survey had been conducted over a wide area with top priority being given to assessing the impact of the Tsunami. The Environmental and Social-Economy assessment in phase 2 was focused more on current conditions and was related to the plans for implementing phase 2 of the project. Most of the sites surveyed were sites actually intended for project activity, particularly ecosystem rehabilitation. As there was no partner on Pulau Simeulue, the phase 2 comprehensive assessment was not conducted on this island. The assessment was therefore centred on four regions, as follows:

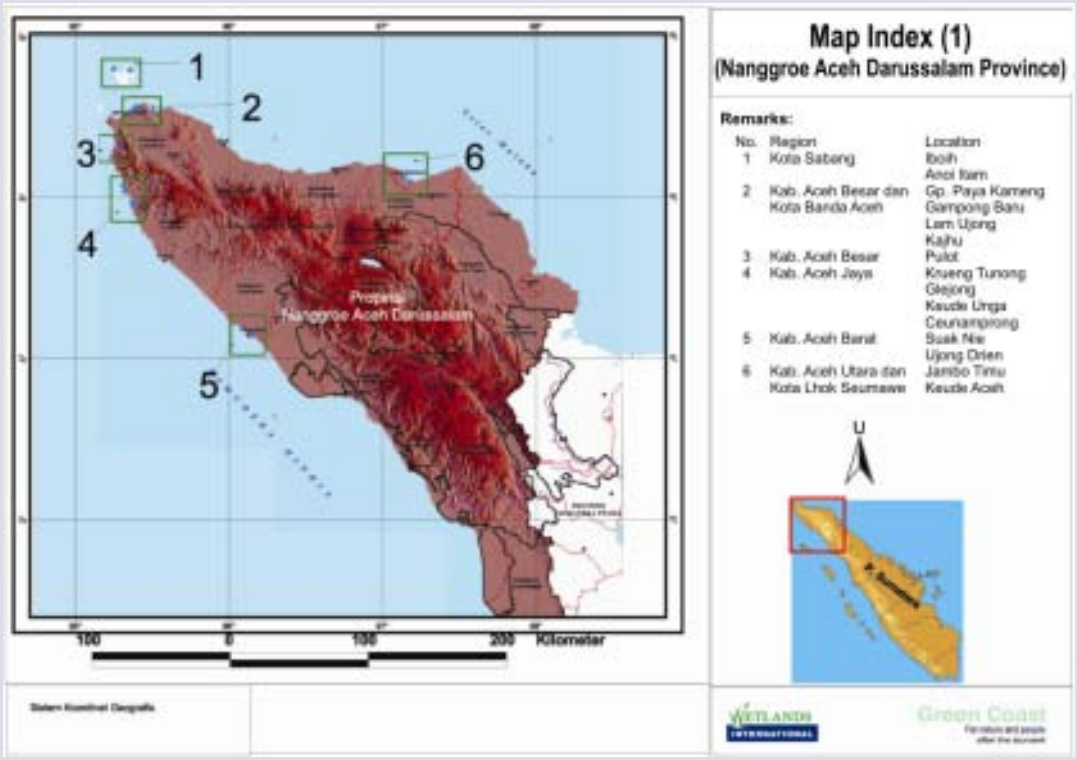
- Region I West coast of NAD : Pulot village in Leupung Sub-district of Aceh Besar district, Suak Nie village in Johan Pahlawan Sub-district, Ujong Drien village in Meurebo Sub-district both are in Aceh Barat district, four villages in Aceh Jaya district Sub district of Jaya (Gle Jong, Ceunamprong, Keude Unga and Kreung Tunong)

- Region II North coast of NAD : Kajhu and Lam Ujong village in Baitussalam Sub-district, Gampong Baru and Paya Kameng village in Masjid Raya Sub-district, all in Aceh Besar district

- Region III Weh Island (Sabang urban district): Anoi Itam village in Sukajaya Sub-district, Iboih village in Sukakarya sub-district, all in Sabang urban district

- Region IV Nias Island : Teluk Belukar village in Gunung Sitoli Utara Sub-district, Nias district, and two villages (Bawonahono and Hilizihono) in Teluk Dalam Sub-district, of Nias Selatan district

This assessment took four (4) months to complete, from June to December 2007. As it covered a wide area, it was done in 4 stages. The team succeeded in identifying a variety of potentials and recommendations for coastal rehabilitation, the implementation of economic activities, and community involvement in the project.



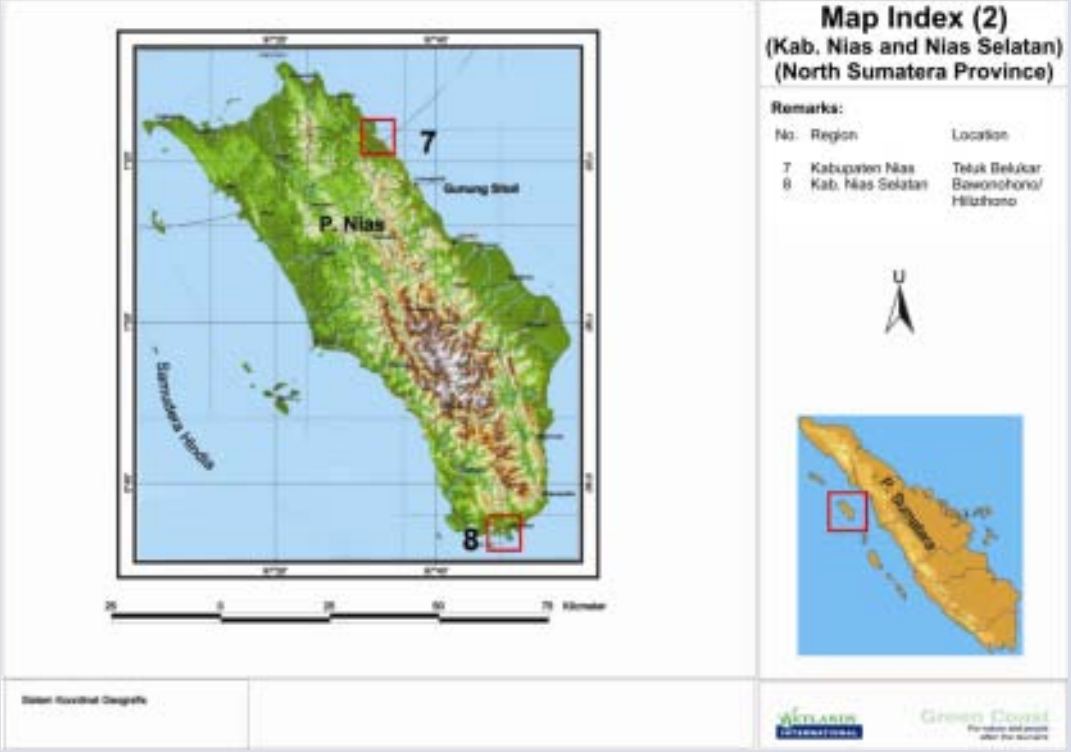


Figure 12. *Sites for Environmental and Social-Economy assessment for* ***"Green Coast"*** *phase 2*

3.2. COMMUNITY BASED REHABILITATION OF COASTAL ECOSYSTEMS AND LIVELIHOODS THROUGH THE SMALL GRANT FACILITY

This time, GC 2 did not need to allocate time specifically for socialisation of the concept and approach used. Throughout GC 1, these had become widely known by Aceh's coastal communities and by other stakeholders. Several parties had openly given a positive response to the strategy, approach and concept of GC which, they judged, could answer the challenges and constraints faced by the people and the environment.

Table 9. Local partners for Green Coast Phase 2

Stretch	No	Project site	Partner	Project Code
East Coast	1	Kedue Aceh Village, Muara Dua, Lhokseumawe Municipalapity	LIMID, LPLHA	ID2-B-09-01
	2	Jambo Timur Village, Blang Mangat Sub-district, Lhokseumawe Municipalapity	APF	ID2-B-09-02
North Coast	3	Gampong Paya Kameng, Masjid Raya Sub-district, Aceh Besar	LPPMA	ID2-A-02-03
	4	Sabang/Weh Island	PUGAR, YPS, ACC	ID2-B-02-04
	5	Kajhu Village, Baitussalam Sub-district, Aceh Besar	LEBAH	ID2-C02-05
	6	Lam Ujong Village, Baitussalam Sub-district, Aceh Besar	ID2-B-02-06 WI-IP	
	7	Gampong Baru Village, Masjid Raya Sub-district , Aceh Besar	CBO (facilitated by WI-IP)*	ID2-B-02-07
	8	Pulot Lagoon, Laupung Sub-district , Aceh Besar	CBO (facilitated by WI-IP)	ID2-B-02-07 ID2-A-02-08
West Coast	9	Lagoon Krueng Tunong, Jaya Sub-district , Aceh Jaya District	Mitra Bahari **	ID2-C-03-09
	10	Kedue Unga Village, Jaya Sub-district, Aceh Jaya District	Mitra Bahari **	ID2-C-03-10
	11	Ceunamprong, Jaya Sub-district, Aceh Jaya District	Mitra Bahari **	ID2-B-03-11
	12	Gle Jong Village, Jaya Sub-district, Aceh Jaya District	Mitra Bahari **	ID2-B-03-12
	13	Suak Raya Village, Johan Pahlawan Sub-district , Aceh Barat	FK-GEMAB	ID2-B-04-13
	14	Ujong Drien Village, Meurebo Sub-district , Aceh Barat	P4L	ID2-B-04-14
Nias	15	Teluk Belukar Village, Gunungsitoli Utara Sub-district Nias	WI-IP & Wahana Lestari	ID2-C-10-15
	16	Bawonahono and Hilizihono Village, Teluk Dalam Sub-district, Nias Selatan	P4KL	ID2-B-10-16

Notes : *) new partners in GC 2 (not involved under GC-1) **) Yayasan Mitra Bahari is an NGO based in Pemalang-Central Java, the individuals involvement of this NGO as facilitators in the GC project in Aceh were due to their success story in implementing Bio-rights in Indonesia. This NGO was not invoved under the GC1.

Due to the limiting fund available, the GC 2 paid special attention to the local NGO partners that considered as more successful in implementing field programme during the GC 1. Important step to measure the successfulness of the local partner's project in GC was by doing *Comprehensive Monitoring and Evaluation* (CME). CME was measuring 4 components of the project namely: (1) Coastal ecosystem rehabilitation (planning, implementation, survival rate, biodiversity aspect); (2) Group's livelihoods development (number of beneficiaries, type of livelihoods, sustainability of financial capital management); (3) Performance of NGO/CBO partner (administrative, reporting, interaction with community); and (4) Gender equity (benefit, access to capital, role of man and woman in decision making). Local partners that accumulating largest points from CME were proposed to become the next GC 2 partners as they were believed to have capacity in implementing the more complex programme of GC 2 (detail of CME criteria is attached).

In phase 2, efforts were also made to improve the quality of activities, as compared to the quantity which is frequently judged in terms of achievement of a target volume. Quality improvements made included biodiversity considerations, sustainable capital management, institutional maturity, and other important aspects. Two examples were the obligating of local partners towards enriching species diversity, and guiding the community to manage their activities as a group using a revolving fund.

The main substance of GC 2 activities was still the same as for GC 1, that is ecosystem rehabilitation combined with livelihood building. Additional activities were slipped into the Small Grant type B and C cooperation contracts in the form of Village Regulations that support the rehabilitation of coastal ecosystems and an environmental education campaign.

a. Realisation and achievements of GC 2 – an overview

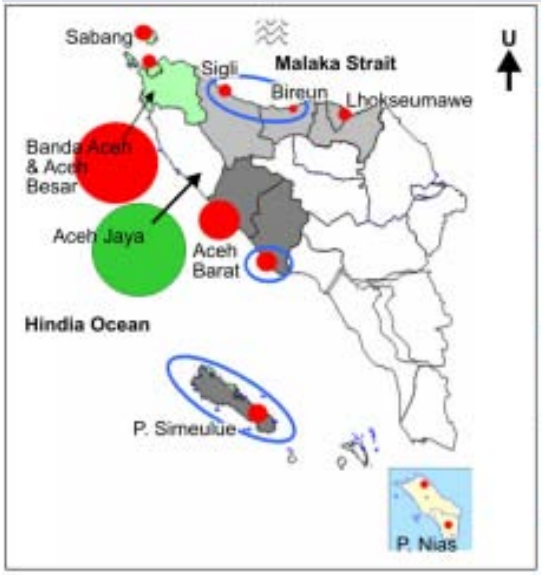
The first step was the submission of proposals by the partner NGOs and CBOs, which were then evaluated and selected by the project management with the assistance of the Provincial Reference Group (PRG)/ Advisory Committee (AC). As explained previously, most of the partners chosen were those from GC 1 who had been judged successful in their implementation of activities in the field. New partners (not involved under GC-1) whose proposals had been approved were a CBO from Desa Gampong Baroe-Aceh Besar village and four (4) CBOs from Aceh Jaya facilitated by NGO Mitra Bahari from Pemalang Central Java.. The total number of partners chosen for GC 2 comprised twelve (12) local NGOs, one (1) NGO from Java,and four (4) CBOs facilitated directly by WIIP scattered along the west, east and north coasts of NAD province and on the island of Nias.

The key criteria used in the implementation of GC 2 were more or less the same as for GC 1, i.e. the site must be land impacted by the Tsunami, the activity must combine livelihood and rehabilitation and must be implemented in an environmentally friendly manner. The sites were not only limited to coastal wetlands degraded by the Tsunami but also to those considered vulnerable to disturbances. The categories and allocation of the small grants were also the same as those in phase 1. They were distributed as follows:

- Type A (< 10,000 •) = 4 activities
- Type B (10,000 - 35,000 •) = 11 activities
- Type C (> 35,000 - 50,000 •) = 4 activities

The largest number of activities was on Aceh's west coast with a fund allocation of IDR 1,651,630,000 which was used for four (4) activities in Aceh Jaya. In the same region, two (2) activities were also undertaken in Kabupaten Aceh Barat district with a value of IDR 580,000,000. On Aceh's north coast, the largest volume of activities was in Aceh Besar comprising five (5) activities with a total value of IDR1,138,500,000. Meanwhile on Sabang island, three (3) activities were conducted with a value of IDR315,000,000. On Nias, there were two (2) activities with a value of IDR 720,000,000. Total rehabilitations and livelihoods value of GC2 was IDR 4,962,280,000 (including costs to provide technical assisstants, trainings and other capacity buildings for the local NGOs which valued IDR 197,150,000)

Green Coast 2 Sites in Aceh-Nias



Coastal Region	District/ City	Number of Activities	Fund allocation (Rp)
East Coast	Lhokseumawe	2	360,000,000
North Coast	Aceh Besar	5	1,138,500,000
	Sabang	3	315,000,000
West Coast	Aceh Jaya	4	1,651,850,000
	Aceh Barat	2	580,000,000
Nias	Nias	1	565,100,000
	Nias Selatan	1	155,000,000
Technical supports for local NGOs		1	197,150,000
Grand Total		19	4,962,600,000

Key :

- The size of each circle indicates the amount of funding
- Red circles indicate districts (Kabupaten) where GC 1 had worked previously (continued under GC2)
- Green circles indicate sites new to GC
- Blue rings indicate GC1 sites which did not continue into GC 2 (however for North Coast of Aceh, GC has allocated small fund from Technical support component to continuing planting activities)

Figure 13. *Map showing distribution of activities under Green Coast phase 2*

Data and information on the process and mechanism by which the local partners of GC 2 managed the funds was more comprehensive compare to GC 1. In the preceding phase, fund allocation and management had been categorised into three (3) primary components: management cost, rehabilitation and economic activities. The funds allocated to the facilitator's fee, operational office expenses and the like, were included in management cost component. This categorization made fund allocated for policy work like village regulation development to support ecosystems rehabilitation, environmental education, and other technical aspects was not easily to identified, Learning from these difficulties and the existence of several environmental educations in some GC locations, the partners reports of fund allocations then made in a more detail category by excluding policy development as special component. Therefore, fund allocations in GC 2 reports were divided into four components namely: (1) Ecosystems; (2) Livelihoods; (3) Policy development and environmental education; dan (4) Management cost. By doing this, all expenses for field activities could be placed in a more detail expenses components.

Based on evaluation of financial report from GC 2 partners showed the pattern of division of funds into these four components was similar for every local partner. Ecosystem rehabilitation took the largest portion at 37%, followed by livelihood and management at 27% each. The smallest allocation was for technical aspects at 9%.

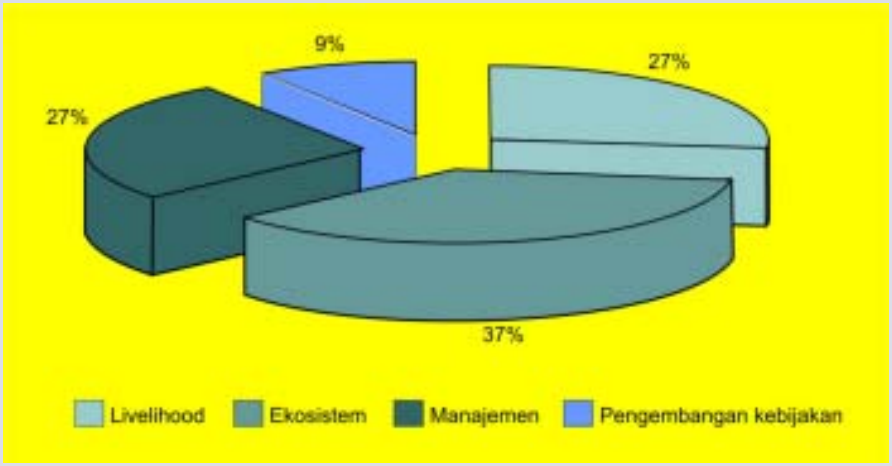


Figure 14. *Percentage allocation of funds in Green Coast 2*

b. Realisation and achievements of coastal ecosystem rehabilitation activities

- **Volume of activities**

GC 2 rehabilitation activities covered four (4) stretches of coast in NAD Province and Nias: Aceh's east coast, north coast, west coast, and Nias island. Mangrove rehabilitation could not be done on Simeulue as the project on this island had not been extended. Altogether, per September 2008 a total area of 353 hectares was planted with a total of 700,123 mangrove and beach plant seedlings. Of this area, 174 hectares was planted

with four (4) species of mangrove totalling 627,400 seedlings. The majority of these were of the species *Rhizophora mucronata* and *Rh.apiculata*. Meanwhile, the remaining 179 hectares was rehabilitated with 72,723 beach plant seedlings comprised of 19 species (mostly the Sea pine *Casuarina equisetifolia*).

Table 10. Summary of activities realised under **Green Coast 2 (per September 2008)**

Stretch	Mangroves		Beach plants		Protected Area	Total	
	Seedlings	ha	Bibit	ha	Ha	Bibit	ha
1. West Coast NAD (Aceh Barat, Nagan Raya, Aceh Jaya)	292,000	64	60,200	141	30	352,200	205
2. North Coast NAD (Banda Aceh, Sabang, Aceh Besar)	205,400	58	12,523	38	32	217,923	96
3. East Coast NAD (Aceh Utara, Lhoksemawe)	70,000	32	0	0	0	70,000	32
4. Nias Island	60,000	20	0	0	0	60,000	20
Total	627,400	174	72,723	179	62	700,123	353

Details of mangrove planting

Mangrove rehabilitation on Aceh's east coast covered 32 hectares with 70,000 seedlings. On Aceh's north coast, 58 hectares were planted with 205,400 seedlings. The largest volume was achieved on Aceh's west coast where 64 hectares were planted with 292,000 mangrove seedlings. The smallest was on Nias island where only 20 hectares were rehabilitated with 60,000 seedlings.

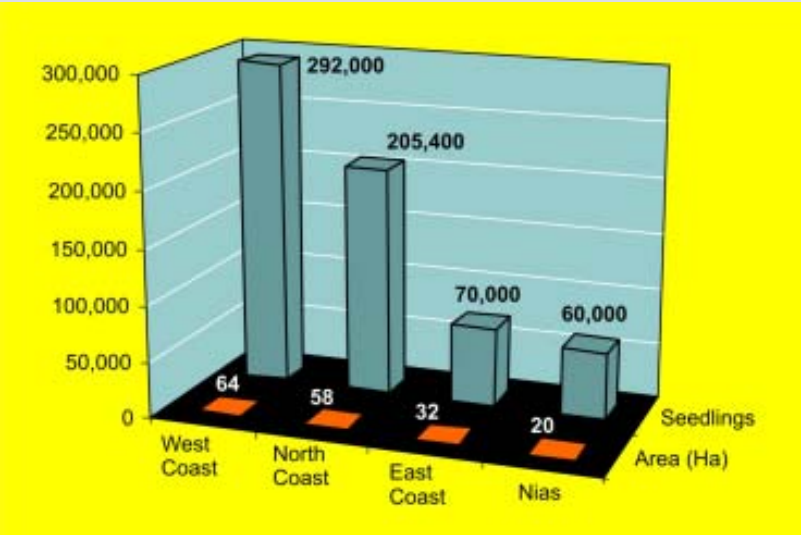


Figure 15. *Mangrove planting achieved (area, number of seedlings) during* ***Green Coast 2***

Improvements were also made to the process for documenting activities in the field. Each stage of the activity and the collection of field data were recorded in greater detail than during the previous phase, in particular the number of seedlings planted of each species. This was one result of the efforts made to improve project performance.

From the data collected by local partners (Table 11), it is known that almost half of the seedlings planted (49%) were Bakau Besar (*Rhizophora mucronata*) at 307,426 seedlings. This was closely followed by *Rhizophora apiculata* (296,760 seedlings or 47.3%). Other species made up only a very small percentage: Bakau Banci *Rhizophora stylosa* (0.4%), Api-Api *Avicennia marina* (1.1%) and Tingi *Ceriops tagal* (2.2%).

Table 11. Mangrove species planted during Green Coast 2

No	Local name	Scientific name	Family	Number planted
1	Bakau kecil	*Rhizophora apiculata*	Rhizophoraceae	296,760
2	Bakau kecil (banci)	*Rhizophora stylosa*	Rhizophoraceae	6,901
3	Bakau besar	*Rhizophora mucronata*	Rhizophoraceae	307,426
4	Api-api	*Avicennia sp*	Avicenniaceae	2,510
5	Tingi	*Ceriops tagal*	Rhizophoraceae	13,803
	TOTAL			627,400

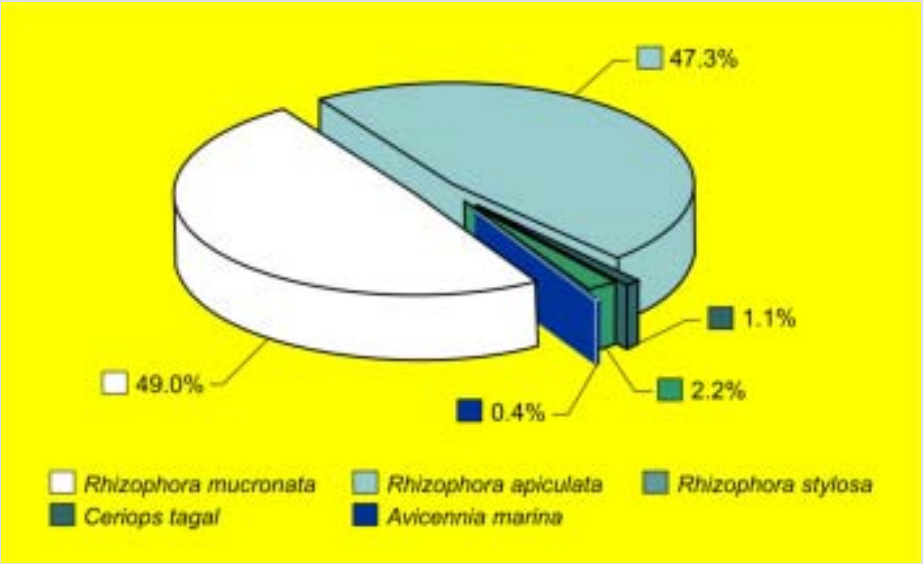


Figure 16. *Percentage of seedlings of each species planted during Green Coast 2*

Planting of beach plants

Sandy beach rehabilitation was carried out at only two sites, which were on the west and north coasts of Aceh. The largest volume was achieved on the west coast where 141 hectares were planted with 60,200 seedlings. On the north coast, 38 hectares were planted with 12,523 seedlings. The species most commonly planted was the Sea-pine/ Cemara Laut *Casuarina equisetifolia* (44.99%) with 32,000 seedlings, followed by Waru *Hibiscus tiliaceus* (13.72%) with 9980 seedlings and *Pandanus tectorius* (12.2%) with 8870 seedlings. Least was Putat Laut *Barringtonia asiatica* (0.03%).

The community's preferred species for planting on sandy beaches were similar to those in phase 1: Cemara Laut (*Casuarina equisetifolia*), Ketapang (*Terminalia cattapa*) and Nyamplung (*Callophylum inophyllum*). These species are easy to obtain from nurseries throughout Aceh and Nias. Their resistance to open beach conditions and the easy availability of seedlings are the main reasons why people choose them. However, despite community's preference to these species, both are difficult to survive in barren sandy beach. Therefore planting these species should consider the type of substrates in rehabilitation site.

Other species often chosen are ones that are easy to grow from cuttings, like Kuda-Kuda (*Lannea caromondalica*) and Waru Laut (*Hibiscus tliliceus*). These two species are generally used for hedges, planted tightly together. For sites around the village, the people tend to choose multi-purpose trees (MPTS) like Mango (*Mangifera indica*) and Belimbing Wuluh (*Averhoea bilimbi*).

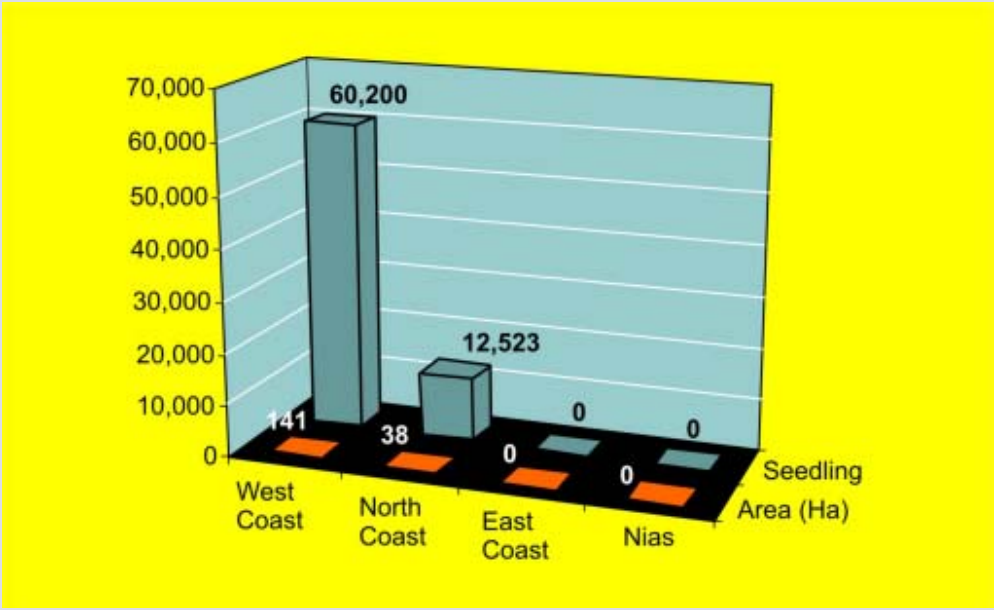


Figure 17. *Sandy beach rehabilitation achieved (area, number of seedlings) during* ***Green Coast 2***

Table 12. Beach plant species planted in the field

No	Scientific name	Family	Number
1	*Tamarindus indica*	Fabaceae	1,006
2	*Callophylum inophyllum*	Guttiferae	2,375
3	*Casuarina equisetifolia*	Casuarinaceae	32,000
4	*Casuarina sumatrana*	Casuarinaceae	720
5	*Terminalia cattapa*	Combretaceae	2,600
6	*Hibiscus tiliaceus*	Malvaceae	9,980
7	*Nephelium lapaceum*	Sapindaceae	770
8	*Citrus maxime*	Rutaceae	300
9	*Cocos nucifera*	Arecaceae	6,112
10	*Averhoea bilimbi*	Oxalidaceae	74
11	*Mangifera indica*	Anacardiaceae	200
12	*Lannea coramondalica*	Anacardiaceae	6,000
13	*Barringtonia asiatica*	Lecythidaceae	22
14	*Azedirachta indica*	Meliaceae	100
15	*Swietenia mahagony*	Meliaceae	946
16	*Cerbera manghas*	Apocynaceae	428
17	*Samanea saman*	Fabaceae	100
18	*Pandanus tectorius*	Pandanaceae	8,870
19	*Manilkara kauki*	Sapotaceae	120
	Total		72,723

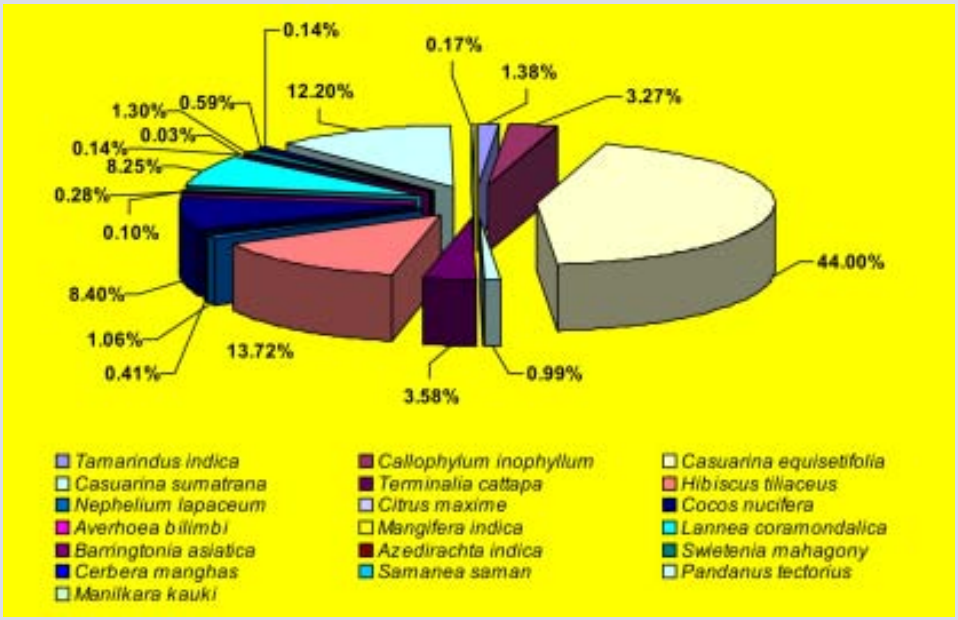


Figure 18. *Composition of beach plants planted during Green Coast 2*

Table 13. Percentage survival rates from rehabilitation activities during GC 2

No	Stretch / Local partners	Site	% Survival	
			Mangroves	Beach plants
A	West Coast of NAD			
1	FK GEMAB	Suak Nie	84.2	-
2	Pusat Pengembangan Potensi Pesisir dan lautan (P4L)	Jong drien	-	81.7
3	Kelompok Swadaya Masyarakat (KSM) Desa Gle Jong difasilitasi oleh Yayasan Mitra Bahari Pemalang	Gle Jong	80	86.6
4	KSM Desa Kedua Unga difasilitasi oleh Yayasan Mitra	Kedua Unga	90	-
5	KSM Desa Krueng Tunong difasilitasi oleh Yayasan Mitra Bahari Pemalang	Krueng Tunong	89	-
6	KSM Desa Pulot difasilitasi oleh Wetlands International Indonesia Programme WI-IP	Pulot	75	-
7	KSM Desa Ceunamprong difasilitasi oleh Yayasan Mitra Bahari Pemalang	Ceunamprong	80	74
B	North Coast of NAD			
8	Yayasan Lahan Ekosistem Basah (Lebah)	Gampong Baru	85	89.1
9	KSM Desa Lham Ujong difasilitasi oleh Wetlands International Indonesia Programme	Lham Ujong	85	-
10	KSM Desa Gampong Baru difasilitasi oleh Wetlands International Indonesia Programme	Gampong Baru	89.47	76.5
11	LPPMA	Paya Kameng	-	40
12	Yayasan Peduli Sabang, Sabang	Sabang	55.23	-
C	East Coast NAD			
13	Lembaga Informasi Masyarakat Independent (LIMID) & Lembaga Pembelaan Lingkungan dan Hak Azasi Manusia (LPLHa)Lhokseumawe	Kedue Aceh	55	-
14	Aceh Partnership Foundation (APF)	Jambo timu	80.29	-
D	Nias			
15	KSM Desa Teluk Belukar difasilitasi oleh WI-IP & Wahana Lestari	Teluk Belukar	-	-
16	Lembaga Pengembangan Pesisir, Pulau-pulau Kecil dan Laut, LP4KL Nias	Hilizihono	40	-

- **Plant survival rate**

The results from monitoring and evaluation indicate a difference between the Survival Rate (SR) of mangroves and that of beach plants. Mangrove planting tended to be more successful with a survival rate of between 55.23% and 90%, compared to beach plants (SR: 40% to 89.1%).

A large proportion of local partners succeeded in exceeding the benchmark of 75%. The mangrove planting facilitated directly by WI-IP in Kedua Unga village showed the highest level of success at 90%. Only one local partner (Sabang) failed to reach the target. This failure was caused by natural constraints, the sedimentation of muddy sand in 1/3 of the planting site.

The highest survival rate for beach plants (89.1%) was achieved by Yayasan Lebah foundation together with the people of Gampong Baru village. The lowest was at Paya Kameng village. Monev results indicated that high tides were the main constraint causing plant death in this village. The table below gives the survival rates derived from monitoring and evaluation.

c. Realisation and achievements of livelihood recovery activities

- **Capital Management and Type of Business**

The management of business capital by the community developed as a result of lessons they had learnt from the implementation of livelihood activities during phase 1. In phase 1 there had been only four models or mechanisms for business capital management. In phase 2, these developed into the following five models.

- Model 1: The business capital is managed by individuals and does not revolve (the capital stays with the individual in the group)
- Model 2 : The business capital is directly managed jointly by the group and does not revolve
- Model 3 : The business capital is managed by an individual and revolves to group members and non members
- Model 4 : The business capital is divided into two types of management, combining models 2 and 3
- Model 5 : The first dispersement of business capital is managed by each individual and does not revolve; the second dispersement revolves to each individual.

Monitoring conducted in field confirmed that there was significant progress or improvement in term of bussines capital management system in phase 2. It can be clearly seen from parameters: (1) number of group successfully implemented revolving

fund mechanism; and (2) number of bussines capital management which was implemented by group. Those parameters chosen based on following reasons:

- Revolving fund model can accelerate group members to be more active as he/she has responsibility to return the loan (financial capital) to the group.
- Revolving fund can provide opportunity to community members outside the group, this approach was an attempt to promote equal opportunity to all community members.
- Business that managed by group (instead of individual) could strengthen relationship and enhance trust amongst each others.

Communities tended to choose model 1 (individual, non-revolving). Of the total of 18 activities throughout all the sites, five groups (28%) managed the capital in this way; these were in Pineung Cabeng Iboih, Lam Ujong, Pulot, Jambo Timu, and Bawonahono. Number of groups whose developed revolving model (Model 3 and 4) were five groups (28%), these were in Paya Kameng, Anoi Itam, Ujong drien, Keude Ungah dan Gampong Baroe. Number of groups managed fund jointly by the group (model 2, 4 dan 5) were group in Gampong Baro, Keude Ungah, Suak Nie, Gle Jong, Krueng Tunong dan Ceunamprong.

Table 14. Business capital management by groups in Green Coast 2

Model	GC 2		Site
	Number	Percentage	
1	5	28	Pineung Cabeng Iboih, Lam Ujong Pulot, Jambo Timu, Bawonahono
2	1	5	Gampong Baroe (facilitated by WIIP)
3	3	17	Paya Kameng, Anoi Itam, Ujong drien
4	2	11	Keude Ungah, Gampong Baroe (facilitated by Yayasan Lebah)
5	4	22	Suak Nie, Gle Jong, Krueng Tunong, Ceunamprong
Not/ has not	3	17	Iboih (mooring buoys), Teluk Belukar, Teluk Pusong (Keude Aceh)
Total	18	100	

Groups that NOT or HAS NOT developed livelihoods activities through financial support from GC were group in Iboih (Sabang, North Coast), Teluk Pusong (Lhokseumawe, East Coast), and Teluk Belukar (Nias). These were due to following reaons:

- Implementation in Iboih (Sabang) only carried out rehabilitation activities by continuing to make mooring buoys without economic empowerment activity for community group.
- By December 2008, there were still two sites where livelihood building had not yet been implemented, which were Desa Teluk Pusong village in the urban district of Lhokseumawe and Teluk Belukar in Nias. The attention of the local partner and the community of Teluk Pusong was still centred on solving the problem of the "Reservoir" construction that they feared would displace the village. As a result of this conflict of interests, the ecosystem rehabilitation activity that had initially been planned to consist of planting mangroves was transformed to Advocacy on the environmentally friendly reservoir construction and the strengthening of community institutions.(*Advokasi Pembangunan Waduk dan Penguatan Kelembagaan Masyarakat*.) .As a result of this change, all activities were postponed, including those for economic empowerment. The facilitators LIMID and LPLHa were still focusing on the ecosystem component.
- In Teluk Belukar, it has not yet been possible to carry out the economic empowerment activity because the facilitator is still focusing on forming a management plan of Teluk Belukar lagoon (*Rencana Pengelolaan Laguna Teluk Belukar*). By December 2008, a local NGO had not yet been identified who could become a partner to facilitate livelihood building together with a community group.

Figure 19. *Goat farming managed jointly by the group in Suak Nie (Aceh Barat)*

- Types of activity

The results of monitoring and evaluation show that 38 economic activities had been carried out by the community during GC 2. The livelihood most commonly chosen was the farming of ruminants (goats, cows, buffalo) for nine activities scattered through the villages of Gle Jong, Gampong Baro, Krueng Tunong and Keude Ungah. The second most common choice was the development of small businesses – seven activities scattered through Paya Kameng, Gampong Baro, Pineung cabeng Iboih, Anoi Itam, Krueng Tunong, Keude Ungah, Gle Jong. These businesses included stalls, fish-mongering and home industries such as making crackers and tempe. Ecotourism was developed only in Anoi Itam, Pulot, Gampong Baro and Gapang.

Table 15. Types and numbers of economic activities in Green Coast 2

Category		Percentage	Site
Fishery	Capture fishery	16	Anoi Itam, Iboih, Kajhu, Gle Jong, Ujong Drien
	Aquaculture	16	Krueng Tunong, Keude Ungah, Jambo Timu
Agriculture	Secondary crops & horticulture	16	Paya Kameng, Kajhu, Krueng Tunong, Suak Nie, Gampong Baro, Iboih,
Animal husbandry	Poultry farming	7	Gle Jong, Gampong Baro, Krueng Tunong, Keude Ungah
	Ruminants/cattle	25	Gampong Baro, Lam Ujong, Kajhu, Pulot, Krueng Tunong, Keude Ungah, Gle Jong, Bawonahono, Hilizihono Nias
Small scale	Small scale	15	Paya Kameng, Gampong Baro, Pineung Cabeng Iboih, Anoi Itam, Krueng Tunong, Keude Ungah, Gle Jong
Ecotourism	Ecotourism	5	Anoi Itam, Pulot, Gampong Baro. Gapang
TOTAL		100	

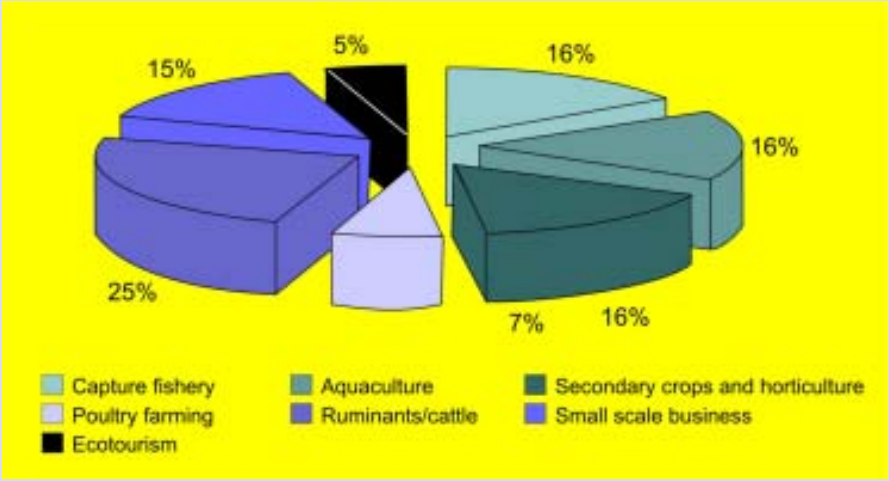


Figure 20. *Percentages for choices of livelihoods developed in GC 2*

As a proportion, ruminant/cattle farming comprised 25% of the economic activities implemented during GC 2. If combined with poultry farming at 7%, the total for animal husbandry comes to 32%. A number of different businesses categorised as small scale business made up 15%, while agriculture and capture fishery both stood at 16%.

Box 2. The Gender Aspect in Green Coast

During December 2006 – January 2007, a team of 6 gender experts was invited to 15 Green Coast project sites to evaluate the gender aspect of the activities being conducted by the local partners. The results of these visits indicated that the local partners had various levels of understanding and sensitivity towards the gender aspect. Local norms and traditions obviously played a determining role regarding the project's degree of success in providing equal benefit for men and women. The situation in the field had conditioned local partners in such a way that women tended to receive less benefit. Nevertheless, local partners were making a fairly big effort to give equal, even wider, room to women to obtain fair benefit. The findings of the gender study are as follows:

- There was a difference in the roles of men and women in carrying out ecosystem rehabilitation. Men usually did the "heavy" work (requiring more strength) like digging, ploughing and construction work, while women did the "light" work (not requiring much strength) like preparing seedlings in the nursery. In some cases, however, these jobs could be reversed. Both men and women agreed that the division of work was fair and balanced because they received equal payment, even though in some cases there were complaints about work hours. Women proposed that they should spend less time on coastal rehabilitation but still be entitled to the full payment. Their reason was that they also had family obligations to fulfil, i.e. routine household activities like cooking, laundry, cleaning, etc.
- Men and women had the same rights of access to capital from the Green Coast project. However, in some cases the women felt that men were given higher priority, because the community considered that the man was the head of the family. Most people considered this to be fair and acceptable as a cultural norm.
- Both men and women had the same right to voice an opinion during the planning, implementation and evaluation of the project. There was no intentional barrier on the part of the facilitator to obstruct the women's right to express an opinion. The facilitator always encouraged the women to take an active part in every meeting and project activity. Nevertheless, findings in the field indicated that a large part of the village apparatus (village head, secretary, treasurer) was dominated by men. Moreover, suggestions and input from men more often agreed to by the group in decision making. Both men and women considered such conditions as being fair enough.
- Benefit from the Green Coast project was of more value to the family if the assistance was channelled through the woman. For this reason, gender equity would enable many people to benefit and have a wider, more significant impact on the family.

All the local partners well understood the need to provide enough room for women to receive benefit from project activities. Nevertheless, most of them were unable to put a better gender equity approach into practice. For that reason, facilitators need to be given training to make them more sensitive to gender equity.

4

Policy Development in Green Coast

Drawing attention to the post Tsunami environment was aimed not only at the public but also at government, decision makers, NGOs/CBOs and academisian. In this context, the role of the policy component was very important, especially in guiding and influencing decision makers and the community in planning, implementing and supervising the process of reconstruction and rehabilitation. There is good reason for the emphasis on this component because the policies produced will impact on what happens in the future.

4.1. STRATEGY AND APPROACH TO CRITICISING POLICY DEVELOPMENT

Policy development and advocacy are intended to create a policy framework capable of supporting the continued and sustainable rehabilitation and reconstruction of NAD Province and Pulau Nias. To achieve this, **Green Coast** undertook a number of activities comprising stakeholder analysis, data/information collection, awareness raising, legal drafting, and lobbying of relevant parties. These five activities are parts of an advocacy for criticising existing policy or the development of new policy. In this policy component, WWF Indonesia is responsible for activities supported by WIIP and local partners throughout NAD province and Nias.

In criticising policy related to coastal management in NAD province, several important steps must be taken. Based on relevant information and data, the project carried out an assessment of legal drafting, followed by public consultation which continued until the “semi final” document was completed. To obtain input from the public, this final document was reviewed in public consultation prior to its widespread promulgation.

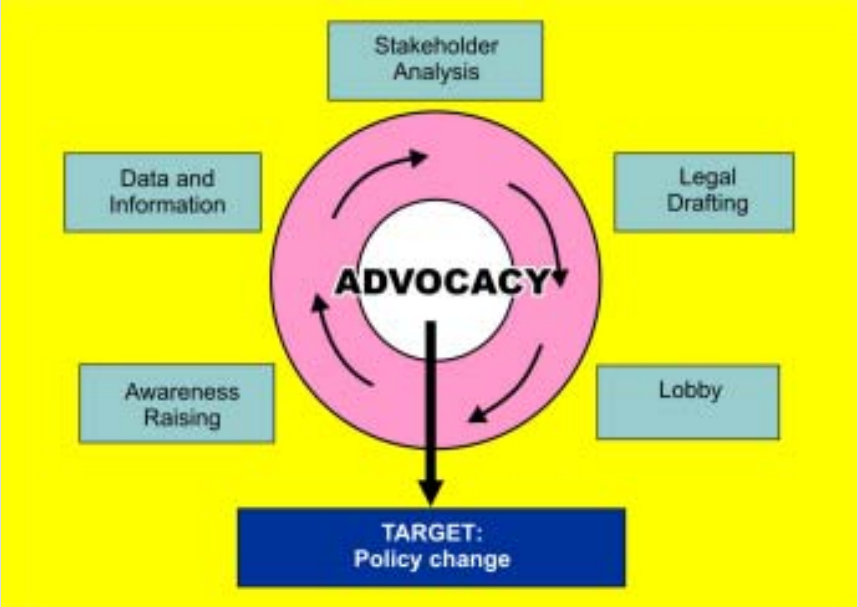


Figure 21. *Strategy and approach to policy development and advocacy in Green Coast*

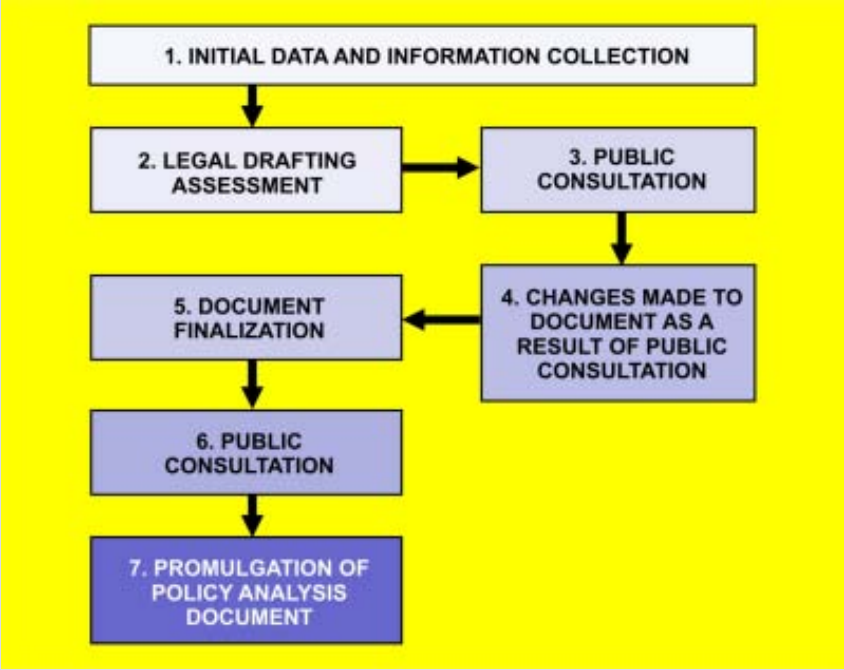


Figure 22. *Flow chart showing the process of policy development through legal drafting*

Aware that policy must be acceptable to and accommodate the wishes of the public, a two-level approach was employed, as follows:

a. Policy Reviews

Policy reviews focused more on various existing regulations (both government regulations and *adat* customary laws), from both before and after the Tsunami. In this context, customary law (*Hukum Adat Laot*) was known to be a part of the traditional wisdom that had existed for hundreds of years and was still strongly held to by the coastal communities, particularly by seafaring fishers. Currently, about 43 regulations in Coastal Resources Management have been identified and analysed to discover the relevance of these policies to post Tsunami conditions. Several issues judged strategic in relation to coastal management were reviewed; these were as follows:

- Rehabilitation and conservation of marine resources and fishery
- Community participation in the management of marine resources and fishery
- Community strengthening in relation to economy or livelihoods

b. On ground input

Experience indicates that public acceptance of a policy is crucial to the policy's application in the field. For this reason, the policy development process must accommodate the community's aspirations and opinions. Socialisation and meetings are the most appropriate media for obtaining input from the various parties concerned, including government, local NGOs, and the community. Several such meetings were held during the period of the project. These discussed a number of different topics, as follows:

- Criticise and evaluate the process of post Tsunami reconstruction and rehabilitation
- Criticise public access to the reconstruction and rehabilitation process
- Coastal defence-Session I : Model identification
- Coastal defence-Session II : Formulation of a coastal defence system in the process of reconstruction and rehabilitation

4.2. FORMATION AND DEVELOPMENT OF THE KUALA NETWORK

In order to make the advocacy process in NAD province and Nias effective, Green Coast developed a forum with the name **K**oalisi **u**ntuk **A**dvokasi **L**aut **A**ceh,(Coalition for Marine Advocacy of Aceh) abbreviated to KuALA. This network was established officially on 3 October 2007, domiciled in the city of Banda Aceh with a scope of work encompassing every region of NAD province. KuALA's main mission is the Conservation of Marine and Coastal Ecosystems for Community Welfare. This network has the following three missions:

- To have an effective public policy in support of the conservation of Aceh's marine and coastal ecosystems.
- To make the local community the primary stakeholder collaborating in the sustainable management of natural resources.
- To have an effective, efficient network of coastal and marine observers supported by high quality human resources and sustainable funding.

In pursuing their mission, KuALA holds high the values and principles of justice, equality, activity, and openness. Members of KuALA comprise NGOs, CBOs and Nature Lover Groups. By November 2008, KuALA had the following 18 members: FK-GEMAB, P4L, PAPAN, KSM RUMITE DAYA, LIMID, LPLHa, JADUP, Aceh Partnership Foundation (APF), LPPMA, PUGAR, YPS, ACC, AOC, LEBAH, Manjago Vano, YSL and Wanahidro. Facilitated by Green Coast, KuALA operates an internet site: http://www.kuala.com. Through this site, KuALA provides the public with a range of information on the institution, membership, calendar of activities, history of KuALA, organisational structure, and several other matters.

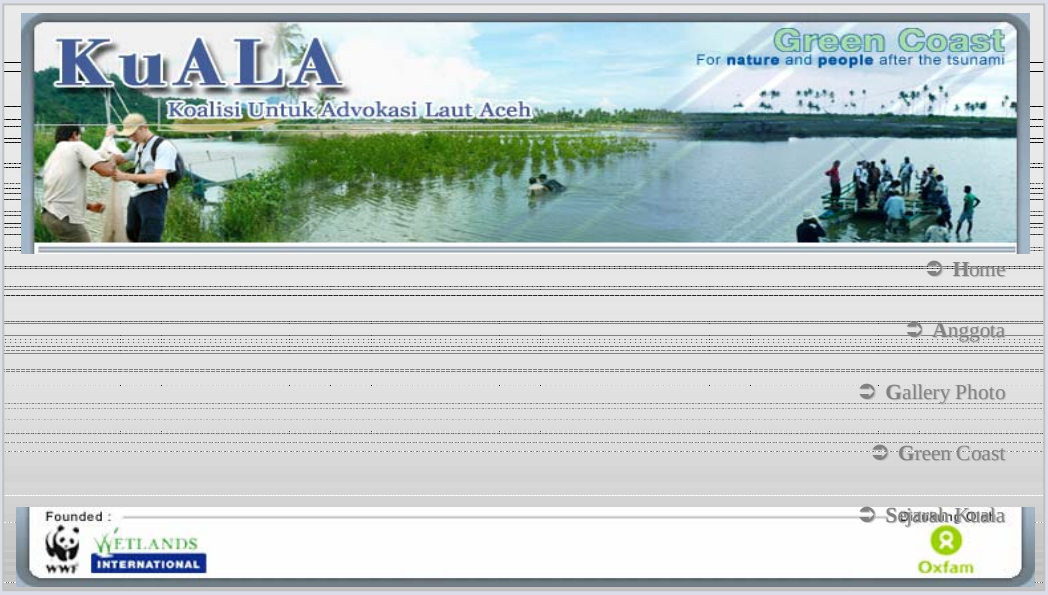


Figure 23. *Front page of Website KuALA-Green Coast (http:// www.KUALA.com)*

4.3. ACHIEVEMENTS OF THE POLICY COMPONENT

During the period of the project, the policy component succeeded in making real contributions in the form of several policy documents related to sustainable coastal management. These are each described below.

a. Reconstruction guidelines

This document possesses a very strategic role in guiding the process of post Tsunami reconstruction in NAD province and Nias. Besides giving direction and guidance to those parties concerned with carrying out activities in the field, this document is also intended to minimize the negative impact of rehabilitation and reconstruction activities on the community and environment. The reconstruction guide comprises the following documents:

- **Policy on coastal areas**

  Policy related to coastal reconstruction should create sustainable livelihoods, particularly for those people whose lives depend on natural resources. Reconstruction must avoid environmental degradation and must have a positive impact on the local community. The community must be given access to manage the coast wisely so that they can reap continued, sustainable economic benefit. On the other hand, the community must also care for and protect the area so as to safeguard its conservation so that it can function normally. Environmentally aware development and the importance of the green belt are also given specific emphasis in this document.

Figure 24. *Policy documents produced through Green Coast*

- **Green Reconstruction Guidelines**

  WWF Indonesia developed "Green Reconstruction Guidelines (GRG)" ("*Panduan Rekonstruksi Hijau*") to accompany the reconstruction and rehabilitation currently in progress in NAD province. These guidelines have been adopted by the provincial government of NAD, distributed and widely used by parties involved with reconstruction and rehabilitation activities. Green reconstruction is part of an Integrated Coastal Zone Management (*Pengelolaan Zona Pesisir Terpadu*) to support environmental improvements being carried out in NAD province. Green Coast encourages its partners to become actively involved in dialogue with regional government, particularly as related

to the various options for reconstruction currently being undertaken. Several options were investigated to find the most appropriate approach for implementation of activities in the field. To make dissemination of this document easier, the project empowered the KuALA network for its promulgation in the field.

b. Marine Customs in Aceh: Local policy on Sustainable Coastal Management

Parties involved in the rehabilitation and reconstruction of Aceh must acknowledge and respect the local customs and regulations on coastal management. There are several traditional regulations for natural resources utilisation and production sharing in the coastal areas of NAD province. These regulations function to protect fish resources and are upheld as law by fishers. The implementation of this customary law is headed by the Panglima Laot (literally: Admiral of the Sea), a traditional leader among fishers. The Panglima Laot has the right and obligation to issue sanctions for the violation of regulations. Below are some of the general regulations applied along Aceh's coasts:

- **No-fishing days**

  One customary law that is both practical and influential in the management of coastal natural resources is the prohibition of sea-fishing on certain days. This regulation demonstrates that the Acehnese have for generations implemented sustainable fish harvesting by taking the environmental carrying capacity into consideration. Special days related to sea-faring in NAD province are as follows.

  - Fridays. Fishing is forbidden from sunset on Thursday evening until sunset on Friday.
  - Idul Adha. At the time of this religious festival, fishing is forbidden for four consecutive days.
  - Idul Fitri. Fishing is forbidden for a period of two days, starting from sunset a day prior to the Idul Fitri holiday until sunset on the last day of the holiday.
  - Indonesian Independence Day. Fishing is forbidden for one day, from sunset on 16 August until sunset on 17 August
  - Marine Law Ceremony. Fishing is forbidden during this ceremony, for the three days from sunrise on the first day of the ceremony until sunset at the end of the ceremony. This ceremony is conducted regularly at least once every three years.

- **Legal sanctions**

  Legal sanctions are applied consistently in order to intimidate offenders. They take the form of confiscation of the total catch and prohibition from going to sea for three to six days. Implementation is administered by Lembaga Hukum Adat Laot (marine customary law institute) through its officers, following discussion with staff of the institute.

- **Marine Norms (*Hukum Adat Laut*)**

  Several forms of destructive exploitation are prohibited by the Marine Norms. The use of explosives, poisonous substances, electric shock, the taking of coral, and every other destructive practice that is detrimental to habitats and the conservation of marine biodiversity are specifically declared as prohibited. The Marine Norms also protect a number of coastal areas, vegetation (including sea-pine, pandanus and mangrove) and rare wildlife species (including dolphins and turtles).

  In addition, the Marine Norm also includes a procedure that must be followed in the case of an accident. This covers accident notification methods, person in charge, and other matters linked to the safety of seafaring.

c. Others

In the implementation of policy in the field, customary regulations and marine norms must not be allowed to come into conflict with government or religious regulations. In certain cases or in urgent situations, customary law can be adapted to the circumstances.

5

Other Activities Supporting Green Coast

5.1. MONITORING AND EVALUATION

The purpose of monitoring was to examine project implementation by the partners in the field, while that of evaluation was to assess the success of the activities and to study matters that should be followed up. Evaluation also made it possible to give the local partner input, recommendations or even warnings concerning the realisation of the activities agreed upon. Monev results were given to project management as information, points for consideration and input.

To conduct monev, Green Coast formed a team made up of experts assisted by staff from the WI-IP Aceh office. To enhance monev activity in the field, the project formed a technical team consisting of three local technical specialists who represented the project region. Two questionnaire formats were developed as a guide and reference for the monev technical team to use in collecting data and monitoring activity in the field. The first questionnaire was for rehabilitation activities, and contained a variety of items concerning: the number of seedlings, their species, the seedling preparation process, the condition of the planting site, pest threats, etc. The second questionnaire was for livelihood activities and contained items on the livelihood building programme such as: type of economic activity, market opportunity, community preferences, the process of choosing livelihoods. Both questionnaires are attached in the appendix.

Before the monev technical team started work, they were given training. The monev coordinator presented material and advice on effective techniques. The trainer taught the technical team to understand and interpret the questionnaire's content before taking it into the field. After practising directly at several sites, the team were eventually judged capable of carrying out the work. One of the main items in rehabilitation monev was to calculate the plant survival rate. The main one in economic monev was an assessment of the activity management process and its impact on the economic status of the community.

During the project, monitoring and evaluation were carried out six times, i.e. three times in GC 1 and three times in GC 2. The first monev was always conducted at the start of activity, when the team identified the initial conditions at all project sites. The second was conducted halfway through the project. For this, the team carried out further monitoring and evaluation to examine the progress of the activity. The third monev was conducted shortly before the end of the project with the main aim of judging the results of the activity. It was used to assess the success or failure of an activity. The monev team made several visits in order to cover all the widespread project sites. For each activity the monev team documented the implementation of the Green Coast programme in the field. In between the 3 monitoring activities, additional monitoring was sometimes carried out as respond to the specific situation like verifying the progress of partner's field work as inputs to the management before the installment of small grants fund to partner.

Monitoring of GC1 and GC 2 activities was also done externally by BRR, government's coordinating body for all post tsunami rehabilitation and reconstruction projects in Aceh and Nias, and by Oxfam Novib through their independent consultant. The BRR's report regarding the result of its monitoring to coastal ecosystems rehabilitation, including the WIIP's Green Coast activities has been published on 2008. Also with the *mid term review* of Green Coast 1 that carried out by independent consultant.

Figure 25. *The process of calculating plant survival rate*

5.2. COMMUNICATION AND COORDINATION

Project communication covers both external communication (between GC and external parties) and internal (between GC and local partners, and between the local partners). One important form of external communication is between GC and the Government. The registration of **Green Coast** activities in the official notes of the coordinator for the rehabilitation and reconstruction of NAD and Nias is one concrete result of this. Coordination between project management and government institutions was achieved through regular reports and meetings. During the project, routine reports were always sent to BRR, BAPPEDA, BKSDA, and BP-DAS. Routine

Green Coast – Small Grant Facility (GC-SGF) reports to BRR were also published in the RAN database which can be accessed at http://rand.brr.go.id/RAND/. At district (kabupaten) level and relevant institutions at a lower level, each partner was obliged to make routine reports on their field activities.

Links between NGOs in NAD and Nias were not ignored. The project actively communicated and coordinated with institutions like Fauna & Flora International (FFI), Food and Agriculture Organization of the United Nations (FAO), International Finance Center (IFC), Yayasan Lamjabat, and several others. In this context, coordination and communication were directed more towards efforts to firm up the existence of Green Coast as part of the process of Rehabilitation and Reconstruction in NAD Province and Nias; and to make technical contributions to the parties involved.

Coordination and communication were also maintained with “key parties”, i.e. those who were responsible for large projects which impinged directly on the community and environment and could give rise to negative impacts. Audiences and discussions were held several times with USAID to seek solutions together so that road construction along the west coast of NAD would not have a detrimental impact on the environment and community. The same was done with the Sea Defence Consultant handling plans for the construction of a sea defence in Lhokseumawe. A happy outcome of this process was that these experts welcomed it and used the input as important matters for consideration in carrying out their activities.

Internally, project development from start to finish was also monitored throughout. This can be a parameter by which to measure the achievement of the project’s internal coordination and communication process. Internal communication and coordination was both administrative and technical. Administratively, communication and coordination were directed more towards cooperation between the project and its partners in the field. Technically, the focus was directed towards the various experiences of project and partners. To support this, GC on several occasions held discussions and forums as a medium for communication and communication. These meetings opened up the opportunity for local partners to exchange experience and get to know one another. This process is expected to be sustainable through the establishment of Kuala Network that consist mostly of GC partners

Figure 26. *Discussion between Green Coast and sea defence consultant, facilitated by BRR*

5.3. CAPACITY BUILDING

Despite the fact that NGOs partnering with GC were environmental organizations, most of this NGO had no experience in rehabilitating coastal ecosystems as their “core business” were in advocating environmental pollution. Based on that fact, GC was allocating special activities in form of technical guidance that packed in Capacity Building component and included training, comparative studies and exchange visits. Practical guides, leaflets and booklets on technical matters were developed and distributed as part of this effort to increase the capacity of local partners and the community.

On several occasions during the project, training was given that involved the local partner and the community in NAD province and Nias. Capacity building in ecosystem rehabilitation was done through several training courses on rehabilitation and coastal ecosystems. The main topics were an introduction to mangrove ecosystems, beach plant species, and the procedures for rehabilitation of mangrove and beach forests. Technical skills were also taught through practical lessons in propagation, planting and care/maintenance. Local partners were taught the expression “sadar lingkungan” (environmentally aware) in the hope that they would undertake rehabilitation work through their own awareness without asking for high wages and would be able to build environmentally friendly businesses based on local resources. To provide study media and exchange among partners, the project also facilitated comparative studies and exchange visits at several sites.

During the process, it was noticed that the local partners were weak at institutional group building. Seeing this, the project facilitated training in group management to which all the local partners were invited. This training was led by senior staff WIIP experienced in the institutional management of organisations. Meanwhile, to help local partners with fund management and finance administration, training was given in the management of finance administration. Both sets of training had a positive effect on the local partners, as seen in, among other things, an improvement in their financial accounting.

In particular, the project facilitated training in the management of revolving business capital. This was given by a team of consultants from the Yayasan Peramu Bogor/YPB foundation. It was given to 5 CBO facilitators, 3 members of staff from WI-IP and 10 representatives from local NGO partners in the vicinity of Banda Aceh and Aceh Besar. This training was also given to community groups from the six villages Krueng Tunong, Gle Jong, Keude Unga, Gle Jong, Lam Ujong, and Gampong Baro.

Local partners are strategic in the dissemination of environmental messages to people living along the coasts of Aceh and Nias. For this reason, GC provided training in environmental campaign strategy and techniques. Various techniques and approaches to environmental campaigning were taught along with understanding and knowledge to interpret a variety of awareness raising materials, and techniques for delivering environmental messages to the community simply and effectively.

It was also felt that the local partners had a poor understanding of policy. Training was therefore given to enable them to analyse policy, with emphasis on the coastal and fishery sectors. By policy was meant both formal policy and the customary law that had been applied for centuries by the people of Aceh.

Figure 27. *Training in institutional management in Banda Aceh*

5.4. AWARENESS RAISING

Observation in the field found that among much of the public in Aceh, and other parties, the level of awareness towards environmental conservation in coastal areas was still low. This was seen in the prevalence of non environmentally friendly practices like indiscriminate dumping of rubbish, felling of trees and burning of land. Nevertheless, it was seen that people were beginning to become aware of the role of mangrove and beach forests in their lives, especially since feeling the impact from the loss of coastal vegetation, such as battering by very strong winds and the difficulty of finding fish near the village. On the other hand, the overlapping designation of land uses on the coast and conflicts of interest between different parties indicated that policy makers and regulators still had only a minimal understanding of coastal environments.

The target for environmental awareness raising was not limited to the general public but extended to all parties, especially those having access to or activities directly in coastal areas, and included the following:

- **General public**

  With improved awareness, it was hoped that the general public would lead their daily lives wisely without disturbing the conservation of coastal areas, and that they would play a role as guardians protecting the coastal areas from various kinds of threats.

- **Government**

  The government has a vital role in planning, in the implementation of activities and supervision in the field. With raised awareness, it is expected that government will issue policy on sustainable coastal management. 'Government' here covers Provincial Government (Pemerintah Daerah Tingkat 1), District Government (Pemerintah Daerah Tingkat 2), urban district governments (Pemerintah Kota), the Forestry Service (Dinas Kehutanan), Marine Affairs and Fisheries Office (Dinas Kelautan dan Perikanan) and other related government agencies.

- **Local NGOs**

  Local NGOs are considered to have an important role in view of their position as a bridge between community and government. With a high level of environmental awareness and understanding, it is expected that they will be able to guide the public towards sustainable coastal management. Moreover, these NGOs also function as a balance that constantly criticises government policy.

- **Community Based Organisations (CBOs)**

  CBOs play a very important role considering that they are the organisations closest to the community and directly represent them. Raised environmental awareness in CBOs institutionally was expected to create conditions conducive to the growth of a commitment towards environmental conservation. It was hoped that groups would be able to influence members to care more about the environment and even play a further role in the conservation and rehabilitation of coastal areas.

- **Educational circles**

  Educational circles can be institutional, i.e. places of education like kindergartens, primary, junior and high schools, colleges and universities. It can also comprise individuals, meaning the pupils, students, teachers and lecturers. With raised environmental awareness, it was expected that these educational circles would be able to play a bigger role in environmental education, and in the formation of attitudes among the younger generation, and provide input or recommendations to relevant parties, especially government, to ensure the integrated, conservation oriented management of coastal areas.

- **Private sector**

  It was necessary to pay attention to the private sector in the awareness raising activities because of the large number of private enterprises involved, directly and indirectly, in the rehabilitation and reconstruction of Aceh and Nias. With raised environmental awareness, it was hoped that the private sector would work in ways that are environmentally friendly and contribute positively to coastal conservation.

To raise the environmental awareness of all these parties in Aceh, the project ran an awareness raising programme that took the form of several activities. The promulgation/socialisation of Green Coast at the start was one initial effort towards introducing the sustainable, conservation oriented management of coastal environments. The project specially developed a range of environmental campaign materials, including several types of poster, leaflets, booklets, flyers and stickers. All these products contained environmental messages, especially concerning the importance of mangroves and mangrove conservation. Besides these two general messages, GC also had a mission to promulgate/socialise several options for conservation oriented coastal management, such as silvofishery and the integrated spatial planning of coastal areas.

Figure 28. *Various awareness products produced by Green Coast*

The dissemination of these materials to the general public through cooperation with local partners and the KuALA network, both of whom played roles appropriate for conveying environmental messages at community level. Moreover, most partners had already received training in environmental campaigning techniques. The local partners acknowledged that this training had been most useful in helping them to carry out their environmental awareness raising mission at the sites where they were working. At certain opportunities, the project handed out various awareness raising materials together with ample explanation.

Besides disseminating these materials, Green Coast also took the environmental campaign to a number of related parties. According to available data, this campaign was conducted in several locations. In Desa Pulot and Desa Kahju villages, the campaign was aimed at group members involved in the project, and took place in October 2006. In Desa Riting village, the environmental campaign was focused more on educational circles (primary and junior-high school pupils and teachers).

Other media employed were environmental exhibitions and special contributions to several events. At the exhibitions, materials were distributed and accompanied by relevant information. On special days, the project frequently put on a variety of programmes bearing environmental awareness messages. At Desa Pulot, as part of Indonesian Independence Day celebrations, GC held a variety of competitions including environmental quizzes, a mangrove drawing contest, and drawing on an environmental theme.

Figure 29. *Environmental campaign at Desa Riting and Desa Kahju*

Figure 30. *Environmental exhibition in Banda Aceh*

Figure 31. *Various competitions as part of Indonesian Independence Day celebrations*

6

Important Findings and Lessons from the Field

6.1. FINDINGS AND FACTS IN THE FIELD

While carrying out activities in the field, the project conducted a number of efforts to help towards their success. Periodic monitoring, which involved the technical team, was performed at every site. While doing this, communication and coordination were established with the facilitator and community group, which resulted in several findings and facts considered important as material for lessons. The following paragraphs detail those findings that were useful for the project and are also expected to be of benefit to other parties involved in similar activities.

a. General pattern of rehabilitation and livelihood activities

Livelihood building activities were usually conducted after ecosystem rehabilitation. The community groups focused their attention firstly on planting, and then went on to business capital management. Management did not standardise this mechanism in this way. It just evolved by itself and became the pattern applied by almost all the partners. Discussions and observation at these sites revealed that this pattern had arisen for the following reasons:

- The obligation to care for the seedlings lasted at least until the end of the contract. Therefore, the partner or group facilitator tended to delay giving out the capital for fear that as soon as the group received it they would focus more on business development than on coastal rehabilitation.
- The capital was used as a guarantee that the community would care for the plants.
- The partner/facilitator tended to give the business capital to the group members who were active in all planting and plant-care activities. This was used as a selection process to ensure that the money was given to the appropriate people.

- To avoid conflict of interests between group members who did not know each other well.
- The wages for planting and other rehabilitation work were needed as an income.

The consequences of the livelihood building and ecosystem rehabilitation not being done in parallel were:

- A wage had to be paid for the work of planting
- The time gap provided for deciding on a type of business became shorter
- The channelling of the business capital did not correspond to the seasonal calendar, so there was a danger that the money would be used for unproductive enterprises. Examples of this would be giving funds to fishermen at a time when the waves were high, or to farmers at the start of the dry season.
- The facilitator had to be flexible regarding the time when the business capital should be paid, and fully comprehend the group's ability to pursue the business chosen.

This shows that the coastal ecosystem rehabilitation and livelihood building under Green Coast had not been able to apply the bio-right concept in its purest form. Nevertheless, the link between the two components was obvious in that the group's responsibility for ecosystem rehabilitation right up until the end of the contract stood as a guarantee for the business capital received.

b. Patterns of facilitation; the strengths and weaknesses of each

A significant relationship was observed between the success of an activity and the pattern of facilitation in the field. This pattern also showed a link with the local partner's degree of seriousness in managing the activity in the field. During the project, the monev team identified the following three patterns of facilitation being used by the local partners:

- **Intensive facilitation**

  "Intensive facilitation" was when the facilitator actually stayed and lived with the community in the village that he/she was working with. The facilitator was directly involved in the daily life of the community. As a result, the people considered the facilitator to be a part of their community, in the same position as themselves and a peer in the communication process. Communication and coordination were quicker and easier both within the group and at village level. This pattern had a positive impact on the project. Community and facilitator could conduct the activities unimpeded, starting from preparation, implementation and plant care to monitoring and evaluation. Living with the community enabled the facilitator to learn a lot about the things affecting their lives: potentials, weaknesses, threats and the like, which was very useful in managing the activity in the field. With this pattern of facilitation, each step of the programme was developed jointly with a "bottom-up" system. Experience in the field showed that this pattern of facilitation was very effective at achieving success from the activity.

» Periodic facilitation

With this pattern, facilitation was conducted at regular intervals of one or more weeks or months. The local partner usually had a base camp that enabled the facilitator to live and be active in the village he or she was working with. In interviews, local partners said that this pattern of periodic facilitation would give the public or group members a wide opportunity to express themselves, to set up and develop their group independently. The local partner purposely reduced the amount of intervention so as to encourage the community's development of self-dependence. However, the local partner also admitted that there were difficulties in obtaining important information concerning activities in the field. Moreover, this pattern of facilitation was unable to identify each problem that arose during the project. In some cases, it was found that the group had lost direction in implementing the activity due to insufficient guidance from the facilitator.

- **Occasional facilitation**

The "occasional facilitation" pattern was applied in line with the packets of activities implemented in the village concerned. The facilitator came to the village to conduct the activities only at scheduled times. One reason for this was that it was more economical and practical than the other two patterns. This pattern was frequently applied by local partners who lived relatively distant from the village concerned. Observations indicated that this pattern of facilitation was not capable of catching the whole process at the community/group level in implementing the programme in the field. The pattern also gave rise to a "distance" between facilitator and the group. If not managed carefully, this could harm communication and cooperation between the group and the facilitator.

c. Achievement of rehabilitation target

The 638 ha target for rehabilitation in GC 1 was achieved in full. However, in GC 2 until September 2008, the achievement for planting have not achieved the target, at 67% (415 of the target 621 hectares). Obstructing factors included land unsuitability, a shortfall in the number of seedlings, and changes in site conditions (e.g. accretion at the prospective planting site). At desa Gle Jong, the rehabilitation specialist recommended that planting on the sandy beach be cancelled due to the unsuitability of the substrate and the threat of pests.

Besides these factors, changes can also occur as the result of actions by other parties outside the project's control. An example of such a case was the reduction in the target for planting in Gampong Keude Aceh, Sub-district Banda Sakti, Kota Lhokseumawe following the construction of a 'sea defence' on the mudflats. At this village, the project was forced to amend the number of seedlings from 50,000 to 10,000. The remaining funds were diverted to environmental advocacy activities in order to minimise the impact of the sea defence construction on the community and environment in its vicinity.

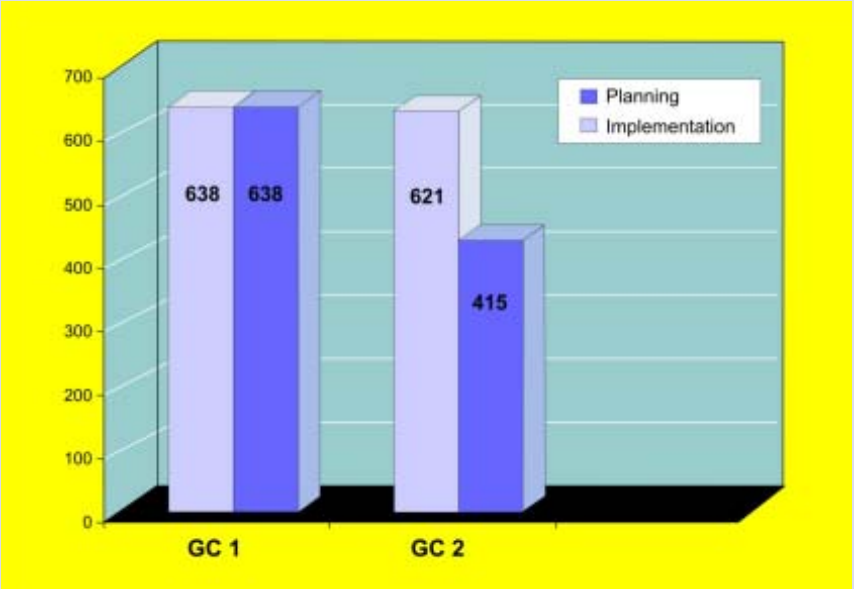


Figure 32. *Rehabilitation planned and achieved under Green Coast (in hectares)*

d. Target volume for planting versus land availability

During implementation in the field it was often found that there was a mismatch between the land's carrying capacity and the plans that had been made for its rehabilitation. The most common instances of this were sites where the land area was smaller than appropriate for the number of seedlings planned, with the result that the target volume planned for the activity and even agreed to in the contract, was no longer appropriate. When this occurred, the local partner often forced the activity to keep to the original target by making certain changes, such as the following:

- **Planting too closely together**

  Spacing seedlings too tightly together is not recommended because it makes the competition for resources too heavy. Moreover, the seedlings will tend to grow tall and spindly with a small diameter. Even though the target volume for planting can be reached in this way, achievement in terms of the area of land planted will still be reduced.

No. seedlings	Distance apart	Area
10.000	1 m x 1 m	1 Ha
10.000	1 m x 50 cm	0.5 Ha
10.000	50 cm x 50 cm	0.25 Ha

Example :

- **Planting on nearby land that is less suitable**

An alternative solution that the partner often took when the site was too small was to plant on land that was less suitable or even unsuitable. The result of planting where conditions are unsuitable is that the seedlings become stressed and may even die. This has a direct effect on the success of the activity as it reduces the survival rate.

The lesson from this is that a more appropriate solution is needed to this problem. One step that can be taken is to rationalise the target by altering it to match the area of suitable land actually available in the field. Options for this rationalisation include:

- Reduce the planting target at the site planned, and carry out additional planting on other suitable land (if there is any in the vicinity)
- Reduce the target for mangrove planting and make up the difference by planting the equivalent number of beach plants or MPTS (if the area suitable for mangroves really is insufficient)
- Reduce the target for mangrove planting and make up the difference by doing non-planting activities such as creating village regulations for protecting the coastal ecosystem

e. Patterns for mangrove planting under Green Coast

- **Planting along water channels**

The species of mangrove most commonly planted along water channels was *Rhizophora mucronata,* which was planted directly as propagules. Only a small proportion were *R.apiculata* and *R.stylosa*. The plants were spaced tightly together at a distance of 30 cm x 30 cm. It was not uncommon to find, during field observation, two propagules planted together in one spot. According to the people there, this double planting had been done on purpose to increase the survival rate. They held the simple assumption that if one seedling died then the other would survive and they would, therefore, not need to carry out replenishment planting.

Planting along water channels was first carried out at the end of 2006. During the following years (2007, 2008), planting continued at nearby sites and using the same pattern. The differences in planting time can be clearly seen from the different sizes of the trees. Those planted in 2006 had reached a height of 1.5 metres and most of them had branches and stilt roots. The younger trees were smaller and most did not

Figure 33. *Planting along water channels*

yet have branches.

- **Enrichment planting along rivers and tributaries**

  The purpose of enrichment planting was to achieve greater diversity of species and increase the population of existing mangroves along the rivers. The technique used was similar to that used for planting along water channels. Plants were spaced tightly at 30 cm x 30 cm. One important finding at this site was a number of spots where planting had been both intensive and sporadic.

  Interviews with members of the community revealed that planting along tributaries had not started until the end of 2007. For this reason the mangrove plants there were smaller than those along the water channels.

- **Planting in *tambak* ponds**

  It is interesting that the planting of mangrove in *tambak* ponds was done in a variety of ways. Early on, the people had tended to plant intensively, spaced tightly together; more recently, however, they had preferred to plant in belts. The following is the result

Figure 34. *Enrichment planting along tributaries*

of observation at the planting sites.

Intensive planting

Intensive planting meant planting throughout the inside of the pond, close together in both directions. The aim of intensive planting was to produce mangrove stands in the ponds, the results of which could then be utilised by the community.

Interviews with the community revealed that mangroves had, in fact, been planted in the ponds before the Tsunami. At that time, planting had been done by only a small number of people, sporadically and on a small scale. After the Tsunami, there was a sharp rise in the community's interest in planting mangrove. The disaster had taught them the ecological and economic importance of the mangrove. Mangrove stands can still be seen that had been planted before the Tsunami and had survived the disaster. These are now around 2-3 metres in height.

In intensive planting, the mangroves were planted fairly close together, at a distance of 0.3 – 1 metre. Most of the trees appear to be thriving and are of various sizes. Growth rates vary from species to species. *Rhizophora mucronata* was observed to have grown more quickly than *R. apiculata* and *R. stylosa*.

Planting in belts/strip

Planting in belts was the result of lessons learnt from previous activities. Intensive planting had been so dense that the community found it difficult to carry out aquaculture because the amount of room was limited, especially when seeding the ponds with larvae, tending them and harvesting. In addition, they worried that the abundant detritus falling from the mangrove trees would pollute the water and poison the fish and shrimp being cultured.

When planting in belts, the seedlings are planted in bands 3 – 4 rows deep and 50 – 70 metres long. They are planted very close together, just 30 cm x 30 cm apart. The distance between belts is very wide, 20-30 metres apart. Thus, each pond generally has only 2-3 belts of mangrove. Most of the mangrove planted in belts are still small, only 0.7 – 1.2 metres tall, because they were planted only a few months ago. Most of the mangroves were planted as propagules. Only a small proportion were planted from

Figure 35. *Condition of mangroves in* tambak *ponds*

Figure 36. *Planting in belts in* tambak *ponds*

prepared seedlings.

f. Achievement of silvofishery development under Green Coast

Mangrove rehabilitation under Green Coast was of two patterns: silvofishery and non-silvofishery. Silvofishery (known locally as "*mina tani*") was frequently applied to *tambak* pond lands, where mangrove planting was combined with aquaculture in the ponds. Non-silvofishery was applied to sites without ponds such as mudflats and along river banks.

According to the data collected, the project facilitated the planting of 856,000 mangrove seedlings over 157 Ha of *tambak* pond lands. The total area of mangrove rehabilitation was 380 hectares (206 Ha GC 1 dan 174Ha GC 2. This activity was distributed through Kabupaten

Figure 37. *Comparison of areas covered by silvofishery and non silvofishery in mangrove rehabilitation under the Green Coast project*

Aceh Utara district, Lhokseumawe urban district, Bireun, Pidie, Aceh Besar and Aceh Jaya.

The table below lists the sites where silvofishery was developed as part of the Green Coast project; these include Desa Lam Ujong Kabupaten Aceh Besar, Desa Kandang, Cut Mamplam

Table 16. Silvofishery ponds in Aceh facilitated by Green Coast.

District/ Urban district	Site	Pond area (Ha)	Number of mangrove seedlings
Banda Aceh	Desa Tibang, Sub-district Syiah Kuala	12	110,000
Aceh Besar	Desa Neuheun dan Lam Nga, Sub-district Masjid Raya	8	30,000
	Desa Cot Paya, Sub-district Baitussalam	9	10,000
	Desa Lampanah, Ujong Mesjid dan Kupula, Sub-district Seulimum	4	40,000
	Desa Leungah, Sub-district Masjid Raya	14	40,000
	Desa Lam Ujong, Sub-district Baitussalam	24	185,000
	Desa Gampong Baro, Sub-district Masjid Raya	7	64,000
Pidie	Desa Grong-grong Capa, Sub-district Ulim	8	40,000
	Desa Pasi Peukan Baroe, Sub-district/Kota Sigli	9	20,000
Bireun	Desa Ie Rhob, Sub-district Gandapura	8	40,000
Aceh Utara	Desa Puntet, Sub-district Blangmangat	6	21,000
	Desa Beuringen, Sub-district Samudera Geudong	12	40,000
Lhokseumawe	Desa Cut Mamplam, Sub-district Muara Dua	8	55,000
	Desa Meunasah Manyang, Sub-district Muara Dua	3	
	Desa Kandang, Sub-district Muara Dua	8	40,000
Aceh Jaya	Desa Krueng Tunong, Sub-district Jaya	7	121,000
	TOTAL	157	856,000

and Meunasah Manyang in Kota Lhokseumawe.

g. Comparative success of planting mangrove and beach plants

Observation in the field showed that the chances of survival varied among the species of mangrove and beach plants. The survival rate for mangroves tended to be higher than that for beach plants. In GC 1, it was 74% for mangroves and 73.4% for beach plants. The final monitoring found a decline in the survival rate for beach plants. Several factors are thought to have been the cause of this difference. They are:

- Mangrove propagules possess high viability for sprouting
- The community had a greater mastery of the techniques for mangrove sylviculture (covering propagation, planting and tending) than for beach plants

- Substrate conditions at mangrove planting sites were more suitable

Among the mangrove species themselves there was a difference in the plants' chances of survival. Those species having a propagule (like *Rhizpohora spp*, *Bruguiera spp* and *Ceriops spp*) had a greater chance of growing than did those having small seeds (such as *Avicennia spp*) and *Sonneratia spp*). Just by sticking the propagule into a suitable substrate it had a good chance of surviving and growing well. Of the species of Rhizophora, *Rhizophora mucronata* was seen to have a higher survival rate than the other two (*Rh.apiculata* and *Rh.stylosa*).

The lower survival rate of beach plants was ascribed to the community's imperfect mastery of sylviculture techniques. Substrate conditions, still open and labile, also played a role in this. At several sites, pest attack, disturbance from livestock, abrasion and water logging with salt water also played a role in the failure of rehabilitation planting in the field.

h. Differences in growth between species (results of case study at Kahju-LEBAH)

A special study was carried out to investigate post-planting growth in the field. For this study, a plot measuring 20 m x 50 m was taken on a planting site that was almost 2 years old. The plot was located at Desa Kahju – Aceh Besar, at coordinates 5° 36' 39.8" N and 95° 22' 32.0" E and was the work area for partner Yayasan LEBAH foundation. The dimensions were measured for every tree in the plot (diameter, height, crown width and crown height). This plot had a population of 219 individuals, consisting of 8 species, i.e. Cemara (*Casuarina equisetifolia*), Pandan (*Pandanus tectorius*), Ketapang (*Terminalia cattapa*), Bayur (*Pterospermum spp*), Coconut (*Cocos nucifera*), Bintaro (*Cerbera manghas*), Mimba (*Azedirachta indica*) and Waru (*Hibiscus tiliaceus*). Analysis revealed that *Casuarina equisetifolia* dominated the cover, with 136 individuals or 62% of the total population. The

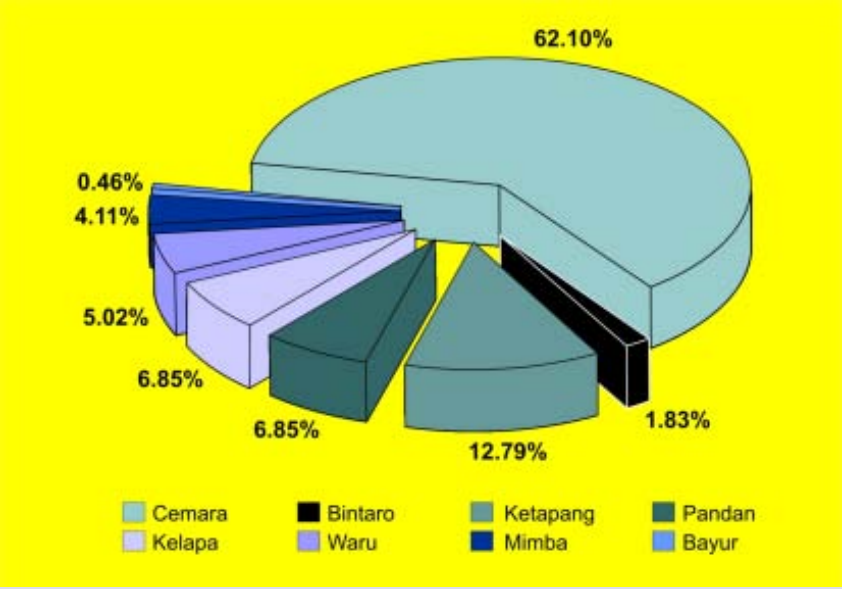


Figure 38. *Pie chart showing the percentage survival rate for each species*

diagram below shows the composition of plant species found on the plot studied.

During this inventory, the coordinates of each tree in the observation plot were recorded and integrated into one programme to produce a three dimensional profile (see Figure 39 below).

Field data showed that the growth of each species of beach plant differed from the others. The highest growth rate was shown by the sea-pine (Cemara Laut) *Casuarina equisetifolia*. The increase in diameter and height of this species far exceeded that of the others. When the others were still in the range of 40-140 cm, this species had already reached a height of almost 4 metres. Ranking second and third respectively for growth rate were Ketapang (*Terminalia cattapa*) with an average height of 1.3 metre and Bintaro (*Cerbera manghas*) at 1.1 metre. Pandan (*Pandanus odorattisima*) was the slowest growing species, reaching an average height of only 45 cm. The other species, i.e. Waru (*Hibiscus tiliaceus*), Mimba (*Azedirachta indica*), Bayur (*Pterospermum spp*) and Coconut (*Cocos nucifera*), ranged on average between 60 cm – 1 m in height.

Factors that are strongly believed to play a role in the variation in the growth rate of these species are:

- **Species characteristics**

  Sea-pine is a fast growing species (FGS), while the others are categorised as either medium growing species (MGS) or slow growing species (SGS).

- **Adaptability**

  Sea-pine (Cemara laut) is a beach plant with pioneering characteristics. This species

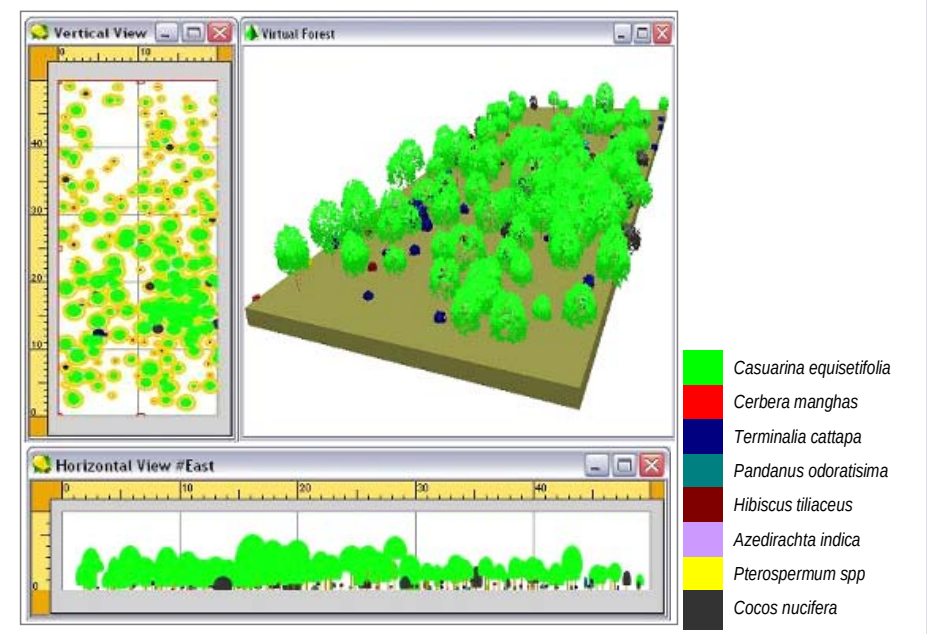


Figure 39. *3D visualisation of a plot measuring 20 m x 50 m on a site planted by Yayasan Lebah (powered by SLIM-ICRAF)*

is capable of adapting even when the substrate is labile and having salinity problem. The other species cannot stand such conditions.

i. Mechanism for the management of rehabilitation activities

In managing rehabilitation activities in the field, Green Coast endeavoured to apply correct procedures whereby the community were expected to play an active role in the rehabilitation activities. Planting was expected to be done using correct techniques so that the seedlings that were planted would grow well. It transpired that the system established previously had a strong influence on the outcome of activities in the field. In previous projects, many donors or local NGOs had committed themselves to involving the community in the programme in the field. However, observation showed that they had only been involved as casual daily labour, for example for planting and carrying, and had been paid money for this. This approach is widely known as *"cash for work"*. In economic empowerment activities, many NGOs had used much the same approach, by simply donating facilities and infrastructure freely, without any conditions or requiring anything in return from the community.

This pattern spread widely throughout Aceh and Nias until the people became used to it. This was a constraint on the Green Coast programme which really did want to involve the community in the activities to rehabilitate ecosystems and economy. The Bio-right approach that GC wanted to apply faced a serious challenge. The community was expected to give their time and energy to the rehabilitation activities in return for the capital that they received, whereas they were already used to receiving handouts from previous programmes without having to expend any effort themselves. The general perception had grown up that all aid was purely free aid with nothing needed in return. For this reason, some partners were forced to apply the *cash for work* approach to the rehabilitation activities.

During their observation in the field, the team identified two mechanisms that partners were

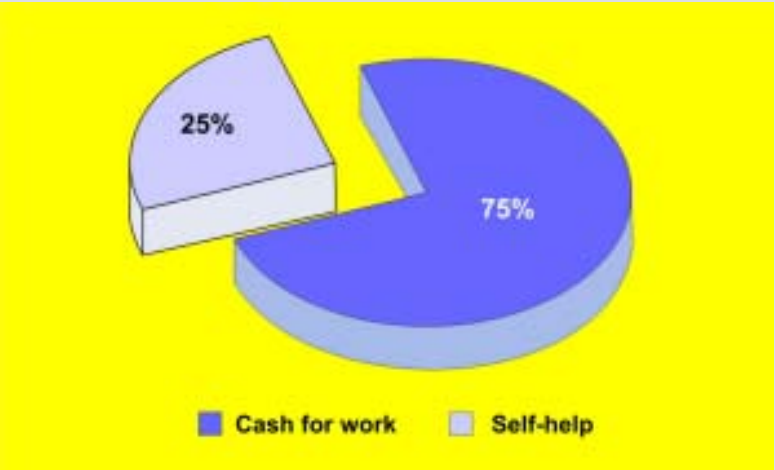


Figure 40. *Activity management system: percentage using cash for work (upah) and self help (gotong royong) in Green Coast 2*

using to manage the rehabilitation activities. These were cash-for-work and self-help (*gotong royong*). About 75% of activities were done using the cash-for-work system and only 25% using self-help (*gotong royong*).

- **Cash for work**

  With this system, the community or group members were paid a sum of money in return for undertaking rehabilitation activities such as transporting the seedlings and planting. The amount paid differed from one activity to another, depending on internal local partner/ facilitator condition (budget) or mutual agreement. Payment was commonly based on the number of seedlings planted, the area of land planted, or a daily wage. The most common was per-seedling, at a rate of IDR 200 – 500 per seedling. From one point of view, those members of the community involved in this activity felt that it benefited them better because they received cash directly from the activity. From another side, however, the cash for work pattern affected the quality of work done as it encouraged people to ignore the technical procedure for planting so as to increase the number of seedlings they could plant.

  Compare to the *cash for work* approach that applied by other projects, the fee range of Rp 200 – 500 per seedling was relatively small and usually the fee used only for snacks and foods during the planting activities. Group members were aware that if they demanding higher fee, the financial capital they could earn would be lower as well.

- **Self help (*gotong royong*)**

  In most cases, *gotong royong* or self-help activity was done only by the members of the groups involved in the project. In Desa Paya Kameng village (Aceh Besar), however, the local partner gave the chance to all the villagers to take part in the planting. For this, the partner coordinated with the village authorities to announce the activity to the community. It was carried out in the same way as is usual for *gotong royong.* The local partner did not give the participants money or anything else in payment, other than providing refreshments and a simple lunch as a token of togetherness.

j. Status of rehabilitated sites

The status of rehabilitated land at **Green Coast** project sites scattered along the coasts of Aceh and Nias varied. The monev team identified several categories of land status, which were: state-owned, village-owned, group-owned, and group-member-owned. The results of an analysis of the status of lands rehabilitated with mangrove and beach plants is given below.

- **Status of mangrove rehabilitation sites**

  A large part (46%) of the lands rehabilitated with mangrove in the project were *tambak*

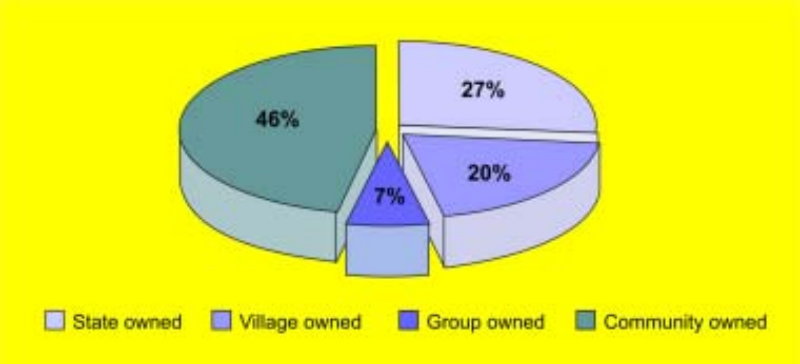


Figure 41. *Status of land rehabilitated with mangrove in Green Coast 2, given in percentages*

pond lands belonging to the community, and 27% belonged to the state. State owned land was generally situated between the coastline and the community's pond lands. Of the remainder, 20% belonged to the village and 7% to groups.

- **Rehabilitated sandy beaches**

In this project, the term "sandy beach" refers to sandy land along the beach, including gardens, roadsides, and other sites around the village. Available data shows that much of the rehabilitated sandy beach is owned by the community (45%), consisting of gardens and other land around the village. Land owned by the village, often referred to as *Tanah Kas Desa* (TKD) makes up 33%, while just 11% belonged to groups and 11% to the state.

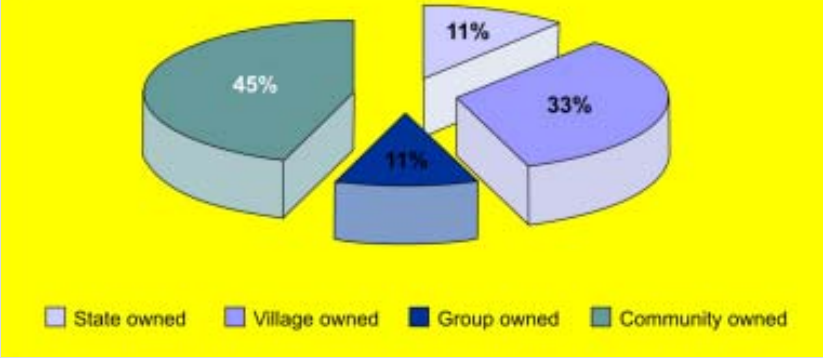


Figure 42. *Status of sandy beach land rehabilitated in Green Coast 2, given in percentages*

k. Selection of plant species and sites for planting

The approach for selecting species and planting sites varied from partner to partner. Most

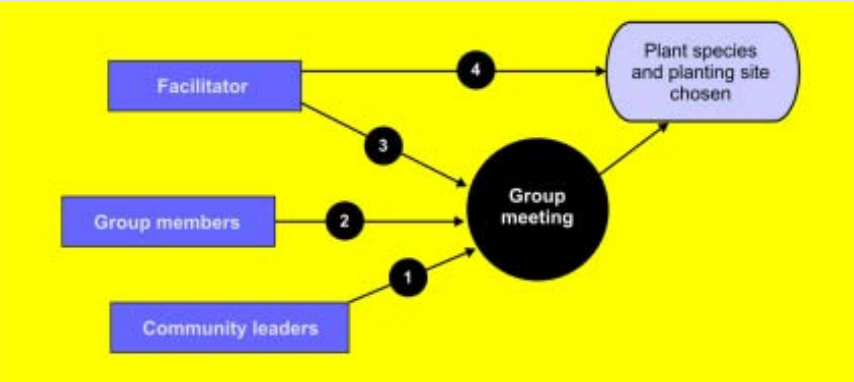


Figure 43. *Flow chart showing alternatives in the decision making mechanism*

of them discussed the matter in the group. Ideas for species and sites often came from the field facilitator, group members or suggestions from community leaders. In some cases, the plant species and planting sites were decided by the group leader or facilitator. The diagram below outlines the process for the selection of plant species and planting sites.

I. General pattern for seedling preparation

Monitoring and evaluation in the field identified at least three methods that the local partner used to obtain the required number of seedlings: purchase, propagation in their own nursery, and direct planting of propagules, cuttings or seeds in the field. The number of each of these differed between mangrove rehabilitation and beach plants.

- **Mangrove species**

  The largest proportion of mangrove rehabilitation was done by planting the propagules

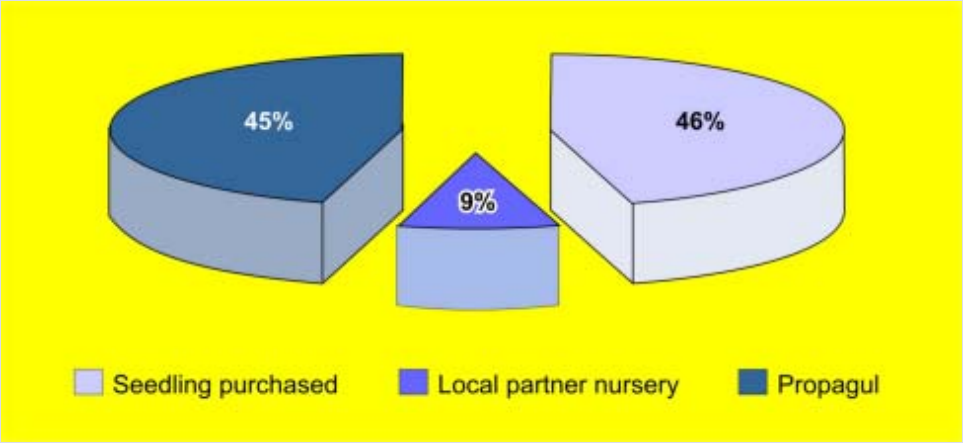


Figure 44. *Pie chart showing methods of obtaining mangrove seedlings*

directly in the field (46%). These were generally purchased in Sigli or other areas on the east coast of Aceh. Almost the same number of seedlings were purchased (45%). The remaining 9% consisted of seedlings grown in the project's own nurseries nearby the planting sites.

- **Beach plant species**

  The percentage of seedlings purchased (60%) was greater for beach plants than for mangrove. Most of these were bought from nurseries in Lhok Ngah, Aceh Besar district for prices varying from Rp 1000 to Rp3500 each, according to species. The main reasons for purchasing the seedlings were as follow:

  - The community were not used to propagating beach plants
  - Propagation of beach plants takes a relatively long time, 6-8 months
  - The community considered it impractical to propagate the plants themselves

  Nevertheless, several local partners did succeed in establishing nurseries to supply seedlings, even though this was only 20% of the total required. The species propagated in these nurseries were usually coconut (*Cocos nucifera*) and Nyamplung (*Callophylllum*

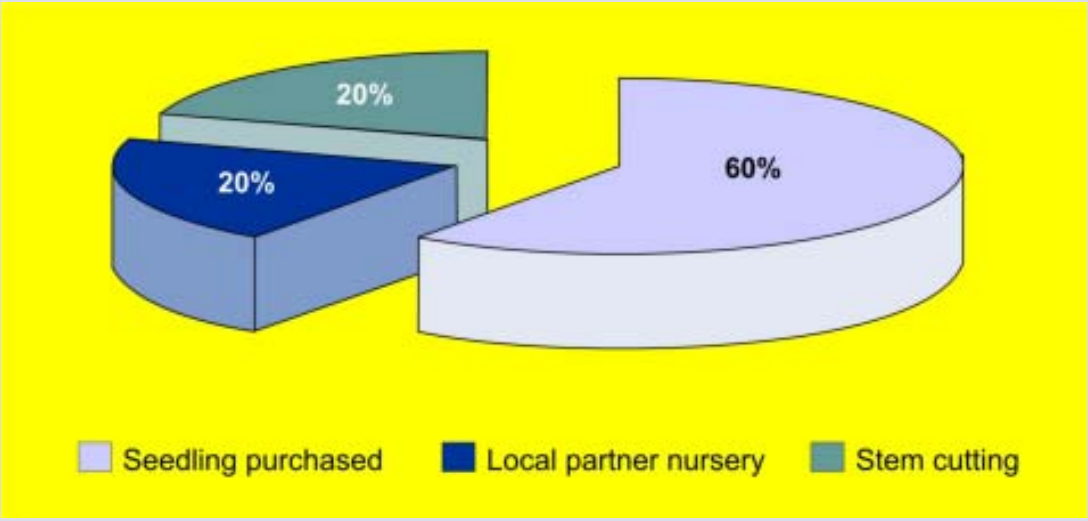


Figure 45. *Pie chart showing methods of obtaining beach plant seedlings*

Box 3. Estimated carbon gained by Sea-Pine trees planted by Green Coast project in Desa Kajhu, Aceh Besar

To determine the carbon content of a Sea-Pine *Casuarina equisetifolia* tree (the dominant species planted under the Green Coast Project in Desa Kajhu-Aceh Besar), a destructive method was used. One *Casuarina equisetifolia* tree aged 1.5 years with a height of 4 metres and diameter at breast height of 5.5 cm was felled. This was then divided up into its parts (leaves, trunk, roots, branches) and each was weighed using kitchen scales to determine its fresh weight. Each part was then oven dried to determine its dry weight (Apriyantono, *et.al*, 1969). This process was carried out at the soil laboratory of the Faculty of Agriculture, Syiah Kuala University. The table below lists the oven-dry weight of each part.

Table 17. Oven-dry mass for each part of the tree (gram)

Plant part	Fresh Weight (FW)	Dry Weight (DW)	Carbon Content (45% of DW)	CO_2 Equivalent
Leaves	5,900	5,241	2,359	8,648
Trunk	8,800	7,607	3,423	12,551
Roots	3,505	3,124	1,406	5,155
Branches	2,650	2,341	1,054	3,863
Total	20,855	18,314	8,241	30,218

To estimate carbon stock, it assumed that 45 % of the dry weight is Carbon. The equivalent weight of CO_2 ($_mCO_2$) is obtained by multiplying the calculated Carbon weight ($_mC$) by the molecular weight conversion factor (44/12)

$$_mCO_2 = {}_mC \times 44/12$$

(note: molecular weight of CO_2 is 44 and molecular weight of C is 12). Thus, each *Casuarina equisetifolia* tree planted (assuming an age of 1.5 years) has the potential to store around 8.2 kg C or the equivalent of 30.2 kg CO_2. From the data above, it can be seen that the trunk stores the most carbon (41% of the total), followed by the leaves (29%), then the roots (17%), and last the twigs and branches (13%).

Thus, if a stand of sea-pine on a plot measuring 20 m x 50 m (0.1 Ha) in Desa Kajhu contains 136 trees, then its carbon stock is 1120 kg or 1.12 ton. This also means that each hectare of a stand of sea-pine aged 1.5 years has the potential to sequester 11.2 ton of carbon (equivalent to 41 ton CO_2).

inophyllum), both of which are not too difficult to propagate and very easy to find around the village. Certain species such as Waru (*Hibiscus tiliaceus*) and Kuda-Kuda (*Lannea caramondalica*) are commonly planted as steam cuttings so did not need to be propagated. Stem cuttings made up 20% of the total.

m. Dynamics of livelihood building

During Green Coast 1 and 2 combined, the livelihood most commonly developed was animal husbandry (25%), followed by aquaculture (16%) and capture fishery (16%). Many groups went in for animal husbandry because it can be developed in many places, does not require large areas of land, requires only small capital investment, and is easy to do (or is practical). Besides these technical matters, the Acehnese traditionally consider animal husbandry as a form of savings or liquid assets. Raising ruminants is not the main livelihood but a side business the profit from which will not be felt until more than a year later. When the people obtain a profit from their main livelihood such as sea-fishing and agriculture, any money left over after deducting the capital investment required for the next cycle of the business (net profit margin) is saved in the form of gold or livestock such as cows and goats. For Nias people, possessing pigs is a proud and symbolizing the social status.

The result of benefit–cost ratio (BCR) showed that investing in cattle farm (cow, goat, pig) business for the period of 1,5 – 2 years will give minimum profit equal to the initial capital invested. Cow fattening is good illustration. Group normally purchase one year old cow for the price of Rp 3.000.000 – Rp 5.000.000. After 1,5 years, during the Iedul Adha day, the price of the cow will increase to Rp. 8.000.000. The detail calculation of BCR of cattle farm is attached to the Annex 6.

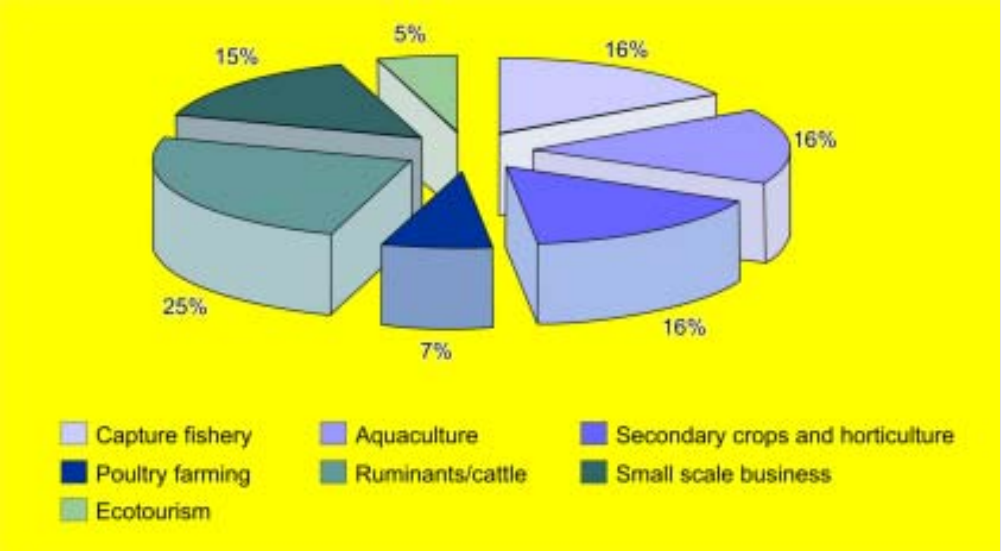


Figure 46. *Breakdown of livelihoods developed under Green Coast (GC1 and GC 2)*

Aquaculture and capture fishery are the main livelihoods generally developed on both the east and west coasts of NAD. Both of these livelihoods are time intensive. It is rare to find somebody who can follow both concurrently, except as business owners who delegate management to another person.

Aquaculture was developed by this project on the east coast of Aceh (Kabupaten Aceh Utara, Lhokseumawe), Kabupaten Aceh Jaya and Kabupaten Aceh Besar. It consisted of milkfish culture, jumbo tiger prawn culture (specifically in Desa Krueng Tunong Kabupaten Aceh Jaya) and crab cage culture. Capture fishery (at sea) was developed at the islands Pulau Simeulue and Pulau Weh (Sabang), Kabupaten Aceh Besar.

Overall, there was not seen to be a difference in the livelihood preference developed in GC1 and GC2. There was a slight increase in the development of small businesses from 12% in phase 1 to 19% in phase 2. This increase was stimulated by the operation of the revolving loan and credit capital system in phase 2. Every beneficiary of the business capital was given the freedom to develop a small scale business, starting by injecting additional capital into a stall, fishmongery, bakery, cracker or soya *tempe* production. In most cases, the capital was used to expand an existing small business rather than to start a new one.

Preferences for choice of livelihood were based on: 1) the amount of capital available, 2) the business(es) currently being followed or which had been followed in the past, 3) the project's regulation stipulating that the businesses developed must be based on natural resources, and 4) agreement with the group's facilitator.

n. Reasons for choice of livelihood

Field investigation revealed that most of the economic activities developed under Green Coast were ones that the community had already followed, such as: aquaculture, provision of equipment for fishing at sea, fish trading, and several others. Thus, there was a reasonable level of certainty that they possessed the experience needed to increase their business' chances of success. Choice of business was influenced by the following main factors:

- **Profit and loss consideration**

  This was the main factor affecting the decision to choose a particular type of business. For businesses that they had run before, the people had enough experience in making simple profit and loss calculations. However, for new enterprises, it was necessary for the local partner to help with the accounting in order to ensure that the business would succeed. The partner also provided consultation on risks and opportunities.

- **Experience**

  The classic reason frequently given by the community for choosing a business activity was that they already had experience of running the same type of business before the Tsunami. To continue with their old work would give them more certainty than starting a new business that they had not mastered.

- **Culture**

This factor had a strong influence in places where traditional values are still held as part of the community's daily life, such as Pulau Nias island. For people on Nias, owning pigs is not only of high economic value but also a symbol of social status. For this reason, pig farming was the groups' first choice of economic activity.

o. Impact of the livelihood programme on the community

Routine monitoring showed an increase in people's incomes from the livelihoods they pursued. Around 4 biilion IDR funding had been distributed to the community, much of it in the form of business capital for livelihood building. At several sites in Lhokseumawe (east coast) and Kahju (north coast), where most of the fish/shrimp ponds had been abandoned/unusable for several years, funding from Green Coast was the first investment capital they had received in aid. With it, these ponds could be reactivated. In phase 1 of the project, at least 180 families were able to restart fish and shrimp farming in *tambak* ponds. A similar result was obtained in the villages of Lampana, Leungah, and Simeulue, where the Tsunami disaster had destroyed the boats, nets and other supporting facilities of 174 fisher families. With the funding they received, they were able to restart their livelihoods. GC 1 facilitated the purchase of 32 boats as a reward for the successful coastal rehabilitation work they had done.

Several local partners in Lamreh, Lhan Ujong, Pulot and several villages in the Aceh Besar had livelihoods like agriculture, stalls/kiosks, and home industries, but the incomes from these were far too small to support their daily needs. Community involvement in the project enabled them to intensify or expand their business. Families in this district have now enjoyed an **increase in daily income**. However incomes from home industries (cake-making, kiosks, and fish processing) activities were still not sufficient to fulfil family's daily expenses. Around 800 people also in this district who used small grant fund for animal husbandry (goats and cows) experienced significant **increase in their annual income**. A similar impact could also be seen on the west coast, where assistance was given to 700 farmers.

One of the economic empowerment activities conducted at Pucok Lueng (west coast) was the construction of fish cages in the lagoon newly created at the time of the Tsunami. Previously, this area had been rice fields. The earthquake that caused the Tsunami also caused the land to subside by up to one metre, altering the landscape and its hydrology to form a lagoon directly influenced by the tides. The brackish water conditions resulting from this caused some of the people to lose their livelihoods as rice farmers. Through funding (capital) from GC, the community were able to start up new economic activities by developing fish cage fishery in the newly formed lagoon. According to the final monitoring and reports from the community, fish culture in cages was running smoothly and was successful. The first harvest was at the end of March 2007 and was followed by subsequent cycles of culture.

p. The role of funding in supporting livelihoods

According to the monitoring and evaluation carried out throughout the duration of the Green Coast project, each member received funds that varied from 500 thousand to 4 million rupiah.

The amount of money each received depended on several things, including : 1) the type of small grant received (type A, B or C), 2) the number of members in the group (affecting the number the fund was shared among), and 3) the mechanism for managing the fund (whether by the group, individual, or a combination).

In interviews with recipients, the monev team were told that the size of the fund received directly by the people affected the economic activity concerned. Members receiving large funds (e.g. over 1 million rupiah) found that the opportunity to start up a new business was easier. For those group members who only received less than 1 million rupiah, this was very difficult. Nevertheless, they were able to use this money to strengthen their existing business.

q. Strengths and weaknesses of cooperation with local partners

Table 18. Strengths and weaknesses of working together with local partners

	Local NGOs	CBOs
Strengths	Large number of Human Resources made it possible to manage project administration (such as financial reports) and manage activities in the field More mature plans for policy on activity management could be formulated because sufficient human resources were available It was easier to approach / communicate with other stakeholders such as the government, other local NGOs and donors.	The CBO and facilitator live in the village with the community. Activities were more successful because of the closeness of communication with the participants. More efficient use of *Small Grant* funds, compared to NGOs. Analysis of partners' financial reports shows that CBOs spent less on management, so the available funds could be allocated to rehabilitation/ ecosystem activities.
Weaknesses	Utilisation of the *Small Grant* fund was less efficient than with CBOs. Analysis of partners' financial reports shows that expenditure on the management component in local NGOs could reach 25-30% of the total budget, whereas in CBOs the maximum used for this was 15% so that more funding could be allocated to rehabilitation/ecosystem activities. The NGOs tend to use up the full 30% maximum allocation for management expenses, even though in reality they could be more economical but allocated the funds as 'savings' for the institution. Sometimes the NGOs did not focus enough on the activity in the field because they are concerned with too many environmental issues.	It was necessary to have facilitators who were fully conversant with technical matters in the field, management of project administration, and lobbying other stakeholders. Policy planning on activity management was formulated at group level or, at the very highest, received input from village authorities. Compared with NGOs, it was harder for CBOs to approach/communicate with government, other NGOs or even donors. They paid less attention to relations with other institutions that were not directly connected to their own activity in the field.

Partnerships were entered into between the project and local NGOs and CBOs. In phase 1, the project had partnerships with 21 local NGOs and 8 CBOs, then in phase 2 with 10 NGOs and 8 CBOs. While working together with these local partners, the project identified a number of strengths and weaknesses in partnerships with these two types of non-governmental institution (local NGO and CBO), as detailed in the table below.

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r. Models of business capital management

The business capital was channelled in the form of cash not products. It could be channelled through the local NGO partner or directly to the group manager. Mechanisms for managing the business capital in phases 1 and 2 can be categorised as follows:

- Model 1: Business capital was managed by individuals and did not revolve (the capital stayed with the individual in the group)
- Model 2 :The business capital was directly managed by the group together and did not revolve
- Model 3 :The business capital was managed by individuals and revolved to group members and non members

- Model 4 : The business capital was divided into two types of management, combining models 2 and 3

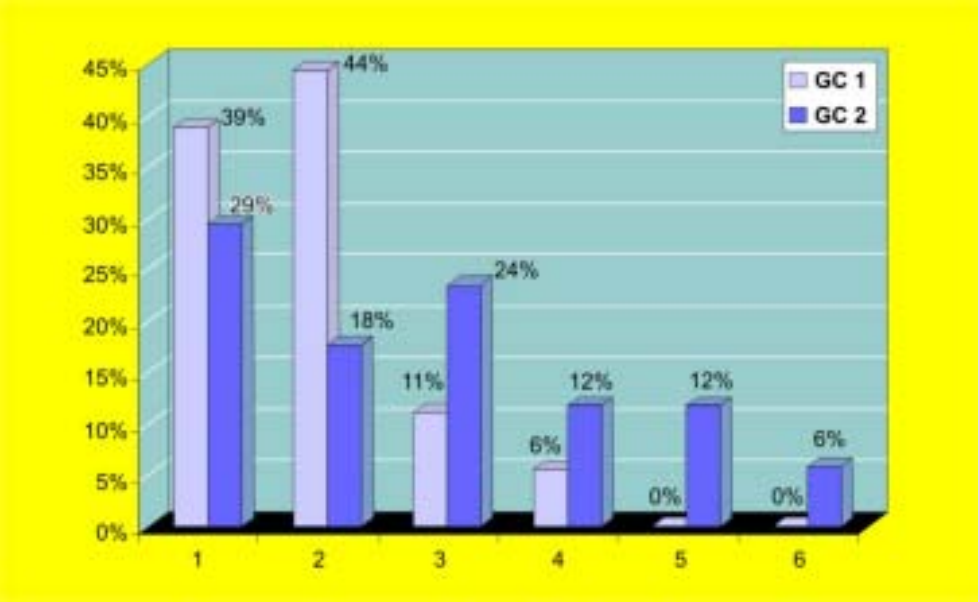


Figure 47. *Comparison of business capital management models in GC 1 and GC 2*

- Model 5 : The first dispersement of business capital was managed by each individual and did not revolve; the second dispersement revolved to each individual
- No livelihood building activity was done

The graphic below shows the results of a comparison of the mechanisms for managing the business capital in phases 1 and 2, given as percentages.

In phase 1, the mechanisms developed were models 1-4. In phase 2, however, there was a combination of revolving capital management and management by individuals and groups. If phases 1 and 2 are compared, it can be seen that there was an increase in the management of revolving business capital both by individuals and by the group, and also in the enthusiasm for managing business as a group.

s. Some success stories from the management of economic enterprises in GC

Monitoring and evaluation succeeded in identifying several successful livelihood activities that were good examples of communities achieving economic improvement for their families. Below are some of these success stories.

- **Fruit crisps production by the women's group from Desa Tibang village in Banda Aceh, facilitator: Yayasan Gajah Sumatera (YaGaSu)**

Figure 48. *Jackfruit crisps home industry by the Women's Group – Desa Tibang*

The fruit crisps production managed by YaGaSu was done with funding from GC 1 with 28 women from Desa Tibang village. The funding supported by the NGO Help Germany was used to obtain vacuum frying equipment and raw materials. Green Coast provided funding in two stages: phase 1 waves one and two. The wave two funding was used to rent a shop-house at Banda Aceh's airport as an outlet for marketing their fruit crisps and other handicrafts produced by the women's group from Desa Tibang.

Sales of fruit crisps, especially the jackfruit crisps, are now very high at an average of 25 kg of dry jackfruit crisps per day. Not all the members joined in making jackfruit crisps. Some were given business capital to produce banana crisps in their own homes.

This business still requires further facilitation, especially in production, the selection of raw materials, marketing management, financial management, and member staffing for the business unit. Facilitation is still carried out at the YaGaSu office, where 80% of the activity still receives intensive guidance.

- **Savings and Credit enterprise in Desa Lamreh village in Sub-district Masjid Raya Aceh Besar, facilitator: LPPMA**

  The savings and credit enterprise developed by LPPMA from GC 1 was more successful than similar livelihoods developed by other GC1 partners. One of the merits of this enterprise was the relative lack of problems with repayments. By December 2008, the funds provided had revolved among 45 group members and 30 non-members. The revolving capital ranged from Rp 800,000.- to Rp 1 million. It was used mostly for stalls, fabric selling, fish selling and cake-making. This success was supported by several factors, as follows:

  - Desa Paya Kameng village had been fostered by LPPMA for two years prior to the start of the Green Coast activities. Thus the community were experienced and familiar with empowerment patterns.
  - The group facilitator often stayed overnight in a villager's home, especially during planting activities.
  - Collection of loan repayment instalments was initially done directly by LPPMA with the help of the group manager; subsequently this was done directly by the group

Figure 49. *Cake-making – a business popular among members of the women's group (using GC revolving fund)*

manager.

- To ensure the sustainability of this activity, the recipients of capital loans were charged an administration fee of Rp 3,000 at the repayment of each instalment.
- The recipients were people who already had a business, so the risk of failure to repay the loan was fairly small.

- **Silvofishery at Desa Lam Ujong village Sub-district Baitussalam Aceh Besar**

Desa Lam Ujong is a coastal village in the district of Kabupaten Aceh Besar, about 30 minutes journey from Banda Aceh. The total area of the village, according to official government records, is around 900 ha, consisting of settlements, *tambak* ponds, open waters and hills.

Almost all the inhabitants of Desa Lam Ujung live from pond aquaculture, capture of crabs, fish and shrimps, harvesting oysters in the mangrove swamps, or salt panning in *tambak* ponds. The Tsunami did not significantly change the landscape but caused the loss of the embankments and dykes between ponds and erosion in several parts of the village.

Various coastal ecosystem rehabilitation activities combined with economic empowerment were developed during Green Coast phase 1 (April 2006 – May 2007) and phase 2 (October 2007 – March 2009). Activities with four community groups, totalling 40 members, comprised the management of 24 Ha of *tambak* pond lands for the purpose of silvofishery. The species of mangrove planted there were *R.mucronata, R.apicualta* and *R.stylosa.* The commodities cultured in the silvofishery ponds were jumbo tiger prawns, wild shrimp and milkfish.

Figure 50. *Silvofishery ponds for milkfish culture (left), crab cage culture (right)*

The development of silvofishery in Desa Lam Ujong did not experience any significant obstacles. At first, *tambak* ponds were developed in the traditional way, with a density of 5-10 larvae/m^2. The ponds were constructed in such a way that the water circulated with the tides. The silvofishery pond model developed at Lam Ujong applied the ditch pond, open pond and "*kao-kao*" (the name of a silvofishery *tambak* pond model, referring to Sofiawan, 1999) patterns. These ponds were managed directly by their owners or by group members with permission from the owners.

After operating for about two years, the community began to feel the benefits of mangroves growing in the ponds, rivers and the water channels servicing the ponds. One real impact of the mangroves was the increased populations of mangrove crabs (*Scyllla serata*) and oysters. For example, there was a rapid rise in the incomes of women oyster gatherers. Before the mangroves were planted, they had had to travel up to 3 km from the village to find oysters; now they can easily gather the same amount in the close vicinity of the village. Another example was given in an interview by group member Pak Ridwan, who pointed out that after planting mangroves as much as 3kg of crabs could be captured in one night. With a retail price of Rp35,000/kg, the crabs sell to the market retailers at Peunayong-Banda Aceh market for Rp25,000/kg. The planting of mangroves along the pond dykes also strengthens the embankments.

- **Silvofishery at Desa Krueng Tunong village Sub-district Jaya**

  Desa Krueng Tunong village is one of four GC2 activities in Sub-district Jaya district. Funding of Rp 2,500,000 for aquaculture was used for production facilities and purchase of larvae. Repair to the ponds was done purely on a self-help basis by the group members themselves. Pond culture of prawns and milkfish has produced two successive harvests.

Figure 51. *Milkfish harvest, from polyculture of milkfish with jumbo tiger prawns (left), Women sorting harvested prawns (right)*

Silvofishery was applied with the stocking of 20,000 shrimps and 500 milkfish. This produced a harvest of 200 kg of prawns size 18 and 50 kg of milkfish size 4. At a price of Rp 50,000/kg for prawns and Rp 20,000/kg for milkfish, the total harvest income was Rp 11,000,000. From an investment of Rp 3,000,000 a profit was obtained of IDR 8,000,000 in 3 months. Being quite profitable, this business has been continued until now.

- **Goat farming at Desa Pulot village Aceh Besar**

Green Coast has developed coastal ecosystem rehabilitation activities, in particular the lagoon ecosystem at Desa Pulot village, since June 2006. As many as 3000 mangrove seedlings have been planted around the lagoon. On the economic front, group members have been facilitated with business capital to build environmentally friendly

Box 4. GC in the eyes of the community

"We used to make about IDR70,000/day from our fish catch, but then this decreased every day after fishers from the opposite village used destructive fishing practices like bombs, poison and trawl nets. Now, with the opportunity offered us by this GC programme, we are going to do our utmost to increase our efforts to conserve this region so as to get better, sustainable incomes."

(*Ahmad*, *small grant recipient, Green Coast, 2006*)

livelihoods. The farmers' group currently involved in phase 2 is the same group that took part in phase 1 from June 2006 to May 2007. They are no longer being facilitated by WIIP and are able to pursue their group activity themselves.

One successful enterprise that stands out is the goat farm built up by Bapak Malik. Starting with four nanny goats, this has increased to 25 goats after just two years. Of these, 16 have been sold while the 9 now remaining continue to be well cared for.

- ***Tempe* soybean cake production in Desa Krueng Tunong village Sub-district Jaya Aceh Jaya**

  As regards the business capital component of the GC project, the management of economic activities in Desa Keude Unga village is more advanced than in the other three villages in Sub-district Jaya district. Two community groups formed in this village have succeeded in building up a savings and credit facility (revolving fund) for their members and so far have not experienced any constraints regarding the repayments

Figure 52. *Small-scale business making tempe, carried out by a group member in Desa Kedue Unga village*

in monthly instalments. This fund is managed by the Group with many different kinds of businesses (including chicken and duck farming, cracker production, opening stalls, and *tempe* production). Of all these, the *tempe* production has advanced the fastest. At the beginning, production ran at a volume of 5 kg of soybeans (the main ingredient) a week. This has now reached a volume of 10 kg of soybeans per day. At a rough calculation, the profit from this *tempe* business now reaches Rp1.5 million a month. Besides this, the group also own a cattle farm that is managed together by the group.

t. Some failure stories in the management of economic enterprises in GC

Below are some stories of failure in the management of livelihoods that were experienced

in the field. Analysis and monev show that many of these failures were due to lack of or insufficient experience in managing a business. In addition to this, marketing constraints were often behind the failure of economic activities undertaken by these communities.

- **Capture fishery by Bapak Adun in Desa Pulot village Aceh Besar**

  In Desa Pulot village, Sub-district Leupung - Aceh Besar, the community group being facilitated undertook the management and rehabilitation of the lagoon, which was integrated with livelihood building. Through the *Small Grant Facility* (SGF), each group member received business capital of Rp 4 million. The group gave its members complete freedom to decide for themselves what kind of business they would pursue. Pak Adun was one of those who used the fund to buy beach seine nets and tackle, even though he had no experience whatsoever in catching fish with beach seine nets.

  After a year, it was obvious that all was not going as expected. One by one, Bapak Adun's nets were lost, especially during the rainy season and big waves. Besides this, his nets often got damaged when they caught on bits of wood left by the Tsunami that had swept along the coast. If it was too difficult to free the nets, he was forced to leave them to decay or be taken by other fishers. All this crushed Pak Adun's enthusiasm and he lost interest in continuing with this livelihood.

- **Goat farming in Desa Lam Nga village, Aceh Besar**

  In Desa Lam Nga village - Aceh Besar, Green Coast facilitated a community group of 15 members to undertake a programme of coastal rehabilitation and livelihood recovery. On the basis of a joint decision, it was agreed that the livelihood they would develop would be goat farming. A total of 20 kid goats was given to the group, so that each member received one or two. A few months later, it was found that about 40% of these goats had died or gone missing. Further evaluation discovered that the farming method they had adopted was highly risky, which was to let the goats wander freely to forage by themselves without being penned or fed. The option of penning livestock was difficult to carry out in view of the fact that the group members were still living in temporary accommodation.

  These examples of failure teach a valuable lesson, which is that the choice of livelihood must be preceded from the beginning by considering as many as possible of the aspects that could impact on the sustainability and success of the enterprise to be developed.

u. Positive synergy between Green Coast and other activities

Table 19. Activities constituting synergy between **Green Coast** and other parties in NAD Province

Coastal region	District/ Urban District	Activity
East Coast	Lhokseumawe	Synergy with Twinning programme activities from UNEP-WIIP in Desa Meunasah Manyang village, with the planting of mangroves in *tambak* ponds and along rivers, and the development of milkfish aquaculture
	Aceh Utara	Synergy with Twinning programme activities from UNEP-WIIP in Desa Jambo Timu and Keude Aceh villages with the planting of mangroves in *tambak* ponds and along rivers, and catfish farming and crab cage farming in the Twinning programme from UNEP
	Bireun	Synergy with Twinning programme activities from UNEP-WIIP in Desa Ie Rhob village to plant beach pandan and develop a mat weaving business.
	Pidie	Synergy with *tambak* pond rehabilitation in Desa Pasi Peukan Baroe village by the ADB (Asian Development Bank)
North Coast	Aceh Besar	1. Synergy with Twinning programme activities from UNEP-WIIP in Desa Gampong Baroe village to develop a rattan weaving business 2. Physical rehabilitation of *tambak* ponds and sluice gates by ADB supported GC group members restarting their aquaculture activities, although at first this contradicted with the mangrove planting previously undertaken by GC
	Sabang	The initiative to create a Marine Sanctuary (DPL) at Anoi Itam synergised with WCS (World Conservation Society) activities to make a census of the coral reef potentials at Pulau Weh island
	Banda Aceh	Activity at Desa Tibang village managed by Yagasu synergised with other activities managed by Yagasu but originating from different donors.
West Coast	Aceh Jaya	1. Synergy with Twinning programme activities from UNEP-WIIP in Desa Krueng Tunong village to develop milkfish pond aquaculture, in Desa Gle Jong village to purchase a boat and in Desa Keude Unga village to culture Tilapia (mujair) 2. The Yayasan Kehati foundation has a savings and credit initiative at Desa Keude Ungah village, which synergises with the revolving model applied under GC
	Aceh Barat	Assistance in the form of boats and reconstruction of the fish landing place (PPI) by BRR in Desa Ujong Drien village greatly supported the sea-faring fishers who were group members who used the business capital to purchase fishing tackle such as lines and nets.

While running its activities in the field, Green Coast established relations with a number of other parties involved in the rehabilitation and reconstruction of NAD and Nias. This unique, on target approach was often appreciated by parties in the field. Some of them were attracted to working together synergistically with Green Coast. The scope of cooperation with related parties was generally concerned with NAD's coastal management and economic empowerment of the community. Throughout the duration of the project, the monev team identified several synergies with other parties or projects , as described in the table below.

6.2. LESSONS LEARNT FROM EXPERIENCE IN THE FIELD

Apart from the important findings described above, the project also identified several practical experiences of things that the community had learnt to do during the project. Some of these were the result of trial and error, spontaneous improvisation, or even accident. In some cases, this experience made the activity run more effectively and efficiently. These are purposely presented here in this document in order to publicize them to all partners and other parties for their information and so they can apply them in the field. The paragraphs below describe a number of local partners' practical field experience.

a. Preferred planting systems and mangrove species for *tambak* ponds (a case study in Desa Lham Ujong village)

Compared with other villages, mangrove planting in Lham Ujong village advanced better. In this village, mangroves were planted in almost all of the *tambak* ponds and two small rivers nearby. It is interesting that the community applied several different systems of planting and several species of mangrove. Field observation discovered that there were at least six systems, as follows:

System A = *Rhizophora mucronata* planted intensively

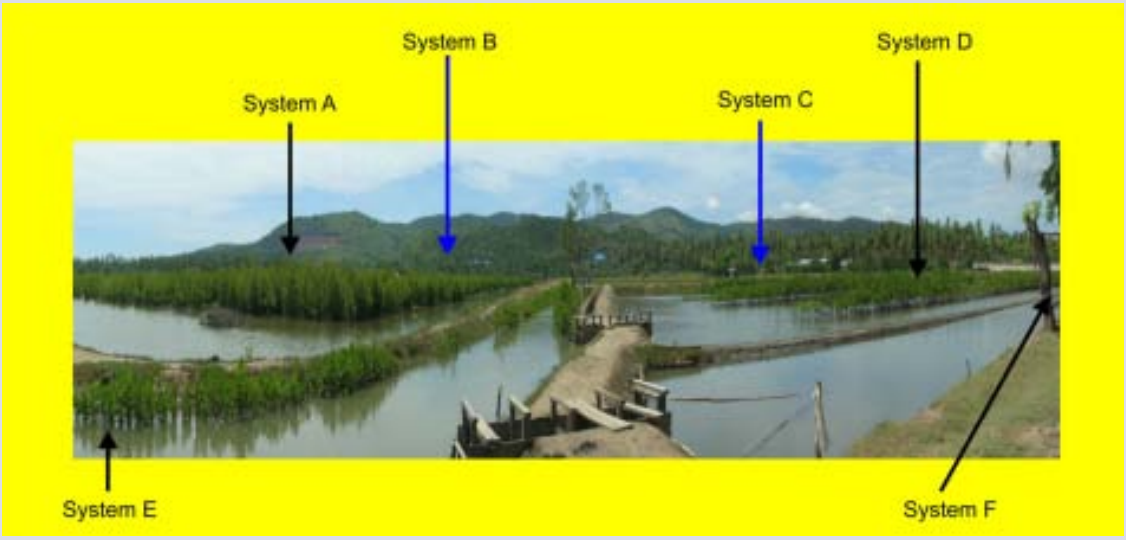


Figure 53. *Six planting systems employed by the community, in the* tambak *ponds - desa Lham Ujong village*

System B = *Rhizophora apiculata* planted intensively
System C = *Rhizophora apiculata* planted in strips
System D = *Rhizophora mucronata* planted in strips
System E = Planting along the banks of water channels, and
System F = Planting along the banks of tributaries

(See illustration below)

According to the experience of the people managing these ponds, each planting system has its own strengths and weaknesses. They judged that the best system was planting in strips. This was because strip planting left empty areas which made aquaculture easier. Conversely, they were not very keen on intensive planting because this system could cause the mangrove to cover the entire pond area and hinder aquaculture activity there. Besides this, it was feared that too large a mangrove population in the ponds could lead to poisoning because mangroves contain tannin. As regards species, the community preferred *Rhizophora mucronata* to *Rh.apiculata*. They did not like *Rh.apiculata* because of its heavy root pattern which they feared would occupy the whole pond area. As regards location, they liked to plant along water channels for the reason that these mangroves would then function as a natural filter and thus play an important role in improving water quality in the ponds. These planting systems are ranked below in the order given by the people of Lham Ulong village based on their preferences and experience in the field (from best liked to most disliked).

Rank 1 = System D
Rank 2 = System C
Rank 3 = System E
Rank 4 = System F
Rank 5 = System A
Rank 6 = System B

b. Simple technique for judging the maturity of a propagule (Family Rhizophoraceae) by looking at the cotyledon

As regards propagation, one lesson gleaned from the field was how to determine the maturity of a propagule without measuring its dimensions. The appearance of the cotyledon, which

Figure 54. *Appearance of the yellow cotyledon characteristic of a mature propagule*

resembles a yellow ring, is the main characteristic signalling that the propagule is ripe. Observation in the field has shown that this simple technique is actually considered to be more accurate than measuring the length of the hypocotyl. This is because the hypocotyl's length often varies depending on internal (tree genetics) and external (environment) factors). If the cotyledon has not yet appeared, the propagule is immature even if the hypocotyl is of the required standard length. Conversely, even if the hypocotyl is not very long (below standard) but shows the yellow ring (cotyledon) then the propagule is ripe and ready to be propagated or planted directly in the field.

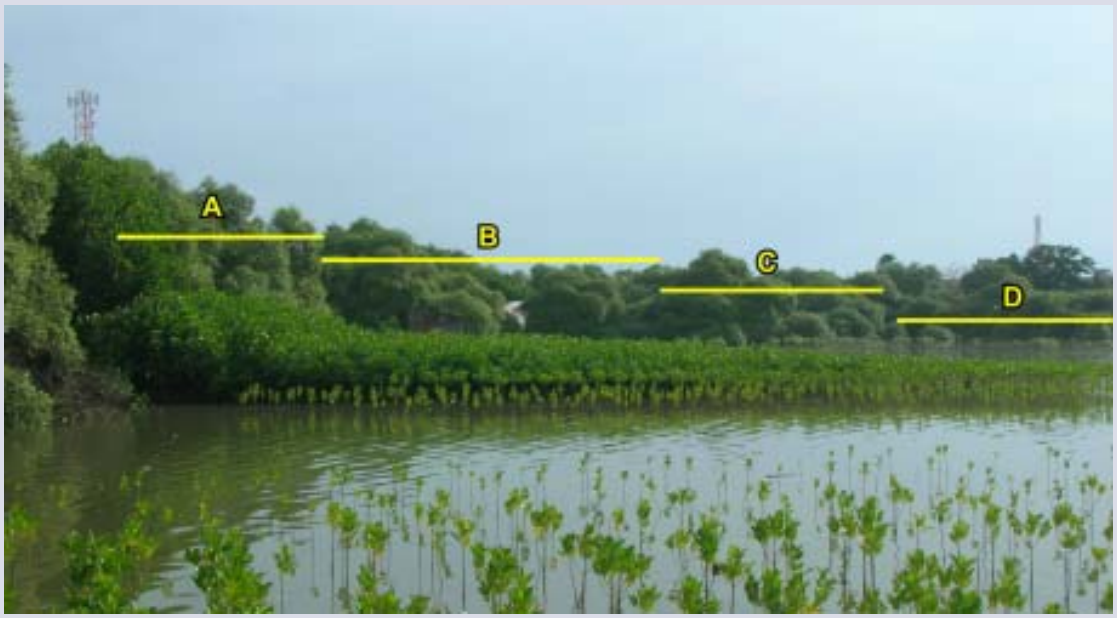
Gambar 55. *Soaked propagul*

c. Soaking the propagule to reduce risk of pest attack and to increase vigour

One lesson learnt in the field during seedling propagation and direct planting was the technique of soaking stored propagules. Experience showed that soaking could reduce the risk of pest attack, especially crabs. The soaking caused the skin to wrinkle so the propagule lost its aroma. With this unattractive appearance and lack of aroma the risk of crabs attacking the propagule decreases. Moreover, soaking the propagule for 4-8 days is believed to increase its vigour, thus improving the processes of sprouting, rooting and growth.

d. Growth of mangrove at several mudflat locations (Lesson from Kemukiman Kandang Lhokseumawe)

Experience of planting mangrove in desa Kedua Aceh village provides a lesson on the link between plant growth and the planting location. From the activity in the field it can be seen



Key:

A = Best growth
B = Moderate growth
C = Low growth
D = Poor growth, high mortality rate

Figure 56. *Gradation in growth from edge to middle of mudflat*

that planting on the edge of mudflats gives the best results. Plant growth gradually declines the nearer the trees are to deep inundation. The illustration below clearly shows the difference in growth rates between mangroves planted at the edge of mudflats and those planted in front of them.

From this, the project obtained another valuable lesson concerning the best place to plant mangroves on mudflats. The recommended sites are those on the landward edge. Conversely, planting on the seaward side should be avoided.

e. Steep embankments reduce the risk of attack from pests (Lesson from Desa Jambo Timur village Lhokseumawe)

In the field, it is not unusual to find local partners who are frustrated by goats attacking and thereby destroying the mangroves planted along the *tambak* pond embankments. Despite a variety of efforts, these attacks continue. At Desa Jambo Timur village, a serendipitous lesson

***Figure 57. Left**: Gently sloping embankment (prone to attack from livestock),*
***Right** : Steep sided embankment (relatively safe from attack by livestock)*

has been learnt. On the stretch of pond lands there are two different conditions on the embankments. At one location, the embankment has been constructed with a gentle slope, while at another it has steep sides. It turns out that goats have attacked the mangrove on almost all the gentle embankment slopes. However, where the embankment sides are steep the mangroves are free from attack by goats. To study this in more detail, further observation was carried out, which revealed that goats experience difficulty in reaching mangrove planted along steep embankments. This experience furnished a valuable lesson for preventing attack from livestock.

f. Intensive facilitation; a key to successful activity

Learning from experience in the field, intensive facilitation is more valuable than the other systems of facilitation ('periodic' and 'occasional'). Intensive facilitation makes it possible to establish smooth communication and coordination. Furthermore, the facilitator will know much more about the various things that affect the lives of the people in the community, the potentials, threats, etc. that can be utilized in the management of activity in the field. This kind of knowledge is very difficult to obtain through periodic or occasional facilitation.

This was proven by the success of the activity in Aceh Jaya where the facilitator lived with the community and immersed himself in the daily life of the community. In other locations where facilitation was either periodic or occasional, it was apparent that the activities

***Figure 58.** Mud skippers indicate a muddy substrate; a good sign for planting mangrove*

experienced heavier constraints and that activity in the field was below optimum.

g. Biological indicators in the choice of planting site

The presence of a particular species of plant or animal can be a biological indicator of whether

Figure 59. *Barnacles; indicator that the site is not suitable for planting mangrove*

or not the site is suitable for the purposes of rehabilitation. For example, the mud skipper (known locally as *ikan glodok* or *Tembakul*) can be used as an indicator for land suitable for planting mangrove. This creature likes a muddy substrate with periodic inundation.

Barnacles, however, are a biological indicator that the site is not suitable for planting mangrove,

Figure 60. *Colony of shoreline purslane; indicator of sandy substrate with high salinity*

even if mud skippers are abundant there. Barnacles spread very quickly and are extremely difficult to eliminate. So far, no effective way of handling this pest has been found other than by scraping them off the infected parts by hand.

The sprawling herb Shoreline purslane (*Sesuvium portulacastrum,* known locally as *gelang air*) is an indicator of a sandy substrate that is rarely inundated. Although seldom inundated, the soil salinity is still relatively high. In such sandy conditions, mangrove cannot grow well. Beach plants do not survive either because they cannot stand the high salinity due to the occasional inundation by salty or brackish water.

Figure 61. *Katang-katang* Ipomea pes caprae *flower (left), Mixture of Katang-katang (light green) and Beach bean (dark green) (centre), Beach bean/kacang laut* Canavalia maritima *pod (right)*

Beach bean (*Canavalia maritima* known locally as *Kacang laut*) and Katang-katang (*Ipomea pes-caprae*) are creeping herbs that grow well on sandy beaches. These herbs are pioneers that grow in open locations with sandy substrate and have a fairly high tolerance to salinity. With this herb cover, the substrate (also eventually the rehabilitation seedlings such as sea-pine) is protected from direct sunlight so the substrate temperature will not be too hot. Moreover, the substrate/sand is also protected from direct wind so is more stable and not easy to blow away. In such conditions, several species of beach plants such as sea-pine (*Casuarina equisetifolia*), Ketapang (*Terminalia cattapa*), Nyamplung (*Callophyllum inophyllum*), and Bintaro (*Cerbera manghas*) grow well.

h. Application of simple propagation techniques (Lessons from Desa Pulot village)

Up till now, the growth media for mangrove has always been taken from muddy soil, especially that from mangrove habitat, while the location for nurseries has always been in tidal areas, mainly in *tambak* pond lands. Experience in Desa Pulot village has produced a form of improvisation that can be used if the ideal location and muddy media are not available nearby.

Figure 62. *Villagers helping to fill polybags with mineral soil as a media for mangrove seedlings*

The practical experiences described below can be applied at other sites suffering from similar constraints.

- Mineral soil as an alternative media to replace mud for mangrove

  Experience at Pulot village shows that in fact mineral soil can be used in place of mud as a media for mangrove seedlings. Mineral soil can hold the propagule well so it stands up straight. For several months, no signs of stress at all are found on the seedling. The mineral soil should be put in a damp place or if necessary in an artificial pool of water.

- Pool model nursery as an alternative if an ideal nursery site cannot be found

  The concept of a “pool nursery” is very simple; the transplant bed is just replaced with

Figure 63. *Terrestrial nursery with artificial water logging*

7

Constraints and Limiting Factors

a. Lack of technical guidelines as a reference for activity in the field

The only guide that the GC partners had for implementing activities in the field was their contract with **Green Coast**. This contract only states the target volume of activity that has to be achieved in the field, that is the number of seedlings planted or the area of land rehabilitated. It contains no implementation guidelines nor detailed steps towards achieving this target. As a result, the local partners endeavour to carry out the activities to the best of their ability with the aim of achieving that final target. Not infrequently, this was done in ways that were not in line with technical principles, thus resulting in failure.

Observation in the field and the results of the Lessons Learned workshop stated that most of Green Coast's local partners lacked sufficient capacity in rehabilitation activities. Monitoring identified only 7 partners (GC1 and GC2) who were judged as possessing adequate technical capacity, while the others did not have the ability to carry out the correct technical procedures. The lack of boundary posts, documentation of the process of the activity, patrols, and other such things was due to this ignorance. When the monev team investigated the numbers of different species planted, the local partner did not possess detailed data, just the total number. Thus it was difficult to determine exactly how many seedlings of each species had been planted. The local partner's excuse for this was that they had not been obligated to record the number of each species planted as long as they met the target in the contract.

Based on the above, it is deemed necessary to create project implementation guidelines which state the stages that must be followed in the rehabilitation activities. These guidelines should form an integral part of the cooperation contract between **Green Coast** and the local partner. In addition, the guidelines should also emphasize certain requirements to the organizer of activities in the field so as to ensure that these activities are carried out in line with the mission, objectives and aims of the project. Such requirements include the following:

- Planting must be heterogeneous so as to satisfy the biodiversity criteria
- Planting must be done on suitable sites
- The planting and livelihood activities must be mutually linked
- Rehabilitation activities must be environmentally friendly (land preparation must not involve burning, etc.)
- Livelihood activities must not be detrimental to nature

The contract should also have attached to it the monitoring schedule and a list of the items to be assessed, together with their consequences. This is important as monitoring is an integral part of the cooperation contract. Thus, if the local partner does not go through the stages specified, then the project is entitled to force them to do so. Moreover, the general guidelines for this project will be extremely useful to local partners in directing activity in the field.

b. Impact on Green Coast of the approaches used by other projects

In the post Tsunami reconstruction and rehabilitation of Aceh and Nias, several donor institutions came with very large sums of money. In assisting post Tsunami recovery, most of them disbursed their aid in simple ways, as free aid or “charity”. The community welcomed this aid that required no effort on their part. It is feared that this kind of aid will have a detrimental impact on the community’s way of thinking and attitudes, such that they will become reluctant to work hard for an income. Assistance in the form of charity and cash-for-work was appropriate in the early part of the post Tsunami period. After 1-2 years, however, this approach needs to change.

The **Green Coast** approach, which adopts the Bio-right concept, is considered in some ways to be an appropriate model for managing activities in the field and ensuring their sustainability. In practice, however, this was difficult to achieve due to a number of obstacles and challenges. One of these was influence from the approaches employed by various donors and NGOs in implementing their activities in the field.

In the attempt to implement the concept of Bio-Right, it was frequently reported that the people were reluctant to take part in Green Coast activities because the aid they would receive was conditional on them doing rehabilitation work, which they saw as an additional burden. They often openly compared GC with other projects which handed out aid easily without requiring anything in return.

Directly and indirectly, this disturbed the implementation of GC activities. Local partners were forced to take a variety of steps and devote a lot of time to convince the community of the strengths of the GC concept. Some of them succeeded in convincing the community and were able to carry out the programme well. Some others, however, were forced to revert to the cash-for-work model which was actually contradictory to the principles of this project.

c. Consequences and impacts of community involvement in various projects

The large number of institutions conducting projects in Aceh often led to the accumulation of several projects at the same time in the same place and involving the same community. In Desa Pulot village, the community was involved in 4 different programmes involving various donors/NGOs, including the **Green Coast** programme. As a consequence, the community's time, attention and energy had to be divided, and of course this could not always be done fairly. In some cases, the activities outside GC really took up a lot of their time so that just to hold one meeting required a great deal of effort.

The community's divided attention caused them to lose focus on the activity. Observation in the field noted that the community were seen to be pursuing an activity just to fulfil the obligation but did not pay heed to nor take seriously the aims of the programme. There was even one case where the community started comparing various donors, passing judgement on the merits and weaknesses of each. Such conditions were often a constraining factor causing the field activity to run at below optimum.

d. Limited project period

The time span of the project was 21 months (1 July 2005- 31 March 2007 for GC 1, and 24 months (1 April 2007–31 March 2009) for GC 2. This is too short a time to complete the activity and achieve the project's goals, especially when using the Bio-right approach. Field observation showed that the necessary administrative process of sending, selecting and approving proposals took 2-3 months. Then there were the various introductory and socialisation activities to explain the project to the community, which took up another 2 to 3 months. In order to implement the field activity itself, a lot of time was needed to prepare the seedlings, provide training, group strengthening, etc., taking another 2-4 months. Effectively, therefore, that left less than one year in which to achieve the activities in the field.

With such a short time span, it is difficult for the project to assess the actual degree of success achieved by each activity in the field. Nevertheless, the monev team have drawn up some indicators and parameters which can at least provide a general picture of an activity's progress and success.

e. The community's limited experience in rehabilitation

Monitoring conducted at all project sites found that both the community and the facilitating institution had a very low level of expertise in the rehabilitation of mangrove and beach plants. Nevertheless, the team found some members of the community who had long been practising rehabilitation by planting mangroves around *tambak* ponds such as those in Lham Ujong, Kahju, Kedua Aceh, and several other villages. The community's experience was generally limited to the species *Rhizophora*. Detailed analysis discovered that the planting technique they had used was very simple. Most of them had planted the propagules directly in the field. It was very rare to find communities who had cultured the seedlings first in a nursery. They did learn some lessons from the activity they had done, for example that it was better to plant in muddy soil than in sandy locations.

f. The impact of economic difficulties on performance in rehabilitation activities

The economic situation of the Aceh communities involved in **Green Coast** is very distressing because of the loss of their livelihoods. The *tambak* ponds, boats and various production equipment they owned were destroyed, while they do not have the ability to start up again. When the project began, many of the people were still living in barracks and dependent for their survival on aid from NGOs and parties concerned with the rehabilitation and reconstruction of NAD.

These pitiful conditions had a significant impact on the project. While the project had a clear vision and mission, particularly concerning sustainable coastal management, the people were still struggling hard to fulfil their basis needs. From another angle, while the project wanted to achieve the Bio-right approach in the field, the people were seeking ways of reactivating their livelihoods.

In the field, the team found that part of the community who became involved were still unable to concentrate fully on the concepts and approach of Green Coast. On this basis, the field organisers finally sought a middle path whereby they could facilitate the community to carry out the programme even though their achievement was relatively limited.

g. Weaknesses in training

In the Lessons Learned-GC workshop, most of the participants said that the results of the training given to facilitators and community were not optimal. It was very difficult for them to understand, comprehend and apply the training in their own work areas. Joint discussion identified the following weaknesses in the training given by Green Coast:

- **Training was not frequent enough**

  The amount and types of training given to GC partners was judged to be insufficient. On some topics it was felt to be adequate, particularly on coastal rehabilitation activities, finance and institutional management. Nevertheless, there were still many other important topics not yet accommodated, especially concerning livelihood activities.

- **Insufficient teaching aids**

  One weakness the community felt in the training was the lack of visual aids. Generally, they were just given handouts that were then explained by the trainer. On some topics, the participants could only imagine the message and information that the trainer was trying to convey, without really experiencing the reality in the field. By the time they got to the field, the messages and information were either out of context or completely forgotten.

- **The material was too general and unfocused**

  Due to time and cost constraints, one training session combined several topics together; for example: introduction to mangrove species, introduction to coastal ecosystems, nursery techniques, planting techniques and plant care all made up one training packet. This made it very difficult for the participants to absorb all the materials. As a result, they were unable to get optimum benefit from the training.

- **Insufficient practical training**

  Rehabilitation involves active physical work in the field. It is unfortunate, therefore, that the training tended to be more theoretical. Hands on practice in planting, preparing seedlings and tending the plants was rarely given. Even though the main points of these were explained in theory, the participants still experienced difficulty in applying them in the field without first having had enough practice. It is strongly recommended, therefore, that the proportion of time spent on practical work should be increased in each training given.

- **Language constraints**

  On average, the Acehnese can understand and speak the Indonesian language. Nevertheless, communication difficulties frequently arose between participants and trainers because the community's ability to use Indonesian was still passive. They could easily understand slow speech on general topics, but had difficulty keeping up with fast speech or technical topics. Something therefore needs to be done to bridge this communication gap. One possible option is to request the help of a local person to become a facilitator with the specific task of acting as interpreter between trainer and participants.

h. Problems with group performance

It was discovered through monev that not all the group members participated actively in doing the field work. At all the sites visited, the majority of active participants were the group leaders or group managers. The other members tended to be passive and just followed the directions given by the group leader or manager. At some sites, members failed to take part in field activity. In several cases, this situation provoked unrest and jealousy among group members. Those who had worked hard on this activity became jealous of those who had rarely taken part, because every member received the same funding from the project. This shows that something needs to be done to foster a sense of group solidarity and commitment towards achieving the target of the activity.

i. Constraints in determining plant survival rate

In the process of determining the plant survival rate, the monev team came up against technical constraints in the field, one being how to decide whether a seedling had died or was still alive. On several occasions they found this difficult to distinguish. To solve this problem, it was agreed that an additional procedure should be carried out; this was to make a small cut in the stem. If the cut was wet, this meant that the plant was still alive.

Besides this, the monev technical team found it difficult to calculate the plant survival rate in detail because of limitations in time and manpower. They therefore determined the rate on the basis of a 20% sample of the total population. All the results for survival rates quoted in the preceding chapter were therefore derived in this way.

j. Time lags in implementation

Monitoring in the field also identified constraints affecting the timing of activities. Activities that should have been done urgently were often delayed. There was even a long time lag between some activities that should have been done one after the other. The following cases are examples of such time lags and delays in the implementation of activities in the field:

- **Comprehensive assessment was done at almost the same time as implementation of the Small Grant programme.**

  The assessment should have been conducted a long time before the activity was implemented in the field, so that the information obtained could provide input and recommendations to enable the programme to be on target and appropriate to the existing conditions. This ideal did not come about in GC1, however, because the assessment was carried out at almost the same time as the implementation of the small grant programme itself. In fact, the small grant programme had already begun before the date on which the assessment report was submitted. The assessment team's recommendations and other input were therefore received too late to be followed up by local partners. The situation improved in GC 2. Even though the time gap between assessment and field activity was not very long, the technical team could communicate directly with partners in the field. Thus, input and recommendations could be channelled and followed up by the local partners even though the official report had not yet been submitted.

- **The interval between training and implementation of the activity was too long**

  In some cases, the training on rehabilitation was given too far in advance of the actual implementation of the activity in the field. As a result, many of the participants forgot what they had learnt from the training. Consequently, the results of the field activity were far from optimal.

k. Mistakes in the choice of planting sites

The monev team also found that some of the local partners had planted on unsuitable sites. The most common forms of such error included the following:

- Planting mangrove on dry grassy soil
- Planting mangrove on sandy beach
- Planting mangrove on pest prone sites
- Planting mangrove on heavily inundated beaches.

Figure 64. *Mangrove planted on an unsuitable site*

Besides this, the team also identified some mistakes in the rehabilitation of sandy beaches. The most common forms of mistake found were: planting on sand that was still labile, and planting on beaches subject to ocean tides. In addition, planting was also found to have been done on paths used by livestock. The monev team found cases where beach plants had been growing well but many had died as a result of disturbance from livestock.

Figure 65. *Beach plants planted on beaches that are labile and subject to ocean tides*

Mistakes in the choice of planting sites had the effect of limiting the success of rehabilitation activity in the field. Where mangroves were planted on unsuitable sites, the percentage of trees that survived was low. Even if the mangrove trees survived, they did not grow well. The same was true for beach plants planted on unsuitable sites. Planting on beaches that are labile or in contact with salt water results in the beach plants becoming stressed and dying. Communication and coordination need to be established with management or the technical team in order to prevent repetition of such mistakes in the future.

I. Conflict of interest

The large number of different parties involved in the rehabilitation and reconstruction of NAD and Nias, combined with the weak coordination and communication among them, has resulted in the overlapping of activities in the field. During the project, several of Green Coast's partners collided with other interests. Some of the conflicts of interest that occurred in the project area are described below.

- **Road construction versus wetlands (west coast of Aceh)**

  On the west coast of Aceh a big project is underway to construct a highway from Banda Aceh to Meulaboh. The project is funded by USAID and carried out by the national contractor WIKA. This road crosses wetlands comprising mangrove stands. Not infrequently, work on this project has disturbed or damaged activities carried out by Green Coast. At Pulot, hundreds of trees planted along the coast were bulldozed. The same fate was suffered by hundreds of mangroves planted around the perimeter of Pulot lagoon. Meanwhile at Kedua Unga village, road construction cut through swamp and mangrove forest. Consequently, many of the mangrove trees (dominated by *Sonneratia caseolaris*) fell victim.

  Analysis shows that construction of the western highway has led to the following detrimental impacts:

  - Swamp defragmentation; where a swamp was cut up into several separate pieces. This happened because the hydrological link between the parts was severed. Generally, the direct impact of this was that the swamp dried out thus disturbing the balance of the swamp ecosystem.

Figure 66. *Swamp defragmented by highway construction*

- Mangrove felling; this usually happened because the highway cut through the mangrove stand. In addition, the need for timber for the road construction often sacrificed the mangrove trees. This happened in the Green Coast village Desa Kedue Unga. According to field observation, at least 5 hectares of mangrove stand were completely cut down for the purposes of road building.

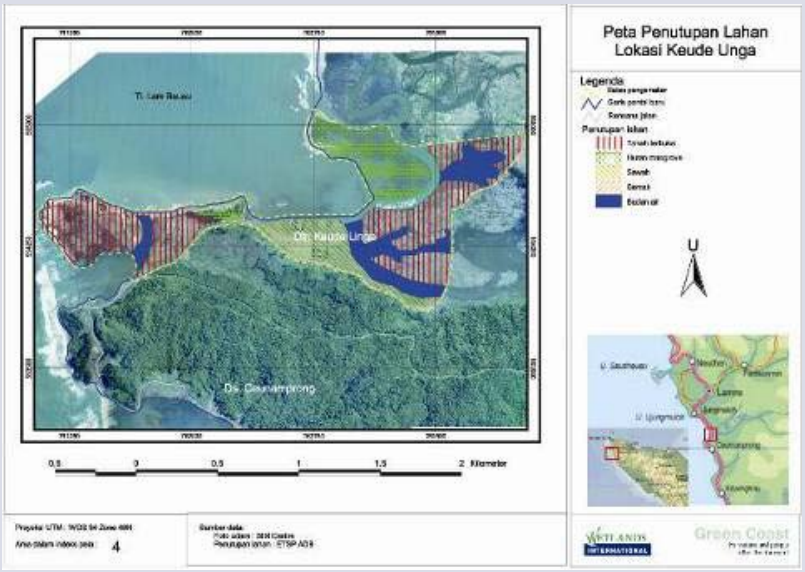


Figure 67. *Mangrove stand fallen victim to road construction at desa Kedue Unga village*

- The removal or destruction of plants (mangrove or beach plants) planted. This happened where the route of the highway being built overlapped with sites where mangroves had been planted.

- **Regional development versus conservation of mangrove and lagoon (Teluk Belukar-Nias)**

  At Desa Teluk Belukar village, BRR constructed a Fish Landing Quay (known by the abbreviation of PPI) about 500 metres from the lagoon where the GC2 project was in progress. As part of the development, the quay was accompanied by the building of an access road to the main highway.

  The construction of this quay and road are a serious threat to the Teluk Belukar lagoon. Some of the quay/road building activities that have stimulated the degradation of this lagoon are as follows:

  - The demand for timber for road construction encouraged the felling of mangrove forest in the vicinity

    Mangrove felling was found at several spots. The team even discovered several strips of land where the people had purposely cut down all the vegetation. At one spot, all the mangrove forest had been felled over an area 8m wide by 150m

long. According to information from the field, this mangrove logging had been done by people claiming to own the land. The mangrove trunks were sold to the road-building project for a price of IDR 6000 for 4m and IDR 12,000 for 8m. These were then used for foundations and props for ditches along both sides of the road. Based on an interview with one of the road construction project's workers, it was estimated that the construction of these ditches required at least 100,000 mangrove stakes. This is bound to encourage degradation of the mangrove forest in Teluk Belukar.

Figure 68. *Mangrove forest completely cut down (left), mangrove trunks made into stakes (centre) and use of mangrove poles for ditch props and foundations*

- The demand for wood planks for the quay has encouraged logging in swamp areas

The demand for planks as a building material also tempts the villagers to cut down trees around the lagoon and swamp. Using simple tools, they saw the trunks into planks that are then dried and sold. This is still going on. Without further regulation, it is feared that this will threaten forest conservation in this village.

Figure 69. *Timber felling around the swamp for sale to the fish landing quay construction project*

- Opening of the Fish Landing Quay (PPI) and access to it has put up the price of land in the Teluk Belukar area

  Easier access has raised land prices around Teluk Belukar lagoon. This has encouraged the owners to sell their land for high prices. Among their targets are tourism entrepreneurs and investors, considering that this is a strategic site for the development of tourism. If this happens, then there will be the potential for a new threat to the conservation of Teluk Belukar lagoon.

- Regional development in the vicinity of Teluk Belukar lagoon has stimulated various investment plans

  In interviews, residents said that several issues had arisen since the construction of the quay and road near Teluk Belukar lagoon. One respondent said that there were several investors who planned to establish tourism activities in the area, including building a track and swimming pool. Irrespective of whether or not these issues are true, urgent steps need to be taken to protect this ecosystem from threats.

- River blocking

  One result of regional development around Teluk Belukar lagoon has been the blocking of the river with sand to facilitate easier access. Thus, the coast around the lagoon can be reached by land in all directions. However, the blocking of the river has also caused disturbance to the hydrological balance in the area. Several sites that had never before been flooded now experience periodic flooding due to the blocking of the river.

Figure 70. *River blocked to facilitate access by land*

- Mangrove versus *tambak* ponds (Desa Pulot village)

  Conflict of interests also occurred around the Green Coast site in Desa Pulot village - Aceh Besar. At this site, the mangroves planted in phase 1 fell victim to the construction of *tambak* ponds. Actually, the community facilitated by GC had agreed on village spatial planning in which there was no provision for *tambak* ponds near the lagoon. However, as the land to be developed belonged to individuals, this could not be prevented by the spatial planning. Regrettably, more than 500 mangrove trees were sacrificed to construct these ponds.

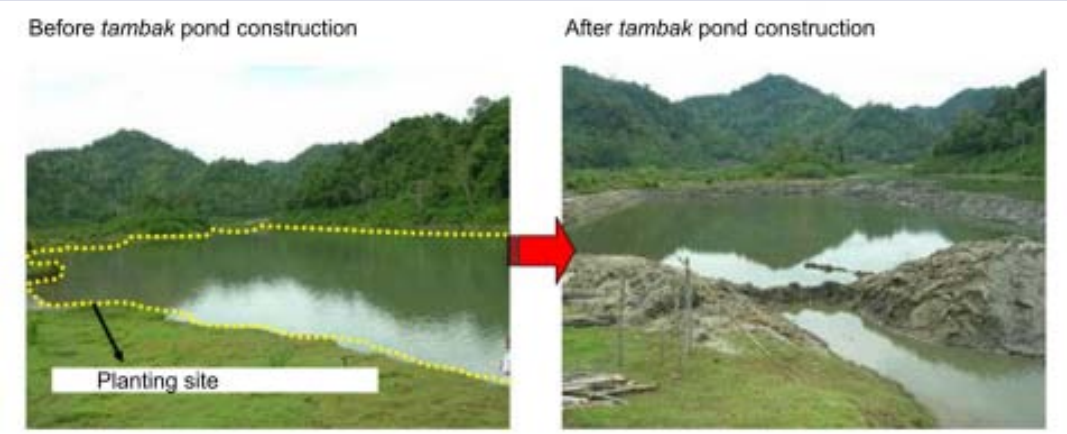


Figure 71. Tambak *pond construction has sacrificed hundreds of mangrove trees planted around the lagoon*

- **Mangrove versus the construction of a sea defence system (Desa Kedue Aceh)**

  The project site in Desa Kedue Aceh village – Lhokseumawe also experienced conflict of interest with the construction of a sea defence. This construction was an initiative from local government, supported by central government, and was intended to protect the city of Lhoksemawe from annual flooding. Ironically, these floods only occurred once a year and lasted 1-3 days. Meanwhile, many people were sure that the cause of the annual flooding was that the network of water channels was not functioning normally. Rubbish clogged almost all the water channels, thus triggering floods. Irrespective of this controversy, the sea defence construction programme continued. In November 2008, the construction of an embankment around the mudflats was almost complete.

Figure 72. *Almost completed embankment sea defence on mudflats at Desa Kedeu Aceh village -Lhokseumawe*

In the field, the construction of this sea defence came into direct conflict with the planting of mangroves under GC2. Not just that, this construction would also push aside the planting sites for the Twinning Program (UNEP) and for GC 1. The existing mangrove stand near the mudflats would certainly also fall victim to this construction.

In a meeting with the sea defence consultant, it was explained that the mud layer of all parts of the mudflat would be removed to a depth of 1 metre so that the dam to be constructed would be capable of holding a certain volume of water. If this happens, it is feared that the biota on the mudflat will suffer. Unfortunately, it is precisely these very biota (oysters, crabs, shrimps, etc.) that provide an income for the local community.

In this respect, thought needs to be given to efforts to answer the following questions:

- What compromise can be reached with the community, especially those people who have lost their livelihoods (such as gathering oysters, fish, shrimps, etc.)?
- What alternative activity can the community undertake to compensate for the loss of their incomes.
- Who will manage operation of the sea defence? If there is a manager, do they have sufficient capacity to manage it?
- What about its future sustainability? This question is based on the worry that the sea defence could be abandoned if there are not sufficient funds and human resources to maintain it.

- **Mangrove versus *tambak* pond maintenance**

In the *tambak* pond lands of desa Jambo Timu village, the monev team found collision with repairs to pond dykes/embankments which had sacrificed hundreds of the mangrove trees planted through GC1. Observation in the field discovered that at least a thousand mangrove seedlings that had been planted in four *tambak* ponds had been destroyed. Serious thought therefore needs to be given to ways of preventing this same thing from happening at other GC sites.

Figure 73. *Mangrove sacrificed in repairs to trenches in Jambo Timu village, Lhoksumawe*

m. Pests and weeds

Pests are one factor that threatens the success of this rehabilitation project, both for mangroves and beach plants. Pigs are the pest most feared by the community because they cause the most damage and are very difficult to control. Fences, ditches, etc. were constructed but often ended in failure. Besides pigs, livestock like cows, buffalo and goats were also often found disturbing plants. Some species like coconut and ketapang were found to be attacked by leaf caterpillars. Although their attack does not kill, it severely disturbs plant growth.

Figure 74. *Livestock and caterpillars; Common pests found disturbing beach plants*

Mangroves were frequently found to be attacked by barnacles. This pest adheres tightly to the trunks and is extremely difficult to eliminate. If the attack is light, the impact on the plants is not easily obvious. Plants under heavy attack, however, can become stressed and die. Caterpillars were also seen attacking mangrove. It was observed in the field that the caterpillars attacking mangroves differed from those that attack beach plants. At Desa Jambo Timu village, caterpillars killed many mangrove trees. Meanwhile in Sabang, the local partner complained that many mangrove had died from attack by crabs. Generally, crabs chew a circle around the trunk. At some sites, gastropods were also found attacking mangrove plants, in particular the leaves. According to observation in the field, this attack was not as severe as that from other pests but did significantly disturb plant growth.

Figure 75. *Barnacle attack on mangrove*

Figure 76. *Caterpillar attack kills mangrove*

In addition to pests, the rehabilitation activity was also threatened by weeds. Attack by Filamentous algae was found at several sites in Desa Gampong Baru, Desa Lhan Ujong and Desa Jambo Timu villages. The form of these attacks ranged from ground occupation to total cover of the mangrove. At a certain level, this algae completely enveloped the plants and hindered sunlight from coming through. Furthermore, many cases were found where the weight of the filamentous algae caused the plants to bend and collapse. Several had fallen to the ground. Where attack is severe, the plants can become stressed and die.

Figure 77. *Filamentous algae disturbing mangrove growth*

n. Natural factors

Natural factors also play a role in determining the success of rehabilitation activity in the field. Several natural disasters and other phenomena occurring at some of the project sites caused many plants to die and thus reduced the level of achievement.

- **Flash floods**

  At the beginning of 2008 in Lhokseumawe, flash floods struck almost the whole coastal area, including the Green Coast sites. These floods damaged thousands of mangrove trees planted in *tambak* ponds. Several floating cages were also damaged, causing considerable loss.

- **Coastal dynamics**

  Compared to other natural phenomena, coastal dynamics are those most commonly met in the field. Important processes that often cause damage to plants in the rehabilitation sites are abrasion and accretion. Abrasion is the erosion of the earth's crust by solid particles moved by geological agents such as wind, surface water and waves. In this case, the abrasion most often found in the field is that caused by waves, causing the coastline to recede and reducing the area of the beach. Accretion is the deposition in estuaries or along the coastline of materials eroded from land and rock and then transported by water and other geological agents. These processes are closely related to the seasons, which influence the direction and strength of winds, sea currents and the strength of waves. These processes are inter-related both on a narrow and wider scale.

Monitoring found accretion at mangrove planting sites in Desa Iboih village (Sabang) and Bahonawono village (Nias). At both sites, hundreds of plants were buried in sandy sediment resulting from the abrasion of other parts of the coast. Observation in the field indicated that the impact on plants is strongly influenced by high accumulation of sediment. Plants with light sedimentation were still able to survive and grow. Where sedimentation was heavy (almost all parts of the plant were buried), in most cases the plants survived but were stressed, while some died. If the plant was completely buried, it would certainly die.

Figure 78. *Accretion in desa Iboih village – Sabang*

Figure 79. *Accretion in Bahonawono village – Nias*

Compared to accretion, abrasion was less frequent. Generally, sites suffering from abrasion were those where beach plants had been planted. When planting began, the sites had been relatively far from the coastline. Slowly but surely, abrasion had eaten away at the shore, pushing the coastline back until it reached the planting site. Many cases of abrasion were found at project sites on the west and north coasts of Aceh. At desa Kahju village, abrasion caused hundreds of trees to be eroded away and die. Similarly, in Paya Kemeng many beach plants died as a result of abrasion.

Figure 80. *Abrasion in desa Kahju village*

o. Poor environmental awareness in the community

Based on monitoring in the field, it is known that the level of concern and environmental awareness among the community is still low. This was clearly seen in the activities they carried out that were not environmentally friendly. Directly or not, these activities have polluted, disturbed or even damaged the environment. Indiscriminate disposal of rubbish, burning bush, and cutting down trees are three such practices easily found in the field. They usually occur in several corners of the village, some even at the project's rehabilitation sites.

At Desa Kedue Unga, land burning has caused dozens of plants in the planting site to catch fire and die. This continues to happen even though warning boards have been put up urging people not to start fires indiscriminately. Meanwhile, in Desa Pulot and Kedue Aceh, rubbish is chucked away indiscriminately almost every day. In Desa Kedue Aceh, the villagers are used to throwing away household waste near their homes not far from the mudflat perimeter. This waste is then picked up by the tides and pollutes the mudflat, including the Green Coast project planting site. The rotting organic material discouraged the community from tending the plants. Observation in the field shows that this pollution has also disturbed plant growth. In addition, it could also potentially invite several diseases that would endanger the health of the local community. Concrete action is needed to solve these problems.

Figure 81. *Burning that killed dozens of plants in Desa Kedua Unga village*

Figure 82. *Pollution has dirtied the environment and had a detrimental impact on the Green coast planting site at Ds Kedua Aceh village*

p. Limited funding for livelihood development

At a glance, the funding channelled to local partners in the livelihood programme appears very large. In reality, however, the amount finally received by each member was relatively small. The size of this amount depended on several things, including the number of members and the mechanism for distributing or managing the fund in the group. According to observation in the field, the sum received by each member varied from IDR 500,000 to IDR 4.000,000. In reality in the field, this sum was not big enough to start up a new livelihood from the beginning, and was more often used by to expand an existing activity. In some places, cases were even found where part of the fund was used for other purposes, the most common being to pay for daily needs.

With the small sum they received, the villagers clearly did not have a free choice of livelihood. In some cases the sum was not enough to be used as business capital. When faced with this problem, many of them changed to a different livelihood appropriate to the amount of capital they had. In several places, it was found that some group members had chosen to change to a new livelihood despite having no previous experience.

q. Constraints in measuring the impact of the livelihood programme

In the limited time, it was very difficult to measure how far the GC livelihood recovery programme had had an economic impact on the community. Reasons for the difficulty the monev team experienced in measuring the economic gain from the project are as follow:

- There was no baseline data on the community's economic condition prior to the effective start of the project, particularly information on their income levels.
- It was difficult to determine the most appropriate time to conduct an assessment of the impact. It could happen that at the time of the assessment, a business was still at Break Even Point (BEP). In fact, a few months later that same business could well have grown and be bringing in additional income, which could be considered as economic gain.
- The starting point for building an economic activity differed from one member to another.
- Limited human resources made it difficult to monitor every economic activity in detail one by one.
- It was difficult to obtain authentic data from the community concerning financial calculations in their business activity. People were often found who appeared insufficiently astute at estimating the size of certain values related to their business. In some places the information obtained from the community was too high or too low. If analysis were forced to include these values, the results obtained would be biased.

r. Constraints in deciding on a livelihood

During field visits, the assessment team came across cases where the mechanism for deciding on a livelihood had not been carried out correctly. Below are some of the things that generally happened in the field:

- The type of livelihood was decided upon without waiting for recommendations from the assessment team
- There was not as yet any standard mechanism for the process of deciding on a livelihood
- Every member of the community had too much freedom in choosing a livelihood.

s. Limited training in support of the livelihood recovery programme

A large part of the community were of the opinion that training was extremely useful for them in pursuing their various livelihoods. They were also confident that training would make their activity more efficient and run more smoothly thereby increasing yield. However, not all kinds of livelihood could be supported by the training facilitated by the project. This was in view of the wide variety of different livelihoods in the community. Moreover, limitations of funding and time were also reasons why only limited training could be given. Based on the monitoring and evaluation, it was found that many recipients of the fund had not received training relevant to the livelihood that they were going to pursue.

t. Problems with the sustainability of economic activities

Observation at several locations still found problems concerning the sustainability of activities. In desa Pulot village, several members were found who had succeeded in cultivating crabs in cages, but this cultivation had stopped after a number cycles. Meanwhile in Nias, pig farming had produced good results but there had been no reinvestment. The number of livestock fell because they were sold.

Based on findings in the field, economic difficulties were the main constraint on the sustainability of activities. The profits obtained were not enough to keep up with constantly increasing needs. In general, this issue of unsustainability of economic activity hit members whose business had reached only Break Even Point or whose profit was too small.

u. Problems with coordination

One constraint faced by Green Coast in general was the imperfect coordination and communication between activities in the field. Each local partner seemed to be working alone, each separate from the other. According to monitoring in the field, a large proportion of local partners knew nothing of the development of each other's activities, and so no mutual learning was taking place. Through the KuALA network and several meetings/trainings, the project had in fact facilitated communication among partners. Nevertheless, after the event finished, the coordination and communication between partners broke down.

8

Recommendations and Suggestions

8.1. MANAGEMENT OF ECOSYSTEM REHABILITATION AND LIVELIHOOD RECOVERY

a. Provision of a technical guide for rehabilitation and livelihood activities

A technical guide to the implementation of activities is badly needed in the field. This technical guide should, at the least, provide adequate information and guidelines on how to manage the activities, both for ecosystem rehabilitation and livelihood recovery. To make it easier for local partners to understand, the technical guide should be simple and based on the stages of each activity. These should be given in the correct sequence, complete with the procedure for implementing each stage. In addition to these stages, several rules also need to be laid down to ensure that the activities carried out in the field are consistent with the basic principles of Green Coast.

b. Establishment of a base line prior to implementing activity

Green Coast should be capable of measuring the impact of its activities in the field. From the point of view of community welfare, the project's impact was concerned more with how much economic gain the community had obtained through the various economic activities that they conducted. From the point of view of the environment, meanwhile, its impact was concerned more with the extent to which the ecosystems hit by the Tsunami had recovered as a result of the coastal rehabilitation activities. However, the absence of any baseline to describe the economic and environmental conditions (prior to the start of the project) made it difficult for the project to measure these impacts. For future projects, it is strongly recommended that each project should collect baseline data before the project begins.

c. Development of a mechanism for selecting group members

While conducting activities in the field, many cases were found where the group's performance was below optimum. Monitoring also indicated that a relatively limited number of group members were in fact active in the rehabilitation activities. A large proportion of members tended to be passive. Ironically, all members (both active and non-active) received the same benefit from the project. Several steps could be taken to improve group members' performance now, including the following:

- Oblige every member to attend and participate in every activity
- Apply a reward and punishment mechanism to members. For example, if a member is absent from a meeting more than 4 times, they will be expelled from the group.
- Conduct a periodic evaluation of members

For the future, a group membership selection mechanism must be prepared and then applied in the field. This mechanism must fulfil the principles of transparency, justice, and prioritize the commitment of would-be members. Through this mechanism, it is expected that each member will genuinely possess strong willingness and motivation to join the group and carry out the activities in the field.

d. Intensive facilitation for groups and community

In view of the community's limited capacity for implementing activities in the field, it is extremely important that facilitation take place. With facilitation, it is expected that there will be good communication as well as a channel for learning a range of knowledge and skills. Facilitation should be intensive. This means that there must be a facilitator who really mentors the community patiently and guides them through each stage of the activities. The facilitator must have the requisite skills to establish communication with the community and have sufficient understanding of the project's vision and mission. With intensive facilitation, it is expected that activities in the field will run smoothly and achieve success.

e. Continued communication and coordination among partners

For communication and coordination among the local partners in Aceh and Nias to cease would be very regrettable. A breakdown in this communication also means a breakdown in the flow of information and lessons that should strengthen the local partners in the future of their programme. Related to this, the communication and coordination established during the GC project should be improved, maintained and continued. Initiation and facilitation from the project are needed to seek the best solution so that communication can continue. One way of doing this would be to keep the Jaringan Kuala network active as a channel for communication between GC partners, both with one another and also with other parties.

f. Maintain or raise the level of environmental awareness

According to observation in the field, there is a frequent rise and fall in the community's level of environmental awareness. At times when environmental problems are an issue, there are plenty of parties enthusiastically making an effort to do environmental recovery activities like planting mangrove, planting beach plants, and environmental campaigning. This, directly or otherwise, stimulates the community to know and eventually become aware of the importance of looking after the environment. But if the environmental issue is in decline, then the level of community awareness will certainly also decline. With the ending of the GC project, it seems necessary to anticipate some endeavours to improve and maintain the community's level of environmental awareness so that it does not decline. Some of the steps that can be taken are as follows:

- Distribute environmental campaign materials to the local partners whenever possible. The local partners are then expected to distribute these materials to the community even though the project is finished.
- Coordinate with other parties (both governmental and non governmental) to synergize environmental awareness activities. Some materials belonging to GC can be channelled to these parties to support their ongoing programmes.
- Integrate the awareness raising programme into the school curriculum. If done, this will guarantee the continuation of the environmental campaign. Even though the project will have ended, the process of raising environmental awareness will continue.

g. Establishment of specific criteria for choosing a livelihood

Several cases of failure discovered in the field have provided invaluable experience and lessons for the project, especially as regards the mechanism for deciding upon a type of livelihood. The mechanism and stages for this should, at the very least, include key criteria that strongly influence the sustainability and success of an economic enterprise. Below, are several criteria to which attention needs to be paid when deciding upon a choice of livelihood:

- The participants already have experience of running economic activity. If they do not, they must fully convince the group and the facilitator that what they plan to do is feasible. This, of course, must be supported by calculations and assumptions that can be substantiated.
- The type of livelihood is approved and stated to be feasible by the facilitator and group. This must be founded on a profit-loss analysis and a number of other considerations. As regards this, each member is under an obligation to make a convincing simple business yield analysis to show that the enterprise chosen has prospects and will be successful.
- The type of livelihood must have prospects and open market opportunity.
- The enterprise to be developed does not have the potential to threaten environmental conservation.

If these criteria are applied, there will not in future be members who are mistaken in their choice of an economic enterprise. Moreover, these criteria will induce the community to be better prepared and capable of achieving success.

h. Application of a service system to support continued facilitation of the revolving fund

As each project draws to a close, the sustainability of activities has become a common issue. Throughout the period of the GC project, the facilitation process could operate on a regular routine basis because the necessary funding was available. When the project ends, however, there will no longer be funding that can be used for facilitation. To address this problem, it is recommended that the local partner apply a service system specifically directed at continuing the facilitation so that the revolving fund can continue to operate well. A sum for this service needs to be discussed together. However, based on several considerations, 0.5% of the revolving fund is deemed to be appropriate for this service system. This money can be allocated to various facilitation related expenditures, such as the facilitator's fee and transportation. If this system can be put into practice, then facilitation can continue even after the project has finished.

i. Assessment of the more specific potentials and constraints concerning livelihoods (including present conditions and predictions for the future)

In the assessment done at the start of the Green Coast project, a study was made of the potentials and constraints related to the prospects of an economic activity. However, this was general in nature and not specifically directed at assessing each economic enterprise one by one. Meanwhile in the field, what the local partner has more need of is technical input on the activities that will actually be carried out. For this reason, an assessment is needed that looks more specifically at the prospects and feasibility of several livelihoods that can be alternatives for the community.

Conditions in the field often experienced change along with the development that was taking place. In some cases in Aceh, the results of the assessment had lost their relevance within just a few months. For this reason, an assessment is needed that is more predictive in character, so as to anticipate the diverse dynamics that could impact on the livelihood activities pursued by the community.

8.2. POLICY ADVOCACY AND SUSTAINABLE COASTAL MANAGEMENT

a. Improvement in the policy advocacy process aimed at sustainable coastal management

During the project, Green Coast took various steps to urge the implementation of sustainable coastal management. Policy is one entry point towards sustainable coastal management. Related to this, Green Coast (coordinated by WWF Indonesia) specially undertook coastal policy advocacy. From this process, several documents were developed. Nevertheless, the road to ideal coastal policy is still a long and winding one. According to observation in the field, there are several obstacles and constraints that slow down this policy advocacy process.

Learning from experience in the field, the project is of the opinion that a concrete step is needed to improve performance and strategy in the advocacy process so that future activities will be more effective. Below are some steps that can be taken to improve performance in the policy advocacy process:

- It is essential to develop and maintain relations with decision makers and parties that will be the target to later adopt the policy, in order to support policy advocacy
- Understand the weaknesses, strengths, challenges and opportunities to support the process of advocacy
- Improved coordination, communication and assignment of roles among parties involved in various activities must be achieved in order to ensure the success of policy advocacy
- Identify and determine strategies, approaches, tactics and targets in policy advocacy
- It is necessary to give room and wide access to parties to involve themselves in policy advocacy to help work towards success.

b. Recommendations concerning policy for regional government

From the policy advocacy process carried out during the project, Green Coast identified several constraints and obstacles which have hampered good coastal management in NAD province and Nias. Based on a policy analysis supported by a number of considerations and related information, the project recommends to Government of Aceh Province and District/Municipal Governments the following:

- Conduct a thorough re-evaluation of development, investment and infrastructure activities in coastal regions that could have a big, important impact on coastal ecosystems and on the communities living there (see summary of analysis results).
- Prepare strategic and action plans to minimize the impact of environmental degradation in coastal areas as a result of the implementation of development, investment and infrastructure activities, both now and in the future.
- Development, investment and infrastructure activities that are being or will be implemented in coastal areas should refer to various regulations currently in force; for example, the AMDAL (environmental impact analysis) regulations, compliance with the provincial spatial planning (RTRWP) and district/municipal spatial planning (RTRWK).
- Draw up Coastal Area Spatial Planning for the province of Nanggroe Aceh Darussalam which is integrated into the RTRWP. The process of drawing up and determining this spatial plan for coastal and marine areas must be based on the regulations in force and be binding on all parties.

- There is an urgent need to create a policy at provincial and district/municipal levels for an integrated and environmentally oriented system of management for coastal and marine areas, and to harmonize the legal system (regulations, policy, organisations and institutions) as a pillar for marine and coastal management. This should use a community based management approach. A community based approach to the development of coastal and marine areas is believed to be more efficient and to achieve strong legitimacy from the community so that the level of success will be higher. Local wisdom practised in the *adat laot* customary marine laws must form the basic substance of the management system to be developed.

- ? A strategy for compensation or accreditation needs to be developed like that mandated in Law No. 27 of year 2007 concerning the Management of Coastal Areas and Small Islands, which is obligatory for all parties intending to utilize coastal areas for the purposes of development, investment and infrastructure. This compensation will be used to ensure that the coastal areas are managed according to the principles of sustainability.

- The Government of Aceh urgently needs to set up a Green Investment System as policy and reference for deciding on activities related to investment, infrastructure and development that will be implemented in or will affect coastal areas.

c. Respect for local wisdom and communal knowledge

Local wisdom and the knowledge of local communities in Aceh show that coastal management practices have been in existence since long ago. These need to be respected and supported in order to support the conservation and sustainable management of coastal and marine resources and the small islands in Aceh.

8.3. SUSTAINABILITY OF THE PROJECT (EXIT STRATEGY)

a. Encourage an exit strategy through the proposal of GC demo sites

From the bio-physical and socio-economic assessments carried out by WI-IP on all Green Coast sites, eleven (11) sites were identified as possessing important ecological and economic values. On this basis, therefore, the project recommends that these selected sites should be managed by the community together with other stakeholders as sustainable Demo sites. These eleven sites are described in the table below.

Table 20. Selected sites recommended as demo sites.

No.	Site	Characteristics
1	Desa Krueng Tunong Sub-district Jaya Kabupaten Aceh Jaya	Sandy beach, river estuary, *tambak* ponds, hills (Temega hill)
2	Desa CeunamprongSub-district Jaya Kabupaten Aceh Jaya	Sandy beach, mudflats, brackish swamp, former *tambak* ponds
3	Desa Keude UngahSub-district Jaya Kabupaten Aceh Jaya	River estuary, mudflats and brackish-salt water swamp (former paddy fields)
4	Desa Gle JongSub-district Jaya Kabupaten Aceh Jaya	Sandy beach, brackish swamp and hills
5	Desa Kajhu Kec. Baitussalam, Kabupaten Aceh Besar	Sandy beach with sand dunes and river estuary
6	Desa Gampong Baroe Sub-district Mesjid Raya, Kabupaten Aceh Besar	Sandy beach with sand dunes, *tambak* ponds and river estuary
7	Desa Lham Ujong,Kec. Baitussalam, Kabupaten Aceh Besar	*Tambak* ponds and river. In the 1960s around 900 ha of this area was mangrove forest, which was then cleared to make way for *tambak* ponds and housing. The loss of this mangrove is thought to have worsened the impact of the Tsunami
8	Desa Pulot, Kec. Leupung. Kabupaten Aceh Besar.	Brackish to salt water lagoon (about 15 ha) formed after the Tsunami. The mouth of the lagoon is sometimes blocked by sand, sometimes open. In the hills near the lagoon, Lutung, long tailed macaques, pig-tailed macaques (Beruk), gibbons (Siamang) and several species of hornbills can be found.In the lagoon are several species of fish of important economic value (such as: Kakap/Serakap, Tengoh, Tanda, Merah mata, Bayam/Kerape)
9	Kelurahan Anoi Itam Sub-district Sukajaya, Kota Sabang	Coral reef, sandy beach, rocky beach, hills.
10	Pinueng Cabeng, Kelurahan Iboih, Sub-district Sukakarya, Kota Sabang	Beautiful, clean white sandy beach.Adjacent to Taman Wisata Laut Pulau Weh marine park in the Selat Rubiah strait (coral reef area 2600 ha)
11	Luaha Talu, Laguna Desa Teluk Belukar Sub-district Gunung Sitoli Utara, Kab. Nias	A coastal lagoon (area 47 ha) surrounded by mangrove forest (area 66ha with 20 species of mangrove). The morphology of the lagoon has the shape of a sting ray, very rich in both terrestrial and aquatic biodiversity. Conservation of the lagoon will support the sustainability of fishers' livelihoods, prevent seawater intrusion, support eco-tourism and play a role in the mitigation of and adaptation to global climate change.

Besides possessing important values, these eleven sites are judged to have succeeded in carrying out activities in the field. Because these sites are so important, it would be most regrettable if their management were to cease in mid-course when the Green Coast project ends in March 2009. Related to this, GC Indonesia has officially submitted a letter to the Aceh Province government (Annex 1), proposing that these eleven demo sites (Annex 2) resulting from Green Coast activity should:

- receive official recognition (in writing) and be publicised by the Regional Governments of NAD and Nias for their important values and benefits to the environment and community (please determine the most effective way of conveying this)

- continue to exist (if possible, funds should be allocated, e.g. from the regional budget/ APBD), to be nurtured and not be converted to other functions that would be detrimental to the environment and local community

- be fully utilized for the interests of eco-tourism and as a vehicle for environmental education for the general public (including government apparatus, NGOs, research institutes, colleges of higher education, school children, etc.)

These steps together form the project's exit strategy to ensure the sustainability of the activities, particularly at the successful sites having important values for the environment and community.

Unfortunately, however, the regional government has not yet given the green light as a positive response to this proposal. Various efforts therefore need to be made to achieve government recognition of the demo sites and the sustainability of the activities. These efforts include the following:

- Continue the administrative process already in progress, for example by monitoring and accompanying letters to regional government, and making efforts to obtain a positive response from regional government

- Continually lobby the local government

- Boost campaigning and promotion of these eleven proposed demo sites so as to support the process underway.

- Coordinate and work together with the community and other parties in order to convince the government of the importance of conserving these eleven demo sites.

b. Sustained maintenance

A key factor in the success of rehabilitation activities is the continued care and maintenance of the plants. This includes replenishment, pest and disease control, and weeding.

Sadly, monitoring has detected that the plants are not being looked after well or regularly. Only a few local partners continue to tend the plants and secure the planting site. As the end of the project draws near, the worry arises that the plants will be abandoned by the local partners and community. To avoid this, efforts need to be made to ensure that the plants continue to be cared for in the field. Some steps that can be taken are as follows:

- Make the local partner and community understand the plants' need to be cared for

- Make it a condition that tending the plants is one of the local partner's responsibilities, even when the project has finished

Coordinate with a relevant governmental body (such the Forestry Office / Dinas Kehutanan and DKP) to explore cooperation in caring for the plants.

References

……..2007. *Green Coast; for nature and people after the Tsunami*. Source: http://www.wetlands.org/Whatwedo/Projects/GreenCoast/GreenCoast2inAceh/tabid/442/Default.aspx.

……..2007. *Ensuring Sustainable Coastal Resource Management through Policy Work*. Source:http://www.wetlands.org/Whatwedo/Projects/GreenCoast/GreenCoastTsunamiresponse/Indonesia/Policy/tabid/1274/Default.aspx.

……..2008. *Pointer hasil diskusi dalam Pertemuan KUALA simpul Barat*. Green Coast Project. WWF Indonesia. Meulaboh.

……..2008. *Jaringan Koalisi Untuk Advokasi Laut Aceh*. Source: Website Kuala. www.kuala.or.id. Green Coast Project-WWF Indonesia.

Apriansyah, H.. 2008. *Pengalaman WWF mendorong kebijakan pengelolaan di dalam green coast program*. Disampaikan pada Lesson Learned Regional Workshop Green Coast 15 Nopember 2008. Banda Aceh.

Apriansyah, H. 2008. *Website Kuala Quo Vadis. Bahan presentasi pada "Workshop Lesson Learned"*. Green Coast Project. WWF Indonesia. Banda Aceh.

Eijk, P. van & R. Kumar, 2008. *Bio-rights in theory and practice. A financing mechanism for poverty alleviation and environmental conservation (Bio-rights dalam Teori dan Praktek. Sebuah Mekanisme Pembiayaan Pendanaan untuk Pengentasan Kemiskinan dan Konservasi Lingkungan)*. Wetlands International, Wstafingen, the Netherlands.

Ilman, M. Ita S. I Nyoman S. 2007. *Small Grants Facility Technical Progress Report : Final*. Green Coast Project. Wetlands International-Indonesia Programme. Banda Aceh.

Mufdatir, A. dan I.T.C. Wibisono. 2008. *Laporan monitoring dan evaluasi kegiatan rehabilitasi di Propinsi NAD dan Nias*. Green Coast Fase 2. Banda Aceh.

Pemerintah Daerah Tingkat 2 Nias. 2008. *Draft Rencana Pengelolaan Strategis Ekosistem Luaha Talu (Laguna Teluk Belukar)*. Nias, Propinsi Sumatera Utara.

Sualia, I., M.Ilman. 2005. *Report of Launching Green Coast Project in Kajhu Village*. Green Coast. Banda Aceh.

Sualia, I. 2008. *Laporan monitoring dan evaluasi pelaksanaan mata pencaharian*. Green Coast Project. Bogor.

Suryadiputra I.N.N (Editor). 2006. *Kajian Kondisi Lingkungan Pasca Tsunami di Beberapa Lokasi Nanggroe Aceh Darussalam dan Nias*. Wetlands International-Indonesia Programme/ CPSG/Universitas Syah Kuala. Bogor.xxvi+421.

Wibisono, I.T.C. 2008. *Laporan teknis kunjungan di lokasi-lokasi proyek GC*. Wetlands International-Indonesia Programme. Bogor.

Wibisono, I.T.C. and INN. Suryadiputra. 2006. *Studi Pembelajaran dari Restorasi Mengrove/ ekosistem Pesisir di Aceh setelah Tsunami*. Wetlands International - Indonesia Programme. Bogor. Xii.

Annex 1. Recommendation of Several Demo Sites for Coastal Ecosystem Rehabilitation after Tsunami

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Bogor, 16 September 2008

The Governor Of NAD Province
in Banda Aceh

Subject: Recommendation on Several Demo Sites for Coastal Ecosystem Rehabilitation After Tsunami

Dear Mr. Governor,

Since October 2005, through the Green Coast Project (funded by Oxfam-Novib), Wetlands International Indonesia Programme (WIIP) in cooperation with WWF Indonesia has facilitated 31 local NGOs and 29 Independent-Community Groups in conducting coastal ecosystem rehabilitation after the tsunami disaster in Aceh-Nias. Up to August 2008, more than 1000 hectares of coastal areas have been rehabilitated (with an average plant survival rate of around 83% or 1.54 million of the 1.85 million seedlings planted) with mangrove and coastal plants in Aceh and Nias. In addition, we have also facilitated some efforts at coral reef protection, especially in Sabang.

The Green Coast Project comprises 4 (four) major activities: (1) coastal ecosystem rehabilitation; (2) the development of alternative, environmentally friendly means of livelihood; (3) the creation of village regulations that support the coastal ecosystem rehabilitation efforts; and (4) environmental education campaign.

The mechanism applied for activities (1) and (2) was by providing interest-free, collateral-free "loans" of capital to community groups willing to carry out coastal ecosystem rehabilitation (facilitated by local NGO). If the rehabilitation activity is successful – i.e. the number of surviving plants is more than 75% after a year – the loan will then be considered as a grant. If the amount of surviving plants is less than 75%, the loan must be paid back based on the percentage of dead plants. It has been proven that this mechanism ensures better growth of the plants used for the rehabilitation and also improves the community's feeling of responsibility for the activity they have conducted.

In total, the Green Coast Project has been carried out at 70 coastal locations: 54 were completed during Phase I (October 2005 to March 2007) and a further 16 begun in Phase II (April 2007 to March 2009). Each location has its own unique characteristics in terms of its ecosystem and the community's means of livelihood. Based on WIIP's bio-physical and socio-economic study of these locations, we can identify some that have important ecological as well as economic values that can be managed by the community along with the other stakeholders as a sustainable Demo Site. Besides that, some locations even have good potential for **eco-tourism** and **environmental education**, and should therefore be promoted.

We realize that the Green Coast activities conducted in NAD and Nias are still far from perfect. Therefore, we recommend that the Provincial Government and District Government take follow-up actions so that the activities we have initiated can continue to improve, provide benefits and be sustained, or even be a model for other coastal locations in NAD/Nias and elsewhere in Indonesia.

In view of this and also of the fact that the Green Coast Project in NAD and Nias will close in March 2009, we would like to propose that certain demo sites resulting from Green Coast activities (attached), in particular those having important ecological and economic values for the community, should:

- receive official written acknowledgement from the NAD and Nias Provincial Governments of the values and benefits these sites provide for the environment and community, and that this be widely announced (please determine the most effective way of delivering this information);

- receive support that enables them to continue in existence and be properly maintained, so that they do not function like other facilities that can bring disdvantages to the environment and community (if possible, allocate some fund, for example in Regional Budgeting);

- be optimally utilised as venues for eco-tourism and as a mode of environmental education for the community (including government officers, NGOs, research boards, universities, school students, etc).

Related to this proposal, please find attached our list of the 11 best sites recommended to be models in NAD and Nias.

We do hope that the NAD and Nias governments can take the follow-up actions proposed. To strengthen the proposal (and if required), we would be happy to make a presentation of the results of our studies of these 11 locations in front of the NAD and Nias governments.

On behalf of Wetlands International Indonesia Programme and the Local NGOs involved in the Green Coast Project, we thank you very much for the cooperation from the NAD and Nias governments as well as the directions from BRR.

It is our hope that this proposal can be followed up.

I Nyoman N. Suryadiputra
Coordinator of Green Coast Project for Indonesia

Copies to :

Assistent of Aceh on Development and Economics, NAD Governor Office

Chief of Regional Development Planning Board of NAD Province

Head of Environmental Impact Control Board of NAD Province

Head of Rehabilitation and Reconstruction Board – Aceh and Nias

Chief of National Development Planning Board in Jakarta

Ministry of the Environment in Jakarta

Head of Marine and Fishery Office of NAD Province

Head of BP-DAS NAD

Head of Forestry Office of NAD Province

Annex 2. List of proposed Demo Site for Coastal Rehabilitation, in Aceh and Nias

Table : List of Proposed Demo Sites* for Coastal Rehabilitation, Activities carried, Suggestions to government, and Details of contact persons in the field.

No	Location Name & Coordinates	Ecosystem Characteristics	Reasons	Activities carried out (for rehabilitation, success rate >85%)	Suggestions for the government	Contact persons in the field
Aceh Jaya District – NAD						
1	Krueng Tunong Village Jaya Sub-district Aceh Jaya District 5° 6' 43.56" (N) 95° 18' 43.27" (E)	Sandy coast, river estuary, coastal pond, hilly area (Temega Hill)	Around 200 metres of coast disappeared after the earthquake and tsunami; the abrasion is very powerful. New housing has been developed behind the coast. The coastal reforestation will protect the coastal ponds as well as the housing and the reforestation of Temega Hill will prevent landslide. It is an area with beautiful landscape which would support coastal tourism activities. The water from the swamps and Krueng Tunong Lagoon is the supply for the coastal fishponds that are an important means of livelihood for the community. It has potential for eco-tourism with beautiful natural scenery.	• Rehabilitation of 90 hectares of coastal area with 121,000 mangroves planted in coastal fishponds and river estuary, 12,000 coastal plants and 12,500 fruit plants on Temega Hill • Grant distribution for micro business of vegetable garden and intercropping coastal fishpond. • Arrangement of Coastal Area Management Strategic Plan (including the regulation of fish capture and coastal management). • Conducting bio-physical and socio-economic study. Capacity improvement of community groups and organizations. • Environmental education for community (including school children)	• Integrate the project result into the space management of the district to protect the project area as green belt. • Continue to maintain and extend the rehabilitation activities in the area. • Acknowledge the coastal management regulations that have been developed by the community. • Integrate the eco-tourism potential of Krueng Tunong with cliff tourism activities in Grufe.	M. Hasballah (Chief of the Group Rumet Jaya, Krueng Tunong Village). HP. 085277890040 Community Facilitator (Nasruddin) email : admin@wetlands.or.id) 0251-8312189
2	Ceunamprong Village Jaya Sub-district Aceh Jaya District 4° 58' 38.24" (N) 95° 22' 38.42" (E)	Sandy coast, muddy area, saltwater swamp, ex-coastal fishpond.	Coastal abrasion. Used to be a habitat where turtles laid their eggs. Coastal rehabilitation will most likely help restore the habitat for turtles to lay eggs.	• Planting 71,000 mangrove, 1,650 coastal plants and 350 garden plants • Distributing grant for micro business. • Arranging coastal area management strategic plan (including fish capture and coastal management) • Conducting bio-physical and socio-economic study) • Environmental education for the community (including school children)	The same as above It requires control of turtle egg harvesting.	Community facilitator (Yunianto Hargo Nugroho) email : admin@wetlands.or.id) 0251-8312189

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No	Location Name & Coordinates	Ecosystem Characteristics	Reasons	Activities carried out (for rehabilitation, success rate >85%)	Suggestions for the government	Contact persons in the field
3	Keude Ungah Village Jaya Sub-disrict Aceh Jaya District 5° 0' 34.52" (N) 95° 22' 8.04" (E)	River estuary, muddy area and saltwater swamp (used to be rice field)	Housing area developed on buried ex-rice field needs to be protected from sea water abrasion and intrusion. It is one example of the combination of coastal ecosystem recovery that occurs naturally (single species, *sonneratia*) and non-naturally (multispecies, various kinds of mangrove).	• Planting 70,000 mangrove, 9,650 coastal plants and 350 garden plants. • Distributing grants for livestock breeding & tempe production businesses that are very successful. • Conducting bio-physical and socio-economic study. • Environmental education for the community (including school children)	The same as above	T. Maruddin (chief of Udep Saree Group, Keude Unga Village) HP. 081360104271 Community Facilitator (Kuswantoro email : admin@wetlands.or.id) 0251-8312189
4	Gle Jong Village Jaya Sub-district Aceh Jaya District 5° 4' 47.53" (N) 95° 19' 17.51" (E)	Sandy coast, saltwater swamp and hilly area.	We need to protect the coastal area where at this moment around 100 trucks of sand (600m3) are quarried every day. There is housing area and the historical cemetery of sultan Ala'addin Riayatsyah nearby. This area also shows good recovery in terms of the vegetation and natural plants after tsunami.	• Planting 70,000 mangrove, 2,000 coastal plants, and 950 garden plants. • Distributing grants for livestock breeding, and small boat procurement. • Conducting bio-physical and socio-economic study. • Environmental education for the community (including school children).	The same as above, and Prohibit sand exploitation /quarrying in this area. Protect the natural flora and fauna in the area.	Abdullah YK (chief of Subur Daya Group). HP. 085277285826 Activity Facilitator (Urip Triyanto. (email: admin@wetlands.or.id.) 0251-8312189
Note: All demo sites in Aceh Jaya District are located close to one another, so they could be managed as an integrated green belt						

No	Location Name & Coordinates	Ecosystem Characteristics	Reasons	Activities carried out (for rehabilitation, success rate >85%)	Suggestions for the government	Contact persons in the field
Aceh Besar District – NAD (Kuala Gigeng Area)						
1	Kajhu Village Baitussalam Sub-district, Aceh Besar District 5° 36' 23.22" (N) 95° 22' 16.03" (E)	Sandy coast with sedimentation and river estuary.	Coastal abrasion is very strong, while behind the coast there are hundreds of new houses, several new schools and mosques.	• Planting 30,000 mangrove seeds (there are 7 kinds) and 15,000 coastal plant seeds (23 kinds, including coastal casuarina trees that are now 8 m high). At the moment, there is an abundance of clams in the mangrove plantation and these have become a source of income for the local fishermen. • Facilitating the community business development activities by providing loan that is managed by the group (at this moment, the group has its own bank account and 6 small boats).	• Officially designate and develop this area as a "coastal arboretum" and green belt area. • Designate this area as a coastal preservation area in the district's spatial management.	Cut Maila Hanum,MP., Executive Director, Lahan Ekosistem Basah Foundation (LEBah Foundation). Perumahan Kebun Tomat Jl. Kebun Raja Lorong 3 No 1 Ie Masen Kaye Adang Banda Aceh (email: lebahfound@yahoo.com)
2	Gampong Baroe Village Mesjid Raya Sub-district, Aceh Besar District 5° 37' 46.30" (N) 95° 23' 51.29" (E)	Sandy coast with sedimentation, coastal fishponds and river estuary.	Geographically, this location is a natural fortress that protects three villages from the waves of the Indian Ocean and Malaca Strait that could destroy community life. It has various ecosystem types and its shape resembles a small island. This makes this site suitable to be an education and tourism facility. Coastal area that used to be productive has been abandoned by the community because it was destroyed by Tsunami. Agricultural land is covered by sand and salt; coastal fishponds have been destroyed & transportation lines cut off.	• Planting 64,000 mangrove (in coastal fishponds and along the river) and 7,000 coastal plants (planted along the coastline). • Establishing and managing Coastal Ecosystem Study Center in Kajhu and Gampoeng Baroe. • Constructing out-bound facility (*flying fox and* tracking) • Holding coastal environmental education for Elementary and Junior High School children in Aceh Besar District and Banda Aceh City. • Conducting school reforestation and school waste management. • Granting small business capital for vegetable gardening or livestock breeding. • Conducting bio-physical and socio-economic study.	• Promote this area as a community environmental education facility and as an eco-tourism venue to other institutions and schools in Aceh. • Designate this area as a coastal preservation area and as a green belt area (from Kajhu until Gampoeng Baroe) in the district spatial management.	Cut Maila Hanum,MP., Executive Director, Lahan Ekosistem Basah Foundation (LEBah Foundation). Perumahan Kebun Tomat Jl. Kebun Raja Lorong 3 No 1 Ie Masen Kaye Adang Banda Aceh (Email: lebahfound@yahoo.com) Suardi (chief of Hudep Teuma group, Gampong Baroe Village). Hp 081360525458 Facilitator: Eko Budi Priyanto (email: eko_pml@yahoo.com.) 0251-8312189

No	Location Name & Coordinates	Ecosystem Characteristics	Reasons	Activities carried out (for rehabilitation, success rate >85%)	Suggestions for the government	Contact persons in the field
3	Lham Ujong Village, Baitussalam Sub-district, Aceh Besar District 5° 37' 13.01" (N) 95° 24' 17.57" (E)	Coastal fishponds and river. In 1960s, around 900 hectares of this area was mangrove forest, then it was converted to coastal fishponds and housing. The disappearance of the mangrove forest is believed to have contributed to the huge destruction in this area when the Tsunami hit.	The destruction to the coastal fishpond area (and also to the housing area) by Tsunami was due to the disappearance of the mangrove forest which could have provided a natural defence. Therefore, the coastal fishpond area needs to be reforested by planting mangrove in some inner parts of the pond and along side the ponds (silvo-fishery).	• Planting 185,000 mangrove along the river separating Lam Ujong Village and Lham Ngah Village, along side the fishpond channels and inside the fishponds. • Granting funds for small business and sending people from Lham Ujong Village to Pemalang in Central Java for training to develop alternative means of livelihood. • Conducting bio-physical and socio-economic study.	• The government of Aceh Besar District should designate and promote this area as a model for environmentally-focused silvo-fishery • Make a policy at provincial level (especially for Eastern Aceh Coast) to assert the importance of silvo-fishery in anticipating climate change.	Azhar. Lam Ujong Village, Baitussalam Sub-district, Aceh Besar District HP : 0852 – 77100350 Facilitator: Eko Budi Priyanto (email: admin@wetlands.or.id.) Ph. 0251-8312189
4	Pulot Village, Leupung Sub-district, Aceh Besar District. 5° 21' 51.91" (N) 95° 14' 59.68" (E)	Brackish-to-salty water lagoon (around 15 hectares) formed after Tsunami. The lagoon estuary is sometimes open and sometimes blocked by sand. On the hill close to the lagoon, we can find long-tailed monkeys, short-tailed monkeys, apes, and several kinds of hornbill. In the lagoon, we can find several species of sea fish that have high economic value (such as: snapper, Tengoh, Tanda, Red Eyes, Bayam/Kerape).	There is a luxurious Sub-district Health Center (by the lagoon side) developed by Red Crescent of Saudi Arabia. Lagoon cliff experienced landslide, but now it has been retained. The lagoon functions as a source of fishery and natural fish descent. The lagoon functions as a flood retaining facility. It has natural coastal tourism potential (close to Banda Aceh – Meulabeh highway). There is a freshwater spring on the back side of the hill.	• Planting 42,000 mangroves along the lagoon sides, and 9,000 other plants (coconut, coastal casuarina tree, keling roe-apple, etc). • Training the Pulot community in techniques to prepare and plant mangrove seeds. • Developing a park behind the Sub-district Health Center (planted with casuarina trees to prevent abrasion and minimize the wind strike from the coast). • Developing a lagoon information center (also functioning as a store). • Creating regulations for utilizing the lagoon/kreung. • Developing waste disposal facilities. • Giving training on crab breeding, etc.	• Sustain and maintain the facilities that have been developed (including the Sub-district Health Center). • Facilitate the tending of plants growing well in the lagoon cliff and alongside the lagoon. • Prevent conversion of the hill nearby the lagoon into unirrigated agricultural fields. • Optimize the lagoon area as an eco-tourism venue & as an educational facility. • Manage construction in the area around the freshwater spring, etc.	Zulkarnaeni, YS (chief of Beu Udep Group, Pulot Village) Abdul Malik (chief of Makmur Beusare Group, Pulot Village) Facilitator: Eko Budi Priyanto (email: admin@wetlands.or.id. Ph 0251-8312189)

No	Location Name & Coordinates	Ecosystem Characteristics	Reasons	Activities carried out (for rehabilitation, success rate >85%)	Suggestions for the government	Contact persons in the field
Sabang District – NAD						
1	Anoi Itam Village Sukajaya Sub-district, Sabang City 5° 50' 32.96" (N) 95° 22' 22.87" (E)	Coral reef, sandy coast, rocky coast, hilly area.	Based on the study of WCS, the area of Anoi Item is a coral reef ecosystem that is still in relatively good condition. Curently, Anoi Itam and the water area around it, which is Le Meulee, have been designated by the local community as a Marine Protected Area, the only community-based Marine Protected Area in NAD Province.	• The establishment of community-based Marine Protected Area of around 20 hectares and its Managing Board as well as the Micro Financial Institution. • The procurement of Patrol Boat for Sea Commander. • 3,000 coastal seedlings planted. • Development of a multi function hall. • 10 waste disposal facilities located in Lhok Anoi Itam tourism venue. • Conducting bio-physical and socio-economic study.	• The government of Sabang City should issue a Decision Letter giving recommendation to the Ministry of Marine Affairs and Fishery to designate Lhok Anoi Itam Marine Protected Area as a Regional Marine Conservation Area.	Lhok Anoi Itam Sea Commander Ir. Sulhanuddin Hsb. Director of People Movement and Advocation Center / Pusat Gerakan dan Advokasi Rakyat (PUGAR), Jl. Keuchik Usman Lrg. Lampoh Paleung II Rumah No 2 Desa Ilie Ulee Kareng Banda Aceh 23119 Telp/Fax (0651) 26771/ 7412584
2	Pinueng Cabeng, Iboih Village, Sukakarya Sub-district, Sabang City 5° 52' 23.48" (N) 95° 15' 23.33" (E)	Beautiful, clean, white sandy coast. Close to Sea Tourism Park of Weh Island in Rubiah Strait (with around 2,600 hectares of coral reef).	The coral reef is threatened by the anchors of fishing boats and foreign tourist yachts. The coast was lifted up by the earthquake and the mangrove subsequently died because it dried out. This area is a model of coral reef ecosystem conservation that supports marine tourism as a means of livelihood for the community.	• The construction of 8 mooring buoys by ACC and the planting of 50,000 mangrove by YPS. • Conducting bio-physical and socio-economic study. • Conducting coral reef transplantation initiated by ACC (Aceh Coral Conservation).	Continue the financing of mooring buoy maintenance and development, as well as the mangrove. Manage the docking activities of yachts coming to the site. Facilitate the extension of coral reef transplantation that is currently being carried out by ACC.	Dodent Mahyiddin, Chief of Aceh Coral Conservation (ACC), Jl. Tinjau Alam, Lingk Potroe Haloh, Kecamatan Sukakarya, Kelurahan Aneuk Laot – Sabang 23514. Telp: 081534020050; email: karangaceh@yahoo.com Irawan, SH. Director of Peduli Sabang Foundation (YPS). Jl. R. Suprapto No. 14 Merbabu, Kota Atas Sabang, Telp: 0652-22872, email: ypsqira@yahoo.com

No	Location Name & Coordinates	Ecosystem Characteristics	Reasons	Activities carried out (for rehabilitation, success rate >85%)	Suggestions for the government	Contact persons in the field
Nias District – North Sumatera						
1	Luaha Talu, Laguna Teluk Belukar Village Gunung Sitoli Utara Sub-district, Nias District 1° 23' 5.35" (N) 97° 32' 25.66" (E)	A coastal lagoon (47 ha) surrounded by mangrove forest (66 ha with 20 species of mangrove). The Lagoon Morphology is in the shape of a rayfish. It is very rich in terrestrial and aquatic bio diversity. The lagoon's preservation will support the sustainability of fishers' livelihood, prevent sea water intrusion, support eco-tourism and also contribute to global climate change mitigation and adaptation.	The Lagoon is endangered by: • construction of fishing harbour and fish auction facility. • construction of the road to the fish auction site, which has opened up part of the mangrove forest, with the result that wood from the mangrove trees is being used as one of the construction materials. • construction of tourism facilities around the lagoon. • dividing up the mangrove area into plots for various interests that will potentially destroy the mangrove forest.	• Conducting bio-physical and socio-economic study. • Conducting environmental campaign about the important values of the lagoon. • Creating booklets about the Teluk Belukar Lagoon. • Facilitating the creation of the draft of the Lagoon Management Strategic Plan. • Funding a local NGO (Wahana Lestari) to run a campaign to preserve the lagoon and its mangroves.	• Reconsider the plan to build a fishery auction facility. • Agree to a Lagoon Management Strategic Plan that is environmentally friendly. • Allocate some funds for the management. • Exert tight control over changes to the function of the mangrove forest around the Lagoon.	Wetlands International Indonesia Programme (WI-IP). Jl A. Yani No 53, Bogor 16161. PO. Box 254/BOO, Bogor 16002 West Java – Indonesia Ph/fax : 0251-8312189/8325755 Contact Person: Ferry Hasudungan Email: admin@wetlands.or.id Local NGO (Wahana Lestari), Chief : Karta Surya Telaumbanua. Jalan M. Hatta No. 60 Gunungsitoli, Kabupaten Nias – Sumatera Utara. Tel/Fax:0639-21939 email: lsm_wahanalestari@yahoo.co.id

Notes : *The Importance Values of the demo sites are based upon : their contribution in protecting the coast, housing, public facilities; their support to the bio-diversity and to the community's livelihoods; their function to prevent sea water intrusion; mitigation and adaptation toward climate change; and their function as an environmental education facility for the community. Besides being supported by Green Coast (funded by Oxfam Novib), the activity in Pulot & Lham Ujong Villages was also funded by UNEP. The activity in Krueng Tunong was funded by Force of Nature (FoN) Malaysia.*

Location Name: Luaha Talu, Teluk Belukar Village Lagoon, North Gunung Sitoli Sub-district, Nias District
Coordinate : 1° 23' 5.35" (North Latitude) - 97° 32' 25.66" (East Longitude))

The lagoon of Luaha Talu in Teluk Belukar Village is in the shape of a rayfish

Sand sea slug, *Holothuria scarba*, is one of the excellent products of Teluk Belukar Lagoon waters

PThe mangrove plant and the bogem fruit, *Xylocarpus granatum*, around the Teluk Belukar lagoon

PThe destruction of the mangrove forest for road construction to provide access to the fish auction facility endangers mangrove conservation around the lagoon.

The construction of a fish auction facility in front of the Lagoon, and the construction of the road towards the fish auction facility has destroyed the mangrove forest.

Mangrove seed cultivation in Teluk Belukar for rehabilitation activities

Location Name: Jaya Sub-district, Aceh Jaya District
Coordinate : 4° 58' 38.24" (North Latitude) - 5° 6' 43.56" (North Latitude) up to 95° 22' 38.42" (East Longitude) - 95° 18' 43.27" (East Longitude)

Krueng Tunong before the Tsunami and Temega Hill (Pfoto 2003).

Krueng Tunong after the Tsunami and Temega Hill (Photo 2008). The arrow direction is the rehabilitation location.

Mangrove seed cultivation in Krueng Tunong

Abrasion at Gle Jong coast, Aceh Jaya

Environmental education for school children (also for the community)

The mangrove in Gle Jong will protect the housing area behind it.

8

Location Name: Aceh Besar District– NAD (Kuala Gigeng Area)
Coordinate : 5° 36' 23.22" (North Latitude) - 5° 37' 46.30" (North Latitude) up to 95° 22' 16.03" (East Longitude) - 95° 24' 17.57" (East Longitude)

The casuarina trees from the GC project at the start of planting in Kajhu (Photo taken in June 2006). It was still dry.

The casuarina trees resulting from the GC project in Kajhu are now protecting the community housing (photo taken in August 2008). The atmosphere is green.

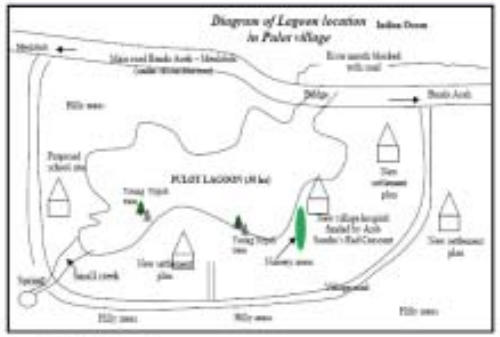
The mangrove plants in Kajhu and Gampong Baroe will in the future be able to protect community housing and other public facilities.

Silvo fishery in Lham Ujong (the mangrove is in the middle of the fishery pond).

The harvest from crab cultivation (the 'seed' crabs can now be acquired from amongst the mangrove plants)

Mangrove of various ages from silvo fishery sites (for carbon content measurement)

Location Name : Pulot Village, Leupung Sub-district, Aceh Besar District
Coordinate : 5° 21' 51.91" (North Latitude) and 95° 14' 59.68" (East Longitude)



Map of Pulot Village Lagoon

The condition before it was sustained and before planting (the building is the Lagoon Information Center / store managed by the community)

The condition after it is retained and after planting.

Casuarina trees by the Pulot Lagoon (2 years old, 2006 – 2008)

Preparing the mangrove seeds and other coastal plants to reforest the Pulot Lagoon.

Mangrove planting by the Pulot Lagoon done by the community group.

Location Name: Pinueng Cabeng, Iboih Village, Sukakarya Sub-district, Sabang City
Coordinate : 5° 52' 23.48" (North Latitude) - 95° 15' 23.33" (East Longitude)

Mangrove seed planting amongst the mangrove plants that died because of the Tsunami.

The location of mangrove planting in Iboy, Sabang.

Announcement Board of Coastal Area Management in Iboy, Sabang

The yellow circle is the location of the mooring buoy in Iboy, Sabang

Annex 3. Comprehensive Evaluation of Local Partners Small Grant (SG)

COMPREHENSIVE EVALUATION OF LOCAL PARTNERS
SMALL GRANT FACILITY COMPONENT
GREEN COAST PROJECT IN ACEH NIAS

Green Coast
For nature and people after the tsunami

	Names	Dates
☼	**Field work evaluator** :	
☼	**Desk Study evaluator** :	
☼	**Representative providing the information** :	
	:	

1.	**PROJECT IDENTITY**				
1.1	SGF Contract Code	:			
1.2	Organization and office base	:			
		:			
1.3	Director of the organization	:			
1.4	Coordinator of the project	:			
1.5	Field assistants	:			
1.6	Location(s)	:			
1.7	Title of the project	:			
1.8	Total Budget	:			
1.9	Division of budget	Livelihoods	Ecosystem	Management	TOTAL
	IDR				
	%				

2. ECOSYSTEM REHABILITATION

2.1 Ecosystem activities based on contract

2.2 Results/Progress of project

Planting process

☼ Preparation:Technical aspects

Mapping for planting:	□No	□Yes
Survey on ecosystem conditions:	□No	□Yes. Which:
		□Future land use

☼ Identified appropiate species
□Based on scientifical indicators
□Based on observation and experience

☼ Preparation: Non technical aspects

Consultation with local community	□No	□Yes. How:
Coordination with local stakeholders	□No	□Yes. Which:

Mangrovees

☼ Seedlings	□Natural collection and develop own nursery	point 4
	□Buy fruit and develop own nursery	point 3
	□Natural fruit/ seedling	point 2
	□Purchase seedling	point 1

☼ Planting techniques □Neatness □Seed treatment □Ajir □Unwrap polibag
☼ Protection and manteniance to seeds planted □No □Yes
□Cluster area □Prot.from animals □Treatment for disease and parasites

☼ Replanting frequency
Reasons :
Response strategies :
☼ Location selected for planting :
Criteria for the selection of location :
☼ Total number seedling planted: :
☼ Area covered (hectars): :
☼ Species used for rehabilitation Number: :
Names: :

	Other coastal trees and species (mangroves only)			
☐	Seedlings	☐Natural collection and develop own nursery		point 4
		☐Buy fruit and develop own nursery		point 3
		☐Natural seedling		point 2
		☐Purchase seedling		point 1
☐	Planting techniques	☐Neatness	☐Unwrap polibag	☐Other Ajir
☐	Protection and mantenance to seeds planted	☐No	☐Yes	
			☐Fences	☐Prot.from anims ☐Treatment for disease and parasites
☐	Replanting frecuency	once		
	Reasons	damaged by high tide		
	Response strategies	plant in another location		
☐	Location selected for planting	sandy substrate		
	Criteria for the selection of location	scientif assessment		
☐	Total number seedling planted:			
☐	Area covered (hectars):			
☐	Species used for rehabilitation	Number:		
		Names:		
	Summary			
☐	Total number seedling planted:	☐More than target	☐Lower than target	☐ Reach the target based on contract
☐	Area covered (hectars):	☐More than target (8,5 ha)	☐Lower than target	☐ Reach the target based on contract
☐	Number species used for rehabilitation (mangrove and beach trees)		☐ >5	Name:
			☐ 2-4	Name:
			☐ <2	Name:
2.3	Other ecosistem activities			

2= entirely achieved
1 = some progress made
0 = no progress made

2.4 Remarks Unexpected results (what and why)

3. LIVELIHOOD RECOVERY AND COMMUNITY GROUP MANAGEMENT

3.1 Livelihood activities based on contract

3.2 Results/Progress of project

☐	Direct beneficeries	Number	people		(% of number of total village population)
			Score : 1	Score : 2	Score : 3
			<5%	5-10%	>10%
		Type	Score		Description
☐	Type of livelihood activites	☐Fishery	4	fishing gear	Provision for 24 unit sampans
		☐Agriculture	3	horticulture farmi	Planting vegetable
		☐Husbandry	2		
		☐Others	1		
☐	Reasons to select type of livelihoods	Main livelihood of community and same with Green Coast concept to develop silvofishery			
	▫ Strategie for financial support management				
	Related to livelihood activities	Direct disburse,no revolving		Score	1
		☐ Disburse, revolving capital to the facilitator			2
		☐ Disburse, revolving capital to the community group			3
		☐ Small scale enterprise managed by facilitator			4
		☐ Small scale enterprise managed by Community Group			5
		☐ Other			
	▫ Related to ecosystem activities				

	□ Free only pay for snack			
	□ Planting Fee	□ To village members	4	(IDR)
		□ To community group members	3	(IDR)
		□ Subcontracting (not members of grc	2	(IDR)
	□ Cash for work			
	□ Subcontract the community group			

▫ Organization of community group	□President	□Secretary	□Treasurer	□Other
▫ Type of control documents used by communit	□Participation in planting	BY chief and secretary of group		
	□Participation in meetings	BY		
	□Livelihood fees per member	BY		
	□Revolving funds	BY		
	□Savings per member	BY		
	□Guest book	BY		
	□Other	BY		

▫ Trainings to community group	Ecosystem	Type	by whom
	□ Livelihood	Type	by whom
	□ Others	Type	by whom

3.3 Remarks

Unexpected results (what and why)

3.4 Community Perceptions

Why are you involved in planting activities?

□
□
□
□
□
□
□
□
□
□

4. FACILITATOR PERFORMANCE

4.1 How old is the organization

4.2 Administrative capacities

▫ Archive management:	□Personal in charge	*Description*		
	□Clasification	*Description*		
		Financial		
		Technical		
▫ Frequency of contact with WIIP:	often not only about green coast but also oth Via phone and email			
▫ Reporting to WIIP:	□Follow format	□On time	□Complete	□Provide extra inputs and suggestions
	□Other			
▫ Staff structure	□Yes	□No		
▫ Number of staff members. Total: 17 Permane	Total at office:	Man	Woman	
Permanent staff : 5	Total at field:	Man	Woman	

4.3 Strategies of community participation for decision making

□ Contact chief of the CG
□ Contact board of the CG
□ Meetings with CG

Description and comments

4.4 Implementation and Monitoring strategies

□General agenda of activities	□Diary
□Cronogram for monitoring	□Others
Describe the system for field visits:	

4.5 **Facilities**

- Office: □No □Yes
- Equipment: :
- Communication facilities □Fax □Internet □Telp □Others
- Furniture: :

4.6 **Other NGOs at the location and actions** □ □

□ □

4.7 **Organization Partnership/Network**

- □ with other donors:
- □ with local stakeholders:
- □ projects in other communities:

4.8 **Relationship with the communities**

- meetings frequency:
- type of contact of field technicians □staff stays □just daily visits □Others
- participation in social events □No □Yes
- organization of social events □No □Yes

4.9 **Remarks: interview a representative of the local NGO**

- **Strengths**
- **Needs**
- **Suggestions to WIP**

5. GENDER

		Male		Female	
5.1	**Number of participants in community group**				
5.2	**Distribucion of livelihood capital**	Rp	%	Rp	%
		Rp			

5.3 **Type of involvement of woman**

- □ Board member of community group
- □ Meetings
- □ Trainings. Type:
- □ Seedling production
- □ Small bussiness Type
- □ Others

5.4 Describe the gender awarness of local partne

5.5 Involvement of woman into other projects, how?

5.6 The role of woman on processes of decision making

5.7 Describe the financial support given to woman

5.5 **Remarks**

Unexpected results (what and why)

Annex 4. Village Regulation of Coastal Area Management at Krueng Tunong Village, Number 11.14.05.03.2022/338/2008

ABOUT

PROTECTION AND PRESERVATION OF MANGROVE AND COASTAL FOREST AS WELL AS THE MAKING USE OF KREUNG SAWAH KAMENG ESTUARY

1. No one is allowed to destruct/take off the fence as well as any kind of coastal plants, without permission from Keuchik, and under the knowledge of Tuha Peut.
2. No one is allowed to catch fish by using dragnet or poison in the catching forbid area in Kreung Sawah Kameng estuary.
3. Catching is allowed only outside the catching forbid area.
4. No one is allowed to throw used (damaged) nets and other used fish catching tools into the Kreung (river) as well as into the sea.
5. No one is allowed to open new fishpond in the coastal planting area without permission from Keuchik and under the knowledge of Tuha Peut.
6. No one is allowed to throw garbages in the coastal rehabilitation planting area.
7. The mesh-size of nets used to catch fish in Sawah Kameng Kreung Tunong cannot be smaller than 2.5 inches.
8. The groups and the other community members together nurse and maintain the mangrove and other coastal plants.
9. No one is allowed to herd livestock in the coastal rehabilitation sites.
10. Whoever sees any livestock being in the coastal rehabilitation sites must bring it out of the sites.
11. No one is allowed to do any activities in the catching forbid area except just for passing through or conducting a research with permission from Keuchik and under the knowledge of Tuha Peut.

Lampiran 5a. Form Regular Monitoring and Evaluation for Livelihood Activities

Monitoring on livelihood activity is aimed to explore process on preparation stage and business developing during the project period. Through this monitoring, its expected also can be identifying types of training needed by community group to support their livelihood activities

A. General Information	
Code of Small Grant Contract	
NGO/ CBO (Name of GC partners)	
Project Location	Village : Kemukiman : Kecamatan (Sub-district) : Kabupaten (District) :
Contact Person of GC Partners	Project coordinator (CP)
	Field Staff (CP)
Evaluator	
Assistance for evaluator	
Time of Monev	Day/ Date : Time : Season (drought, rainy, rice harvesting, east or west monsoon; etc)
B. Main Livelihood of The Community	
Type of main livelihood before tsunami	
Type of main livelihood before Green Coast Project implemented	
Type of main livelihood during implementation of Green Coast Project	
C. Community Group Participation in GC Phase 1	
Does the group participate in GC 1? **(If yes, goes to next question)**	
Group performance in GC 1	
Obstacle faced during GC 1	1. 2. 3. etc
Problem solving for some obstacles in GC 1 ?	1. 2. 3. etc
Lesson to learn from GC1?	1. 2. 3. etc

D. Review on Preparation Process and During Developing Livelihood Activity	
Number of Group members	Male : Female :
Type of Livelihood activities which are developing in GC project	1..... 2..... 3.....
Process during project preparation and development	
Process in deciding type livelihood and financial capital management mode & reason in selecting type of livelihoods	
Mechanism of fund management (managed by individuals or managed together within group)	
Revolving fund mechanism	Rp...../xxx week or per month
Agreement between community group and others related to livelihood activity	
Training for community group (related to livelihood activity)	
Business analysis before developing the livelihood activity	If yes, how is it?

E. Achievement and Benefit

Additional number of business, staff, income/ benefit?

Product marketing

Is the product easy to sell?

Market level: at same village? Same sub district?

Future Prospect?

Obstacle in marketing?

F. Monitoring and Evaluation & Capacity Building

- Internal Monitoring and Evaluation done by community group/ facilitator?
- Training on business management
- Satisfaction on the training?
- The impact of the training (positive and negative) for community group
- Other trainings needed by community group

G. Community Perception on Green Coast Project

- Does livelihood activity developed synergy with community preference?
- If Green Coast Project ended, is community still willing to caring rehabilitation trees?
- What is the perception of community excluding (whose are not involve) in GC project?
- Is it any other activities duplicated GC approach?

H. Awareness Raising

Awareness raising held by facilitator to motivate community group become independent

- Awareness on environmentally friendly livelihood

I. Dynamical on Community Group Institution

Changing in community group board structure, please attached board structure

J. Livelihood activities facilitated by other NGOs/ donors

No	Type of activities	Donor/ Facilitator	Status (on going / done)	Fund mechanism	Remars
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Impact to GC activities

L. Remarks for next monitoring

M. Other Planned Activities

Annex 5b. Form of regular monitoring and evaluation

FORM of

REGULAR MONITORING AND EVALUATION

Aspect : REHABILITATION

Conducted by :
Date of monev :
Accompanied by :

Implementer :
Location :
Extent : Ha
Coordinate : 1) 3)
2) 4)
Lay out of rehabilitation site : (Pls attach)

Condition and Status of planting site

Substrate type :
Flooding level : Min: ..... cm Max: ..... cm *(* For mangrove planting site)*
Land cover : %
Previous land use (before Tsunami) :
Land status :

The detail of Planting

Activities				
Planting	Number of Seedling	Date of planting	Planting mechanism	Remarks
Planting stage 1				
Planting stage 2				
Planting stage 3				
Replenishment planting				
Replenishment planting stage 1				
Replenishment planting stage 2				
Replenishment planting stage 3				

* provide information in detail based on species

Spacing line :

MONEV RESULT

1. Survival rate of plants (%)

Count result:

No	Species	N Total	N survived	N Dead	% SR	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Note: Sampling intensity .....%

2. Seedling growth

No	Species	Height (average)	Number of leaves
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

3. Pest and disease

Causing factor	Part of plant attacked	% of attacked population	Remarks
a. Pest			
1			
2			
3			
4			
b. Disease			
1			
2			
3			
4			

4. Others

	yes	No	Remarks
a. Training on rehabilitation			Date:
b. Counterparting during field activties			Implementer in field:
c. Cooperation with other stake holders			Mention:
d. Planting conducted before Tsunami			Who?
			Species

e. Management plan in the future	:
f. Who decide planting site?	:

g. Source of seedlings	:
h. Distance from planting site	:

Annex 6. Benefit Cost Ratio Analysis on Ruminants/ Cattle Farming

Description	Ruminants/Cattle Framing (analysis for a goat and a cow)	
Deskripsi	• Ruminant farming is the top preferences of community group both in GC 1 and GC 2, about 27% of community group chosen ruminant farming as livelihood activities, beside easy to develop, cattle also considering as the way of community saving their money	
Fix cost/ asset	**Price and Uses Period**	**Price per Production Cycle**
	• Fence (5 years) Rp 1.000.000 • **Sub Total Rp 1.000.000**	• Fence Rp 200.000,- • **Sub Total Rp 200.000**
Operational Cost per Production Cycle	• Baby goat, age 6 months @ Rp 450.000- Rp 500.000 • Calf, age 1 year @ Rp 3.000.000	
Nurturing cost	**Nurturing cost**	**Nurturing cost per Production Cycle**
	• Fence Rp 200.000 per year	• **Sub Total Rp 200.000**
Total Coast per Production Cycle	• **Sub Total Cost for Goat Rp 700.000** • **Sub Total Cost for Cow Rp 3.400.000**	
Production Time	• Minimum one year	
Land area	6x 3 m	
Number of labour	One person	
Income per Production Cycle	• Selling Price of Goat @Rp 1.000.000 - Rp 1.500.000 (for age one and half year) Profit = Selling price - Operational cost Rp 1.200.000- Rp 700.000 = **Rp 500.000** • Price of Goat @Rp 8.000.000 - Rp 12.000.000 (for age two years) Profit = Selling price - Operational cost Rp 10.000.000- Rp 3.400.000 = **Rp 6.600.000**	
Obstacles	• In Aceh, generally cattle farming developing without special fence. The risk of die or lose are very high, because lack of controlling and farmer does not provide feed for the cattle. In this case need special area of grassland	
BCR (Benefit & Cost Ratio)	• Goat farming = 1,8 • Cow farming = 2 • Business on cow farming very profitable at least in one year, it can reach profit is about three times of infestations in one cycle production. Note : This analysis using assumption no cost for cattle grass/ feed	