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**Target Country**

Indonesia

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**Partners**

- University of Hohenheim, Germany
- Lembaga Riset Perkebunan Indonesia (LRPI), Indonesia
- Indonesian Soil Research Institute, Indonesia

**Area :**

Coastal Zone Management

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**EUROPEAN  
COMMISSION**

## Asia Pro Eco IIB – Post Tsunami

Assisting the rehabilitation and reconstruction of the areas affected by the India Ocean Tsunami in Asia

### Title

Trees, Resilience and Livelihood Recovery in the Tsunami-affected Coastal Zone of Aceh and North Sumatra (Indonesia): Rebuilding Green Infrastructure with Trees People Want

Coastal zone management has to provide environmental protection and meet economic targets of livelihood options for the local people. Tree crops and trees preferred by farmers contribute to both. Even before the Tsunami of December 2004, 40-60% of the economy of West Aceh and Nias depended on tree crops. Our aim is to help rebuild a green infrastructure that enhances the resilience of the coastal population in the face of multiple stresses. We start with assessing damage to trees, changes in land suitability and impacts on the production-marketing chain and will follow up with activities supporting short term recovery (using existing trees) and preparing for the opportunities of rehabilitated infrastructure. Lessons learnt on resilience and the outcome of the research and support activities will be important in future disasters; these will be shared as international public goods

### 1. Introduction and Project Description

Coastal zone management has to provide environmental protection and meet economic targets of livelihood options based on sea plus land-based activities. Tree crops and trees preferred by farmers contribute to both. Pre-Tsunami 40-60% of the economy of West Aceh and Nias depended on tree crops. The debate on environmental issues in coastal zone management cannot be separated from the issue of livelihood options and economic recovery. Trees planted by coastal zone farmers with an expectation of economic benefits are far more likely to survive and provide environmental services, than trees planted in externally-led reforestation programs. A focus on the type of trees and the way they will be managed is a key to the success of coastal zone management. The dependence of the Tsunami-affected part of the west coast of Aceh and Nias (North Sumatra) has probably been underestimated so far, with 'collateral damage' to farmers beyond the flooded areas who lost their access to world markets through loss of traders and processors. Addressing the needs of all groups affected is essential to the success of rehabilitation and recovery programs.

Target groups:

- 1) Farmers plus trade chain operators: Prior to the Tsunami 105588 people (nearly 60% of the total 176586 district population) lived in the four coastal sub-districts.
- 2) Government and civil society actors on the environmental protection debate.
- 3) NGO's and other agencies active in the rehabilitation programs.

Farmers plus trade chain operators have a mutual dependency, and loss of market channels has aggravated the Tsunami and earthquake impacts in Aceh and on Nias. Assessments of the damage to natural resources as well as livelihoods in the coastal population in West Aceh and Nias have been completed. These actions included targeted rehabilitation in the affected areas with economically valuable tree crops based on site-tree matching, remote sensing and soil data. The ReGrIn action aims at contribution to the rebuilding of green infrastructure as a system of diverse trees in the coastal landscape fulfilling environmental protection and production functions with trees people want and enhance the resilience of livelihoods through improved market links for tree products. It is an action research designed for a pilot scale in a number of villages along the western coast of Aceh Barat. Some development support and market studies are also conducted in Nias (Gunung Sitoli).

## 2. Description of activities

The project covers the following key activities:

- Participatory assessment of damage and opportunities for short term recovery and long term improvement of tree crop production; appraisal of tree diversity –activities contribute to a shared understanding between farmers, policy shapers and (external) support agencies of the opportunities for 'green infrastructure' on the basis of trees that farmers want, as alternative to 'top down' tree planting
- Support for short term recovery of tree benefit flows – activities support the short term recovery of farmer income derived from use of existing trees to pre-Tsunami levels and to enhanced capacity of farmers to manage the whole tree-production chain for increased local benefits (nutritional diversity, environmental protection) and income.
- Ex ante impact of infrastructure recovery; coastal protection forests with economic value – activities support a multi-stakeholder spatially explicit planning process for coastal zone management that provides realistic livelihood options plus coastal protection.
- Lessons learnt about the role of tree crops in coastal areas prone to Tsunami flooding - activities lead to the availability of international public goods in other coastal areas that can help enhance resilience and reduce vulnerability.

All activities were fully discussed between partners and responsibilities

based on expertise and resource availability with the partner institutions. The selection of action sites, organising trainings, setting up soil, water and tree growth monitoring plots, damage assessment involved all partners at various stages. While there are key individuals from the partner institutions responsible for different activities, all field work in West Aceh is co-ordinated through ICRAF office in Meulaboh where a permanent team of five staff members of ICRAF, LRPI and University of Hohenheim is based. Supported by one Program Assistant based in Bogor, over 20 researchers (both national and international scientists) are involved in different activities of the project and visit the field on a regular basis. In Nias, the project has developed strong links with a local NGO YPKM that is providing necessary support and facilitating tree crop development through farmer groups and nurseries.

Technical support to farmer groups, nursery management, planting material production, distribution and other aspects of tree crop management for rubber and cocoa, the two most important tree crops both in West Aceh and Nias is provided by relevant national research institutions under the umbrella of LRPI. Additional focussed trainings are planned for farmers as well as government and NGO technical staff. Soil and water assessments are being carried out by researchers from ISRI and University of Hohenheim. Necessary links have been initiated with the local government land use planning agency (BAPPEDA and BRR). ICRAF takes the overall coordination responsibility.

### 3. Results

Rubber, cocoa, coconut, Nypa fruitcans and other fruit species are important 'trees people want' and these have both economic and environment protection functions. Rubber is the most important tree crop in West Aceh (90% farmers' preference). Coconut is abundant in the area, and consequently, does not provide large income to the farmers. Oil palm is limited to large scale plantations controlled by relatively rich farmers or the state close to oil palm processing factories. Cocoa is generally planting under coconut or in home gardens. The potential to improve both rubber and cocoa is substantial. Good quality planting material and technical knowledge on planting, management, harvest and post-harvest processes are required.

While trees close to the western coast (approximately 50-100m) were uprooted by the Tsunami waves, local people reported how rubber forest reduced the water run-up height over a very short distance of only a few hundred meters. In other places, fatal damage was observed in fruit trees (Rambutan, Durian and Langsat), mostly due to salt-water intrusion. Land subsidence was significant in a few places along the western coast. Large areas of paddy fields are now under permanent sea water. In other areas, the new 'Tsunami soils' have changed the crops (e.g. peanuts, chilli, beans and maize) that are now grown in previously paddy fields.

Soil and water monitoring points were setup where regular observations are being taken. The main driving factor of changes of soil fertility is the salt accumulation contained in the Tsunami mud. Salinity was one of the main problems that causes nutrient imbalance in the soils. Most of the salinity problem has subsided. Land suitability maps (at 1:25,000 and 1:100,000 scales) for the coastal areas of West Aceh have been prepared and bulletins drafted and circulated. The evaluation of the dynamics of soil properties and tree crop response in selected sites has been completed.

In most places, salt-water intrusion is no more a concern for groundwater quality. First screening of land use dynamics in the flood area through subsidence or Tsunami impact was also carried out. Collaboration with active NGOs (such as Mercy Corps, Tear Funds, Fauna and Flora International, YPKM) is helping scale-up the ReGrIn contributions in the post-Tsunami tree crops development in West Aceh and Nias. The project and its team in the field is becoming a source of technical information on various aspects of tree crops and natural resource management. LRPI along with its rubber and cocoa research institutes is bringing in the much needed up-to-date technical knowledge and expertise on rubber and cocoa. Ways to link the project to policy dialogue in land use planning are being explored at various stakeholder meetings in the district.

#### **4. Lessons Learnt**

The ReGrIn approach and focus on tree crops in West Aceh and Nias is considered by partners and government agencies as important and useful for the reconstruction and development of Aceh and Nias. It is providing new technical knowledge and know-how missing in many government and NGO activities. The project is also providing means for the national partners (LRPI and ISRI) to be involved and contribute to the rebuilding of post-tsunami Aceh and Nias. The partnership of University has further widened the links to an international scale. The partnership of two national research institutes, one European university and one internal research centre is proving quite productive and efficient. The joint team in the field, while with some challenges, is also working satisfactorily.

One of the difficulties is the high turnover of staff, particularly those hired locally. The high demand for good people and NGOs with short presence willing to pay escalated remunerations makes both finding and keeping staff in the field office. Similar problems are encountered in the participation of local people in project activities. It appears the participation of local people decreases with increased intensity of external aid/support available there. The ReGrIn project relies on voluntary participation of local people without cash payment. In the current context in West Aceh, participation without payment is proving to be difficult.

## 5. Outreach and dissemination

So far ReGrIn project has not had any opportunity for establishing synergies with other Pro Eco projects in the region. The action is a pilot scale initiative to test and demonstrate participatory development and planning based on sound scientific information and knowledge related to tree crops and environment protection. The results from first year work were disseminated at a recently organised workshop with research information bulletins. Likewise, presentations of project findings and observations have been made at district, national and international meetings. The local partners in West Aceh and Nias have picked up the message and are scaling up from ReGrIn's pilot scale efforts. The local government of West Aceh and concerned line agencies are fully aware of the project efforts and are co-operating very positively in project activities. The project also assists in many of the NGO and government's tree crop development and training programs. This type of collaboration and direct support to capacity building of farmers and staff of government and NGOs means the project will have longer downstream effect also on stakeholders not directly involved in the project.

At the end of its first year, ICRAF produced 16 research information bulletins with conclusions and clear key messages of various activities conducted by ICRAF and close partners from the ReGrIn project and few other linked projects in West Aceh and Nias. These are also available through ICRAF website.

## 6. Sustainability

The two Indonesian partners (ISRI and LRPI) in the project are national research and capacity building institutes. The project approach is to support, link expertise, find relevant information, and help capacity building (farmers, government and other NGOs). Involving farmers, farmer communities in research and capacity building programs from the start has generated significant ownership of these programs. The local development agencies (agriculture, forestry and plantation and extension services) regularly participate in trainings and research activities. This has helped to increase skills and confidence of these institutions. A local capacity building (knowledge, institutions and dialogue) is an important aspect of the project. All project actions are transparent, both government and farmers informed and all action is in line with current rebuilding policy. We are confident that the government (and other NGOs) interest will remain high and be able to continue and scale up the output of the project over the region, even after the current project. While other projects (in the pipeline) will enable ICRAF and partners to be in the region longer than the current project, it is anticipated that by the end of the project, government agencies and other active NGOs will not require much external support to continue with the activities and methods promoted by the project.

Working closely with concerned line agencies, government and NGOs (local and international) active in tsunami related projects and programs

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has been very useful for the project – both for research collaboration and result dissemination. The close collaboration with district line agencies and the strong emphasis on knowledge sharing and local capacity strengthening is an important component that will contribute to the sustainability and long term impact of the project in the region. The transparency in planning and implementation of project strategy and activities has resulted in open yet positive comments and feedback.

The support from Asia Pro Eco management has been very useful. The advice and suggestions from the project monitoring teams have been incorporated where applicable.

