



Forest rehabilitation in Indonesia

Where to after more than three decades?

Editors

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The Center for International Forestry Research (CIFOR) is a leading international forestry research organisation established in 1993 in response to global concerns about the social, environmental, and economic consequences of forest loss and degradation. CIFOR is dedicated to developing policies and technologies for sustainable use and management of forests, and for enhancing the well-being of people in developing countries who rely on tropical forests for their livelihoods. CIFOR is one of the 15 centres supported by the Consultative Group on International Agricultural Research (CGIAR). With headquarters in Bogor, Indonesia, CIFOR has regional offices in Brazil, Burkina Faso, Cameroon and Zimbabwe, and it works in over 30 other countries around the world.

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Preface

Many tropical countries have achieved economic growth at the expense of converting their forests. Some of those countries have prospered and others remain impoverished despite converting their forests. Both have the will now to restore some of their lost forest cover and commit resources to this end.

Forest rehabilitation is not a new phenomenon. But as tropical forest conversion continues seemingly unabated, rehabilitating degraded landscapes is likely to become more and more important. Countries individually or collectively will increasingly turn to rehabilitation to undo the negative consequences of diminishing forest cover. Countries that had or still have large forested areas, like Brazil, Indonesia, Vietnam, Philippines and China, have initiated programmes meant to restore millions of hectares.

Forest rehabilitation is a major concern for the Center for International Forestry Research (CIFOR) and its partners. Future benefits from forests will in many places only be assured if forests can be successfully rehabilitated. Downstream water quality and flows, biodiversity conservation, raw material supply and forest-based income for the poor will depend on it. CIFOR has since its beginning undertaken research programs and projects that address forest rehabilitation.

This report is one of six emerging from the study 'Review of forest rehabilitation: Lessons from the past'. This study attempted to capture the rich but under-utilised experiences of many years of forest rehabilitation in Brazil, China, Indonesia, Peru, Philippines and Vietnam, and make this information available to guide ongoing and future rehabilitation efforts. The study was carried out with generous contributions from the Government of Japan.

We present this and the other five study reports in the hope that the lessons they contain will be relevant for people who are concerned about tropical forests, and that as a result societies will continue to enjoy the benefits that tropical forests can provide.

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And a special appreciation goes to local community members in all case study sites, who were involved in the surveys, focus group discussions, and other meetings. Hope this study contributes to improve benefits received by community from better implementation of forest rehabilitation initiatives.

Executive Summary

1. Introduction

Background. Indonesia has 96.3 million ha of degraded forestland due to illegal logging, forest fires, forest conversion, unplanned agricultural expansion, consequences of the beginning of Reformation Era since 1998, and social conflict over forest resources. An estimated 54.6 million ha of this degraded forestland includes production forests and conservation and protection forests, and 41.7 million ha of degraded land outside forest areas. Since the early 1950s, the Government of Indonesia (GoI) has implemented a range of rehabilitation programmes. In the past, most rehabilitation projects were government driven, dependent on public funding from the Indonesian government and international donors and focused mainly on the technical aspects of rehabilitation. Institutional arrangements for executing the rehabilitation programmes to establish effective implementation on the ground were not developed. As a result, there has been little adoption of the rehabilitation techniques by local people living in and around the target areas. Innovative approaches are necessary if the objectives of a rehabilitation programme are to be achieved while at the same time giving associated socioeconomic benefits to private companies and local people.

Study aims and objectives. The study aimed to increase the chances of success of future rehabilitation projects by identifying the approaches that have contributed to longer-term sustainability under different scenarios and have had minimal negative impacts on the different stakeholders. Specific objectives of the study were:

1. To obtain strategic lessons on driving forces, impacts and underlying constraints from past and ongoing rehabilitation initiatives and research
2. To identify the most promising rehabilitation approaches under different ecological and socio-economic scenarios, and
3. To identify appropriate economic and institutional incentives under different conditions.

Methodology. The focus of this review was on initiatives that aimed to establish trees on formerly forested lands, and not on strictly technical trials of planted species or designs. The forest rehabilitation initiatives in the study are framed by the description: *Deliberate activities aimed at artificial and/or natural regeneration of trees on formerly forested grasslands, brushlands, scrublands, or barren areas for the purpose of enhancing productivity, livelihoods, and/or environmental service benefits* (CIFOR Rehab Team 2003). On the other hand, according to the Ministry of Forestry (MoF)'s definition, reforestation (*reboisasi*), or forest rehabilitation refers to the initiatives implemented inside state forest areas. Afforestation (*penghijauan*), or land rehabilitation, refers to the initiatives that are usually implemented on community land outside state forest areas.

The study was conducted through an inventory and characterisation of past and ongoing rehabilitation initiatives and their changing profiles in each selected region by conducting a series of consultations and workshops with national and local stakeholders, as well as literature reviews of project-related documents and other secondary sources. As the first step of this review, a Preliminary Database of 150 rehabilitation projects was compiled in order to capture basic information on the project variables.

Database 1 then served as the basis for analysing the key characteristics and changing trends of rehabilitation efforts in Indonesia. Fifty-four rehabilitation programmes or 101 projects (i.e. implemented in 101 locations) were selected from the Preliminary Database using various criteria: (1) the status of the land where the project was located (inside state forest, outside state forest, and in both areas), (2) the condition of the area before the project started (fire-affected, logged-over and other land degraded by a variety of factors), (3) the executing agencies (government, international agencies, state/private companies, NGO or community groups, and a combination of different stakeholder groups), and (4) the scale, based on the area covered (< 100 ha, 100–1,000 ha, and > 1,000 ha). This database also provided information on typology and project characteristics (e.g. project profile, objectives, beneficiaries and intended impacts), with which ten case study projects were then selected for Database 2.

Project case studies. The 10 projects for Database 2 were selected using the following criteria: (1) located in the 10 provinces that require the most rehabilitation, as they hold the largest area of degraded forest, (2) both successful and failed projects, according to general perceptions, (3) approaches used (top-down, transition from top-down to participatory, and with strong emphasis on participatory approach), (4) project period, and (5) a representative sample of the project clustering in Database 1. Of the ten selected case studies there were five past and five on-going projects included in the analysis of the impacts of rehabilitation initiatives on the ground.

The on-going projects included: the Collaborative Forest Management Project (*Pengelolaan Hutan Bersama Masyarakat – PHMB*) initiated by Perhutani (State-owned Company) in Sukabumi, West-Java in 2001, the two *DAK-DR* projects in Kampar (Riau Province) and Kubar (East Kalimantan Province) developed under the Programme of Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus-Dana Reboisasi - DAK-DR*) in 2001, Conserving a National Park (Meru Betiri National Park) in Jember District, East Java (1998), and Farm Forestry in Gunung Kidul, Yogyakarta (1970). The success of this last project can be seen not only in its continuing existence but also in the national awards it has received. It is one of the few *Inpres* afforestation and reforestation projects that have been successfully implemented.

The past projects included: the Rehabilitation of Logged-over Areas as part of the MoF's programme assigned to the state-owned companies Inhutani I to V that was initiated in 1996, but all activities had ceased by the end of 2002/03 as *DR* had been closed and the rehabilitation assignment revoked; the Participatory Reforestation Project, implemented from 1994-99, was part of a bigger Community-based Forest Management Project (initiated and funded by GTZ and the GoI) in the northern part of Sanggau District, West Kalimantan; the Rehabilitation of Fire-affected Forest Project was funded and implemented by ITTO and the Forestry Research and Development Agency from 1992-94; the Mechanised Plantation Project was five of six project phases implemented from 1983-95; and the Watershed Protection Project, Gajah Mungkur reservoir, in Solo, Central Java implemented from 1988-95.

Defining the successes and failures of rehabilitation initiatives. To date, the success or failure of a project has been based on general public perceptions rather than on a systematic independent evaluation of all aspects of the rehabilitation work. For some projects in this study the evaluation process was conducted by contracting independent consultants, however, this was done mainly to meet the formal requirements (budget allocation) set by particular funding agencies. Three approaches were used to define the successes and failures of rehabilitation initiatives. These were discussed and recommended during the first national workshop¹ in October 2003:

1. The perceptions of concerned stakeholders were taken into account
2. The indicators of outputs and processes were examined, and
3. The period after the project ended was taken into account.

There was no project that could be perceived as a complete success or failure, after all aspects (technical, socio-cultural, economic and institutional) of implementation

¹ The first National Rehabilitation Workshop organised by CIFOR and FORDA, 22-23 October 2003

were taken into account, there were only partial successes or failures, depending on the stakeholders' perceptions. Although forest rehabilitation requires a long-term process of evaluation (3-4 years, at least), the government system does not usually permit such a long period of evaluation. Consequently the evaluation is more of an administrative measure and just a 'snapshot' of the situation.

2. History and state of deforestation and land degradation

Dynamic forest management changes have affected deforestation and land degradation, and related past and present rehabilitation programmes being implemented. The Indonesian forest management policies of the last fifty years fall into four main periods with their own distinct priorities. During the 1950s to 1975 the main concern was that of agricultural expansion, while realising permits for commercial logging concessions was the top priority from 1975 to the 1990s, and during the early 1990s to 1997 the focus was on forest management outside state forest. In the most recent period from 1998 to the present Indonesia has seen major political change ranging from the New Order Era to the Reformation Era. The changes in forest management policies have always been in line with the aims of improving the national economic condition. These dynamic changes have also affected the progression of deforestation rates with consequences for ecological and livelihood aspects, and the past and present rehabilitation programmes being implemented.

Driving factors behind deforestation and land degradation have become progressively more complex covering various aspects. The driving factors, causing deforestation, are both direct and indirect. The main direct causes have been logging operations, illegal logging and unmanageable intensive reoccurring fires, mainly during long dry seasons. The indirect causes include market failures (e.g. under pricing of timber), policy failures (e.g. the 20-year logging permit granted to concessionaires as a disincentive for enrichment planting), and other socioeconomic and political issues in a broader sense. Since the mid-1990s up to the present, besides repeated forest fires, and mismanagement of logging concession areas, complex problems include the transition period from a centralised to decentralised governance system, forest conversion for other uses (e.g. oil palm plantations), illegal logging and extensive forest encroachment, usually with aims to convert the forest, mainly for agriculture or estate crop development.

3. Past and present policies and programmes affecting forest and land rehabilitation initiatives

From the 1950s to the 1970s the approaches used in forest rehabilitation policies were mainly ‘top down’ and then towards the end of the 1990s, they became more conceptually participative. Between the 1980s and the mid 1990s, the rehabilitation initiatives were in transition. Rehabilitation started to be managed intensively once the Ministry of Forestry (MoF) became an independent ministry in 1983 (separated from the Ministry of Agriculture). The government divided rehabilitation efforts into the two categories of reforestation (*reboisasi*) in state forests and afforestation or greening (*penghijauan*) in community areas outside state forests. Since the Reformation in 1998 the shift from privately based and large-scale forest management to smaller-scale community-based forest management has started picking up momentum.

The forest land classification system of the Forest Land Use by Consensus (TGHK: Tata Guna Hutan Kesepakatan) defined in 1984 aims to better target rehabilitation in state forest, but the conflicts over land boundaries have impeded the implementation of the policy on the ground. In 1990 the TGHK was overlaid with the RTRWP – the spatial management plan related to provincial land areas. These two formed the basis for the design and control of the development of the Right of Forest Exploitation (*Hak Pengusahaan Hutan – HPH*), Industrial Plantation Forest (*Hutan Tanaman Industri – HTI*), and estate crop plantations. By reducing the rate of conversion of natural forest it was anticipated that the negative impact on the environment could be minimised.

HTI development with the objective of rehabilitating logged-over areas has led to an increase in degradation and areas to be rehabilitated. In 1988, the development of HTI using fast-growing tree species became the main approach of rehabilitation programmes. However, success stories were few, and the programme has even created more severely degraded forest areas. The HTI planting realisation rate was low and totally inappropriate for the rehabilitation of ex-logging areas. Most companies obtained a HTI concession not to develop a plantation but to clear fell the remaining standing stock. Once this was achieved the area was simply abandoned to its own fate.

Policies result in higher risks as logged-over areas become ‘open access’: the unclear status of forest on revoked concession areas. To ensure that HPH concessionaires practise the principles of sustainable forest management, the contract required them to apply the Indonesian System of Selective Cutting and Planting (*Tebang Pilih dan Tanam Indonesia – TPTI*) introduced in 1989, which replaced the

Selective Cutting System (*Tebang Pilih Indonesia – TPI*). *TPTI* was then replaced by the System of Selective Cutting and Line Planting (*Tebang Pilih Tanam Jalur – TPTJ*) for lowland forests. Concessionaires had an obligation to comprehensively undertake reforestation and promote regeneration. Due to a lack of supervision of the implementation, and the inconsistent umbrella regulations, many *HPH* were revoked, and huge logged-over areas became open access leading to more degraded forest areas.

Highly degraded forest areas are often produced in the aftermath of inconsistent policies as in the case of the rehabilitation programme assigned to state-owned companies. The discontinuity of rehabilitation policies in assigning the state rehabilitation programme to state-owned companies (Inhutani I to V), well reflects this. After only three years of implementation the programme was put-on-hold and then simply left hanging with no clear hand-over provided. The Ministry of Forestry then handed over approximately 5.5 million ha of returned logged-over areas to the provincial governments, but no budget. With no funding and very little in the way of human resources, these areas quickly became ‘open access’ and were subject to illegal logging.

Recent national-level rehabilitation initiatives since the Reformation Era. Since 1999, the rehabilitation programmes implemented under the new Regional Autonomy Policy have had to deal with greater pressures on rehabilitated areas and forests, such as forest encroachment. The Master Plan for Forest and Land Rehabilitation (*Master Plan Rehabilitasi Hutan dan Lahan or MP-RHL*) was developed in 2000 and used as the basis for planning. In 2003 the MoF initiated the National Movement for Forest and Land Rehabilitation Programme (*Gerakan Nasional Rehabilitasi Hutan dan Lahan – GN-RHL/Gerhan*), in response to the need to rehabilitate the increasing area of degraded lands.

Funding for *GN-RHL/Gerhan* comes from the central government’s portion of *DR* funds. However, the annual procedure in proposing the activities to be funded is quite complicated. The working plans, composed by the Ministry of Forestry for this programme must pass through a series of discussions with, and on approval from, the People’s Consultative Assembly (*Dewan Perwakilan Rakyat – DPR*), National Development Planning Board (*Badan Perencanaan Pembangunan Nasional – Bappenas*), and the Ministry of Finance. The whole process takes about a year, in which there is given little time for adequate preparation between budget realisation and actual implementation.

The management of the Reforestation Funds (*Dana Reboisasi*). The current government regulation on Reforestation Funds (*Dana Reboisasi – DR*) PP No. 35, was introduced in 2002 to replace PP No. 6/1999. The regulation states that forty

per cent of the funds are to be reallocated to the provinces that have contributed to the central government's Reforestation Funds - called the 'contributing provinces'. The programme developed under this funding is called the Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus – Dana Reboisasi - DAK-DR*). This has been in operation since 2001 under the coordination of the district governments. The objectives of the programme are: to facilitate community participation in rehabilitation activities by providing assistance with designing the activities, developing community institutions and providing technical assistance in implementing the planned activities. No recorded data on the realisation of the area rehabilitated under this programme could be obtained.

Sixty per cent of the funds collected are allocated to the Ministry of Forestry to finance rehabilitation projects in non-contributing provinces (provinces that have not contributed to the central government's Reforestation Funds). The allocation is based on a 5-year rehabilitation plan designed jointly by the Minister of Forestry and Minister of Finance. The funds are allocated to cooperatives, forest farmer groups and other organisations with the legal status to implement the rehabilitation project on the ground through a lending scheme, which is designed as a revolving fund.

4. The historical national overview and characteristics of rehabilitation initiatives

The long history of forest rehabilitation initiatives covers six major periods: pre-colonial to colonial, colonial to the 1960s, 1960s to 70s, 1970s to 80s, 1980s to 90s, and 1990s onwards. During the last fifty years there have been 150 official rehabilitation projects in 400 locations nation wide. However, these projects have only recently started to mushroom and during the 1990s to 2004, their numbers had double that of the 1980s. This is almost certainly in response to the escalating rate of deforestation since the late 1990s, and with few if any earlier rehabilitation projects showing positive results. The budget required to fund these activities has had to increase accordingly. More projects are now being implemented outside state forest. These are, however, smaller in area, i.e. 1,495 ha, compared to the projects inside state forest areas, i.e. 127,067 ha

Important features, objectives and approaches of rehabilitation initiatives from conservation to improving community welfare. Following the major floods in the late 1970s in Solo, Central Java, the government was forced to introduce more serious rehabilitation initiatives. This also was a major turning point for implementing different forest rehabilitation approaches. During this period the implementation of conservation farming in sloping areas by applying soil and

water conservation methods, which combine vegetative and physical-mechanical or civil structure techniques, were the most effective and wide spread, particularly in Java. Again during the transition period of the 80s and 90s degraded lands resulting from extensive logging activities, mainly outside Java, and increasing numbers of devastating natural disasters were the main concern of rehabilitation initiatives.

Since 1984, when the *TGHK* was implemented, conservation has become the specific objective of rehabilitation initiatives in protection and conservation forests. The main objective of rehabilitation initiatives in protection forests is to improve ecological functions, and in conservation forests to conserve biodiversity. However, the efforts have not been very effective and hampered by problems of illegal logging, forest fires and forest encroachment, due to increasing population pressures and land-use competition.

From the 1990s up to the present, the driving forces behind rehabilitation programmes were initiated in response to even more complicated problems to include severely degraded areas due to over-logging, forest fires, forest conversion, forest encroachment and illegal logging. Having multiple objectives became an important feature of these initiatives from the late 1990s. Specifically, rehabilitation programmes accommodated objectives that improved community welfare and produced more timber from plantation forests. This was in order to meet the national demand for timber by rehabilitating critically degraded land both inside and outside state forest. For example, the government was being pushed to meet the increasing national demand for wood for the growing pulp and paper processing industries. The development of large-scale Industrial Forest Plantations (*Hutan Tanaman Industri - HTI*), as well as the rehabilitation of critically degraded land, both inside and outside state forest, became the government's new rehabilitation initiative. Degradation of Indonesia's forests has continued unabated.

Political change has complicated the rehabilitation issues even further. The transition from a centralised to a decentralised government system, and inappropriate forest management were followed by the revocation of the rights of many forest concessionaires and *HTI* concessionaires. The latter left the government with a vast area of logged-over forest to be rehabilitated. The beginning of the Reformation Era also influenced the objectives of rehabilitation programmes initiated after 2000. Issues that were to be addressed in these programmes included: increasing the distribution of benefits to the people who live in and around forest areas and the involvement of the local communities in the programmes.

Throughout the history of rehabilitation watersheds have often been the unit of management. The watershed approach is more holistic; it can be used to evaluate

the interrelations between biophysical factors and the intensity of social, economic and cultural activities from upstream to downstream; and is a quick and easy way to evaluate environmental impacts. However, problems have occurred: 1) the effectiveness and relevance of the planning system has been in doubt; 2) planning has lacked integrity and therefore acceptance at the field level; 3) planning has been out of step with local government regulations; and 4) criteria and indicators for monitoring and evaluation have not been comprehensive nor well-developed.

Major impediments and constraints for the sustainability of rehabilitation initiatives. Despite substantial emphasises on the technical aspects of past and on-going rehabilitation initiatives, positive long-term results were not often observed. This was found particularly in the assessment at the project level. Relevant features observed from the project implementation were: the site characterisation as part of the preparation step, consideration for species-site matching, seedling preparation, timely planting, site or land preparation, and maintenance planning.

As part of the site characterisation, baseline data of the rehabilitation area, covering topography, altitude, soil type, and soil fertility is of paramount importance. It is from this data that the most ecologically suitable species for an area can be selected. However, only 14% of the projects had even basic maps of their area. Equally it is advantageous to select species that are already part of a community's culture and relevant to their livelihoods. Species used in the rehabilitation projects were mostly chosen by the government agencies and the local communities were rarely consulted.

The availability of a nursery, in each rehabilitation project is important for seedling preparation. However, these basic supporting facilities were also lacking in most of the projects, only 23% of the projects confirmed the availability of project nurseries and the techniques used in preparing the seedlings, 13% (of the projects) met the minimum standard for seedlings, and 20% had planned tree nurseries for viable seedlings.

Planting seedlings at the right time is crucial to the survival of the seedlings in the field, the beginning or in the middle of the rainy season being the optimum times. However, many factors, such as the late arrival of seedlings or delayed budget release, still cause delay or mean that the seedlings are planted at the wrong time, e.g. at the end of the rainy season or during the dry season. Further, inadequate budget for the maintenance of newly planted seedlings has been a major problem in the field. Not surprisingly, most of the projects had a low rate of survival of planted trees.

Most rehabilitation initiatives did not take into full account the economic aspects as part of the project designs and strategies. This was mostly due to the project-based orientation of the programmes. The most important being: funding sustainability beyond the project period due to the absence of a reinvestment mechanism, an adequate economic feasibility analysis, and clear integration with the market. This is reflected in the unclear economic incentives and a lack of voluntary community participation.

Less than half of the respondents (40% of Database 2) claimed that the socio-cultural aspect was considered in the project. The indicator under the socio-cultural aspect is the recognition of local community organisations as project partners. Local customary institutions were not often considered for this role. Further, only limited half hearted rights were awarded to the community to manage the rehabilitated areas, particularly inside state forest. Types of formal rights assigned to the community include Memorandum of Understanding (MoU), Letter of Agreement (LoA) or Letter of Agreement based on traditional land boundaries (SPKS). The MoU is supported by a government regulation (*Peraturan Daerah – Perda*), and it is considered to be more appropriate for granting community rights than the LoA, since this is not backed-up by legislation. The MoU entitles the community to manage an area jointly with the District Forest Services, while the LoA includes permits for managing the land based on the agreement with other farmer cooperatives. The MoU and LoA are often drawn up with little community involvement, and as a result the community neither respects nor trusts this form in granting access.

Problems with the process for assigning rights to communities included the fact that the rights assigned were insubstantial, the process was top down, there was no verification process on the ground, and there was no clear conflict resolution mechanism. The lack of a clear conflict resolution mechanism has led to greater social unrest at the sites to be rehabilitated. The types of conflict inside state forests were more serious and larger in scale than those on community land, which often affected the sustainability of the rehabilitation projects.

5. Rehabilitation projects in Indonesia: impacts and lessons learnt from the ten selected case studies

Impacts on land productivity. Tree planting in the rehabilitation projects involved a range of products with most projects producing more than one product such as timber, fruit, fuel wood and food crops or vegetables as secondary crops. Nearly

half of the respondents (48%) reported food crops and vegetables as products of the rehabilitation projects, while timber from natural forest and tree plantations was reported by a little more than 20%. Another indicator in assessing impacts of rehabilitation initiatives on land productivity is a comparison of the growth of the three tree groups, which shows that the annual increment, in both height and diameter, was lowest for the forest tree species. The highest annual increment was found in the multipurpose tree species.

Impacts of rehabilitation on burnt areas tends to be less sustainable compared to logged-over areas. Through natural succession the vegetation of logged-over areas can revert to tropical forest, at the climax phase, if the threat of fire is low. However, the air temperature in some logged-over areas does increase and subsequently the threat of fire. Logged-over areas in fact, if not in a phase of *blocked development*, human intervention do not require for regeneration to take place. A blocked development phase (ecological development) such as occurs on *Imperata* grasslands, is a phase that inhibits or at least slows down the processes leading to the next development phase. Under these circumstances human intervention is needed to prevent fire in both fire-affected and logged-over areas before a rehabilitation effort is undertaken.

Livelihood impacts: the community's short term project-based oriented benefits. Generating incomes after the first 5 years of a project and beyond was easier for the communities involved in projects implemented outside state forest. This was indicated mainly by the replanting of timber trees for a second rotation after the project had ended. Replanting implies that there is a second rotation, particularly in timber-based rehabilitation projects, such as the Farm Forestry Project. In the Farm Forestry Project, the second rotation was financed from a proportion of the revenues received from the teak harvested. Replanting is now part of this community's forestry management. Projects implemented inside state forest were less likely to generate significant incomes for local people, even after the first 5 years. In the short term (less than 5 years), incomes were generated mainly from project-based labour opportunities. In the long term, however, with no (formal) right to harvest timber species planted inside state forests, the surrounding communities used the forest and its products only for their subsistence needs. For state forest-based rehabilitation projects, even after the first 5 years of the project, the forest and its products provide only limited subsistence use. However, incomes generated from rehabilitation project activities play a less important role than other sources of household income, such as the sale of agricultural and non-agricultural crops. To reduce poverty marginalized groups need to be taken into account at all stages of a project. The results of the field observations, particularly in the case of the Collaborative Forest Management Project, indicate that efforts in this area are minimal.

Impacts on a community's access rights to forest resources. Clarification of land ownership and security of rights to trees and other forest resources are two positive impacts of rehabilitation projects on local communities. Where there are clearer and more secure rights to rehabilitation areas and access to collectively managed resources, the institutional and traditional strengths of local communities should increase, and social cohesion improve. This should then lead to clear representation of the community in all aspects of natural resource management.

Improvements in institutional capacity, but there are still conflicts and low social cohesion. In the long term the most significant impacts have been on the community's institutional capacity, including community representation in various aspects of natural resource management, and on community institutions and socio-cultural strengths. However, about 50% of the community respondents had not perceived any change in the interrelations among community members or in social cohesion, while the perceptions of the project staff varied. The analysis shows that for more secure land ownership the empowerment of community institutions is important. Weak community institutions lead to the under-representation of the community in project management, which can and often does result in dissatisfaction, conflicts over land status and low social cohesion. There are three sources of conflict over tenure inside state forests: 1) conflicts of interest between customary institutions, private companies, NGOs and the government, which is reflected in overlapping rights to use and manage land; 2) land boundaries that are not agreed; and 3) forest encroachment due to weak law enforcement and unclear management rights. Conflicts in state forests are often greater and more serious than those on community land. Outside state forests, disputes over land boundaries were the main causes of conflict. Strong competition for land outside state forest is the main problem leading to conflicts over land boundaries.

Since the Reformation era encroachment, often due to a lack of clarity over land-use rights and a lack of law enforcement, has increased. Understandably, local communities, often supported by a local NGO, are usually reluctant to participate in rehabilitation projects implemented in these conflict areas. Overlapping land-use problems need to be resolved before a project is implemented. At one surveyed project, failure to do so resulted in arson attacks at their project camps. Dialogues were begun and solutions implemented, but they did not resolve the conflict.

Overly high expectations of community participation. Most programmes and projects have relied on the active participation of the communities in making the projects successful. However, the participation has relied more on mass mobilisation rather than on interactive community participation. Characteristics of the mobilisation system include the immediate termination of community

participation at the end of the project cycle, high community dependence on the project – particularly for funding, and a low level of community initiatives emerging from the project. Despite the importance of the programme in raising a community's awareness, as part of the efforts to encourage their participation, this programme has been very limited. Only 5.8% of responses in Database 2 stated that this programme has been conducted to support the rehabilitation project. In general, there have been overly high expectations of community participation, yet approaches and incentives to encourage this have been lacking.

Governing the rehabilitation initiatives: evolution from top-down to participatory approaches and its impacts. However, the projects implemented during the different periods also demonstrated some positive features. Projects initiated during the top-down period had more positive features in relation to technical intervention than those initiated under the transition and participatory approaches. This occurred because the projects were initiated more than 30 years ago and multiplier effects and impacts have been generated. There are five important factors that are significant in motivating and increasing the success of forest and land rehabilitation, seen especially in the Farm Forestry case study project: (1) policy support from the head of the district government, (2) the rise in critical awareness of various parties, particularly NGOs (since the 1990s) so that local institutions are developed, (3) the feudal patron–client culture, (4) capital to support Farm Forestry development from remittances, and (5) strong commitment from the community to develop Farm Forestry plantations taking into account previous considerations, identified as local commitment

Projects implemented during the transition period were still characterised by their strongly centralised setting and culture. For example, implementation always had to be based on approval from the highest authority, often only as a formality, such as letters of decree signed by high-level authorities under a top-down process. As a result, there were always conflicts of interest among stakeholders, and it was mainly the interests of the local communities that were not accommodated. Such conflicts were an inherent part of rehabilitation activities in the transition period.

During the transition period, the roles of local communities and civil-society groups, such as NGOs and traditional or local organisations, increased slightly. These changes occurred mainly as a result of strong pressure from the groups for more community involvement in all development activities. Although the word 'participatory' has been included in the Guidelines for the Direction of National Development (*Garis-garis Besar Haluan Negara – GBHN*) since 1984, in practice the government bureaucratic system has not been fully prepared to accept a greater role for civil society groups or local communities. A major problem for

the surveyed projects, regardless of the rehabilitation period, has been the effective distribution of rights and responsibilities to local organisations. Tenure conflicts, resulting from encroachment, occurred in all the projects during the transition and participatory periods. During the participatory period, encroachment occurred mainly because of inconsistent policies that resulted in overlapping management rights, as in the Rehabilitation of Logged-over Areas Project.

The active involvement of local people is a critical element in the survival and success of any rehabilitation project. Equally technical intervention needs to be carefully selected and designed with specific ecological causes of degradation in mind, particularly those that continually disturb rehabilitated areas and are of concern to the local people. The success of nine of the ten projects surveyed varied considerably in their degree of success and only one was considered to have been totally unsuccessful. The Rehabilitation of Logged-over Areas Project was hampered by major problems that were not conducive to success.

6. Reorientation of the rehabilitation programme in Indonesia: where to after more than three decades?

The rates of rehabilitation have lagged behind degradation with a low cost-effective budget allocation. During the last three decades it would seem that the Indonesian Government has made a concerted effort to address the growing rate of forest degradation and the ramifying consequences of this degradation. However, the government's target of 18.7 million ha for rehabilitation of degraded forest by 2004 has not been reached. Instead of 24.9 million ha of degraded forest Indonesia now has 43.6 million ha, this is double that of the 1970s. This suggests that rehabilitation initiatives and projects have not been successful nor have policies and programmes really addressed the underlying causes of forest degradation.

Rehabilitation activities have been more reactive initiatives than proactive in conjunction with implemented or imposed forest management policies. Ineffective rehabilitation initiatives have been mainly at the expense of the government budget. The total government budget spent on rehabilitation projects may account for as much as 85% of the total government forestry budget since the start of the *Inpres* programme in 1976/77 (H. Pasaribu, personal communication, 2004). The rehabilitation cost per ha was higher than the standard *HTI* establishment costs (Rp 5 million per hectare or USD 550). The cost per ha ranged from USD 43 to 15,221 per hectare - depending on the sources of funding. The government projects cost the least while those financed by international donors cost the

most, due to the high cost of technical expertise and usually calculated as a part of the project costs. The government projects implemented inside state forests were more expensive than those located outside state forest on community land. Together, the significant amount of forestry budget, allocated to rehabilitation, low rehabilitated areas of major government programmes and the high cost per ha, are a strong indication of the low cost effectiveness in the implementation of the rehabilitation activities and therefore wasted budget. This is reflected in the amount spent on rehabilitation compared to the actual results.

Reforming the funding mechanism policy to avoid project-oriented funding mechanisms. In view of the classic problems of project-oriented funding, the policy governing the funding mechanism urgently needs to be reformed. The funding for forest and land rehabilitation activities needs to be a multi-year system, less bureaucratic and adjusted to the planting seasons and local conditions. Budget approval should be given for at least 5-10 years and integrated into the rehabilitation planning.

In the implementation of rehabilitation programmes *DR* should work more consistently with the DAS management approach. The latter does, however, need to be coordinated across administrative boundaries and government agencies. A clear mechanism for the utilisation of products obtained from these rehabilitation programme activities is also urgently needed by both the government and communities. This should provide long term sustainable funding of the initiatives post project. Equally new funding mechanisms for forest and land rehabilitation initiatives should be explored; whether policy oriented to provide incentives for private sector involvement or an alternative approach such as the Collaborative Forest Management Project. Lastly, rehabilitation efforts should be viewed not so much as 'cost centres', but as 'revenue centres'. Forest and land rehabilitation activities would then involve multi-stakeholders based on a cost sharing and risk analysis.

Addressing the causes of deforestation and degradation in the rehabilitation initiatives as part of the design of rehabilitation initiatives. Identifying the direct and indirect underlying causes of land and forest degradation should be conducted during the preliminary planning stage. This would of course include detailed planning of how these would be addressed in the initiated projects. By understanding the flow of goods, services and the multiplier effects from the ground up, the design of rehabilitation activities can be greatly improved. While considering the overall integrated economic, ecological and social aspects, scenarios for the multiplier effects can then be incorporated into the project design as target impacts to be achieved by the projects, within a reasonable and clear timeframe. These will underlie the process of defining the project strategy

and approach. Applying the most suitable technical intervention that fits the underlying problems of degraded areas is important, so significant ecological impacts can be achieved.

Ensuring the economic feasibility of the rehabilitation initiatives. Short-term cash incomes for the communities involved were generated from project-based employment opportunities, mainly by working as labourers for seed planting. To ensure long-term economic benefits, a number of economic aspects should ideally be integrated into project designs such as: incentive mechanisms designed to encourage community participation; the definition of a marketing strategy in the planning process; a financial analysis conducted prior to the project implementation as well as designing mechanisms for reinvestment and costs and benefits sharing for stakeholders; and reaching out to ensure economic impact for marginalised groups. The importance of the government's role in creating the right incentives for community initiatives cannot be emphasised enough. However, the role of the government should be that of facilitator only, e.g. it is crucial that the government (local government, and local government with support from central government) should respond to the local initiatives by providing the right policy framework. For optimal livelihood impacts, attaching rehabilitation initiatives to other ongoing project developments, as part of integrated strategic planning directed by the local government, may well be the key to this situation.

Institutional arrangements and clearer ownership for greater and active community participation. Equally for greater community participation it is important for there to be: a local (or other) organisation involved in the implementation of the rehabilitation activities or alternatively, a newly formed community organisation; programme (s) aimed at empowering the community's institutional and technical capacities to support the rehabilitation programme; and multi-stakeholder facilitation processes at various stages of the rehabilitation programme(s), i.e. planning, implementation, monitoring and evaluation. Further, institutional arrangements should be managed to increase community participation at all project stages. Projects implemented on community land tend to have a higher success rate than those in state forest. Clearer ownership of the land and freedom from overlapping government policies is almost certainly playing a major role in this success. Clear land status means less conflict over land, a high commitment by the community to maintain the trees planted and a guarantee to community members that they will be able to harvest anything they have planted.

Ensuring adoption: addressing the gap in knowledge by understanding the determining factors influencing a community's adoption behaviour. Although extensive technical rehabilitation projects have been implemented, at the community level, there are still gaps in technical knowledge and very few of the

different technical approaches, implemented on the ground, have been adopted. The high cost of the introduced technology is often not in keeping with the financial means of most community-based projects. A preliminary assessment must be conducted to find the best technical interventions to suit the local ecological and social conditions as well as to meet the capacity and budget of the communities involved. The level of adoption may also be related to the introduction process of a project and the technology in the initial socialisation phase of a project. Equally, if the community participants cannot understand the relevance of the technology, and the project itself, in regard to their livelihoods, they are most unlikely to adopt or accept either.

Long-term management planning of the rehabilitation project to ensure sustainability. The process of defining the management framework should be a participatory process and involve all stakeholders. The most important conditions to ensure the sustainability of rehabilitation activities are: the activities must be long-term and self sustaining; the activities must be implemented in accordance with the terms of the project (no premature termination); the rehabilitation programme corresponds with and is integrated into regional spatial planning (*rencana tata ruang*); plans are made for long-term monitoring and evaluation; a feedback mechanism exists; efforts are made to protect the rehabilitated areas from continuing local disturbances, such as fires and grazing; infrastructure development is part of the rehabilitation programme; informal land rights are recognized; and formal land ownership or occupation is revised.

Towards different scenarios for rehabilitating logged over areas. Currently the government is giving priority to the rehabilitation of state forest, particularly logged-over production forest. However, the generalised approach used in these initiatives is ineffective at best. Each area needs to be specifically assessed and activities planned accordingly, depending on the various conditions of the area, such as human population (in or in close proximity to the area), location of the area in terms of markets or economic activities, ecological functions and all disturbances, to name but a very few. Disregarding this baseline information may render the project ineffective and therefore a waste of time, money and energy. This may even result in conflict and/or increase the driving factors causing the degradation.

Making the most of the decentralisation policy. The decentralisation policy implemented since 1998, also influences forestry management regimes. Despite the many drawbacks, the decentralisation policy actually provides an opportunity for a new direction in designing a strategy for forest and land rehabilitation. In view of the fact that local governments have better knowledge of their areas and their forestry management priorities, it is best if the local governments themselves (i.e.

the forestry services at the provincial/district level) lead the process of designing the most appropriate local rehabilitation programmes. The central government, i.e. the Ministry of Forestry would ideally act as a facilitator providing the necessary policy framework.

The government, together with all key stakeholders, need to make a concerted effort to address and to take into account the various aforementioned components. Since the government does not have sufficient capacity or resources to do all of the forest rehabilitation activities on the ground, it is important for other sectors (such as the private sector) to be involved by providing the right incentives. Equally the management of the reforestation funds and budgeting system requires some major adjustments if local communities are to be truly empowered and a project-based orientation is to be avoided.

7. Conclusions

Throughout Indonesia, in more than 400 locations, rehabilitation initiatives have been put into practice for three decades or more. However, in 2002 there was a total of 96.3 million ha (54.6 million ha inside state forest and 41.7 million ha outside state forest) of degraded forest and lands still to be rehabilitated. Successful projects have been characterised mainly by the active involvement of local people, and the technical interventions used to address the specific ecological causes of degradation that concern local people. Still there remains the never ending challenge of sustaining any positive impacts beyond the project timeframe.

Not only has the sustainability of rehabilitation projects been a major challenge but simply keeping pace with deforestation and degradation has proved to be impossible. To add to this dire situation is the fact that, since the start of the *Inpres* programme in the 1970s, 85% of the government's total forestry budget has been spent on rehabilitation projects with, it would seem, little or minimal success. Various long-standing factors have contributed to the ineffectiveness of many rehabilitation programmes, these include: 1) the targeting of forest resources as the main source of national income, still a priority for local governments; 2) the development of more complex issues of both direct and indirect causes of deforestation and degradation; 3) the transition and implementation of policies affecting rehabilitation initiatives; and 4) project-based oriented approaches have resulted in: inadequate maintenance of planted trees; a lack of funding sustainability beyond the project period due to the absence of a reinvestment mechanism, an adequate economic feasibility analysis, and clear integration with the market; unclear economic incentives leading to a lack of voluntary community participation; limited community participation due to unresolved tenure problems and ineffective community organisation; ineffective capacity building

for the community; inadequate considerations of socio-cultural aspects; and on a broader level, there has been unclear distribution of rights and responsibilities among the stakeholders involved, particularly local government, community and technical forestry agencies.

Important policy frameworks influencing rehabilitation initiatives include: 1) the forest classification system following the policy on Forest Land Use by Consensus (*Tata Guna Hutan Kesepakatan - TGHK*); 2) the development of *HTI* using fast-growing tree species; 3) the Indonesian System of Selective Cutting and Planting (*TPTI*) and the System of Selective Cutting and Line Planting for lowland forests (*TPTJ*); and 4) the rehabilitation programme assigned to state-owned companies (Inhutani I to V) that was subsequently revoked. Further, the policies pertaining to the political change from the New Order Era to the Reformation Era (from 1998 to the present) have all greatly influenced rehabilitation initiatives. Of particular note from this period is the new Regional Autonomy Policy implemented in 1999.

If rehabilitation initiatives are to be sustained far into the future, then various crucial factors must be addressed such as: appropriate project design to ensure the generation of multiplier effects; intensive forestry extension to ensure adoption of the rehabilitation approach by communities; enabled policy frameworks; well-planned funding mechanisms to effectively use the reforestation funds; and an effective mechanism to reconcile the land status before the project starts. Equally, communities are now being expected to participate fully and play more important roles in rehabilitation initiatives. Therefore, careful selection, design and planning of the right economic and social incentives are very important. From the analysis, economic and livelihood benefits generated from ecological improvements tend to be more sustainable in the long-term, than project-based economic opportunities.

List of Abbreviations

AAC	Annual Allowable Cut
ADB	Asian Development Bank
ADR	Alternative Dispute Resolution
AIDAB	Australian International Development Assistance Bureau
APAN	Asia Pacific Agroforestry Network
APBD	<i>Angaran Pendapatan dan Belanja Daerah</i> , Regional Budget
APHI	<i>Asosiasi Pengusaha Hutan Indonesia</i> , Association of Indonesian Forest Concessionaires
AusAID	Australian Government Overseas Aid Programme
<i>Bangdes</i>	<i>Pembangunan Desa</i> , Village Development
BAPLAN	<i>Badan Planologi Kehutanan</i> , Forestry Planning Agency
BAPPEDA	<i>Badan Perencanaan Pembangunan Daerah</i> , Provincial Development Planning Board
<i>Bawasda</i>	<i>Badan Pengawasan Daerah</i> , Regional Oversight Agency
BKLN	<i>Bina Kependudukan dan Lingkungan Hidup</i> , Population and Environmental Affairs
BKPH	<i>Bagian Kesatuan Pemangkuan Hutan</i> , Forest Sub-district Office
BKSDA	<i>Balai Konservasi Sumberdaya Alam</i> , Institute for Natural Resources Conservation
BOT	Build Operate and Transfer Pattern
BPDAS	<i>Balai Pengelolaan Daerah Aliran Sungai</i> , The Watershed Management Centre
BP2TPDAS IBB	<i>Balai Penelitian dan Pengembangan Teknologi Pengelolaan Daerah Aliran Sungai Wilayah Indonesia Bagian Barat</i> , Institute for Watershed Management Research and Development, Western Region of Indonesia
BPK ¹	<i>Bina Produksi Kehutanan</i> , Forestry Production Management

<i>BPK²</i>	<i>Badan Pemeriksa Keuangan</i> , Finance Supervisory Agency
<i>BPKP</i>	<i>Badan Pengawasan Keuangan dan Pembangunan</i> , Financial and Construction Supervisory Agency
<i>BPN</i>	<i>Badan Pertanahan Nasional</i> , National Land Agency
<i>BPP</i>	<i>Balai Penyuluhan Pertanian</i> , Agricultural Extension Institute
<i>BRLKT/Sub BRLKT</i>	<i>Balai/Sub Balai Rehabilitasi Lahan dan Konservasi Tanah</i> , Centre/Sub-Centre for Land Rehabilitation and Soil Conservation
<i>BTN</i>	<i>Bank Tabungan Negara</i> , Tabungan Negara Bank
<i>BTPDAS</i>	<i>Balai Teknologi Pengelolaan Daerah Aliran Sungai</i> , Institute for Watershed Management Research and Development,
<i>BTR</i>	<i>Balai Teknologi Reboisasi</i> , Reforestation Technology Institute
<i>CBA</i>	Cost Benefit Analysis
<i>CIDA</i>	The Canadian International Development Agency
<i>CIFOR</i>	The Center for International Forestry Research
<i>CSAR</i>	The Centre for Soil and Agroclimate Research
<i>DAK-DR</i>	<i>Dana Alokasi Khusus- Dana Reboisasi</i> , Specially Allocated Funds – Reforestation Fund
<i>DANIDA</i>	Danish International Development Agency
<i>DFID</i>	The Department for International Development
<i>DFS</i>	Deutsch Forest Service
<i>Ditjen BPK</i>	<i>Direktorat Jenderal Bina Produksi Kehutanan</i> , Directorate General of Forestry Production Management
<i>DG LRSF</i>	Directorate General of Land Rehabilitation and Social Forestry
<i>Ditjen PHKA</i>	<i>Direktorat Jenderal Perlindungan Hutan dan Konservasi Alam</i> , Directorate General of Forest Protection and Nature Conservation
<i>Ditjen RLPS</i>	<i>Direktorat Jenderal Rehabilitasi Lahan dan Perhutanan Sosial</i> , Directorate General of Land Rehabilitation and Social Forestry
<i>DITSI</i>	Directorate of Afforestation and Reforestation
<i>DJKPN</i>	<i>Direktorat Jenderal Keuangan dan Perbendaharaan Negara</i> , Directorate General of State Finance Supervisory
<i>DJR</i>	<i>Dana Jaminan Reboisasi</i> , Reforestation Guarantee Deposit Fund
<i>DPR</i>	<i>Dewan Perwakilan Rakyat</i> , National People's Consultative Assembly

<i>DPRD</i>	<i>Dewan Perwakilan Rakyat Daerah</i> , Regional People's Consultative Assembly (at provincial and district level)
<i>DR</i>	<i>Dana reboisasi</i> , Reforestation Fund
EPA	Environmental Protection Agency
ES	Environmental Services
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FGD	Focus Group Discussion
FINNIDA	Finnish International Development Agency
FLRP	Forest and Land Rehabilitation Programmes
FORDA	Forestry Research and Development Agency
FWI/GFW	Forest Watch Indonesia/Global Forest Watch
GBHN	<i>Garis-garis Besar Haluan Negara</i> , Guidelines for the State Policy
GN-RHL/Gerhan	<i>Gerakan National Rehabilitasi Hutan dan Lahan</i> , the National Movement for Forest and Land Rehabilitation
GoI	Government of Indonesia
GR/PP	Government Regulation/Peraturan Pemerintah
GTZ	German Gesellschaft für Technische Zusammenarbeit
<i>HGU</i>	<i>Hak Guna Usaha</i> , Estate Land Right
<i>HKm</i>	<i>Hutan Kemasyarakatan</i> , Community Forestry Schemes
HP	<i>Hutan Produksi</i> , Production Forest
<i>HPH</i>	<i>Hak Pengusahaan Hutan</i> , Concession Right Holder
<i>HPHTI</i>	<i>Hak Pengusahaan Hutan Tanaman Industri</i> , Concession Right for Industrial Plantation Forest
<i>HPK</i>	<i>Hutan Produksi Konversi</i> , Conversion Production Forest
<i>HPT</i>	<i>Hutan Produksi Terbatas</i> , Limited Production Forest
<i>HTI</i>	<i>Hutan Tanaman Industri</i> , Industrial Plantation Forest
HTI Trans	<i>Hutan Tanaman Industri Transmigrasi</i> , Transmigration Industrial Plantation Forest
IBRD/World Bank	International Bank for Reconstruction and Development
ICRAF	International Centre for Research in Agroforestry
IFAD	International Fund for Agricultural Development
IFFM	Integrated Forest Fire Management
<i>IHH</i>	<i>Iuran Hasil Hutan</i> , Forest Product Royalty
<i>IHPH</i>	<i>Iuran Pengusahaan Hutan</i> , HPH Licence Fee
IMF	International Monetary Fund
<i>INPRES</i>	<i>Instruksi Presiden</i> , Presidential Instruction
<i>INTAG</i>	<i>Inventarisasi dan Tata Guna Hutan</i> , Forest Inventory and Land Use

<i>IPB</i>	<i>Institut Pertanian Bogor</i> , Bogor Agricultural Institute
<i>IPK</i>	<i>Ijin Pemanfaatan Kayu</i> , Timber Utilisation/Clearance Permit
<i>IPPK</i>	<i>Ijin Pemungutan dan Pemanfaatan Kayu</i> , Timber Extraction and Utilisation Permit
<i>ITJEN/IRJEN</i>	<i>Inspektorat Jenderal/Inspektur Jenderal</i> , Inspectorate General/ Inspector General
<i>ITTO</i>	International Tropical Timber Organisation
<i>ITWILDA</i>	<i>Inspektorat Wilayah Daerah</i> , Regional Inspectorate Body
<i>IUPHHK</i>	<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu</i> , Timber Utilisation Permit
<i>JICA</i>	Japan International Cooperation Agency
<i>JIFPRO</i>	Japan International Forestry Promotion and Cooperation Centre
<i>Juklak</i>	<i>Petunjuk Pelaksanaan</i> , Implementation Guidelines
<i>Juknis</i>	<i>Petunjuk Teknis</i> , Technical Guidelines
<i>KKN</i>	<i>Korupsi, Kolusi dan Nepotisme</i> , Corruption, Collusion and Nepotism
<i>KKPH</i>	<i>Kepala Kesatuan Pemangkuan Hutan</i> , Head of District Forest Office
<i>KRB</i>	<i>Koperasi Rimba Berseri</i> , Forest Cooperative
<i>KTH</i>	<i>Kelompok Tani Hutan</i> , Forest Farmer Group
<i>KTMR</i>	<i>Kelompok Tani Mitra Rehabilitasi</i> , Farmer Group Partnership for Rehabilitation
<i>KUK DAS</i>	<i>Kredit Usahatani Konservasi Daerah Aliran Sungai</i> , Farming Credit for Watersheds Conservation
<i>LATIN</i>	<i>Lembaga Alam Tropika</i> , a local Non Government Organisation
<i>LEI</i>	<i>Lembaga Ekolabeling Indonesia</i> , Indonesian Ecolabeling Institution
<i>LKAD</i>	<i>Lembaga Kerjasama Antar Desa</i> , Intervillages Cooperation Body
<i>LKMD</i>	<i>Lembaga Ketahanan Masyarakat Desa</i> , Community Welfare Organisation, at Village Level
<i>LSM</i>	<i>Lembaga Swadaya Masyarakat</i> , Non Government Organisation
<i>MBNP</i>	Meru Betiri National Park
<i>MEFP</i>	Memorandum on Economic and Financial Policies
<i>MoF</i>	Ministry of Forestry
<i>MoFE</i>	Ministry of Forestry and Estate Crops
<i>MOU</i>	Memorandum of Understanding

<i>MPR</i>	<i>Majelis Permusyawaratan Rakyat</i> , People's Consultative Assembly
<i>MP-RHL</i>	<i>Master Plan - Rehabilitasi Hutan dan Lahan</i> , The Master Plan for Forest and Land Rehabilitation
MPTS	Multi-Purpose Tree Species
NGO	Non-Government Organisation
NIB/ NDF	Nordic Investment Bank/ Nordic Development Fund
NTFP/NTFPs	Non Timber Forest Product/Non Timber Forest Products
OECE	Overseas Economic Cooperation Fund
<i>P2WK</i>	<i>Pengembangan Perkebunan di Wilayah Khusus</i> , Plantation Development in Special Areas
<i>P3RPDAS</i>	<i>Proyek Perencanaan dan Pembinaan Reboisasi dan Penghijauan Daerah Aliran Sungai</i> , Afforestation and Reforestation Development and Planning Project for Watershed Management
<i>PAD</i>	<i>Pendapatan Asli Daerah</i> , Local Government Revenues
<i>PEDUM</i>	<i>Pedoman Umum</i> , General Guidelines
PELITA	<i>Pembangunan Lima Tahun</i> , Five-Year Development
<i>Perda</i>	<i>Peraturan Daerah</i> , Local Government Regulation
PES	Payment for Environmental Services
PFMA	Participatory Forest Management Area
<i>PHBM</i>	<i>Pengelolaan Hutan Bersama Masyarakat</i> , Collaborative Forest Management between Company and Community
<i>PIL</i>	<i>Penghijauan Input Langsung</i> , Direct Inputs for Afforestation
<i>PIMPRO</i>	<i>Pimpinan Proyek</i> , Project Leader
<i>PIR/NES</i>	<i>Perkebunan Inti Rakyat</i> , Nucleus Estate Smallholder
<i>PKT</i>	<i>Perhutanan dan Konservasi Tanah</i> , Forestry and Soil Conservation Service
<i>PLK</i>	<i>Penyuluh Lapang Kehutanan</i> , Forestry Extension Field Officer
PP/GR	Peraturan Pemerintah/Government Regulation
PRA	Participatory Rural Appraisal
PS	<i>Penghijauan Swadaya</i> , Self-funded Afforestation
<i>PSDH</i>	<i>Provisi Sumber Daya Hutan</i> , Forest Resource Rent Provision
<i>Pusdiklat</i>	<i>Pusat Pendidikan dan Latihan</i> , Centre for Training and Education
<i>REPELITA</i>	<i>Rencana Pembangunan Lima Tahun</i> , Five-Year Development Plan (New Order Regime)

<i>RHL</i>	<i>Rehabilitasi Hutan dan Lahan</i> , Land and Forest Rehabilitation
<i>RKPH</i>	<i>Rencana Karya Pengusahaan Hutan</i> , Work Plan for Forest Management
<i>RLKT</i>	<i>Rehabilitasi Lahan dan Konservasi Tanah</i> , Land Rehabilitation and Soil Conservation
<i>RLPS</i>	<i>Rehabilitasi Lahan dan Perhutanan Sosial</i> , Land Rehabilitation and Social Forestry
<i>RRL</i>	<i>Reboisasi dan Rehabilitasi Lahan</i> , Land Rehabilitation and Reforestation
<i>RTRW</i>	<i>Rencana Tata Ruang Wilayah</i> , Regional Spatial Planning
<i>RTRWP</i>	<i>Rencana Tata Ruang Wilayah Propinsi</i> , Provincial Regional Spatial Management Plan
<i>SFDP</i>	Social Forestry Development Project
<i>SJFCP</i>	South Java Flood Control Sector Project
<i>SKSHH</i>	<i>Surat Keterangan Sahnya Hasil Hutan</i> , Log Transport Permit/s
<i>SKT</i>	<i>Surat Keterangan Tanah</i> , Land Papers
<i>SPKS</i>	<i>Surat Perjanjian Kerjasama</i> , Contract Agreement
<i>SPKS/LoA</i>	<i>Surat Perjanjian Kerjasama</i> , Letter of Agreement
<i>TAHURA</i>	<i>Taman Hutan Raya</i> , National Park (at provincial level)
<i>TGHK</i>	<i>Tata Guna Hutan Kesepakatan</i> , Forest Land Use Consensus
<i>TGLDK</i>	<i>Tata Guna Lahan Desa Kesepakatan</i> , Forest Land Use Consensus at the Village Level
<i>THPA</i>	<i>Tebang Habis Permudaan Alam</i> , Clear Cutting with Natural Regeneration
<i>THPB</i>	<i>Tebang Habis Permudaan Buatan</i> , Clear Cutting with Artificial Regeneration
<i>TIMDAL</i>	<i>Tim Monitoring dan Evaluasi</i> , National Monitoring and Evaluation Team
<i>TPI</i>	<i>Tebang Pilih Indonesia</i> , Selective Cutting System
<i>TPTI</i>	<i>Tebang Pilih dan Tanam Indonesia</i> , Indonesian System of Selective Cutting and Planting
<i>TPTJ</i>	<i>Tebang Pilih Tanam Jalur</i> , System of Selective Cutting and Line Planting
<i>UBSPP</i>	<i>Usaha Bersama Simpan Pinjam Pedesaan</i> , Community Business Unit
<i>UNDP</i>	United Nations Development Programme
<i>UPP</i>	<i>Unit Pelayanan Pengembangan</i> , Development Service Unit
<i>UPT</i>	<i>Unit Pelaksana Teknis</i> , Technical Implementation Unit

<i>UP-UPM</i>	<i>Unit Percontohan Usaha Pertanian Menetap</i> , Demonstration Plots for Sedentary Farming Systems
<i>UP-UPSA</i>	<i>Unit Percontohan Usaha Pelestarian Sumberdaya Alam</i> , Demonstration plots for sustaining natural resources
USAID	United States Agency for International Development
UTHN	<i>Usaha Tani Hutan Menetap</i> , Sedentary Forest Farming System
WFP	World Food Programme
YPSBK	Yayasan Bumi Katulistiwa, a Non Government Organisation

Glossary

Afforestation	Rehabilitation initiative usually implemented on community land outside state forest (according to MoF's definition).
Agricultural extensification	Development of an extensive form of agriculture to some extended areas with or without applied/use of cultivation technologies and modern tools.
Agricultural intensification	Development of intensive forms of agriculture that could be attributed to major technical inventions (e.g. metal tools, terracing, the plough, oxen teams) or to increase knowledge (e.g. fertilising, breeding of draft animals or more productive forms of crops).
Agroforestry system	A land management system that combines agriculture and a forestry component to create more integrated, diverse, productive, profitable, healthy and sustainable land-use systems (King and Chandler 1978 ¹).
Alternative Dispute Resolution	A dispute resolution process and technique that falls outside the government judicial processes.
Assisted natural regeneration	An approach to reforestation that uses natural regeneration of forest trees (wildlings or natural seedlings and sprouts) and helping trees grow faster in other ways (Friday <i>et al.</i> 1999 ²).
Artificial regeneration	The propagation of trees by human intervention through generative and vegetative methods including assisted natural regeneration.
Authoritative	Given with or showing authority

Biodiversity	The number, variety and variability of living organisms; sometimes referred to as the total variety of life on earth (Charter 2001 ³).
Climate change	Any change in climate over time, whether due to natural variability or to human activity (Charter 2001 ³).
Community Forestry	A reforestation programme with the active participation of local people usually using applied agroforestry technologies.
Complex Agroforestry System	A land-use system consisting of a number of components: trees, tree crops, seasonal plants and or grass, where the physiognomy and the function are nearly similar to the natural ecosystem (Michon and de Foresta 1992 ⁴).
Conflict resolution mechanism	The process used in attempting to resolve a dispute or conflict.
Contributing provinces of Reforestation Funds (See also to Non-contributing provinces)	Provinces with forest areas, in which there are active logging companies in operation. These provinces collect Reforestation Funds (<i>Dana Reboisasi</i>) according to the tree species logged and area of origin per cubic meter of logged timber. This money is then transferred to the central government.
Cost Benefit Analysis	One approach used to assess the feasibility whereby the Net Present Value (NPV) of returns per hectare from a project or initiative is calculated. The decision criterion used in the financial analysis is to consider a project feasible if its NPV is positive.
Critical land	Degraded land that must be reforested (Kartodihardjo and Supriono 2000 ⁵).
<i>Culturstelsel</i>	A revenue system in the Dutch East Indies (Indonesia) that forced farmers to pay revenue to the treasury of The Netherlands in the form of export-crops or compulsory labour. Johannes van den Bosch, the Governor-general of the Dutch East Indies, introduced the system in 1830.
<i>DAK-DR</i>	Reforestation funds allocated for specific purposes.

Decentralisation	The expansion of local autonomy through the transfer of power and responsibilities away from a national political and administrative body (Charter 2001 ³).
Deforestation	The loss or continual degradation of forest habitat due to either natural or human-related causes. Agriculture, urban sprawl, unsustainable forestry practices, mining and petroleum exploration all contribute to deforestation.
Degraded forest land/degraded land	Formerly forested lands severely impacted by intensive and/or repeated disturbance, e.g. fires or illegal logging. The degraded forest land delivers a reduced supply of goods and services from a given site.
Devolution	The statutory granting of power from the central government of a state to a government at national, regional or local level or means a delegation of powers.
Enrichment planting	Increasing the stocks of commercial species by planting seedlings or seeds in logging gaps or along cleared lines (Putz <i>et al.</i> 2000 ⁶).
Erosion	The displacement of solids (soil, mud, rock and other particles) by the agents of wind, water or ice, by downward or down-slope movement in response to gravity or by living organisms (in the case of bioerosion).
Ex-logging area	A forest area where logging activities had been conducted.
Farm forestry	Forest developed outside state forest areas.
Food security	Access by all people at all times to the food needed for an active and healthy life. At the household level refers to the ability of a household to secure, either from its own production or through purchases, adequate food to meet the dietary needs of its members (Mula 1999 ⁷).
Forest encroachment	Illegal forest activities (e.g. agriculture practices) usually on state forest area that affected the forest ecosystem.

Forest rehabilitation initiatives (definition used in this report)	Deliberate activities aimed at artificial and/or natural regeneration of trees on formerly forested grasslands, brushlands, scrublands, or barren areas for the purpose of enhancing productivity, livelihood, and/or environmental service benefits (CIFOR Rehab Team 2003 ⁸).
Forestry Services (Provincial Forestry Services/District Services)	Agencies at provincial and district levels under the Ministry of Forestry. They are responsible for the implementation of forestry policies and control of the forest areas inside their jurisdiction.
Forest rent and royalties	Charges or payments applied to forestry production, e.g. timber. Ideally payments should reflect the real economic values of forestry resources in encouraging the behaviour to protect the resources.
<i>GN-RHL/Gerhan</i>	The National Movement for Forest and Land Rehabilitation, initiated in 2003.
<i>Hutan Tanaman Industri (HTI) or Hak Pengusahaan Hutan Tanaman Industri (HPHTI)</i>	Permission to establish an industrial plantation forest in a designated area and to supply the raw material for the processing industry. For this purpose, fast-growing species are commonly planted.
<i>HTI Trans or Hutan Tanaman Industri Transmigrasi</i>	Joint industrial plantation forest between Concession Holders and the participants of transmigration program (reallocation program of people from Java to outer islands).
Illegal logging	The illegal removal of timber/logs from a forest, and this illegal activity affecting the forest (e.g. ecosystem) and the people who depend on it (Tacconi <i>et al.</i> 2004 ⁹).
Incentive (in rehabilitation)	Payment (direct or indirect) or schemes in various forms to encourage a community and other sectors (e.g. private sector) to participate voluntarily in forest rehabilitation activities.
<i>Inpres Penghijauan dan Reboisasi (Inpres P & R)</i>	A Presidential Instruction on reforestation and afforestation issued in 1976/1977.
Institution	Social structures and mechanisms of social order and cooperation governing the behaviour of two or more individuals.

Integrated approach	Approaches taking into account various aspects of ecology, economics and sociology from inter-related points of view.
<i>Karangkitri</i> movement	Government policy on forest and land rehabilitation initiated from October 1951–1960. It was a national campaign for communities to plant trees in their yards and on other lands.
<i>Kabupaten</i>	District.
<i>Kecamatan</i>	Sub-district.
<i>Kelompok tani</i>	Farmer groups that also function as tree grower organisations (informal) (Nawir <i>et al.</i> 2003 ¹⁰).
<i>Kelompok Usaha Bersama</i>	Community development group – a tree growers' group under a Participatory Reforestation scheme.
Land degradation	A human-induced or natural process that negatively affects the capacity of land to function effectively within an ecosystem by accepting, storing and recycling water, energy, and nutrients.
Land tenure	The right to exclusively occupy and use a specified area of land and forest.
Livelihood	Capabilities, assets and activities required for a means of living (DFID 1999 ¹¹)
Logged-over Area	A forest area where logging activities have been conducted.
Market failure	A situation in which markets do not efficiently organise production or allocate goods and services to consumers.
Matching funds (<i>Dana pendamping</i>)	10% of funds that should be provided by local government (usually at district level) in complementing the budget allocated by central government to implement the rehabilitation program under <i>DAK DR</i> .

Natural disaster	Extreme phenomenon, of great intensity and limited duration, occurring at certain locations, involving a complex interplay between physical and human systems, causing loss of lives and threats to public health as well as physical damage and disruption of livelihood systems and society, outstripping local capacity and resources and requiring outside assistance to cope with it (Freks and Hilhorst 2001 ¹²).
Natural regeneration	The natural propagation of trees without human intervention.
Non-contributing provinces of Reforestation Funds	Provinces that have no logging company operating in the region, so no DR or any other levies received that would be transferred to the central government.
Non Timber Forest Products	All products collected/harvested from forest areas, except timber or wood, such as rattan, fruits, honey, etc.
Participation	Active involvement of insiders and outsiders in all decisions related to objectives and activities, as well as the activities themselves. The primary purpose of participation is to encourage community self-determination and thus foster sustainable development (Case 1990 ¹³ ; Nawir <i>et al.</i> 2003 ¹⁰)
Participatory approach	An approach to development that accommodates the involvement of interested stakeholders, e.g. community.
Partnership	The range of relationships established by two or more parties on the expectation of benefits. A partnership may be formal or informal and may involve third parties in a variety of roles (Case 1990 ¹³).
Performance bond	A bond issued by an insurance company to guarantee satisfactory completion of a project by a contractor or forest concessionaire.
Perhutani	A state company whose main responsibility is to manage teak plantations on Java (Nawir <i>et al.</i> 2003 ¹⁰)

<i>Polokromo jati</i>	The district policy that supports farm forestry development in Gunung Kidul District. Issued by Darmakum Darmokusumo in the 1980s, the policy obliges every person who marries to plant at least 10 teak trees on their land.
Poverty	The condition of being without adequate food, money, shelter, health care, etc.
Privatisation	The transfer of property or responsibility from the public sector (government) to the private sector (business).
Productivity	The amount of output created (in terms of goods produced or services rendered) per unit input used.
Reforestation	A forest rehabilitation initiative implemented inside a state forest area (according to MoF's definition). See also Afforestation
Reforestation Funds	Government revenues from timber concession companies that aim to finance the rehabilitation of degraded forests (Nawir <i>et al.</i> 2003 ¹⁰).
Reinvestment mechanism	A mechanism to ensure that there is funding continuity from the current operation, e.g. by allocating a certain proportion of the revenues to fund follow up activities.
Resource-based management	The management of natural resources that places emphasis on balancing socio-economic and environmental factors.
Secondary forest	A forest or woodland area that has re-grown/regenerated after being deforested. Secondary forest tends to have trees that are closer in space than plantation forest. Secondary forest also tends to contain more undergrowth.
Shifting cultivation	An agricultural system in which a person uses a piece of land only to abandon or alter the initial-use a short time later. This system often involves clearing a piece of land followed by several years of farming until the soil loses fertility. Once the land becomes inadequate for crop production, it is left to return to its natural vegetative state.
Slash and burn	A specific functional element of certain farming practices, often shifting cultivation systems.

Social cohesion	The existence of social bonds within human relationships.
Social Forestry	An approach that tries to change the (negative) attitude of people towards forests, to change their behaviour.
Social Welfare	A range of government programmes that provide assistance, to those in need, to enable them to maintain a minimum standard of well-being.
Survival rate	Comparison between planted seedlings that have survived and the total number of seedling that were planted. This is usually stated in percentage (%).
<i>Surat Keterangan Tanah</i> (SKT)	A land status certificate signed by the Head of a Village (Nawir <i>et al.</i> 2003 ¹⁰).
Sustainable development	The ability of the present generation to meet its needs without undermining the ability of future generations to meet their needs (Charter 2001 ³).
Sustainable Forest Management	A set of practices that are undertaken within the legal and regulatory framework and that pursue a variety of goals, including the sustained yield of forest goods and services, positive socioeconomic impacts, and maintenance of biodiversity (Tacconi <i>et al.</i> 2004 ⁹).
<i>Taungya</i> system	A man-made forest establishment which allows land-less/forest dependent people living inside or around of forest areas to grow food crops and fuel wood in between rows of timber trees during the first two-three years of tree plantation
Timber management	Forest management that places emphasis on timber production objectives.
Top-down approach	A political development approach that omits participatory processes.
Transmigration	A government policy to move people from Java and Bali to the outer islands, implemented since the 1980s.

Verenigde Oost Indische
Companies (VOC)

Dutch East India Company. The VOC was established on March 20 1602, when the Estates-General of the Netherlands granted it a 21-year monopoly to carry out colonial activities in Asia. It was the first multinational corporation in the world and the first company to issue stocks. It remained an important trading concern for almost two centuries, until it went bankrupt and was dissolved in 1798.

Wiyata Jati

A district policy that supports farm forestry development in Gunung Kidul District. The policy aims to plant teak trees in schoolyards.

Endnotes:

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Chapter 1

Introduction

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1.1. The research context: background and issues

Indonesia is a country with one of the world's largest areas of tropical forest. The forest areas cover up to 120.4 million ha, or 68% of its total land area (Baplan 2002). Indonesian forests provide habitats for globally important species of flora and fauna. Economically, since the 1980s, forest resources have contributed to the rapid growth of the country's Gross National Product.

Unfortunately, illegal logging, forest fires, forest conversion, unplanned agricultural expansion, consequences of the beginning of Reformation Era since 1998, and social problems, such as disenchantment, resentment and conflict over forest resources with local communities, have contributed significantly to the estimated 54.6 million ha of degraded forestland. This includes production forests and conservation and protection forests, and 41.7 million ha of degraded land outside the forest areas (Departemen Kehutanan 2002^a). The livelihoods of 10–20 million forest-dependent people have been affected by this degradation (Forest Watch Indonesia/Global Forest Watch - FWI/GFW 2002; Sunderlin *et al.* 2000). The responsibility for rehabilitating the 96.3 million ha of degraded land lies not only in the hands of the Ministry of Forestry (MoF), but of all concerned stakeholders, including forest dependent people.

Since the early 1950s, the Government of Indonesia (GoI) has implemented a range of rehabilitation programmes. The earliest rehabilitation initiative was a national campaign for local communities to plant trees in their home-yards under

the *Karang Kitri* movement, initiated in October 1951 (Mursidin *et al.* 1997). The most important projects were those initiated with *Inpres* funding (government funding based on a Presidential Instruction) in 1976/77, covering most of the degraded areas on Java; the project provided seedlings for people to plant trees, such as *Paraserianthes falcataria*. Since then, rehabilitation programmes to combat the degradation of forest areas have become an important focus of the MoF's priorities.

In 2002, the MoF also initiated a policy under the umbrella of social forestry to promote community-based rehabilitation programmes. The technical plan for this was developed under the Five-Year Plan for the Forest and Land Rehabilitation Programme (*Rehabilitasi Hutan dan Lahan - RHL lima tahun*) and uses catchment areas as the unit of management; the first priority category to be rehabilitated includes 60 watersheds. However, due to financial constraints, the programme initially planned to focus on rehabilitating 17 catchment areas over the first five years at a total cost of USD 1.6 billion (Baplan 2003). The policy complements the Allocated Reforestation Funds for Specific Purposes (*Dana Alokasi Khusus-Dana Reboisasi – DAK-DR*) Programme that has been implemented since 2001 under the coordination of district governments. At the end of 2003, the National Movement for Forest and Land Rehabilitation or *Gerakan Nasional Rehabilitasi Hutan dan Lahan (GN RHL/Gerhan)* was launched by former President Megawati Sukarnoputri, and planned to cover three million ha within five years. Under the new government with the new President Susilo Bambang Yudhoyono, the initiative has continued to be one of the five priorities set by the MoF.

In the past, most rehabilitation projects were government driven, dependent on public funding from the Indonesian government and international donors, and focused mainly on the technical aspects of rehabilitation. Institutional arrangements for executing the rehabilitation programmes to establish effective implementation on the ground were not developed. As a result, there has been little adoption of the rehabilitation techniques by local people living in and around the target areas. Innovative approaches are necessary if the objectives of a rehabilitation programme are to be achieved while at the same time giving associated socioeconomic benefits to private companies and local people.

In view of the fact that many new projects with substantial resource investment are continually being implemented, even until now, CIFOR in collaboration with scientists from FORDA (Forestry Research and Development Agency, MoF), worked for two years (between 2004 to 2006) to draw strategic lessons from past experiences and to use them as guides for future efforts. The Government of Japan, with Dr. Takeshi Toma as the Project Leader, funded this initiative.

1.2. Aims, objectives and research questions

The study aimed to increase the chances of success of future rehabilitation projects by identifying the approaches that have contributed to longer-term sustainability under different scenarios that have had minimal negative impacts on the different stakeholders. Specific objectives of the study were:

1. To obtain strategic lessons on driving forces, impacts and underlying constraints from past and ongoing rehabilitation initiatives and research
2. To identify the most promising rehabilitation approaches under different ecological and socio-economic scenarios, and
3. To identify appropriate economic and institutional incentives under different conditions.

The main output of the study is a country synthesis of lessons learned from the processes of inventory and characterisation of past and ongoing rehabilitation initiatives and their changing profiles (see methodology section). The analysis will provide the stakeholders with a comprehensive understanding of the factors affecting successes and failures in implementing rehabilitation initiatives. This is essential for the local communities as the main stakeholders, as it is important that they are involved in designing, planning, implementing, monitoring and evaluating rehabilitation initiatives. Thus, future rehabilitation initiatives will have greater chances of success; if they take the approaches shown to be the most applicable, cost-effective and socio-culturally acceptable in their implementation, by taking into account the important lessons from both past and on-going projects.

1.2.1. Scope of rehabilitation initiatives and projects

The focus of this review was on initiatives that aimed to establish trees on formerly forested lands, and not on strictly technical trials of planting species or designs. Integrated projects with forest rehabilitation components were included in the review. The **forest rehabilitation initiatives** in the study are framed by the description: *Deliberate activities aimed at artificial and/or natural regeneration of trees on formerly forested grasslands, brushlands, scrublands, or barren areas for the purpose of enhancing productivity, livelihood, and/or environmental service benefits* (CIFOR Rehab Team 2003). Deliberate activities could include technical interventions, new or revised socio-economic arrangements, and new or revised institutional arrangements (land tenure, policies, rules and regulations, and monitoring). ‘Artificial and/or natural regeneration of trees’, or any rehabilitation methods that involved trees, ranged from agroforestry through plantations to assisted natural regeneration. Rehabilitated areas were formerly forested grasslands, brushlands, scrublands, or barren areas, reflecting initiatives that aimed to reforest formerly forested land. The study did not include the rehabilitation of degraded or secondary forest areas or reclamation on mined areas; it dealt only with initiatives

that aimed to reforest formerly forested land. The types of environments covered by the study were restricted to upland and lowland areas, excluding wetlands. The purposes and objectives of the rehabilitation initiatives in the study ranged from productivity to livelihoods generation and/or environmental benefits for different stakeholders.

The study had to take into account the definition provided by the MoF in Indonesia, which uses specific terms to define the rehabilitation efforts based on the status of land or areas where the projects are located. **Reforestation** (*reboisasi*), or forest rehabilitation refers to the initiatives implemented inside state forest areas. **Afforestation** (*penghijauan*), or **land rehabilitation**, refers to the initiatives that are usually implemented on community land outside state forest areas. More discussion on reforestation and afforestation can be found in Chapter 3.

1.2.2. Methodology and data analysis

The study was conducted through the inventory and characterisation of past and ongoing rehabilitation initiatives and their changing profiles in each selected region by conducting a series of consultations and workshops with national and local stakeholders. This was done in conjunction with in-depth evaluations and comparative analyses of all factors, within and across projects, and based on the literature reviews of project-related documents and other secondary sources. Additional information on the methodology is included in Appendix 2.

As the first step of this review, a Preliminary Database of the rehabilitation projects was compiled in order to capture basic information on the project variables of more than 150 projects. Based on these data, a preliminary analysis was undertaken and projects were selected for Database 1.

Database 1 is an inventory of selected rehabilitation projects that serves as the basis for analysing the key characteristics and changing trends of rehabilitation efforts in Indonesia. Fifty-four rehabilitation programmes or 101 projects (i.e. implemented in 101 locations) were selected from the Preliminary Database using several criteria: (1) the status of the land where the project was located (inside state forest, outside state forest, and in both areas), (2) the condition of the area before the project started (fire-affected area, logged-over area and other land degraded by a variety of factors), (3) the executing agencies (government, international agencies, state/private companies, NGO or community groups, and a combination of different stakeholder groups), and (4) the scale, based on coverage area (< 100 ha, 100–1,000 ha, and > 1,000 ha). This database provides information on typology and project characteristics (e.g. project profile, objective, beneficiaries, intended impacts), which allows the selection of case study projects

for Database 2¹. The information sources were questionnaire interviews and literature reviews, including reviews of project documents and other related documents. The analysis of Database 1 is hereafter referred to as 101 projects. The distribution of projects, based on the criteria drawn up for Database 1, is summarised in Table 1-1.

Table 1-1. Project sample frames based on the selection criteria of Database 1

Condition of the area before the project	Executing agency	Status of project area		
		Inside state forest area	Outside state forest area	Inside & outside state forest area
Fire-affected area	Government	3	0	2
	International agency	1	0	0
	State/private company	1	2	0
	NGO/Community	1	1	0
	Multi-agencies	2	1	0
Logged-over area (e.g. ex-HPH or illegally logged), degraded conversion areas, etc	Government	3	4	5
	International agency	0	1	0
	State/private company	4	3	0
	NGO/Community	1	2	0
	Multi-agencies	10	2	5
TOTAL (54 projects)		26	16	12

Note: HPH: *Hak Pengusahaan Hutan* (Commercial Forestry Concession)

From the projects in Database 1, 10 projects were selected for Database 2, a case study database. The selection criteria were: (1) located in the 10 provinces that require the most rehabilitation as they hold the largest area of degraded forest, (2) successful and failed projects, according to general perceptions, (3) approaches used (top-down, transition from top-down to participatory, and with strong emphasis on the participatory approach), (4) project period, and (5) a representative sample of the project clustering in Database 1. In addition, the willingness and interest of the project coordinators/personnel to collaborate in this study were also considered. The database consists of detailed information on the impacts of rehabilitation activities on the ground, which were analysed based

¹ Database 1 and Database 2 in Indonesian can be obtained from <http://www.cifor.cgiar.org/rehab/>

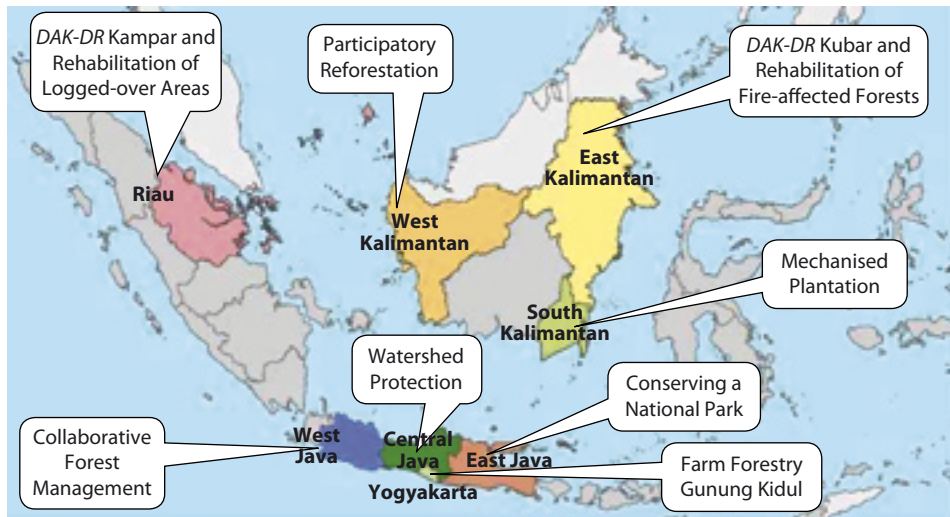


Figure 1-1. Location and names of case study projects

on assessment indicators covering technical, environmental, socioeconomic, and management aspects.

The case study projects were located in Sumatra, Kalimantan and Java (Figure 1-1):

1. Collaborative Forest Management (*Pengelolaan Hutan Bersama Masyarakat - PHMB*) initiated by the State-owned Company of Perhutani in Sukabumi, West-Java (2001-present). In this report this is referred to as the Collaborative Forest Management Project
2. Community Rehabilitation Project of the Reforestation Funds (*Dana Alokasi Khusus-Dana Reboisasi - DAK-DR*) in Kampar, Riau, Sumatra (2001-present). Referred to in this report as *DAK-DR Kampar*
3. Community Rehabilitation Project of the Reforestation Funds (*Dana Alokasi Khusus-Dana Reboisasi - DAK-DR*) in West Kutai (Kutai Barat or Kubar), East Kalimantan (2001-present). Referred to in this report as *DAK-DR Kubar*
4. Conserving Meru Betiri National Park in Jember, East Java (1998-present)
5. Rehabilitation of Logged-over Areas conducted by the State-owned Forest Company in Riau (1996-2000)
6. Participatory Reforestation in Sanggau District, West Kalimantan (1994-99)
7. Rehabilitation of Fire-affected Forests through the establishment of demonstration plots in East Kalimantan (ITTO Project PD 84/90 (F)) (1992-94)
8. Upper Solo Watershed Protection Project in Wonogiri, Central Java (1988-95)

9. Mechanised Nursery and Plantation - Reforestation and Tropical Forest Management, FINNIDA Project - Phase II to VI in South Kalimantan (1983-96) Referred to in this report as the Mechanised Plantation Project.
10. Farm Forestry in Gunung Kidul, Yogyakarta Province (1970-present). Referred to in this report as the Farm Forestry Project.

An in-depth study was carried out at the 10 rehabilitation projects (see Figure 1-1). Data were collected through direct field observations, interviews and focus group discussions (FGDs). The general condition of the rehabilitated area was recorded during the field observations: data were recorded on vegetation (including planted trees), forest or land cover, soil type, soil and water conservation practices and the condition of the community in the surrounding areas. Three types of respondents were interviewed using different questionnaires²: namely project managers, project personnel and/or observers, and community members, either participants or non-participants of the project. The interviews with project managers were conducted at seven of the ten case study projects, since the managers of the other four projects had already moved to other sites after their projects had ended. The total number of project personnel and observers interviewed was 18. Interviews with community members who were involved and/or not involved in the projects were held with 131 respondents. The community members interviewed included village heads and members of forest farmer groups. The FGDs were carried out with 28 groups, and a total of 238 participants. The different stakeholder groups were formed for the discussions based on the status of the participants and gender considerations: formal and informal leaders, community members that participated and did not participate in the rehabilitation project, including women. A detailed sample distribution is included in Appendix 2. The case studies of the 10 rehabilitation projects were conducted from January to June 2004.

Major analysis of Database 1 and Database 2 used SPSS software to run a Cross Tabulation, Kruskal-Wallis Test, and Correspondence Analysis. The results were crosschecked with the key finding notes from the FGD and direct researcher observations (discussed further in Appendix 2).

A further in-depth case study survey focussed on gender and livelihood issues in forest rehabilitation, led by Ms. Chiharu Hiyama, was conducted at the project site of Collaborative Forest Management (*Pengelolaan Hutan Bersama Masyarakat - PHBM*) in Sukabumi. The study aimed to understand gender-based roles and responsibilities, decision-making systems and the impacts of forest rehabilitation activities on men, women and marginalised groups in a

2 Questionnaires in Indonesian can be obtained from <http://www.cifor.cgiar.org/rehab/>

society. Gender³ and human diversity⁴ are concepts that constitute analytical approaches to understanding the world around us. There are two reasons why a gender and diversity analysis is important for rehabilitation projects. First, current rehabilitation projects are required to address both the environmental and social needs of the local communities. Such projects need gender-based information to know who does what and who benefits or loses in a society. Such information is vital for appropriate planning and implementation, and to avoid programme failure (Wilde and Vainio-Mattila 1995). Second, all rehabilitation projects that are deemed successful in environmental terms might have components that result in negative impacts on the communities. By exposing different segments of society, the analysis makes it possible to grasp impacts on various dimensions of society. The case study survey on gender and livelihood issues in forest rehabilitation was undertaken from September to December 2004. Some of the results of this study are included in Chapter 5, but further discussion on the methodology and results can be obtained in Widiarti *et al.* (2006).

1.2.1. Defining the successes and failures of rehabilitation initiatives

To date, the success or failure of a project has been based on general public perceptions rather than on a systematic independent evaluation of all aspects of the rehabilitation work. For some projects the evaluation process was conducted by contracting independent consultants, however, this was done mainly to meet the formal requirements (of budget allocation) set by particular funding agencies. Three approaches were used to define the successes and failures of rehabilitation initiatives in the study. These approaches were discussed and recommended during the first national workshop⁵ in October 2003:

1. The perceptions of concerned stakeholders were taken into account
2. The indicators of outputs and processes were examined, and
3. The period after the project ended was taken into account.

There was no project that could be perceived as a complete success or failure, after all aspects of the implementation had been taken into account (technical, socio-cultural, economic and institutional), there were only partial successes or failures, depending on the stakeholders' perceptions. Since the different stakeholders have different perceptions on the success or failure of a rehabilitation project, the

3 Gender is a social distinction that is culture-specific and changes across time. It often refers to the different social roles that women and men play, and the power relations between them (Aguilar *et al.* 2002).

4 Human diversity refers to all the other significant segments of social and biological differences crosscutting gender and ethnicity, such as wealth, profession, status, age and class (McDougall 2001).

5 The first National Rehabilitation Workshop organised by CIFOR and FORDA, 22-23 October 2003.

opinions of the various stakeholders that were taken into account were closely related to the particular aspect being evaluated.

Indicators of outputs and outcomes were categorised under technical, socio-cultural, economic and institutional aspects. The priority indicators to be used depended on the main objective of the project. All the aspects and relevant indicators had to be reviewed according to the planning, implementation, and monitoring and evaluation processes. Although forest rehabilitation requires a long-term process to evaluate it appropriately (3–4 years, at least), the government system does not usually permit such a long period of evaluation. Consequently the evaluation is more of an administrative measure and just a ‘snapshot’ of the situation. For example, the government might consider a project as successful without assessing the results after the project has ended. In evaluating the rehabilitation projects in this study, therefore, the assessment included two timeframes: from one up to five years after the project had been initiated, and more than five years after the project had been initiated up to the present. A more specific assessment indicators list is presented in Appendix 1.

1.3. Structure of the report

The report describes a review of forest rehabilitation initiatives in Indonesia starting from the colonial period, through Old and New Order (*orde lama* and *orde baru*) governments and the Reformation Era to the present era of regional autonomy. It discusses programmes and projects on forest and land rehabilitation, driving forces, approaches used, scales, funding and executing/implementing agencies, impacts and lessons learnt as well as making recommendations for the sustainable management of rehabilitation initiatives.

The publication is divided into three parts. The first part (Chapters 1 and 2) provides background and a short overview of forest/forestry, including its role in the national economy, forest-resources-dependent people, forestland degradation and forest and land rehabilitation programmes. There is also further information on working definitions, methodology and data analysis. The second part (Chapters 3 and 4) describes the characteristics and profiles of forest and land rehabilitation programmes and/or projects, mainly discussing project features and the management of different rehabilitation initiatives. An overview of policies and programmes that affected forest and land rehabilitation is also presented here. Finally, the third part of the publication (Chapters 5 and 6) discusses the impacts of forest and land rehabilitation and provides lessons learnt to achieve the sustainable management of forest and land rehabilitation initiatives.

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Chapter 2

History and state of deforestation and land degradation

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Understanding the causes of deforestation and land degradation is a very crucial as part of the process of designing effective rehabilitation initiatives. These causes often also act as the continuing disturbances in the rehabilitation sites, with various factors behind them. These include the dynamic changes of forest management in Indonesia, and direct and indirect driving factors. Rehabilitation initiatives are less likely to be successful, unless the causes are overcome simultaneously with the implementation of rehabilitation initiatives. This chapter presents a historical overview of forest management changes and the complex driving factors behind the deforestation and land degradation at the national level and also in the eight provinces, where the case studies were surveyed.

2.1. Historical overview of forest management changes and the effects on deforestation and land degradation

Forest management in Indonesia has been influenced mostly by dynamic changes in government policies and the economic condition of the country, which allows forestry management policies to be grouped into four periods:

- a. 1950–75: the policy for agricultural expansion in forest areas resulted in natural disasters, such as floods and land erosion, mainly in Java
- b. 1975–90: the policy to release permits for commercial logging concessions

- c. 1990–97: the government focused on the management of forest outside state forests
- d. 1997–present: Reformation Era, following significant political change after the end of New Order Era.

Long before Indonesia became an independent country, the forest and land management policies prioritised during the colonial era, influenced the subsequent Government of Indonesia (GoI) in setting up the regulations and policy frameworks for national forest management.

1950–75. In Indonesia, deforestation has a long history. During the Dutch and British colonial eras, deforestation occurred mainly because of the trading policy of the Dutch East India Company or VOC (*Vereenigde Oost Indische Compagnie*), which recognised forests as timber (logs) resources for construction and shipbuilding (Mursidin *et al.* 1997). This was supported by the policy that released permits to open up land for agricultural purposes to obtain revenues (from land taxes) and the *Cultuurstelsel* (Dutch colonial cultivation Policy - *Sistem Tanam Paksa*), which forced forest conversion for sugar cane, coffee, indigo (*nila*) and rubber plantations (Mursidin *et al.* 1997). The story of deforestation continued during the Japanese colonial era (1942–45). Deforestation was caused mainly by harvesting teak plantations and natural forests at double the Annual Allowable Cut (AAC) to pay for the war, and, on Java, leasing land to the people to grow food crops (4,428 ha), which stimulated the opening up of more land (Mursidin *et al.* 1997).

After Independence, deforestation continued mainly on Java, where up to 500,000 ha (about 17% of the forested area) were deforested, which caused an increase in flooding and land erosion. Deforestation became a serious problem in the early 1970s, in line with the government's intention to boost the national economy by providing logging permits to concessionaires to operate on Java (FWI/GFW 2002).

1975–90. During this period, besides that from the oil sector, the government received revenues from a boom in the timber industries resulting from the policy releasing logging permits to concessionaires or concession-right holders (*Hak Pengusahaan Hutan – HPH*). Until June 2000, the areas managed under logging operations totalled 41 million ha (Departemen Kehutanan 2005). Other studies stated that the national government had allocated over 60 million ha of forests to commercial logging companies for more than 30 years (Barr 2001). East Kalimantan was the main focus of the logging policy implementation (FWI/GFW 2002).

As logging operations required large labour forces, the concessionaires needed to recruit people to work in remote areas. Transmigration projects, which moved people from Java and Bali to the outer islands, have supported the concessionaires by supplying labour for the timber industry since the early 1980s (Dauvergne 2001). One of the environmental impacts of the transmigration programme was that the migrants found it easy to open up the forests for agricultural land, resulting in further deforestation (Dauvergne 2001).

The first major outbreak of forest fire in Indonesia occurred in 1982–83 and contributed to higher forest degradation. The fires were caused mainly by a severe occurrence of El Niño, and hit vast logged-over areas and burnt about 3.2 million ha of forest, 2.7 million ha of which were the most important tropical rainforest in Kalimantan and Sumatra. The degree of fire damage of forest areas is directly correlated to the level of forest degradation (FWI/GFW 2002).

1990–97. In this period, the deforestation outside state forests became the government's main focus of attention in terms of forest management. Deforestation was caused mainly by extensive conversion of forest to estate crops, such as oil palm, following government priorities of boosting the revenues from exports and increasing international prices (Box 2-1). The Ministry of Forestry (MoF) issued an increasing number of permits for forest conversion for plantations of up to 6.7 million ha by 1997 (Kartodihardjo and Supriono 2000). Furthermore, it was estimated that there would be a deficit in conversion forest of 1.6 million ha as a result of the government's plans to expand the area under oil palm plantation through NES (Nucleus Estate Schemes) and other plantation developments, which required another 9 million ha (Kartodihardjo and Supriono 2000). Forest conversion for different uses has been shown to be a potential threat to the existence of the remaining forest areas. Forest fires have become a common problem, since burning techniques were commonly used in intensive land clearance for opening up areas in order to establish plantations.

Intensive logging operations continued during this period, and as a result of pressure from the NGO movement and international criticism of Indonesian forest mismanagement, the government declared its commitment to achieving sustainably managed forests by the year 2000. For example, the formation of the Indonesian Ecolabelling Institution or *Lembaga Ekolabel Indonesia* (LEI) resulted in a number of concessionaires' rights being revoked (Septiani 1994). Despite this, deforestation resulting from the mismanagement of unsustainable logging practices has continued.

Box 2-1. The role of estate crops in Indonesia and in the local economy

Central government, through the Ministry of Agriculture, has perceived estate crops to be one of the ways to earn foreign exchange and also to be a vehicle for development. Under the New Order government, estate crops had become the priority for boosting national economic development through PIR in combination with the transmigration programme. Since the 1990s, strategic development concepts that have been introduced include the Nucleus Estate and Smallholder Scheme (NES) (*Perkebunan Inti Rakyat - PIR*), Development Service Unit (*Unit Pelayanan Pengembangan - UPP*), and Plantation Development in Special Areas (*Pengembangan Perkebunan di Wilayah Khusus - P2WK*).

Estate crop areas grew from 597,362 ha in 1985 to 5.6 million ha in 2005. The most impressive change has been the growth of community estate crop areas from 118,564 ha in 1985 to 1.9 million ha in 2005, which accounts for 34% of the total estate crop areas. Based on the current market value, palm oil production is Rp 43.4 trillion or 11.87% of GDP contributed by agriculture or 1.79% of GDP from non-oil and gas. However, palm oil productivity in Indonesia has been lower than in other major producing countries, e.g. in Indonesia the annual productivity of palm oil per ha in 2002 was 14–16 tons compared to 25 tons in Malaysia.

In the Reformation era, the new development paradigm has been implemented in accordance with the People's Consultative Assembly (MPR) mandate of 1998. Accordingly, since 1999, the government started to demarcate Estate Land Rights (*Hak Guna Usaha - HGU*) owned by the corporate estate crop industry. A similar strategy has been adopted by the district governments under the regional autonomy policy, especially outside Java, where estate crop investors were invited to establish plantations in designated areas provided by the district governments, and forest conversion was often involved. However, the estate crop industries have had to collaborate with local communities through cooperative agreements. Although the number of cooperatives reached 50,000, with a membership of 21 million people, most cooperatives were not active or had a limited period of operation, e.g. they functioned only during the distribution of manure and loans from financial institutions.

Sumatra has always been the main area for palm plantation development, particularly in Riau Province, where serious deforestation has occurred. Forest areas designated for conversion in Riau covered 658,139 ha in 2000. In reality, there was 18% more conversion forest outside designated areas. By 2002 the area developed in Riau Province had reached 2.5 million ha (26%) of the planned development of estate crops on 3.1 million ha, or 33.1 % of the total area of the province (9.5 million ha) based on the Regional Spatial Plan (*Rencana Tata Ruang Wilayah - RTRW*). There has been an increase in volume of export estate crops from 830,000 tons (USD 196.5 million) in 2001 to 2.4 millions tons (USD 738 million) in 2004. In 2003, the

Box 2-1. Continued

average farmer income per household per year was Rp 11.4 million – USD 1,295, an increase of 23.5% compared to Rp 9.2 million – USD 1,049 in 2001 due to the oil palm contribution. The highest farmer household income per month came from oil palm plantations (Rp 1.5 million – USD 171), followed by rubber (Rp 988,000 – USD 112), and coconut plantations (Rp 360,000 or USD 41).

Despite the promising facts, as an important source of income for the country, provincial government, and community members, negative impacts could not be underestimated. Forest ecosystems have been degraded, with higher risk of forest fires, and serious social conflicts due to the violation of land rights of local people.

Sources: Summarised from Ardiansyah 2006; Baplan 1999; Tambunan 2006; Anonymous 2004, 2003^a.

1997–present (Reformation Era). Forest fires, the implementation of regional autonomy and its consequences, illegal logging, and increasing forest encroachment are the main factors that have continued to cause deforestation and threatened the sustainability of the remaining 120.35 million ha of Indonesian forests (Authors' field observations 2004; Obidzinski and Barr 2003; Tacconi 2003; FWI/GFW 2002).

During the period 1997–98, there was a second major outbreak of forest fires, which damaged 9.8 million ha including 5.4 million ha of forest, mostly in Kalimantan and Sumatra (FWI/GFW 2002). The year 1998 was an important year for political change in Indonesia, and was considered to be the beginning of the Reformation Era after the fall of the Soeharto regime. The changes in the political situation were followed by stronger claims by communities for greater and more direct benefits from forests, as indicated by increasing cases of forest encroachment inside state forests (Scotland 2000; Potter and Lee 1998). Cases of conflict, e.g. multiple claims on forest resources by different parties, between communities and local governments or forestry companies were common, and took place in almost all provinces (Potter and Lee 1998).

The most significant change in the Reformation Era was the implementation of the regional autonomy policy at the end of 1998. Several policies were emerging to provide more opportunities for communities to be involved in forest management. One such policy gave a community group a concession right of 100 ha. Therefore, logging operations were managed intensively by communities under the small-scale forest concession licences granted by the district governments (Obidzinski and Barr 2003; Barr *et al.* 2001). Under the decentralised system, the district

governments have greater responsibility than the provincial governments for controlling forest resources.

2.2. The dynamics of factors affecting deforestation and land degradation

In this report, deforestation is defined as the loss or continual degradation of forest habitat due to either natural or human-related causes. Agriculture, urban sprawl, unsustainable forestry practices, mining and petroleum exploration all contribute to deforestation. Degraded forest land or degraded land is defined as the formerly forested lands severely impacted by intensive and/or repeated disturbance, e.g. fires or illegal logging. The degraded forest land delivers a reduced supply of goods and services from a given site.

However, any discussion on the rates of deforestation and total area deforested is clouded by the lack of clear or consistent key definitions agreed by all stakeholders and of adequate baseline and time-series data on forest cover changes (FWI/GFW 2002; Kartodihardjo and Supriono 2000; Sunderlin and Resosudarmo 1996). Nevertheless, the increasing rates of deforestation have become an issue of national concern, since they have major consequences for the national economy, community livelihoods, and global forest biodiversity. It is important to understand the range of driving factors behind deforestation, so that the interventions made by the rehabilitation programmes can be synergised with the efforts to address the underlying causes of deforestation.

2.2.1. Driving factors behind deforestation and land degradation

The rate of deforestation in Indonesia is between 1.6 million and 2.5 million ha per annum; there are 54.6 million ha of degraded areas inside state forests and 41.7 million ha outside state forest (Baplan 2002). The driving factors behind deforestation may be identified by understanding the direct and underlying causes of forest decline, and the agents responsible (Contreras-Hermosilla 2000). The direct causes of deforestation are mainly natural conditions/causes and human activities (Figure 2-1).

Natural conditions/causes. Indonesian geomorphology and high rainfall (1,500–4,000 mm per annum) affect the soil so that it is vulnerable to natural catastrophes such as landslides and erosion, which lead directly to deforestation (Santoso 2005). However, it is very difficult to estimate the total area affected and deforested due to these causes. The last prominent natural disaster was the big floods from the River of *Bahorok* in North Sumatra in early November, 2003 (Anonymous 2003^b).

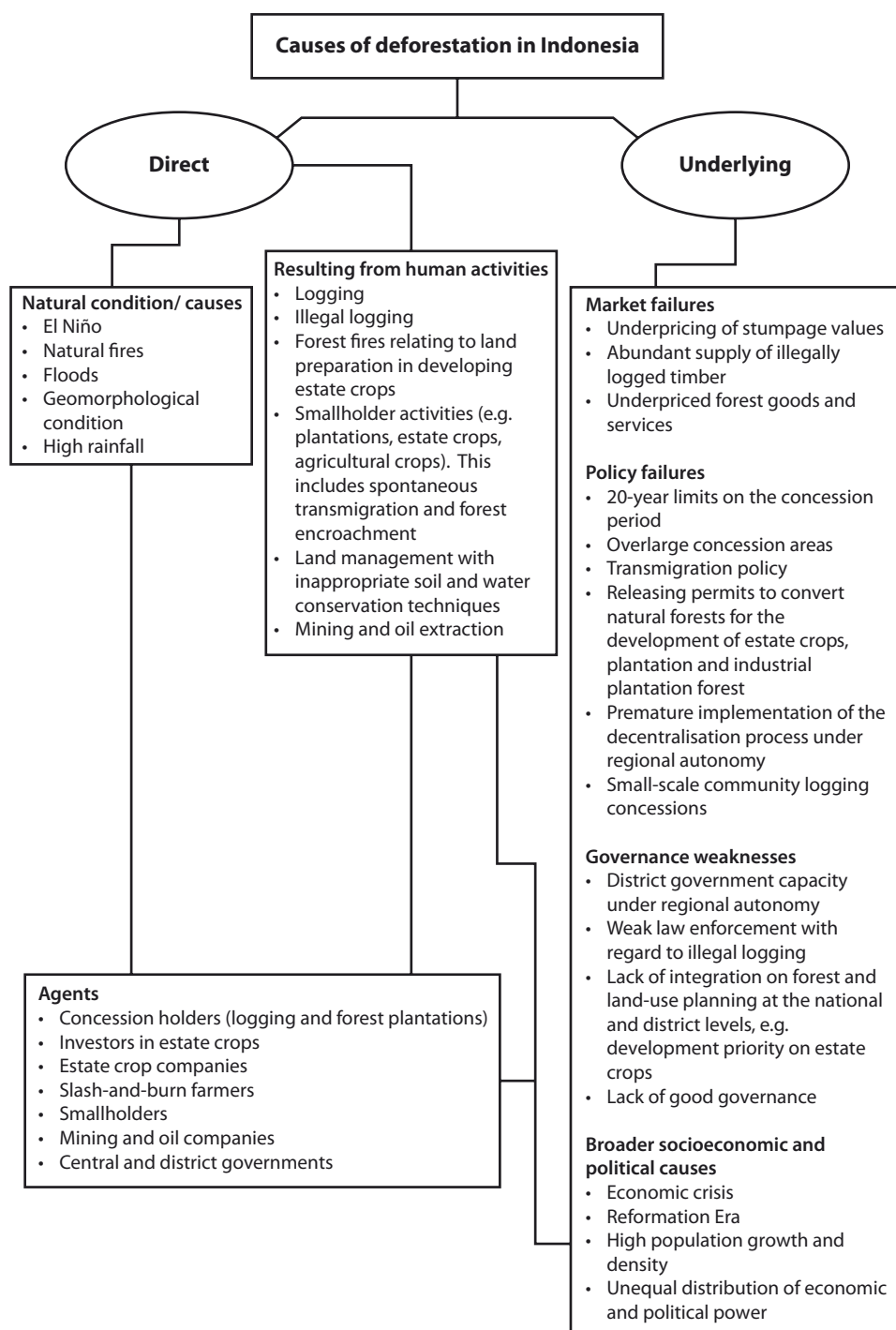


Figure 2-1. The causes of deforestation in Indonesia

Sources: The diagram has been modified from Contreras-Hermosilla 2000.
Other references: Sunderlin and Resosudarmo 1996; Santoso 2005.

However, NGOs and a number of government officers believed that the floods were the effect of logging (Anonymous 2003^e).

Human activities and agents of deforestation. Human activities in relation to forest extraction have been the main causes of deforestation, mainly through logging operations, illegal logging and unmanageable fires (Sunderlin and Resosudarmo 1996; FWI/GWF 2002; Tacconi *et al.* 2004). During long seasons of drought (such as those caused by El Niño) forest fires are often unmanageable (FWI/GFW 2002).

Logging contributes to an estimated 77,000–120,000 ha of deforestation annually; this is about 10–20% of the total deforested area and 10–15% of the 800,000 ha logged each year (Sunderlin and Resosudarmo 1996). Since 2001, the trend has been for the number of logging companies or *HPH* to decline, following the increasing rates of deforestation and increasing volumes of wood logged illegally (Tacconi *et al.* 2004). In June 1998 there were 652 *HPH* companies with concessions totalling 69.4 million ha, whereas by 2001 there were only 361 active *HPH* companies with a total operating area of 36.42 million ha (Tacconi *et al.* 2004; Kartodihardjo and Supriono 2000). There are three reasons for the fall in *HPH* numbers: permits have expired and have not been extended (186 units, 15.69 million ha), permits have been withdrawn and returned to the state (10 units, 1.15 million ha) and permits have been withdrawn as a punishment for violations (67 units, 4.32 million ha) (Ministry of Forestry and Estate Crops 1998 in Kartodihardjo and Supriono 2000).

Although the number of *HPH* companies has declined, the area deforested has continued to increase because of other problems, such as illegal logging. There is no clear information on the areas of forest affected by illegal logging. Tacconi *et al.* (2004) estimated illegally logged areas to be about 2.5 million ha in 2001, with a total volume of 50 million m³ based on the assumed harvesting rate of 20 m³ per ha.

Indonesia has experienced major outbreaks of fire twice: during 1982/83 (which damaged 2.7 million ha of tropical rainforest) and 1997/98 (which damaged 5.4 million ha of forest, mostly in Kalimantan and Sumatra) (FWI/GFW 2002). However, it is not clear whether the areas burnt in 1982/83 had recovered before the 1997/98 fires occurred. The total area affected by fires (Table 2-1), which does not include only forests, was 11.7 million ha across the five islands of Sumatra, Java, Kalimantan, Sulawesi and West Papua (Tacconi 2003). Further, Tacconi discusses the economic costs of the fires, which ranged from USD 2.3 billion to 3.2 billion, and USD 5.1–6 billion if carbon emissions are taken into account.

Table 2-1. Estimate of area affected by fire, 1997/98

Island	Fire-affected area	
	Ha	%
Sumatra	2,071,000	17.7
Java	100,000	0.9
Kalimantan	8,127,379	69.5
Sulawesi	400,000	3.4
West Papua	1,000,000	8.5
Total	11,698,379	100.0

Source: Tacconi 2003

The causes of the fires varied, but the main source was intentional burning, during land-clearance prior to the development of estate crops, that spread out of control (FWI/GFW 2002).

Underlying causes and agents of deforestation. The underlying causes of deforestation are much more complex, covering various aspects of market failure, inappropriate policy implementation in relation to forest management, lack of governance capacity at central to district levels, and other, broader socioeconomic and political issues, such as political change. The underlying and direct causes cannot be separated, undoubtedly because there is a long chain of events that ultimately leads to deforestation (Contreras-Hermosilla 2000).

Since the late 1980s, market failures have been identified as one of the disincentives to managing the forest sustainably, which means that, due to distorted or malfunctioning markets, prices do not necessarily reflect the social and environmental values of the resources (Richards and Costa 1999; Perman *et al.* 1996; Pearce *et al.* 1990). In Indonesia, even the most commercialised forest product, timber, has been undervalued as the domestic market for round wood has been protected; this is reflected in the rates of stumpage fees and obligatory reforestation fund payments set by the government (Scotland 2000). With an abundant supply from illegal logging the value of timber is even further reduced; this provides no incentive to conserve forest resources and leads to deforestation.

Policy failures occurred when the policies implemented created disincentives to sustainable management and distorted market prices (Richards and Costa 1999). Sunderlin and Resosudarmo (1996) discuss the main reasons for deforestation caused by logging companies' irregular management of their concessions, and the short-term investment period due to the 20-year logging permit granted to concessionaires. This short term logging licence serves as a disincentive for companies to implement enrichment planting.

The transmigration policy was implemented intensively during the 1970s; this was the policy to reallocate people from high-density areas, such as in Java, to other islands with low-density population. Transmigration has three effects on forest cover on the outer islands: forest is converted for cultivation, new forest areas are opened up where cultivation in the initially designated land is unsuccessful, and pressures are placed by the transmigrants on the land and forests managed by local people (Sunderlin and Resosudarmo 1996). The government also started the Transmigration Industrial Plantation Forest (*Hutan Tanaman Industri Transmigrasi - HTI Trans*) programme in 1985, which was a programme to develop forestry plantations under partnerships between companies and transmigrants (Nawir *et al.* 2003). However, there is no clear indication that this programme has been successful (Barr 2001; Potter and Lee 1998).

An economic crisis hit the Indonesian economy in mid 1997 and this had an effect on the decreasing of natural forest cover (Sunderlin *et al.* 2000). There were 68% of those interviewed stated that they had cleared new land during the crisis period. The category of 'land cleared' included primary forest, which ranged from 2.8% to 46.2% of the total forest area in the Provinces of Riau, Jambi, Lampung, West and East Kalimantan, and Central Sulawesi (Table 2-2).

Table 2-2. Total area of land cleared during the economic crisis

Category of land cleared during the crisis (mid 1997 to mid 1999)	Proportion of land cleared by category (%) in provinces studied				
	Riau and Jambi	Lampung	West Kalimantan	East Kalimantan	Central Sulawesi
1. Primary forest	46.2	-	12.8	18.3	2.8
2. Secondary forest aged 30 or more years	7.6	-	6.9	1.9	24.3
3. Secondary forest aged 10–30 years	8.0	16.7	19.3	11.7	4.7
4. Secondary forest aged 6–10 years	10.9	46.7	27.1	19.1	44.9
5. Secondary forest aged 1–5 years	23.1	25.0	30.6	30.4	15.9
6. Grassland or brushland	0.4	11.7	1.5	13.2	7.5
7. Burned forestland	-	-	1.1	4.3	-
8. Plantations or gardens	3.4	-	0.7	0.4	-
9. Other	0.4	-	-	0.8	-
Total	100.0	100.0	100.0	100.0	100.0

Source: Sunderlin *et al.* 2000

A combination of premature decentralisation by central government and the inadequate capacity of local government and Forestry Services at the district level

have contributed indirectly to forests being managed unsustainably for the last six years and the increasing degraded forest areas (Obidzinski and Barr 2003; Casson 2001). Continued illegal logging has been a serious problem since the implementation of regional autonomy under the district governments, particularly in those provinces with a high proportion of natural forest remaining. It was estimated that illegal logging contributed to 64% of total timber production in 2000, and 83% in 2001 (Tacconi *et al.* 2004). In Indonesia, losses due to illegal logging account for about Rp 30 trillion per annum (Minister of Forestry, Kaban, in *Tempo* newspaper, 14 November 2004). However, no accurate statistical records can be found of the total area deforested due to illegal logging.

Forest encroachment has also become a serious problem, particularly in areas where the competition for land use is high. One farmer clears only a small area of land to practise shifting agriculture, however, the net impacts of many farmers is very damaging to the natural forests (Scotland 2000). Further discussion of the encroachment problem is also a sensitive issue, since it often involves people who are poor and rarely have other income options.

The area of degraded forest and land, and latest trends. Holmes (2002) estimated a total of 20 million ha of deforestation during the period 1985 to 1997, 17.4 million ha of which was concentrated in Sumatra, Kalimantan and Sulawesi. Further, according to Holmes (2002), these areas were deforested due to conversion for industrial plantation forest (1.9 million ha or 11%) and estate crops (2.4 million ha or 14%), forest fires (1.74 million ha or 10%), small investors (2.4 million ha or 10%) and forest pioneers (1.22 million ha or 7%); they include logged-over areas waiting to be developed as industrial plantation forest (7.7 million ha or 48%).

Current figures presented by the Directorate General of Forest and Land Rehabilitation and Social Forestry (*Rehabilitasi Hutan dan Lahan, dan Pehutanan Sosial - RLPS*) (Dirjen RLPS 2004) indicate the total area of degraded forest to be 14.2 million ha (25%), logged-over areas – 13.6 million ha (23.9%), degraded mangrove forest – 5.9 million ha (10.4 percent), and critical land inside protection forests – 8.1 million ha (14.2 percent) (Table 2-3). Although statistics show that 26.5% (15.1 million ha) of critical land is outside state forests, the causes of degradation outside state forests have not been studied sufficiently. One of the impacts of deforestation has been the prospect of declining timber production, as indicated by rates decreasing by 9.45 m³ per ha or by three stumpages per ha for timber trees larger than 50 cm in diameter (Baplan 2004). Subsequently, some provinces namely North and South Sumatra, Jambi, Bengkulu, Central and South Kalimantan and Maluku showed declines greater than 20 m³ per ha (Baplan 2004).

Table 2-3. Areas of degraded forest by 2004

Type of degraded forest	Ha (million)	(%)
a. Critical land outside state forest	15.1	26.5
b. Critical land inside protection forest	8.1	14.2
c. Inside production forest		
1. Degraded forest ^a		
- Inside concessions (HPH)	11.6	20.4
- Ex-concessions	2.6	4.6
2. Logged-over areas ^b		
- Inside concessions (HPH)	11.1	19.5
- Ex-concessions	2.5	4.4
d. Mangrove forests		
- Inside state forest	1.7	3.0
- Outside state forest	4.2	7.4
TOTAL	56.9	100.0

Notes: a. Due to inappropriate management practices or forest fires

b. Ex-logging areas

Source: Dirjen RLPS 2004

2.1.1. Driving factors behind the deforestation and land degradation in the case-study provinces

In view of the distribution of rehabilitation projects that were and are still being implemented in the preliminary database and Database 1, provinces selected for case-study observations in the CIFOR-FORDA Study were: Riau, East Kalimantan, South Kalimantan, West Kalimantan, East Java, Central Java, West Java and D.I. Yogyakarta.

In developing more-integrated rehabilitation programmes, the Planning Agency, MoF, initiated a master plan as the basis for planning the programmes, mainly the National Movement for Forest and Land Rehabilitation (*Gerakan Nasional Rehabilitasi Hutan dan Lahan – GNRHL*). The Master Plan for Forest and Land Rehabilitation (MP-RHL) used satellite imagery to improve the integration of forest and land rehabilitation planning processes. The satellite imagery was cross-checked by a ground survey led by the Forestry Services at the provincial level. In 2004, 28 provinces completed their master plans, and governors in 16 of the 28 provinces approved the plans to be used as the reference for implementing the rehabilitation programmes (Baplan 2004).

Under the master plans, the areas of degraded forest were calculated and the term ‘indicative areas to be rehabilitated’ was used. The highest proportion of indicative areas to be rehabilitated was concentrated in production forests (16.8 million ha), i.e., production forest (*Hutan Produksi – HP*), limited production forest (*Hutan Produksi Terbatas – HPT*) and conversion production forest (*Hutan Produksi*

Konversi – HPH) (Baplan 2004). These areas are located mainly in Kalimantan (with a total of 7.5 million ha) and Sumatra (with a total of 5 million ha). As discussed above, forests in Kalimantan and Sumatra used to be the areas with a high concentration of logging operations by *HPH* (logging companies). The ‘total indicative areas’ on the different islands were based on forest cover by bushes, open spaces, mixed agricultural crops and shrubs. The areas to be rehabilitated are in Sumatra (16.2 million ha), Kalimantan (14.6 million ha), Sulawesi (4.3 million ha), Maluku (1.4 million ha), Papua (2.7 million ha), Bali and West Nusa Tenggara (2.9 million ha) and Java (4.9 million ha) (Baplan 2004). Based on the same information (Baplan 2004), the 10 provinces with the greatest deforested areas and requiring serious rehabilitation effort are concentrated on the four islands of Sumatra, Kalimantan, Sulawesi and Java. The 10 provinces are Central Kalimantan, East Kalimantan, West Kalimantan, Riau, South Sumatra, North Sumatra, South Sulawesi, North Sulawesi, East Nusa Tenggara and East Java: (Table 2-4).

Table 2-4. The ten provinces requiring the most intensive rehabilitation efforts

Provinces	Area of forest and land to be rehabilitated by 2000 (000 ha)			
	Coverage category			Total
	1	2	3	
1. Central Kalimantan	3,847	7,282	377	11,506
2. East Kalimantan	4,162	6,182	190	10,533
3. West Kalimantan	5,620	4,029	447	10,095
4. Riau	1,913	3,411	1,268	6,592
5. South Sumatra	5,584	255	287	6,125
6. South Sulawesi	1,951	1,829	870	4,649
7. North Sumatra	1,784	1,299	1,510	4,593
8. East Nusa Tenggara	2,041	756	1,221	4,018
9. East Java	1,499	353	2,008	3,860
10. North Sulawesi	945	2,132	290	3,367

Notes for coverage category:

1. Forest and land cover category 1: Bushes, open spaces, mixed agricultural crops and shrubs
2. Forest and land cover category 2: Secondary forest and mangrove forest
3. Forest and land cover category 3: Formerly forested areas that were converted to agricultural land, rice fields, mining areas, and housing areas

Source: Baplan 2003.

Logging and industrial plantation companies in Sumatra are concentrated mostly in Riau, with the highest rates of conversion of logging concessions (*HPH*) to industrial plantation forest (*HTI*) – 534,094 ha by 1998 (Direktorat Bina Program RLL 1998). The concessionaire rights of 11 logging companies were revoked in 2000, and this left 181,734 ha of logged-over areas to be rehabilitated by the MoF. The driving factors behind the degradation of the forest were mainly legal

and illegal logging activities, forest conversion into oil palm plantations, forest encroachment and forest fires. In Sumatra, Riau had the highest deforestation rate, at 71,925 ha per annum (PISK^a 2002) during 1985–98 (Table 2-5), with ‘indicative degraded areas’ totalling 6.6 million ha, followed by South Sumatra (6.1 million ha), and North Sumatra (4.6 million ha).

Table 2-5. Forest areas and deforestation rates in Riau Province.

Status	Year		
	1985 ^a	1991 ^b	1997 ^c
Indicative total areas (ha)	9,859,700	9,831,470	9,661,817
Forest areas (ha)	5,935,500	6,158,720	5,071,891
Percentage of forests	60.2	62.6	52.5
Deforestation rates 1985–98 (ha/year)	71,925		
Number of <i>HPH</i> up to July 2001 (units)	33 units	(2,152,094 ha)	
Number of <i>HTI</i> up to July 2001 (units)	13 units	(743,382 ha)	
<i>HTI</i> plantations realised		377,184 ha	(51%)

Notes:

a. Based on RePPProt 1985

b. Ministry of Forestry 1991

c. Ministry of Forestry 1997

Source: PISK^a 2002

In Kalimantan, East Kalimantan has the highest proportion of production forests (9.7 million ha), but also of deforestation rates (373,159 ha per annum). However, in terms of ‘indicative areas to be rehabilitated’, as defined by the Planning Agency (Baplan 2003), Central Kalimantan has the highest total of degraded areas for all categories: 1) bushes, open spaces, mixed agricultural crops, and shrubs; 2) secondary forest and mangrove forest; and 3) agricultural land, rice fields, mining areas and housing areas on formerly forested areas. With a deforestation rate of 373,159 ha per annum during the period 1985 to 1998, the area of forest in East Kalimantan decreased from 17.9 million ha in 1985 to 13.4 million ha in 1998 (Table 2-6). The same pattern of decrease was also seen in West and South Kalimantan, although with lower deforestation rates: there were 6.7 million ha of forest left in West Kalimantan, and less than 1 million in South Kalimantan.

In general, the driving factors behind deforestation in these provinces have similar patterns to those that have driven deforestation nationally. One of the important driving factors in Kalimantan has been forest fires; for example, the severe drought and repeated fires of 1982/83 burnt 3.2 million ha of tropical rain forests in East Kalimantan (FWI/GFW 2002). The forest fires have also repeatedly disturbed various rehabilitation initiatives, such as the Wanariset Research Forest managed under the Forestry Research Institute of Samarinda, located some 38 km from Balikpapan, which was also burnt, with varying degrees of destruction (Authors’

Table 2-6. Forest areas and deforestation rates in three provinces in Kalimantan

East Kalimantan Province	Year		
	1985 ^a	1991 ^b	1997 ^c
Indicative total area (ha)	19,721,000	20,162,030	19,504,912
Forest area (ha)	17,875,100	17,584,260	13,361,195
% of forest	91	87	69
Deforestation rates 1985–98	373,159 ha/year		
Number of <i>HPH</i> up to July 2001	75 units	(8,311,217 ha)	
Number of <i>HTI</i> up to July 2001	22 units	(1,550,815 ha)	
<i>HTI</i> plantations realised		517,170 ha	(33.35%)
West Kalimantan Province	Year		
	1985 ^a	1991 ^b	1997 ^c
Indicative total area (ha)	14,753,000	14,674,940	14,546,318
Forest area (ha)	8,700,600	8,117,980	6,713,026
% of forest	59	55	46
Deforestation rates 1985–98	165,631 ha/year		
Number of <i>HPH</i> up to July 2001	26 units	(1,993,139 ha)	
Number of <i>HTI</i> up to July 2001	19 units	(1,078,639 ha)	
<i>HTI</i> plantations realised		131,287 ha	(12.17%)
South Kalimantan Province	Year		
	1985 ^a	1991 ^b	1997 ^c
Indicative total area (ha)	3,749,000	3,668,360	3,703,550
Forest area (ha)	1,795,900	1,749,360	999,182
% of forest	48	48	27
Deforestation rates 1985–98	66 393 ha/year		
Number of <i>HPH</i> up to July 2001	5 units	(602,670 ha)	
Number of <i>HTI</i> up to July 2001	13 units	(525,200 ha)	
<i>HTI</i> plantations realised		126,000 ha	(24%)
Central Kalimantan Province	Years		
	1985 ^a	1991 ^b	1997 ^c
Indicatives total areas (ha)	15,360,400	15,419,840	15,249,222
Forest areas (ha)	11,614,400	11,419,050	8,543,384
% of forests	75,6	74,5	56
Deforestation rates 1985–98 (ha/year)	138,208		
Numbers of <i>HPH</i> up to July 2001	63 units	(5,203,256 ha)	
Numbers of <i>HTI</i> up to July 2001	22 units	(586,921 ha)	
Realisation of <i>HTI</i> plantations		73,819.38 ha	(12.58%)

Notes:

a. Based on RePPPProt 1985

b. Ministry of Forestry 1991

c. Ministry of Forestry 1997

Sources: PISK ^{b c d} 2002; PISK ^h 2001

field observations 2004). The demonstration plot funded by ITTO, a total area of 1,099 ha, was established on the burnt area of Wanariset Research Forest. Besides forest fires, other prominent driving factors behind the degradation of forest and

land in the case-study project sites was forest exploitation, both legal and illegal. For example, huge logged-over areas in Kutai Barat District were converted to open areas and grasslands. In the logged-over areas, especially in protection forests, rehabilitation was carried out by means of reforestation¹ (*reboisasi*), while in production forest areas, rehabilitation was conducted through the establishment of private forests by using agroforestry systems.

Up to July 2001, the number of logging companies (*HPH*) in East Kalimantan totalled 75 units with 8.3 million ha of concessions, the largest area compared to West Kalimantan (26 units with 1.9 million ha) and South Kalimantan (5 units with 600 thousand ha) (PISK^{b c d} 2002; PISK^h 2001). Further analysed from the same references, the number of areas inside *HPH* areas that are in poor condition are also higher in East Kalimantan, at 1.9 million ha, compared to 1.7 million ha in West Kalimantan and only 151,000 ha in South Kalimantan. The degraded areas inside ex-logging concessions follow the same pattern, with less than 100,000 ha in South Kalimantan rising to 680,000 ha in East Kalimantan. Hence, the total area to be rehabilitated is 2.4 million ha in East Kalimantan and 2.8 million ha in West Kalimantan, with a higher proportion of production forest to be rehabilitated.

East Java has the highest area of forest (1.4 million ha), including production forests, compared to West and Central Java (Table 2-7). On the other hand, at 49% the proportion of areas requiring rehabilitation is also higher in East Java. Most of the forest areas in Java are plantations managed mainly by the state company, Perhutani. In West Java, 97% of forest areas are managed by Perhutani – the proportion is much lower in Central Java (51%) and East Java (57%) – therefore, there is no detailed information on deforestation rates. However, up to the 1980s, the rehabilitation projects were implemented mostly in Java in response to deforestation caused by logging activities in the mid 1960s to 1970s.

Due to the high population density on Java, farmers living in the area have only a very small area of agriculture land so that forest conversion for agriculture purposes is critical. Under such conditions, the driving factor behind deforestation has been forest encroachment by communities surrounding the forests, especially during the economic crisis of 1997. Despite the limited area of land available to them, people in Java are interested in planting timber on their own property as there is a growing local timber market. For example, in Wonosobo the main timber species planted is *Paraserianthes falcataria*; it takes some 5–8 years before it can be marketed at a diameter of 20–30 cm. Initially, Falcata trees were planted intensively under government reforestation projects during the mid 1970s (South Java Flood Control Sector Project – SJFCP in 1976/77), which is now managed

1 Further discussion of reforestation and afforestation is included in Chapter 3.

Table 2-7. Forest areas in four provinces in Java

Province/forest category	Total area (ha)	Area requiring rehabilitation	
		Ha	%
West Java			
Protection and Conservation Forest	429,779	123,214	28.7
Production Forest	597,113	172,191	28.8
Total	1,026,892	295,405	28.8
Central Java			
Protection and Conservation Forest	190,624	n.a	n.a
Production Forest	935,745	n.a	n.a
Total	1,126,369		
East Java			
Protection and Conservation Forest	582,216	119,264	20.5
Production Forest	842,210	577,586	68.6
Total	1,424,426	696,850	48.9
Yogyakarta ^a			
Protection and Conservation Forests	29,468.40	n.a.	n.a.
Production Forests	13,851.28	n.a	n.a
Total	16,819.52		

Sources: PISK^{e f g} 2002; ^a Baplan 2001

by individual households as *Hutan Rakyat* (Farm Forestry). At that time, people's interest was low and the survival rates were questionable. According to information from the Head of the Reforestation and Land Rehabilitation (RRL) unit at the *Kanwil²* or *Kantor Wilayah* (regional office), in the last 5–10 years, Central Java has been considered to be the main production area for Falcata wood, particularly in supplying wood to the provinces of West and East Java. One of the main production areas is Wonosobo District. The booming Falcata industry in Wonosobo is driven indirectly by investment in processing plants to meet the demand for white wood by Japanese consumers. The processing technology for this wood has come from Japan. European countries and the US also import white wood from this area.

2.1. Summary

Indonesia has gone through a long history of forest management policies, these include prioritising the agricultural expansion (during 1950s to 1975), realising permits for commercial logging concessions (during 1975 to 1990s), and

² *Kanwil* was the Ministry of Forestry office at the provincial level; this has now become *Dinas Kehutanan Propinsi*, Provincial Forestry Services.

focussing on forest management outside state forest (during 1990s to 1997). The recent political changes have been from the New Order Era to the Reformation Era (from 1998 to the present). The changes in forest management policies have always been in line with the aims of improving the national economic condition. These dynamic changes have also affected the progression of deforestation rates with consequences for ecological and livelihood aspects, and the past and present rehabilitation programmes being implemented.

In this report, deforestation is defined as the loss or continual degradation of forest habitat due to either natural or human-related causes. Agriculture, urban sprawl, unsustainable forestry practices, mining and petroleum exploration all contribute to deforestation. Degraded forest land or degraded land is defined as the formerly forested lands severely impacted by intensive and/or repeated disturbance, e.g. fires or illegal logging. The degraded forest land delivers a reduced supply of goods and services from a given site.

The driving factors, causing deforestation, are both direct and indirect. The main direct causes have been logging operations, illegal logging and unmanageable intensive reoccurring fires, mainly during long dry seasons. The indirect causes include the market failures (e.g. under pricing of timber), policy failures (e.g. the 20-year logging permit granted to concessionaires as a disincentive for enrichment planting), and other socioeconomic and political issues in a broader sense. Throughout different periods, the driving factors of deforestation have become progressively more complex covering various aspects. Since the mid-1990s up to the present, besides repeated forest fires, and mismanagement of logging concession areas, complex problems include the transition period from a centralised to decentralised governance system, forest conversion for other uses (e.g. oil palm plantation), illegal logging and extensive forest encroachment, usually with aims to convert the forest, mainly for agriculture or estate crop development.

Of the five big islands of Indonesia, Sumatra and Kalimantan have larger areas of degraded forest than Java, Sulawesi and Papua. In Sumatra, Riau province has the highest deforestation rates, and also the largest area to be rehabilitated. In Kalimantan, Central Kalimantan has the highest total of degraded areas. The driving factors for deforestation in these provinces follow the same countrywide pattern.

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Chapter 3.

Past and present policies and programmes affecting forest and land rehabilitation initiatives

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Forest and land rehabilitation initiatives have been directly and indirectly affected by forest policies and programmes implemented since the 1950s. However, the impacts have not been very positive for successful rehabilitation initiatives. Understanding past policies and programmes is important for policy and decision makers to acquire useful lessons learnt, so similar mistakes or failures are not repeated. This chapter presents an overview of different policies that were or are being implemented, since the 1960s. Important policies and programmes are discussed in detail, such as the policy and approach to differentiate reforestation and afforestation, the forest land classification system of the Forest and Land Use by Consensus (*Tata Guna Hutan Kesepakatan - TGHK*), production forest management policies, the conditions for rehabilitation initiatives and the management of the Reforestation Funds (*Dana Reboisasi – DR*) under the decentralisation policy, and the national rehabilitation initiatives since the reformation.

3.1. The changes in forest policies affecting forest and land rehabilitation initiatives

There are two outcomes of the forest policies that have affected forest and land rehabilitation initiatives. Firstly, the policies that have resulted in the rapid increase

of deforested and degraded areas, because of problems with the implementation, have caused rehabilitation achievements to be left far behind. The logging licence given to concessionaires, implemented since 1970, and the development of the Industrial Plantation Forest (*Hutan Tanaman Industri – HTI*) has been practiced since 1985, are two such policies. Secondly, the policies and programmes on forest and land rehabilitation initiatives have in turn been ineffective. This included the policies on assigning the rehabilitation initiatives to state-owned companies. Since 1999, forestry management has been decentralised as part of the regional autonomy policy. This has influenced how rehabilitation programmes have been designed and implemented.

Before the logging policy, laid down in *Peraturan Pemerintah (PP)* or the Government Regulation on Forest Exploitation Rights No. 21, was released in 1970, there were limited forest-based activities, since the focus of development was mostly on the intensification and extensification of agriculture. Intensive, large-scale logging operations on the outer islands started with Suharto's New Order Regime in 1966, principally to provide Indonesia's main source of income. Between 1969 and 1974 income from timber increased by 2800%, primarily from East Kalimantan's 11 million ha of concessions (Christanty and Atje 2000). In 1990, the Government of Indonesia (GoI) made a commitment to implement the International Tropical Timber Organisation (ITTO) guidelines for sustainable forest management by the year 2000 (Seve 1999). In the Sixth 5-Year Development Plan, the government placed increasing emphasis on implementing sustainable forest management, which was difficult to achieve since timber was still the main source of national income.

The increasing demand for timber during the 1980s, due to the expansion of wood processing facilities, resulted in the government's forest management strategies were strongly focused on promoting the development of *HTI*. Integrating timber production and rehabilitation objectives was important during this period, both in production forests and on community forest lands. Responding to the need for large areas to be rehabilitated as a result of inappropriate logging practices, the rehabilitation policy focused on developing *HTI* plantations, with little success – only 2.3 million ha out of a targeted 6.2 million ha were developed as *HTI* areas (Iskandar *et al.* 2003).

Following the political changes after Reformation in 1998, the focus of forest management shifted direction to improve the balance between community-based and state-based management. Initially, the International Monetary Fund (IMF) imposed this shift on the GoI in early 1998 for the forestry sector policy reform under the Memorandum on Economic and Financial Policies (MEFP), signed by the GoI and the IMF (Seve 1999). However, the proposed reforms did not

include comprehensive and fundamental issues since the MEFP focused only on the Reforestation Fund (*Dana Reboisasi – DR*), trade restrictions, forest rent royalties, privatisation, auctioning, length and transferability of concessions, land conversion and performance bonds (Seve 1999).

The shift from privately based and large-scale management to smaller-scale community-based forest management is also reflected in the rehabilitation initiatives. The two most recent government-initiated rehabilitation efforts were designed firmly in line with the current policy paradigm. The main umbrella approach of involving community forestry/social forestry was taken to implement the major current programmes, such as the *GN RHL/Gerhan*, which was launched at the end of 2003, and the Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus Dana Reboisasi – DAK-DR*) Programme. This has been in operation since 2001 under the coordination of the district governments.

In 1969, the New Order government introduced a 25-Year Development Plan, which was divided into five stages based on 5-year development plans (*Rencana Pembangunan Lima Tahun – Repelita*). Accordingly, forest rehabilitation programmes were also implemented following the same planning arrangements. At that time, the programmes were usually implemented at the project level in a wide range of locations throughout Indonesia. Following a decision made at the First Forestry Congress in 1955, the government divided rehabilitation efforts into two categories: those focused on formerly state forested areas – reforestation (*reboisasi*); and those focused on unforested community areas outside state forest – afforestation or greening (*penghijauan*) (Mursidin *et al.* 1997).

In general, forest rehabilitation policies took a mainly ‘top down’ approach from the 1950s to the 1970s and then became more participative towards the end of the 1990s conceptually. Between the 1980s and the mid 1990s, the rehabilitation initiatives were in transition¹. Changes in certain aspects of the policies instituted since the Reformation in 1998, have influenced government approaches in defining rehabilitation policies (Table 3-1).

Since the beginning of the New Order Era in 1966, 12 major forestry policies have influenced different rehabilitation initiatives (Box 3-1). These policies and regulations will be discussed further in the following sections of this chapter:

1. The New Order government’s 25-Year Development Plan – 1969
2. Basic Forestry Law (BFL) – 1967, which was replaced by the New Basic Forestry Law – 1999

¹ Based on a series of discussions in the Ministry of Forestry (2003, 2004), in expert group meetings (2004, 2005), and personal interviews with different experts (2003, 2004)

Table 3-1. Changes in government policies that have affected the forest rehabilitation programme, 1950s – present

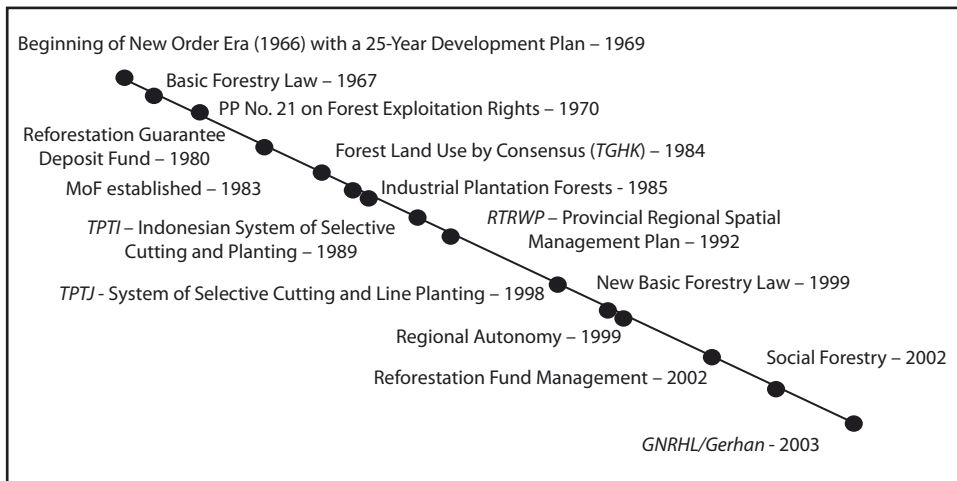
Aspect of policy	Policy orientation		
	1950s– 60s	1970s–90s	1998–present
Forest management	Ecological focuses: restoring and maintaining the ecological functions (water and soil conservation)	Economic focuses: timber management oriented to reduce dependency on oil exports	Resource-based management focuses: balancing socioeconomic and environmental aspects
Scale of management	Small to medium-scale management	Large-scale management	Community-based forest management
Governance system	Centralised governance	Centralised governance	Decentralised governance
Target of forestry rehabilitation	Rehabilitation mainly in Java by developing teak plantations	Rehabilitation in production forests and on private land	Rehabilitation of production forest and conservation area
Management approaches	Sectoral approaches	Sectoral approaches	Integrated approaches
Funding	Government funding	Government and donor funding	Principle of cost sharing, but still heavily dependent on government funding

Sources: Modified from Mursidin *et al.* 1997; Christanty and Atje 2000; Ditjen RLPS 2003; Dirjen RLPS 2004

3. PP No. 21/1970 on Forest Exploitation Rights, which was later replaced by PP No. 6/1999
4. Reforestation Guarantee Deposit Fund (*Dana Jaminan Reboisasi – DJR*) – 1980
5. 1983 was an important year: rehabilitation began to be managed intensively as the Ministry of Forestry (MoF) was established (and separated from the Ministry of Agriculture)
6. Forest Land Use by Consensus (*Tata Guna Hutan Kesepakatan – TGHK*) – 1984, which was complemented by the Provincial Regional Spatial Management Plan (*Rencana Tata Ruang Wilayah Propinsi – RTRWP*) – 1992
7. Industrial Plantation Forest (*Hutan Tanaman Industri – HTI*) – 1984, however, this was not formalised until PP No. 7 – 1990
8. The Indonesian System of Selective Cutting and Planting (*Tebang Pilih dan Tanam Indonesia – TPTI*) was established as the silvicultural system to maintain forest sustainability in 1989
9. *TPTI* – 1989 was replaced by the System of Selective Cutting and Line Planting (*Tebang Pilih dan Tanam Jalur – TPTJ*) – 1998, as described in the Minister of Forestry and Estate Crops Decree No 625/Kpts-II/1998

10. The New Basic Forestry Law was passed in 1999 to replace the 1967 Basic Forestry Law
11. The Regional Autonomy Policy was based on Laws No. 22/1999 and No. 25/1999 on Fiscal Balancing
12. Reforestation Fund Management – 2002, based on PP No. 35/2002
13. Social Forestry – 2002, and
14. (*Gerakan Nasional Rehabilitasi Hutan dan Lahan*) or National Movement for Forest and Land Rehabilitation - 2003.

Box 3- 1. Timeline of major policies influencing rehabilitation initiatives



Note: PP: *Peraturan Pemerintah* (Government Regulation)

Sources: Sembiring 2003; Kartodihardjo and Supriono 2000; Seve 1999.

In September 1999, the GoI finally replaced the 1967 Basic Forestry Law with the 1999 Forestry Law (Dauvergne 2001). There were some potentially important changes, including the regulation that companies were now responsible for fires in their concession areas, unless they could provide exonerating evidence, and corporate executives could face long jail terms and stiff fines if found guilty of negligence in these cases; there was greater emphasis on community forestry and on initiatives to allocate concessions to cooperatives (Dauvergne 2001). However, many NGOs were sceptical about the actual impacts of these changes.

3.2. Government rehabilitation initiatives: Reforestation and Afforestation

Reforestation is defined as any effort to rehabilitate degraded forest areas inside state forests that were formerly barren land, *Imperata* grassland or shrubland, with

the aim of restoring the functions of the forests through replanting. Afforestation is defined as any effort to rehabilitate critical areas on community land outside state forests through vegetative and 'civil structure' techniques, which aim at restoring the functions of the land. The general public tends to believe that the differences between reforestation and afforestation relate only to the status of forest within state forest as opposed to outside state forest and define the jurisdiction on the government agencies responsible. For example, the *Inpres* programme was implemented both inside and outside state forests, but two different agencies were responsible for the implementation: the Provincial Forestry Services carried out the reforestation and District Government undertook the afforestation.

Reforestation focuses on priority watersheds in protection forests and production forests where no concession rights have been granted (*Hutan Produksi yang tidak dibebani hak*) with the objectives of increasing the land cover, and taking a participatory approach in providing benefits for local people. For production forests with rights granted, the responsibility for rehabilitation is in the hands of those who have the rights and pay taxes to the Reforestation Guarantee Deposit Fund (*Dana Jaminan Reboisasi*). The main rehabilitation activity under reforestation is replanting with forest tree species and trees that provide livelihood benefits (*tanaman kehidupan*); these are usually multi-purpose species.

Afforestation focuses on prioritised critical areas on community land (Table 3-2). Since 1998 (the beginning of the Reformation Era), community involvement and participation have been important aspects of the approaches to implementing afforestation. However, since the 1990s, community participation has been part of the concept of developing rehabilitation programmes, but still actual participation and roles in the implementation have been limited. Therefore, starting in 1990, experts in rehabilitation in Indonesia have tended to categorise this year and onwards as the transition period from top a down to participatory approach (1998). More discussion on these different approaches can be found in Chapter 5.

Before this, afforestation was implemented by providing a government support package for the community to rehabilitate critical land outside state forests. However, this approach was considered to be ineffective and inefficient. In recent years, afforestation has been carried out by developing demonstration units/plots with the objective of replication by the local communities. Examples of afforestation programmes initiated in the 1990s are Programmes of Direct Inputs for Afforestation (*Penghijauan Input Langsung – PIL*), Afforestation on Impacted Areas (*Penghijauan Areal Dampak – PAD*), and Self-funded Afforestation (*Penghijauan Swadaya – PS*) (Ditjen RLPS 2003).

Table 3-2. Aspects of reforestation and afforestation initiatives

Aspect	Reforestation	Afforestation
Definition	Rehabilitation efforts on degraded forest areas with the conditions of formerly barren land, <i>Imperata</i> grasslands or shrubland to restore the forest functions through replanting	Rehabilitation efforts on critical land outside state forests through vegetative and civil structure ^a techniques to restore the functions of the land
Scope	Rehabilitation activities inside state forests	Rehabilitation activities on community land outside state forests
Focus	<ul style="list-style-type: none"> • Prioritises watersheds of protection forests, which are in urgent need of rehabilitation • Production forests with no concession rights granted (<i>HP yang tidak dibebani hak</i>) 	<ul style="list-style-type: none"> • Prioritises critical areas on community land • Since 1998, community involvement/ participation has been an important part of the approach
Main activities and their objectives	Planting forest areas with forest tree species and other tree species that provide livelihood benefits (<i>tanaman kehidupan</i>) and are useful to local people. The programme has been implemented in a participatory manner, with the objective of increasing optimal land cover while providing benefits for the local people	Developing demonstration units/ plots with the expectation that the surrounding communities replicate the approaches by seeing and then carrying out the same programme.
Programmes/ projects (example)	Rehabilitation of logged-over areas by five state companies: Inhutani I to V ^b	Direct inputs for afforestation (<i>Penghijauan Input Langsung – PIL</i>), Afforestation on impacted areas (<i>Penghijauan Areal Dampak – PAD</i>), and Self-funded afforestation (<i>Penghijauan Swadaya – PS</i>)

Note: a. Civil structure (*sipil teknis*) is a technique for building soil conservation facilities or civil structure

b. Inhutani is a state-owned company

Sources: Mursidin *et al.* 1997; Ditjen RLPS 2003

The MoF always sets higher targeted areas to be rehabilitated outside state forest, at 500,000 ha per year and only 70,000 ha per year for inside state forest (Figure 3-1) (Baplan 2003). This trend was based on the assumption that degraded areas are higher outside state forest than inside. However, people perceive that rehabilitation outside state forest tends to be more successful, such as through the Farm Forestry Development Programme.

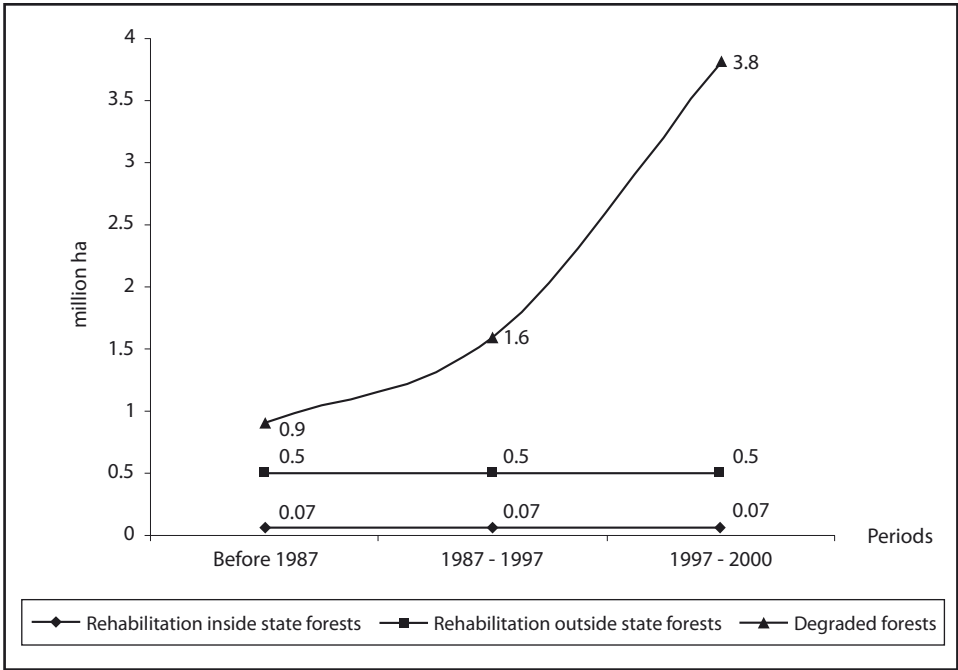


Figure 3-1. Trends in forest and land degradation and rate of forest and land rehabilitation

3.3. The forest land classification system of the Forest Land Use by Consensus (*Tata Guna Hutan Kesepakatan-TGHK*): Aims to better target rehabilitation in state forest

The 1980s was a very important point in the development of rehabilitation programmes, since rehabilitation started to be managed intensively once the MoF became an independent ministry in 1983 (separated from the Ministry of Agriculture). Following the division of rehabilitation programmes, based on the forest land classification of ‘state forest’ and ‘outside state forest’ as discussed in Section 3.2, the MoF further classified initiatives in state forest based on production forest, protection forest and conservation forest as included in the forest classification of *TGHK* in 1984 (GoI/FAO – Government of Indonesia and Food and Agriculture Organisation 1990). The *TGHK* was defined by the agreement of the Provincial Forestry Services (*Dinas Kehutanan Propinsi*), Provincial Agriculture Services, National Land Agency (*Agraria*), Provincial Public Works Services, and the Regional Planning Agency (Seve 1999; Kartodihardjo and Supriono 2000). In 1988, the *TGHK* was renewed. A fifth category inside state forest, conversion forest, was adopted in the late 1980s to cover degraded forest land designated for permanent conversion to other uses (Barber 1997).

In 1990 the *TGHK* was overlaid with the *RTRWP* – the spatial management plan related to provincial land areas – to further elaborate the Spatial Management Act of 1992 (Kartodihardjo and Supriono 2000). According to the *RTRWP*, the spatial classifications were: protection forest, forest land cultivation area, and non-forest cultivation area. Since 1993, the two functional land classification systems have been integrated.

The *TGHK* and the *RTRWP* form the basis for the design and control of the development of the Right of Forest Exploitation (*Hak Pengusahaan Hutan* – *HPH*), *HTI* and estate crop plantations so as to minimise their negative impact on the environment by reducing the rate of conversion of natural forest. In fact, *HPH* operations have been one of the main causes of degradation of natural forest. The integration of the *TGHK* and *RTRWP* in a top-down manner has not solved this problem, and has led to negative social and economic impacts (Kartodihardjo and Supriono 2000). Another major issue regarding the present legal and regulatory framework affecting the Indonesian forestry sector deals with the fundamental problem of conflict between corporate forest users and local populations (Fay and Contreras-Hemillosa 2005; Seve 1999).

The forest land classification system allowed rehabilitation initiatives to be better targeted. The MoF classified the forests eligible for reforestation based on different categories of state forest (Otsamo 2001; Kartodihardjo and Supriono 2000; GoI/FAO 1990):

- Conservation forests, where no logging is permitted. These areas are to be used for nature reserves, genetic conservation, education, research and recreation
- Protection forests, where no logging is permitted. These areas are used for water conservation and soil protection
- Limited production forests, where selective felling is permitted. These areas are used for timber production and control of soil erosion
- Fixed production forests, where selective cutting or clear felling may be undertaken. These areas are used for timber production, and
- Conversion forests, which can be converted to other land uses, such as agriculture, mining or settlement. In Indonesia, these areas will not be classified as forest land after conversion.

In reality, however, the guidance provided under the *TGHK* and *RTRWP* cannot be used as a reliable reference to decide forest area utilisation. The reasons for this include, first, that *de facto* integration of these two approaches cannot resolve local community claims, or other parties' claims to forest land (Kartodihardjo and Supriono 2000). Second, there has been too much intervention by central government in the use of forest land (Kartodihardjo and Supriono 2000). Consequently, problems related to land use were inevitable in the development

Table 3-3. Government forest classification and its rehabilitation approaches

Classification of forest area	Causes of deforestation	Rehabilitation approaches and technical methods	Objectives	Institutional arrangement	Land tenure	Actors involved
Production Forest (limited and regular production forests)	Over-logging & illegal logging, land claims, forest fires	Establishment of HTI, enrichment planting, replanting of logged-over areas in the Selective Felling and Planting System (TPTI) mechanism, small-scale plantations, and assisted natural regeneration	Commercial, increase forested areas & fire prevention	Concessionaires' rights, management rights given to tree grower cooperatives, company and communities	State land	Private and state companies, forestry services, communities
Protection Forest	Encroachment, forest fires, illegal logging, population pressures, and mining	Community forestry programme by developing agroforestry and payment for environmental services (water)	Improve ecological functions	Management rights provided to communities to access NTFPs. Facilitated by NGOs	State land	Forestry services, communities, NGOs
Conservation Area	Encroachment, illegal logging, forest fires, population pressures	Creating buffer zones and watershed management by developing agroforestry, conducting enrichment planting, and creating terraces on steep land	Conserve biodiversity & water resources	Management rights provided to communities to access NTFPs. Facilitated by NGOs	State land	Forestry agencies, communities, NGOs
Special Purpose Forest (education and research)	Encroachment, illegal logging, population pressures	Enrichment planting, community forestry	Improve ecological functions, conserve biodiversity, increase forest cover	Management rights provided to universities and research centres/institutes	State land	Universities and research centres/institutes
Community land	Demand for increased productivity, inappropriate land use, population & market pressures	Farm forestry, partnerships, traditional forestry management by developing small-scale plantations and agroforestry	Income generation, improve land productivity, conserve water resources	Community manages the areas individually or in a group, without or with partnerships	Private and communal land/customary land	Forestry services, communities, private and state companies

Sources: Wibowo 2006; Santoso 2005; Baplan 2003; Ditjen RLPs 2003; Mursidin *et al.* 1997

of tree crop plantations and timber plantations as these investment initiatives are usually led by the district government (Authors' field observations 2004; Kartodihardjo and Supriono 2000).

The forest classification is useful when initiatives are being planned, since it helps planners to clearly define the different objectives (single or multiple objectives) of the rehabilitation initiatives to be implemented in the different forest areas. For example, in production forests, the rehabilitation initiatives permit the felling of trees as harvestable products (but there is no access yet for communities), while in protection forest or conservation areas, it is not permitted to fell trees and harvestable products were limited to non timber forest products (NTFPs). A good example of developing NTFPs in a national park is the Project on Conserving the National Park of Meru Betiri in East Java, where non-timber species have been successfully planted and provide revenues for the local community, while maintaining the ecological function of the forest.

In many cases, where communities are involved in rehabilitating the areas inside production forest, they have the expectation of being able to harvest the planted trees at the end of the rotation. However, the right to harvest timber is not part of the rehabilitation programme being implemented all over Indonesia (Authors' field observation 2004; Nawir *et al.* 2006). Therefore, the MoF needs to find the best mechanism to accommodate the community's expectations; otherwise, they will be less committed and less willing to participate in rehabilitation initiatives.

3.4. Policies in rehabilitating production forest of state forest areas

One of the major MoF's policies influencing the direction of rehabilitation programmes in production forest has been the *HTI* development on logged-over areas. In many cases, the development of *HTI* has not been successfully implemented and has resulted in the unclear status of many forest areas. Another policy that resulted in higher risks for logged-over areas that become 'open access' is the implementation of the mandate for *HPH* to follow the silvicultural system set by the MoF. This resulted in many companies' licences being revoked following the failure to implement the silvicultural system, but then no clear follow up on the forest status has been conducted. The discontinuity of rehabilitation policies is another example resulting in the unclear status of state forest that then become open access. A particular example of this is the rehabilitation programme assigned to state-owned companies that was halted after three years of implementation but with no clear hand-over action.

3.4.1. HTI development with the objective of rehabilitating logged-over areas: led to more areas to be rehabilitated

Although initially designed in the 1970s, the development of fast-growing plantations has become the main approach of rehabilitation programmes for *Imperata* grasslands since 1988 (Potter and Lee 1998; Otsamo 2000). The underlying concept was to replace forest vegetation with the remaining standing stocks less than 16 m³ per ha, or scrub, or *alang-alang* (*Imperata cylindrica*), with forest plantations (Haeruman 1993). However, it is important to note that not all forestry plantation development programmes in production forest have the objective to rehabilitate the degraded forest areas.

To boost the development of plantations, a package of incentives was provided by the government to develop large-scale *HTI*, including (Potter and Lee 1998; Haeruman 1993; Sudradjat and Subagyo 1993; Hasanuddin 1996; Potter 1996; Otsamo 2000):

1. Interest-free loans from the Reforestation Fund were made available in 1980
2. *HTI Patungan* (Joint venture *HTI*) – MoF supported companies borrowing start-up capital from banks or other financial institutions and/or under joint venture schemes with a state forest company (i.e. Inhutani) with the proportion of shared capital being 40% provided by the government and its state forest company and the private company provided the remaining 60% investment
3. Low concession-land taxes
4. The right to clear cut and sell any remaining vegetation under the Timber Clearance Permit (*Ijin Permanfaatan Kayu – IPK*) for concession areas (logging approvals were provided so that the *HTI* permit holders could reforest logged-over areas)
5. The '*HTI* Trans' scheme was jointly initiated by the Ministries of Forestry and Transmigration in 1992; it aimed to accelerate the establishment of plantations while also providing employment opportunities for the transmigrants.

Up to October 1998, encouraged by government incentive schemes, the *HTI* development reached 98 units for all categories: pulp, non pulp, and transmigration (Table 3-4). From 1989 to 2000, the government provided soft loans (0% interest rate for about 32.5% of the total fund) to establish *HTI* plantations (Table 3-5). The money came from the Reforestation Fund. A total of 98 timber plantation companies received the credits, but in 2000 loans from the Reforestation Fund ceased, in accordance with the Letter of the Secretary General of the MoF (No. 549/II-Keu/2000).

In 2000, the Directorate General of Forestry Production Management (*Bina Produksi Kehutanan – BPK*) produced a regulation, based on Ministerial Decree

Table 3-4. Summary of *HTI* development up to October 1998

Type	Application approved	Area approved	Area planted
	Unit	Ha	Ha
<i>HTI</i> Pulp (23 units)	18	3,128,443	997,213
a. Priority	13	2,605,938	395,908
- with <i>DR</i>	9	1,799,162	n.a.
- without <i>DR</i>	4	806,776	n.a.
b. Non priority	5	522,505	601,305
<i>HTI</i> Non pulp (52 units)	31	835,334	812,399
a. With <i>DR</i>	13	377,613	n.a.
b. Without <i>DR</i>	18	457,727	n.a.
<i>HTI</i> Transmigration (70 units)	49	604,441	266,007

Note: *DR*: Reforestation Funds (*Dana Reboisasi*)

Source: Kartodihardjo and Supriono 2000.

Table 3-5. The composition of funds provided for developing Industrial Plantation Forest (*HTI*)

Type of fund	Proportion	Source
1. Reforestation Fund at 0% interest rate	32.5%	Reforestation Fund
2. Reforestation Fund at commercial interest rate	32.5%	Reforestation Fund
3. Government joint venture fund	14%	Reforestation Fund
4. Private joint venture fund	21%	Private fund
Total	100%	

Source: Iskandar *et al.* 2003

No. 10.1/Kpts-II/2000 dated 6 November 2000, to give *HTI* rights only on non-forested areas of production forest (Ditjen BPK 2000). Following this regulation, *BPK* produced the ‘*HTI* Development as Part of the Reforestation Programme’ Action Plan. Since 2002, *HTI* development has been prioritised on 2.6 million ha of barren, degraded production forest in ex-*HPH* areas, in which natural succession is not possible. The second priority is to implement reforestation inside active *HPH* areas covering 11.6 million ha (Departemen Kehutanan 2002). It has been pointed out that the funding for new *HTI* companies should come from private investment and not from the Reforestation Funds. The full support of the MoF is provided for anyone who is willing to establish a self-funded *HTI*. However, looking at the existing planted areas, it has been difficult statistically to distinguish *HTI* developed involving the reforestation of logged-over areas under *IPK* rights from those focused mainly on barren, degraded forest areas (Table 3-6). Except that the rehabilitation of ex-*HPH* areas was assigned to the state forestry companies, Inhutani I–V. By developing plantations, the objective of rehabilitation has not been focused on restoring the condition of the forest

Table 3-6. Development of *HTI* areas by category

Year	Pulpwood plantation	Non-trans construction- timber plantation	<i>HTI</i> Trans construction- timber plantation	Locally specific species	Mixed plantation forest	Self- funded forest plantation	Total
1989/90	29,160	102,495					131,655
1990/91	65,661	104,213					169,874
1991/92	104,222	109,769					213,991
1992/93	83,962	139,771	11,120				234,853
1993/94	113,066	138,625	50,021	71,895			373,607
1994/95	117,940	56,253	44,620	77,973			296,786
1995/96	162,200	54,449	48,551	61,248			326,448
1996/97	172,320	63,477	60,420	94,324			390,542
1997/98	100,883	38,181	39,003	88,542		2,500	269,109
1998/99	82,604	22,840	29,526	45,536		2,072	182,578
1999/2000	85,744	24,448	27,301			1,169	138,662
2000	58,152	7,960	13,637			2,569	82,317
2001	56,299	6,276	4,397			500	67,472
2002	87,614	5,707	8,166		1,121	15,900	118,508
2003	100,497	14,128	4,627		1,456	3,983	124,691
Total	1,420,324	888,592	341,389	439,518	2,577	28,693	3,121,093

Source: Ditjen BPK 2005^a

but more on improving the productivity of the degraded forest areas, since *HTI* development makes intensive use of fast-growing exotic species, such as *Acacia mangium*.

Conceptually, *HTI* development seemed to be good, and it has worked in many other countries. However, because it was developed under a top-down approach and has not considered the high numbers of forest-dependent people, implementation on the ground has faced many difficulties. Serious challenges to developing plantations for the reforestation programme have included disenchantment, resentment and conflict with local communities over forest resources (Kartodihardjo and Supriono 2000; Muhtaman *et al.* 2000). The other major challenge to developing *HTI* comes from the development of oil palm plantations, especially where there is competition for land allocation and uses. Further, local governments at the district level are more supportive of private investments in oil palm plantations, because they see them as providing local government revenues (*Pendapatan Asli Daerah – PAD*).

Unexpected impacts from this *HTI* package of incentives have even led to greater rehabilitation efforts being required, due to *HTI* areas' being abandoned since most companies were more interested in clear felling the remaining standing stock

in logged over areas instead of developing plantations. The interest-free loans from the Reforestation Fund and the *IPK* rights have been misused by many *HTI* companies (Barr 2001, Kartodihardjo and Supriono 2000; Ditjen BPK 2000). By June 1998, 1 million ha of natural forest had been converted; however, only 23.1% of the area had actually been planted under the *HTI* programme (Kartodihardjo and Supriono 2000). The *HTI*Trans scheme, which was a joint venture between private companies (*HPH* concessionaires) and the state companies (Inhutani I–V), resulted mostly in abandoned forest areas since the *HPH* concessionaires relied primarily on the Reforestation Fund to finance the schemes. Uncertainty about marketing the timber was another serious issue hampering the development of the *HTI*Trans scheme (Ditjen BPK 2000).

In fact, plantation development was not the right approach to rehabilitating the ex-logging areas. Since, in general, the areas were logged using selective cutting techniques and then totally cleared during the land preparation stage, before trees were planted, mostly fast growing species. The *HTI* planting realisation rate was low, i.e., 23.1% (Kartodihardjo and Supriono 2000). According to Iskandar (2003), the total area of *HTI* planted up to March 2002 was only 2,275,040 ha and consisted of 501,692 ha planted for *HTI* construction wood; 1,402,279 ha for *HTI* pulp; and 371,069 ha for *HTI*-Trans. This led to a situation where increasing areas of degraded forest needed to be rehabilitated, making the existing rehabilitation programmes meaningless because the pace of degradation outstripped the speed at which rehabilitation could be implemented. It has been suggested that using assisted natural regeneration techniques would have been a cheaper option in rehabilitating the logged-over areas (Directorate General of Forest Production management staff personal communication, 2004).

3.4.2. Policies result in higher risks as logged-over areas become 'open access'

a. The unclear status of forest on revoked concession areas

The New Order government began to control Indonesia's forest resources in 1966 and introduced a policy to grant more than 60 million ha of timber concessions to privately owned companies (Brown 1999; Barr 2001). This was possible under the Basic Forestry Law, which provided the basis for 20-year *HPH* permits to be granted to state-owned corporations and private investors in areas classified as production forest (Barr 2001). In 1989, the basic concession length of 20 years was revised to 35 years (Greenomics Indonesia 2004). This was in accordance with the introduction of the Indonesian System of Selective Cutting and Planting (*Tebang Pilih dan Tanam Indonesia – TPTI*). Detailed policies regulating the timber logging rights are found in PP No. 6/1999, which replaced PP No. 7/1990 and the earlier PP No. 21/1970 on Forest Utilisation and Forest Product Harvesting in

Production Forests. Indonesia was the world's largest exporter of tropical timber during the 1970s, exporting about 300 million m³ to international markets (Barr 2001).

To ensure that *HPH* concessionaires practised the principles of sustainable forest management, the contract required them to follow the silvicultural system defined by the Forestry Department as *TPTI* (Seve 1999; Barr 2001; Christanty and Atje 2000). *TPTI* was introduced in 1989, replacing the Selective Cutting System (*Tebang Pilih Indonesia – TPI*), and was designed to optimise forest management by applying appropriate harvesting methods, and to promote natural regeneration and increase growth of the residual stand (Seve 1999). It is based on a cutting cycle of 35 years and allows the removal of commercial stems down to 50 cm dbh (diameter at breast height). The decree on *TPTI*, issued by the Director General of Forest Utilisation (now Director General of Forest Production Management) Number 564/Kpts/IV-BPHH/1989 dated 30 November, includes specific obligations for concessionaires to complete regeneration and reforestation options, and specifies silvicultural systems to meet different needs and situations. In addition to *TPTI*, there are Clear Cutting with Natural Regeneration (*Tebang Habis Permudaan Alam – THPA*) and Clear Cutting with Artificial Regeneration (*Tebang Habis Permudaan Buatan – THPB*) systems (Chandrasekharan 1990). *TPTI* was replaced by the System of Selective Cutting and Line Planting (*Tebang Pilih Tanam Jalur – TPTJ*) for lowland forests by MoF Decree No. 625/Kpts-II/1998 (Seve 1999).

The concessionaires' obligations to undertake reforestation and promote regeneration have been very comprehensive. However, the lack of supervision during implementation, and the inconsistent umbrella regulations have affected implementation on the ground. In 2003, the number of remaining concessions totalled only 270 units – comprising both private and state-owned companies – with 28.1 million ha producing 6.7 million m³ of timber (Mulyana *et al.* 2005). The number of concessions has decreased by 50% since 1989/90 (Table 3-7), followed by a decline in timber production.

The decreasing numbers of *HPH* concessions operating was in line with the increasing number of logged-over areas to be rehabilitated, as a result of the increasing numbers of *HPH* concessions revoked by the government. The total extent of logged-over areas had reached 41 million ha by 1998 (Departemen Kehutanan 2005) (Table 3-7). A total of 112 ex-*HPH* units covering 5.7 million ha (of which 44% were logged-over areas in mediocre to good condition and 45% were degraded logged-over areas) were assigned to Inhutani to be rehabilitated (Table 3-8).

Table 3-7. Trends of *HPH* units, 1989–2000

Year	HPH (units)	Area (million ha)	Timber production (million m ³)
1989/90	557	58.9	
1990/91	564	59.6	
1991/92	567	60.5	23.9
1992/93	580	61.4	28.3
1993/94	575	61.7	26.8
1994/95	540	61.0	24.0
1995/96	487	56.2	24.9
1996/97	447	54.1	26.1
1997/98	427	52.3	29.5
1998/99	420	51.6	19.0
1999/2000	387	41.8	20.6 ^a

Note: a. Data from April to December 1999 only

Source: Ditjen BPK 2005 ^b

Table 3-8. Production forest areas to be rehabilitated

Forest coverage	Managed by concessionaires		Rehabilitation assigned to Inhutani ^b		Total	
	Million ha	%	Million ha	%	Million ha	%
1. Primary forest ^a	18.3	45	0.6	11	18.9	41
2. Ex-logging areas in good–mediocre condition	11.1	27	2.5	44	13.6	29
3. Logged-over areas, barren and agricultural areas	11.6	28	2.6	45	14.2	30
TOTAL	41.0	100	5.7	100	46.7	100

Note: a. 7.3 million ha (39%) are located in Papua

b. Inhutani is a state-owned company

Source: Departemen Kehutanan 2005

The ex-*HPH* degraded forests were reclassified as reserve forests (forests without definite functions) or placed in the ‘non forest uses’ category (Kartodihardjo and Supriono 2000). Often, the MoF used terms that were not clear to define the status of *HPH* concessions, such as *HPH* expired, but extended temporarily, extended in principle for 20 years, or extended definitely for 20 years; *HPH* administered by an Inhutani; *HPH* being rehabilitated (inactive); *HPH* status undecided; *HPH* not yet assigned a new use and *HPH* changing function (Brown 1999). This lack of clarity contributed to the condition of ‘open access’ or *‘tanah tidak bertuan’* (Kartodihardjo and Supriono 1998; Brown 1999). Because it was not clear who had the responsibility for rehabilitating the logged-over areas after the concession right had been revoked, as often occurs in the field, anyone could go in and use the area for non-forestry purposes, such as agriculture. It is commonly perceived

that the rights attached to the *IUPHHK* (*Ijin Usaha Pemanfaatan Hasil Hutan Kayu*) or the licence to collect timber refers more to utilisation (or exploitation) than to the broader area of management, in which rehabilitation is part of the concessionaires' responsibilities.

b. Discontinuity of rehabilitation policies: case of rehabilitation programme assigned to state-owned companies

In many cases, inconsistent policies have disrupted the rehabilitation programmes being initiated. This resulted in the waste of government reforestation funds as no end outputs were ever produced. An example of the most inconsistent policy was the case of rehabilitation programmes being assigned to state-owned companies Inhutani I to V.

In 1995/96 the Ministry of Forestry (MoF) assigned the state companies Inhutani I, II and III and formed Inhutani IV and V to rehabilitate logged-over areas in Sumatra, Kalimantan and Sulawesi. The assignment was implemented through Ministerial Decree No. 362/Kpts-II/1993. The MoF assigned Inhutani I to Inhutani V to rehabilitate ex-concession areas totalling 5.5 million ha. As state-owned companies, they are intended to be profitable and to act as government partners to support national development and forestry management, with the core business of logging and timber plantation development. Inhutani I to III are the continuation of Perhutani, which was the first state company to be established, i.e., Inhutani I was formed from Perum Perhutani in East Kalimantan, and Inhutani II was formed after the liquidation of Perhutani in South Kalimantan. In the provinces of Central and South Kalimantan, South and North Sumatra, Jambi, Lampung and Riau, degraded logged-over areas were located in more than 50% of forest areas (Table 3-9).

However, in 1998 the MoF did not release a budget for this programme, and an official decision was then made in 1999 to revoke the rehabilitation assignment by the end of 2002/03 (date of closure varied from company to company) (Directors and staff of Inhutani personal communication 2004). From 1995/96 to 1998 there was little progress in the state companies' rehabilitation activities, and social problems occurred in some of the rehabilitated areas (Table 3-10). Overall, the allocated funding reached approximately Rp 600 billion (USD 68.3 million) but with no fixed estimation of the successfully developed plantations (Anonymous 2005). The transition from a centralised to a decentralised forestry management policy in 1999 created a conflict of interest and uncertainty regarding law enforcement. The assigned areas were returned to the MoF, who handed the areas over to the provincial government to manage. With no budget allocated to the provincial government in conjunction with the responsibilities, due to a lack of funding and human resources to at least supervise the areas, these areas

Table 3-9. Ex-HPH areas assigned to Inhutani^a to be rehabilitated in selected provinces

Province	Total indicative areas		Primary forest		Logged-over areas in mediocre to good condition		Degraded logged-over areas	
	Units	Ha	Ha	%	Ha	%	Ha	%
East Kalimantan	32	1,603,485	241,243	15	827,912	52	534,330	33
Central Kalimantan	9	870,010	74,298	9	346,800	40	448,912	52
West Kalimantan	20	1,454,700	129,610	9	632,060	43	679,850	47
South Kalimantan	6	164,200	7,950	5	59,750	36	96,500	59
Central Sulawesi	2	169,725	42,420	25	67,273	40	60,032	35
South Sumatra	10	625,409	34,270	5	265,905	43	325,234	52
Jambi	11	265,706	9,457	4	109,546	41	146,703	55
Bengkulu	3	95,774	26,920	28	55,720	58	13,134	14
Lampung	1	11,550	-	-	1,600	14	9,950	86
Aceh	4	107,290	28,580	27	46,020	43	32,690	30
North Sumatra	2	106,919	-	-	-	-	106,919	100
Riau	11	212,547	30,816	14	48,218	23	133,513	63
West Sumatra	1	40,855	-	-	37,438	92	3,417	8
TOTAL	112	5,728,170	625,564	11	2,498,242	44	2,591,184	45

Note: a. State-owned Company

Source: Departemen Kehutanan 2005

Table 3-10. Logged-over areas assigned to state-owned companies of Inhutani and the progress of rehabilitation activities up to December 2000

Company	Area (ha)	Progress at the time assignment cancelled by the MoF
Inhutani I	1,481,085	Planning, delineation, feasibility studies conducted. Commercially feasible areas developed jointly with other companies as plantations. For the development of areas that were not commercially feasible, the plan was to use government funds that were subsequently withheld
Inhutani II	1,951,204	Database made on species-site matching, propagation, delineation, integrated planning with provincial spatial planning (<i>Rencana Tata Ruang Wilayah Propinsi – RTRWP</i>), and technological development
Inhutani III	870,000	Scenario developed for strategic planning for up to 70 years, including a cross-subsidy scheme between the company's different activities
Inhutani IV	743,428	Planning and planting activities undertaken in four units, in North Sumatra, Aceh, West Sumatra and Riau
Inhutani V	494,815	Feasibility study completed and work plan for forest management written (<i>Rencana Karya Pengusahaan Hutan - RKPH</i>)
Total	5,540,532	

Sources: Websites of Inhutani I, II and Perhutani; Mursidin personal communication 2004; Directors and staff of Inhutani I to V and Perhutani personal communication 2004

then became open access and have been subject to illegal logging. This has led to further degraded forest areas

3.5. The Reformation Era and decentralisation policy: opportunities for a greater focus on community-based forest management?

In 1998 Indonesia experienced a major change in its political situation when the incumbent President Soeharto stepped down after 32 years, a period described as the New Order Era. The Reformation or Reformation Era then began, and in 1999 the GoI started the process of moving from a centralised to a decentralised government system based on the Regional Autonomy Policy (transition process). The most significant aspect of this has been the promulgation of Law 22 on Regional Governance and Law 25 on Fiscal Balancing, both of which were passed in May 1999 (Obidzinski and Barr 2003). The introduction of regional autonomy influenced the future direction of the rehabilitation programmes established by the MoF.

3.5.1. Regional autonomy

The rehabilitation programmes being implemented under the new Regional Autonomy Policy after the reformation have to deal with greater pressures on forests because they have to accommodate the various stakeholders' interests, which are often in conflict; consequently the polices do not always concentrate on rehabilitation for its own sake (Table 3-11).

One example was the implementation of a community-based forest management policy on small-scale community logging concessions, under the Right of Timber Extraction and Utilisation Permits (*Ijin Pemungutan dan Pemanfaatan Kayu – IPPK*). It was discovered, from a case study undertaken in Malinau District, that, due to inadequate control by the local authority over the areas to be felled, licences had also been issued for logging in other designated areas, such as protection forest (Barr *et al.* 2001). Further, the impacts of the logging undertaken by the *IPPK* permit holders were not monitored effectively. This has led to the possibility of an increase in the number of degraded logged-over areas, with no clarity as to the authority responsible for implementing the rehabilitation programme.

Because of the limited capacity of district forestry services, under regional autonomy there has been a massive increase in illegal logging cases, uncontrolled *IPPK* practices, especially in Kalimantan (Authors' field observations 2004; Ismail 2006; McCarthy 2001). These have increased the need for immediate rehabilitation efforts in these areas, with the implication that a high level of

Table 3-11. The situation since reformation and its impacts on rehabilitation initiatives

Since reformation and the introduction of regional autonomy	Impacts on rehabilitation initiatives/implementation in state forests
1. IPPK permits granted	<ul style="list-style-type: none"> • Increase in logged-over areas – possibly scattered • Less community interest in rehabilitation activities • Collection of fees (e.g. Reforestation Funds) opened up opportunities for misuse
2. Increasing illegal logging	Uncontrolled logged-over areas – increased pressures to rehabilitate the areas with implication of high funding requirement
3. Increasing cases of land claims/ encroachment	Implementation in the field more difficult due to conflict of interest of parties claiming the land
4. New Reforestation Fund allocation system	New system has been implemented but needs better capacity and skills at the district level to manage the funds for rehabilitation purposes

Sources: Authors' field observations, and Ismail 2006; Samsu *et al.* 2005; Wibowo 2006; and Barr *et al.* 2001

government funding will be required (Wardojo in Anonymous 2003; McCarthy 2001). This situation has been worsened by the increased number of cases of land claims and encroachment, even on state forest lands. Consequently, implementing rehabilitation projects in certain areas, even those designated by the government for rehabilitation, has become difficult due to the conflict of interest of parties claiming the land for purposes such as oil palm plantation development.

The transfer of authority from central to local governments has significantly redefined the roles and responsibilities of government agencies at each level of the nation's administrative structure (Obidzinski and Barr 2003). This has included the roles of those managing the allocated Reforestation Funds, particularly under the *GN RHL/Gerhan* programme and the Project on Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus Dana Reboisasi – DAK-DR*). Rapid transfer of knowledge to improve capacity and skills at the district level, to manage the funds for rehabilitation purposes, did not follow the new system.

Directly and indirectly, the Reformation Era, followed by the introduction of regional autonomy, has influenced the direction of rehabilitation policies and programmes to be implemented on the ground. One of the important shifts in implementing rehabilitation has been a greater focus on community-based forest management, with serious efforts made on the ground. However, an evaluation should be carried out to provide factual evidence of whether or not such management is being implemented properly.

3.5.2. The management of the Reforestation Funds (*Dana Reboisasi*)

Besides funding from the government, since 1970, donor funding has financed rehabilitation projects in Java and in 1981 began to fund rehabilitation projects in Sumatra. Some donor funding required counterpart budgets from the country partner, in this case the MoF (joint funding). The major donors are ADB, EU, FINNIDA, ITTO, JICA, and GTZ. Donors contributing through bilateral collaboration were JICA, USAID, GTZ, Australian International Development Assistance Bureau (AIDAB)/Australian Government Overseas Aid Programme (AusAid), Danish International Development Agency (DANIDA), The Canadian International Development Agency (CIDA), and International Institute for Geo-Information Science and Earth Observation (ITC, Netherlands), while donors involved in multilateral collaboration were the World Bank/International Bank for Reconstruction and Development (IBRD), ADB, Nordic Investment Bank (NIB)/Nordic Development Fund (NDF), OECF, FAO/UNDP, World Food Programme (WFP), International Fund for Agricultural Development (IFAD), International Timber Trade Organisation (ITTO), International Centre for Research in Agroforestry (ICRAF), Japan International Forestry Promotion and Cooperation Center (JIFPRO), Ford Foundation and Global Partner. Collaboration covered technical assistance and project aid in order to transfer technology related to forest and land rehabilitation, watershed management and the strengthening of human resources. Funding schemes took the form of grants and loans.

Reforestation Funds (*Dana Reboisasi -DR*) provide the main sources of government funding for implementing rehabilitation projects and other related supporting activities (Departemen Kehutanan 2002). The policy of collecting Reforestation Funds from concession holders was established in 1980 under the name of the Reforestation Guarantee Deposit Fund (*Dana Jaminan Reboisasi – DJR*), with the aim of endorsing better management of production forest (Otsamo 2001; Oka and William 2004). The concession holders are required to pay certain ‘deposits’ defined for each cubic metre logged based on timber species and the origin of the logging area, as included in the Presidential Decrees (*Keputusan Presiden - Keppres*) No. 24/1997; No. 53/1997; and No. 32/1998. The latest charges are included in PP No. 92/1999 (Appendix 3). These ‘deposits’ were refundable if the concession holders fulfilled their obligations to replant the ex-logging areas inside their concession areas; however, this never happened since the companies did not feel obliged to implement the rehabilitation process after paying the deposits (Otsamo 2001). Later the *DJR* was changed to a non-refundable Reforestation Fee and became the highest tax in the timber industry (Barr 2001). In the Sumatra and Sulawesi regions, the *DR* charges for one cubic meter of the same species are

lower than in Kalimantan. In Eastern Indonesia, the levy is even lower. The most expensive is for the Dipterocarpaceae family. The cheapest rate is for mixed species (*rimba campuran*).

In addition to the Reforestation Fund, the main instruments of fee collection include the following (Barr 2001):

- a. *HPH* Licence Fee (*Iuran Pengusahaan Hutan – IHPH*): an area-based fee collected annually from concessionaires
- b. Forest Product Royalty (*Iuran Hasil Hutan – IHH*): an *ad valorem* fee on each unit of timber harvested, depending on species and grade and
- c. Timber Export Tax: an *ad valorem* tax on all exported wood, depending on species and grade.

The *DR* has been used for implementing several government programmes (Iskandar *et al.* 2003):

- From 1989 to 2000, the funds were used mainly for plantation development (based on Presidential Decree (*Keputusan Presiden - Keppres*) No. 31/1989 and the Secretary General of the Ministry of Forestry Letter No. 549/II-Keu/2000)
- In 1995/96, most private companies and state companies (*Inhutani I to V*), which participated in plantation development and received their funds from the government through a soft loan mechanism, were not focused on degraded forests
- In 1995/96, the funds were also used to support the Farm Forestry Credit Schemes, and
- Since 2001, these funds have also been used to finance the Specific Allocated Funds – Reforestation Funds (*DAK-DR*) Programme, and since 2003 to fund 5-year programmes such as *GN-RHL/Gerhan*.

Several credit facilities were provided by the government to initiate or implement rehabilitation initiatives; the most significant were credit facilities, such as *Kredit Usahatani Konservasi DAS (KUK DAS)* to support a farming programme to conserve watershed areas during the period 1990/91–1997/98 and soft loans to *HTI* companies. The success rate of the *KUK DAS* was valued by the percentage of loans repaid – 59% of the total credit provided (Ditjen RLPS 2003). The concession holders now include community groups who have timber logging permits for community forestry schemes (*Hutan Kemasyarakatan – HKm*) under Timber Extraction and Utilisation Permits (*Ijin Pemungutan dan Pemanfaatan Kayu – IPPK*) granted by the District Head (*Bupati*). According to this government regulation, the Reforestation Funds are to be deposited into the Central Government Account (*Kas Negara*) under the control of the Minister of Finance (Figure 3-2). The concession holders who fail to fulfil their obligation to

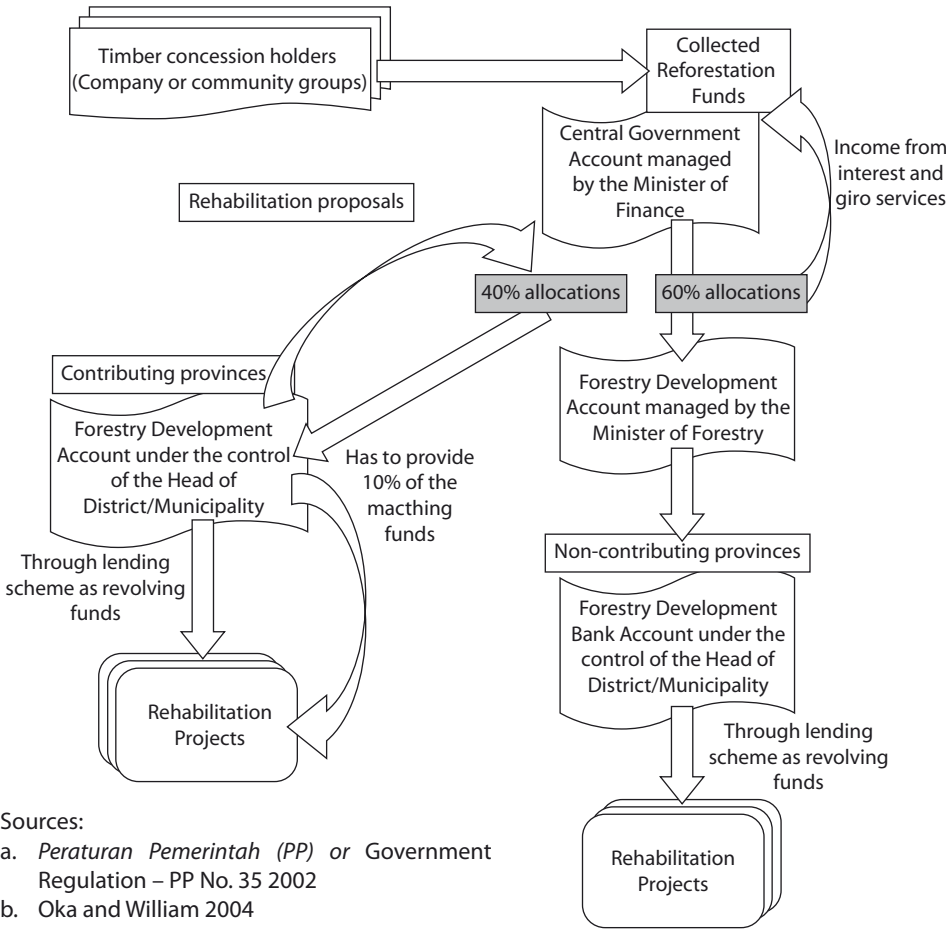


Figure 3-2. Reforestation Fund flows

pay their Reforestation Fund fee will be fined 2% of their debt per month. They will receive three warning letters within 30 days of the due date, after which legal proceedings will be taken against them.

Rehabilitation can be funded by the Reforestation Fund as these funds are defined as being for activities that include reforestation (inside state forest), afforestation (on private land), maintenance, enrichment planting (*pengayaan tanaman*), or applying soil conservation techniques on critical and unproductive land, and supporting activities such as forest protection, fire prevention or forest fire-fighting. The establishment of *HTI* areas will continue to be supported through the Reforestation Fund. More detailed general guidelines (*Pedoman Umum – PEDUM*) are included in the Decree of the Director General of Forest and Land

Rehabilitation No. 093/Kpts/V/2002. However, these activities are still thought of as being project-based and short-term, with long-term sustainability not taken into account.

The current government regulation on Reforestation Funds is PP No. 35, produced in 2002, and it replaced PP No. 6/1999. The PP No. 35 regulates the allocation of *DR* to the district and central governments. Forty per cent of the funds are reallocated to the provinces that have contributed the revenues from *DR* to central government - called the 'contributing provinces'. These funds are held in a bank account under the control of the District/Municipality Head. Prior to these allocations and in coordination with the district governments, the provincial government proposes the planned rehabilitation activities in its area to the Ministry of Finance. The programme developed under this scheme is called the *DAK-DR* or *Dana Alolasi Khusus – Dana Reboisasi* or Specific Allocated Funds – Reforestation Funds (Santoso 2005; Departemen Keuangan *et al* 2001). Under this scheme, the forestry technical units do not provide technical assistance, which has caused shifted direction in the implementation (Picture 3-1). The objectives of the programmes are: to facilitate community participation in rehabilitation activities by providing assistance to design the activities, develop community institutions and provide technical assistance to implement the activities planned (Departemen Keuangan 2001). No recorded data on the realisation of the area being rehabilitated under this programme could be obtained and was thought have faced many problems and not to have been very successful (Santoso 2005). Further, field observations showed that the programme has been implemented under top-down approach and community participation has been limited.

Sixty per cent of the funds collected are allocated to the Ministry of Forestry to finance the rehabilitation projects in non-contributing provinces (provinces that have not contributed Reforestation Funds to the central government). The allocation is based on a 5-year rehabilitation plan designed jointly by the Minister of Forestry and Minister of Finance. The funds are allocated to cooperatives, forest farmer groups and other organisations with legal status to implement the rehabilitation project on the ground through a lending scheme, which is designed as a revolving fund. If this is not feasible, rehabilitation may be funded by the Reforestation Fund as part of a government planned budget, such as *GN-RHL/Gerhan*. Under this programme, technical assistance is provided (Santoso 2005; Departemen Keuangan *et al.* 2001).

Many contributing provinces have felt that the allocation system is unfair and the received funds are not enough to maintain the remaining forest. From the implementation case in South Sulawesi shows, the practical implementation of the allocation ratio of 60:40 has resulted in the contributing districts receiving



Picture 3-1. Diverted focus from main species due to lack of technical assistance: rubber and coffee trees dominate the *DAK-DR* rehabilitation area rather than the main forest tree species (Location: Kampar, Riau - *DAK-DR* Kampar Project)

less of the allocated funding than the non-contributing districts for several reasons (Oka and Wiliam 2004):

1. The district government did not have good documentation of the total Reforestation Funds collected, and was therefore unable to compare them with the funds reallocated
2. The district government received the allocated funds in the form of projects rather than in cash, and had to provide 10% of the matching funds (*dana pendamping*) from their own budget.

The Minister of Forestry, MS Kaban stated that about Rp 1 trillion (USD 109.3 million) of *DR* allocated to local government under the *DAK-DR* scheme has been misused for non-rehabilitation purposes (Anonymous 2006^a). He further elaborated that since 2006, the Ministry of Finance directly allocated the funds to local governments at the district level and this has caused problems for the MoF to supervise and control in ensuring the funds have been used for rehabilitation purposes. Oka and William (2004) interpreted, based on PP No. 35 2002, that actually the central government has more flexibility to use the received funds for non-rehabilitation purposes. This problem shows that there is minimal coordination between the Ministry of Finance, as the responsible department for

releasing the budget, and the Ministry of Forestry as the responsible technical department for controlling the activities on the ground.

GN-RHL/Gerhan has been funded by *DR* from the portion received by the central government. However, the annual procedure in proposing the activities to be funded is quite complicated. These procedures are defined in the Ministerial Forestry Decree No. P.01/Menhut-II/2006 on the mechanism for the Ministry of Forestry to compose the working plans and the budget attached (Departemen Kehutanan 2006). According to this PP, the working plans composed by the Ministry of Forestry should be discussed in a series of discussions with, and approval obtained from the People's Consultative Assembly (*Dewan Perwakilan Rakyat - DPR*), National Development Planning Board (*Badan Perencanaan Pembangunan Nasional - Bappenas*), and the Ministry of Finance. The whole process takes about a year. The discussions take place in the same year as the implementation creating serious problems, since there is inadequate preparation time between budget realisation and actual implementation, which is usually towards the end of the year (RLPS in Rumboko 2004). Allowing the allocated budget to be carried over to the following year is a possible solution to this problem. The actual implementation could then be well planned instead of simply trying to finish the budget before the end of the year.

3.6. National-level rehabilitation initiatives since the Reformation Era

In 2005 the Ministry of Forestry put together five national strategic priorities as the direction for national forestry management for the period 2005–09. The forest rehabilitation programme has become an important priority at No.3, and this continues the strategic direction defined by the earlier minister for the period 2003–05 based on Ministerial Decree, *SK Menteri Kehutanan* No. 342/KPTS-VII/2003, when the forest rehabilitation programme was priority No. 5. The five strategic priorities are:

1. Integrated combat of illegal logging (*Penanggulangan pencurian kayu secara terkoordinasi*)
2. Revitalisation of the forestry sector, especially the forestry industry (*Revitalisasi industri kehutanan*)
3. Rehabilitation and conservation of forest resources (*Rehabilitasi dan konservasi sumberdaya hutan*)
4. Economic empowerment for forest communities (*Pemberdayaan ekonomi masyarakat sekitar hutan*)
5. Establishment of forest areas (*Pemantapan kawasan hutan*).

These five national strategic priorities were then used as the basis for setting the national programmes. Rehabilitation programmes were prioritised through the Master Plan for Forest and Land Rehabilitation (*MP-RHL*) and the *GN RHL/Gerhan* Programme, as a means of implementing the rehabilitation of priority degraded areas.

3.6.1. The Master Plan for Forest and Land Rehabilitation

The *MP-RHL* was developed in 2000 with the objective of providing the basis for planning rehabilitation programmes and activities that are integrated, transparent, participatory, and based on the local regions' aspirations and uniqueness (Baplan 2003). In practice, the objectives of the Master Plan are (Baplan 2002):

- To support the implementation of the five priorities of the forest policy, especially for effective and efficient FLRP (Forest and Land Rehabilitation Programmes)
- To facilitate macro planning by providing information/data on areas prioritised for rehabilitation
- As an entry point to unify the vision and commitment among relevant parties
- As the basis for designing the Master Plans at the provincial level
- To identify priority areas for allocating/implementing rehabilitation programmes.

The Forestry Planning Agency (*Badan Planologi Kehutanan*) coordinates the Master Plan, as determined by Presidential Decree No. 177/2000. The Master Plan has two levels (Baplan 2003):

1. The National Master Plan: deals with macro plans for national-level forest and land rehabilitation
2. The Regional Master Plan: designed at the provincial level, by referring to the national Master Plan, is used to direct the implementation of rehabilitation at the regional level.

By 2004, 28 provinces had finished their Regional Master Plans, 16 of these had been approved by the Provincial Head and were referred to in the implementation of the rehabilitation programme (Baplan 2004). Consistent with the national forest rehabilitation programme, the Master Plans use watersheds as the unit of coverage. Consequently, coordination between the agencies responsible for managing watersheds, along their whole length, has become crucial. The Forestry Planning Agency designed the schemes to coordinate the efforts of all concerned parties implementing forest and land rehabilitation programmes (Table 3-12). However, implementation of the Regional Master Plans on the ground has not been optimal, as is indicated by the fact that actual coordination and participation

Table 3-12. Coordination between the MoF, local government and other sectors in implementing forest and land rehabilitation programmes

Issues of forest and land rehabilitation	Policy focuses at the national and regional levels to address issues of rehabilitation, and conditions for communities to be involved in rehabilitation activities		
	National level: DG of MoF responsible for macro national policy	Regional level: local government agencies responsible for defining policies to support the rehabilitation	Conditions for communities to be involved in rehabilitation activities
1. Pre-conditions, such as secured status of forest and land, and economic infrastructures	<i>BAPLAN</i> <i>DG BPK</i>	Forestry Unit, Economic Unit, <i>BPN</i>	Secured rights and the communities have entrepreneurial skills
2. Involvement of local communities in implementing forest and land rehabilitation programmes	<i>DG BPK</i> <i>DG PHKA</i> <i>DG RLPS</i>	Forestry Unit, Land Unit	Community institutions are capable of being involved in forest management
3. Administrative matters, such as funding, Reforestation Fund scheme, control mechanism	<i>DG RLPS</i> Ministry of Finance	Forestry Unit, Finance Unit	Communities have entrepreneurial skills
4. Regulations to control the utilisation permits for the forest resources	<i>DG BPK</i> <i>DG PHKA</i> <i>DG RLPS</i>	Forestry Unit	Communities understand the carrying capacity of the natural resources, and community rights and responsibilities
5. Institutions responsible for forest and land rehabilitation, capacity, and coordination with relevant organisations	<i>DG BPK</i> <i>DG PHKA</i> <i>DG RLPS</i>	Forestry Unit	Communities have the capacity to be involved in defining policies
6. Technical problems in the field, in relation to, e.g. infrastructure, community institutions, human resources and costs		Forestry Unit, Community empowerment unit	Community organisations are empowered in the business development of products, marketing strategies, price negotiation, and other aspects

- Notes:
1. *BAPLAN*: Badan Planology (Planning Agency)
 2. *BPK*: *Bina Produksi Kehutanan* (Directorate General of Forestry Production Management)
 3. *DG*: Directorate General
 4. *RLPS*: *Rehabilitasi Hutan dan Lahan, dan Perhutanan Sosial* (Directorate General of Forest and Land Rehabilitation, and Social Forestry)
 5. *PHKA*: *Perlindungan Hutan dan Konservasi Alam* (Directorate General of Forest Protection and Nature Conservation)
 6. *BPN*: *Badan Pertanahan Nasional* (National Land Agency)

by local stakeholders is weak. Further, issues of land ownership have not been resolved appropriately on the ground.

3.6.2. The National Movement for Forest and Land Rehabilitation (GN RHL/Gerhan)

The MoF initiated the *GN RHL/Gerhan* programme in 2003 in response to the need to rehabilitate the increasing number of degraded areas. *GN RHL/Gerhan* focuses on the approach of generating people's involvement in forest and land rehabilitation by involving them in planting and maintenance. The programme is considered to be a strategic national initiative to restore and improve the function of forests and land, with the aim that eventually the carrying capacity of the forest, its productivity and roles can be maintained to provide services for human beings (Wibowo 2006). To support the implementation of *GN RHL/Gerhan*, rules and regulations based on ministerial decrees were drawn up; they include:

1. How *GN RHL/Gerhan* is to be implemented – *GN RHL/Gerhan* No. P.02/Menhut-V/2004
2. Guidelines to *GN RHL/Gerhan* implementation (Books 1 and 2) No. P.03/Menhut-V/2004
3. Standardised seedling prices for *GN RHL/Gerhan*, No. 272/MENHUT-V/2004
4. Seedling evaluations by universities, No. 393/Kpts-V/2003.

The *GN RHL/Gerhan* programme was claimed to be a moral movement to invite people's participation in forest and land rehabilitation activities (Santoso 2005). The total target area is 3,000,000 ha with a total planned budget of Rp 5.9 trillion (\pm USD 670.6) (Dirjen RLPS 2004; Ditjen RLPS 2003). This will be achieved gradually with 300,000 ha covered in 2003, 500,000 ha in 2004, 600,000 ha in 2005, 700,000 ha in 2006 and 900,000 ha in 2007. The target areas are located in 236 districts, in 68 priority watersheds in 27 provinces. The priority areas are critical watersheds with critical levels of degraded forest and land, vulnerable to natural disasters and with a low area of forest cover. Target areas should be important for dam protection, and should have effective community institutions. The programme was also planned to cover conservation areas of 20,952 ha in 2003; 39,450 ha in 2004; 47,340 ha in 2005; 55,230 ha in 2006; and 71,011 ha in 2007.

The programme has required a significant amount of funding, which has come from the bank interest of the Reforestation Fund (*Dana Reboisasi – DR*). In 2003 the programme budget required was Rp.1.5 trillion (\pm USD 170.5 million), in 2004 the budget required was Rp.1.7 trillion (\pm USD 193.2 million), and in 2005 it was Rp.1.6 trillion (\pm USD 181.9 million) (Anonymous 2003; Ditjen RLPS 2003). The late budget disbursement approaching the end of the year has also

hampered the implementation of this programme, which has been quite common with the previous programmes as well (Rumboko 2004). This has affected the programmes' effectiveness.

Rehabilitation activities through *GN-RHL/Gerhan* are implemented in defined degraded areas in all categories (Table 3-13). Over all categories, the highest area of degraded state forest is in the fixed production forests (4.7 million ha), and the lowest is in the conversion production forest areas (0.799 million ha). However, these figures are much lower than those for the areas outside state forest, which amount to 13 million ha. Consequently, there is a greater concentration of targeted rehabilitation activities in areas outside state forest. *GN-RHL/Gerhan* covers one-third of the total degraded areas (3 million ha). The remaining degraded areas are rehabilitated through other programmes, such as *DAK-DR* as discussed in Section 3.5.2.

Table 3-13. Degraded and targeted areas of *GN-RHL/Gerhan* by forest category

Forest category	Unit	Indicative degraded areas (all categories) ¹	Indicative areas (priority one) ²	Area targeted for first 5 years of <i>GN-RHL/Gerhan</i> programme	
				Option 1 ³	Option 2 (under <i>GN-RHL</i>) ⁴
1. Conservation forest	Ha	987,307	899,533	448,244	161,200
	%	(4.4)	(5.0)	(5.0)	(5.18)
2. Protection forest	Ha	2,489,247	2,372,533	1,182,248	425,500
	%	(11.1)	(13.1)	(13.1)	(13.68)
3. Fixed production forest	Ha	4,740,421	4,461,062	2,222,976	744,200
	%	(21.2)	(24.7)	(24.7)	(23.93)
4. Conversion production forest	Ha	799,425	698,841	348,237	178,450
	%	(3.6)	(3.9)	(3.9)	(5.74)
5. Outside state forest	Ha	13,333,989	9,629,204	4,798,295	1,600,000
	%	(59.7)	(53.3)	(53.3)	(51.46)
Total	Ha	22,350,389	18,061,173	9,000,000	3,109,350
	%	(100.0)	(100.0)	(100.0)	(100.00)

Source: Baplan 2003; Santoso 2005

Notes: 1. Indicative means the estimation based on satellite imagery. Categories of degraded area:

Category 1: bushes, open spaces, mixed agricultural crops and shrubs

Category 2: secondary forest and mangrove forest

Category 3: agricultural land, rice fields, mining areas, housing areas

2. Includes category 1 and 2

3. Option 1 includes all categories of degraded areas

4. Option 2 includes the priority categories 1 and 2 degraded areas, and was defined as the target areas for the current *GN-RHL/Gerhan* totalling three million ha

Universities were involved as independent witnesses to evaluate the seedlings prepared for planting, to ensure accountability. *GN RHL/Gerhan* also involves a range of agencies and stakeholders from central to district levels, in addition to the universities (Table 3-14). The Directorate General of Forest and Land Rehabilitation and Social Forestry (*Ditjen Rehabilitasi Hutan dan Lahan, dan Perhutanan Sosial – DG RLPS*), assisted by its Technical Implementation Units (*Unit Pelaksana Teknis – UPT*) are responsible for planning and technical development. *UPT* is the smallest technical unit and has the task of implementing project management at the site level. The Watershed Management Center (*Balai Pengelolaan DAS – BP DAS*), as one of the *UPTs* under *DG RLPS*, has the responsibility of ensuring seedling supplies at the project site. In the past, the Watershed Management Center was called the Center for Land Rehabilitation and Soil Conservation (*Balai Rehabilitasi Lahan dan Konservasi Tanah – BRLKT*).

BP DAS is the main implementing agency at the site level because the watershed has been defined as the unit of planning, control and management in implementing forest and land rehabilitation programmes (Santoso 2005). The watershed is considered to be the hydrological unit that can accommodate the interests of communities living in both upstream and downstream areas, and of multi agencies/institutions managing land for various purposes (Santoso 2005). The watersheds are used also to manage both on-site and off-site impacts.

The agencies are responsible for implementing *GN-RHL/Gerhan* according to the following forest classifications (Baplan 2003):

- Conservation forest (including National Park): Institute for Natural Resources Conservation (*Balai Konservasi Sumberdaya Alam - BKSDA*) and Institute for National Parks (*Balai Taman Nasional*)
- *Taman Hutan Raya-TAHURA*: Forestry services at provincial and district levels
- Protection forest: Forestry services at district/municipality levels.
- Production forest: Forestry services at district/municipality levels, private and/or state companies
- Outside state forest: Community, private and/or state companies

For the monitoring and evaluation stage, the overall Programme Monitoring Team consists of five components:

1. The programme monitoring team at the central level (*Tim pengedali tingkat pusat*) assigned by Decree of the Coordination Minister for Social Welfare (*Menko Kesra*)
2. The regional development team (*Tim pembina wilayah*) assigned by Decree of the Minister of Forestry

Table 3-14. Responsibilities of agencies involved in *GN RHL/Gerhan*

Responsibility	Agencies involved
Planning and technical development	DG RLPS and its relevant UPT (Technical Implementation Units)
Supplying seedlings	Watershed Management Agency (<i>Balai Pengelolaan DAS</i>)
Planting and implementing the rehabilitation	Local government in district/municipal areas
Seedling evaluation and field activity performance	Independent universities (Forestry and Agriculture Departments)
Monitoring and evaluation	Central and provincial government as members of the Programme Monitoring Team

Source: Wibowo 2006

3. The programme monitoring team at the provincial level / (*Tim pengendali tingkat propinsi*) assigned by Decree of the Head of the Provincial Government (Governor)
4. The programme monitoring team at the district/municipal level / (*Tim pengendali tingkat kabupaten/kota*) assigned through a Letter of Decree of the Head of a District/Municipality
5. National monitoring through the Inspectorate General of the MoF, Agency for Financial Inspection (*Badan Pemeriksa Keuangan – BPK*), Agency for Development Inspection (*Badan Pengawasan Pembangunan – BPKP*), and Agency for Regional Development (*Badan Pengawasan Daerah – Bawasda*) at the provincial level.

The Director General of RLPS, MoF admitted that the implementation of *GN-RHL/Gerhan* in past years had failed in the outer islands, but not in Java (Anonymous 2006^b). In 2003, *GN-RHL/Gerhan* was implemented in 15 provinces covering 26 watersheds; while in 2004 it was implemented in 31 provinces covering 141 watersheds and 374 districts/cities (Santoso 2005). The survival rates in 2004 ranged from the lowest at 17% in Indramayu District of West Java to the highest at 100% in Banjarnegara and Grobogan District of Central Java (Santoso 2005). As there had been no comprehensive independent assessment of the implementation on the ground of *GN-RHL/Gerhan*, the Minister of Forestry, M. S. Kaban, ordered a comprehensive audit of the programme. The results of the audit will serve as the basis for a decision on the continuation of *GN-RHL/Gerhan* (Anonymous 2006^b). Inputs from various stakeholders suggested that it would be better to redirect the budget allocated for *GN-RHL/Gerhan* to support the community based industrial plantation of *HTI Rakyat* (*Hutan Tanaman Industri Rakyat*) (Anonymous 2006^c). However, redirecting and redesigning the programme is better than discontinuing it, which could lead to wasted government funding for unfinished outputs.

3.7. Summary

Slowly, the focus of the forest management concept has shifted from privately based and large-scale management to smaller-scale community-based forest management, especially since Reformation in 1998. Forest rehabilitation policies took a mainly ‘top down’ approach from the 1950s to the 1970s and then towards the end of the 1990s, they became more conceptually participative. Between the 1980s and the mid 1990s, the rehabilitation initiatives were in transition. Rehabilitation started to be managed intensively once the Ministry of Forestry (MoF) became an independent ministry in 1983 (separated from the Ministry of Agriculture). Since 1955, the government divided rehabilitation efforts into the two categories of reforestation (*reboisasi*) and afforestation or regreening (*penghijauan*). Reforestation focuses on formerly state forested areas; and afforestation on unforested community areas outside state forest.

Forest classification, following the policy on Forest Land Use by Consensus (*Tata Guna Hutan Kesepakatan - TGHK*) defined and introduced in 1984, has been used to plan approaches and programmes aiming for better targeted rehabilitation initiatives. Six years later, the *TGHK* was overlaid with the *RTRWP* – the spatial management plan related to provincial land areas. These two formed the basis for the design and control of the development of the Right of Forest Exploitation (*Hak Pengusahaan Hutan – HPH*), Industrial Plantation Forest (*Hutan Tanaman Industri – HTI*), and estate crop plantations so as to minimise their negative impact on the environment by reducing the rate of conversion of natural forest. The conflicts over land boundaries between communities and other parties (i.e. local government, private and state-owned companies) have impeded the implementation of the policy on the ground. The development of *HTI* using fast-growing tree species has become the main approach of rehabilitation programmes since 1988. However, success stories have been few, and the programme has even created more severely degraded forest areas, and has caused the true worth of the existing rehabilitation programmes to be put into question. The *HTI* planting realisation rate has been low and may not be the right approach to rehabilitating the ex-logging areas. In general the areas were logged using selective cutting techniques and then totally cleared during the land preparation stage. The area was then planted but mostly with fast growing tree species. The development of *HTI* has led to areas being abandoned since most companies are more interested in the clear felling of the remaining standing stock, in logged over areas, instead of developing plantations.

To ensure that *HPH* concessionaires practise the principles of sustainable forest management, the contract requires them to apply the Indonesian System of Selective Cutting and Planting (*TPTI*) that was introduced in 1989, replacing the Selective

Cutting System (*Tebang Pilih Indonesia – TPI*). *TPTI* was then replaced by the System of Selective Cutting and Line Planting (*Tebang Pilih Tanam Jalur - TPTJ*) for lowland forests. Concessionaires then have an obligation to comprehensively undertake reforestation and promote regeneration. Due to a lack of supervision of the implementation, and the inconsistent umbrella regulations, many *HPH* were revoked, and huge logged-over areas became open access. Responsibility for the rehabilitation of these areas was then far from clear. This situation would not have occurred had the concessionaires been made responsible for the rehabilitation of these areas.

Highly degraded forest areas are often produced in the aftermath of inconsistent policies. The discontinuity of rehabilitation policies regarding the rehabilitation programme, assigned to state-owned companies (Inhutani I to V), well reflects this. After only three years into its implementation, the programme was put-on-hold and then simply left hanging with no clear hand-over provided. Approximately, 5.5 million ha of logged over areas were returned to the Ministry of Forestry, who then handed over the areas to the provincial governments with no subsequent budget. Due to a lack of funding and human resources to implement supervision or any development investment, these areas have also become ‘open access’, and subject to illegal logging.

Since 1999, the rehabilitation programmes implemented under the new Regional Autonomy Policy have had to deal with greater pressures on rehabilitated areas and forests, such as forest encroachment. The Master Plan for Forest and Land Rehabilitation (*Master Plan Rehabilitasi Hutan dan Lahan* or MP-RHL) was developed in 2000 and used as the basis for planning. In 2003 the MoF initiated the National Movement for Forest and Land Rehabilitation Programme (*Gerakan Nasional Rehabilitasi Hutan dan Lahan - GN-RHL/Gerhan*), in response to the need to rehabilitate the increasing number of degraded areas.

The current government regulation on Reforestation Funds (*Dana Reboisasi – DR*) is PP No. 35, was introduced in 2002 to replace PP No. 6/1999. The regulation states that forty per cent of the funds are to be reallocated to the provinces that have contributed to the central government’s Reforestation Funds - called the ‘contributing provinces’. The programme developed under this funding is called the Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus – Dana Reboisasi - DAK-DR*). This has been in operation since 2001 under the coordination of the district governments. The objectives of the programme are: to facilitate community participation in rehabilitation activities by providing assistance to design the activities, develop community institutions and provide technical assistance to implement the activities planned. No recorded data on the

realisation of the area rehabilitated under this programme could be obtained. It was, therefore, thought to have faced many problems and considered not to have been very successful.

Sixty per cent of the funds collected are allocated to the Ministry of Forestry to finance the rehabilitation projects in non-contributing provinces (provinces that have not contributed to the central government's Reforestation Funds). The allocation is based on a 5-year rehabilitation plan designed jointly by the Minister of Forestry and Minister of Finance. The funds are allocated to cooperatives, forest farmer groups and other organisations with the legal status to implement the rehabilitation project on the ground through a lending scheme, which is designed as a revolving fund.

The recent national government-initiated rehabilitation is the National Movement for Forest and Land Rehabilitation (*Gerakan Nasional Rehabilitasi Hutan dan Lahan -GN RHL/Gerhan*), which was launched at the end of 2003. Funding for *GN-RHL/GN-RHL/Gerhan* comes from the central government's portion of *DR* funds. However, the annual procedure in proposing the activities to be funded is quite complicated. The working plans composed by the Ministry of Forestry for this programme should be discussed in a series of discussions with, and on approval obtained from, the People's Consultative Assembly (*Dewan Perwakilan Rakyat - DPR*), National Development Planning Board (*Badan Perencanaan Pembangunan Nasional - Bappenas*), and Ministry of Finance. The whole process takes about a year, in which there is given little time for adequate preparation between budget realisation and actual implementation.

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Chapter 4.

The historical national overview and characteristics of rehabilitation initiatives

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Indonesia has a long history of forest rehabilitation, dating far back beyond the country's independence in 1945. It started as a spontaneous activity encouraged by culture and beliefs, and subsequently evolved into planned and systematically developed programmes and projects implemented in priority areas. The form that each rehabilitation initiative took was influenced by causes of forest and land degradation, driving forces related to the time of implementation, and status of the rehabilitation area. Understanding the features of different rehabilitation initiatives, and factors influencing the approaches, provides important lessons learnt in designing future rehabilitation programmes. The approaches, objectives and techniques have evolved gradually, since the beginning of the rehabilitation initiatives. Changes discussed in detail in this chapter are: important features of the rehabilitation projects and the major impediments and constraints for ensuring the sustainability of rehabilitation initiatives. All of the discussions in this chapter are drawn and summarised from the analysis of literature reviews supported by a preliminary database, Database 1, and Database 2 compiled during this study. Detailed results of the analysis are included in Appendices 5 and 6.

4.1. Important features of past rehabilitation initiatives

The national overview of rehabilitation initiatives can be divided into six major periods: pre-colonial to colonial, colonial to 1960s, 1960s to 70s, 1970s to 80s, 1980s to 90s, and 1990s onwards. The pre-colonial to colonial period covers initiatives practiced by the traditional Hindu communities, who migrated to Java bringing teak seeds with them around the year 200AD. The Hindu community venerated the teak trees and treated them as ‘world trees’ believing that they arose from the souls of their ancestors. This concept encouraged the Hindu community to plant as many teak trees as possible, since these trees would generate benefits for them and for future generations. In this way, the people would be protected by the souls of their ancestors. This concept altered the vegetation of Java, which became an area rich in teak forests covering some 1–1.5 million ha (Wibowo 2006).

The colonial to 1960s period included the implementation of rehabilitation activities initiated by the colonial government and the Government of Indonesia (*GoI*) after independence in 1945. During the Dutch colonial period, the most important initiative was the introduction of rehabilitation funds, or *Bosfonds*, which were derived from taxes levied on converting downstream forests into agricultural or estate land; these funds were used to rehabilitate the upstream areas (Ditjen RLPS 2003). Evidence of the successful implementation of this tax system can be seen today in the pine forests of Aek Nauli, North Sumatra (Mursidin *et al.* 1997). No rehabilitation efforts were made during the Japanese colonial era, despite the fact that forest areas became increasingly severely degraded between 1942 and 1945. This degradation was due to forest conversion for agricultural crop development to maintain supplies for the Japanese army during the war (Mursidin *et al.* 1997).

The subsequent categories refer to various clusters of government initiatives catering for different focuses influenced by different driving factors from the 1970s to 1990s and onwards. Between 1950 and 1970 rehabilitation initiatives were mostly government-driven projects, and in the 1970s and 1980s projects were aimed at rehabilitating forest areas degraded as a result of extensive logging activities, mainly in Java, and increasing numbers of devastating natural disasters. Declared as a national natural disaster, the major floods in the late 1970s in Solo, Central Java, were the main turning point for the introduction of more serious government initiatives (Ditjen RLPS 2003; Mursidin *et al.* 1997).

Another approach to categorise rehabilitation initiatives is based on the implementation of forest rehabilitation policies¹, which was a ‘top down’ approach from the 1950s to the 1970s; between the 1980s and the mid 1990s, the rehabilitation initiatives were in transition; and then conceptually became more participative towards the end of the 1990s. During the top-down period (1950s–70s), the main driving factors behind rehabilitation were floods and other natural disasters, and initiatives were characterised by the Mass Mobilisation Programme. This programme was implemented through a series of campaigns to encourage public involvement in planting trees in various areas, including people’s own home gardens. In the 1980s, the government reformulated the rehabilitation initiatives because of the urgent need to increase forest cover and meet the increasing national demand for wood from, for example, pulp and paper processing companies. The main driving factor behind the rehabilitation initiatives was forest exploitation, which resulted in vast areas of deforestation. The main aim of the programme was to develop large-scale Industrial Plantation Forest (*Hutan Tanaman Industri - HTI*). At the end of the 1990s, the government took important steps to reformulate forest rehabilitation initiatives. This reformulation focused on efforts to diversify the rehabilitation strategies to accommodate the objective of improving community incomes through a participatory approach. The main driving factors at this point were extensive forest encroachment and illegal logging.

4.1.1. The rehabilitation initiatives and project areas have increased sharply to more than double since the 1980s

In 1946 the Government of Indonesia (GoI) formed the Reforestation Committee, which comprised members from the ministerial agencies, to rehabilitate a degraded area of 110,000 ha left by the Japanese (Mursidin *et al.* 1997). However, the committee’s plans did not produce results of any significance. Since then, various programmes have been initiated in response to different driving factors (Ditjen RLPS 2003; Mursidin *et al.* 1997). Before the 1960s, most initiatives were small in scale and implemented sporadically. Since 1961, when the first President of Indonesia inaugurated the first annual National Afforestation Week (*Pekan Penghijauan Nasional*), rehabilitation initiatives have become national programmes and implemented throughout the country. The National Afforestation Week was conducted regularly every year up to 1996 and was usually implemented for small-scale areas. Since, this was mainly ceremonial in nature, attended by the president and high level people, the implementation required an expensive budget with unclear impacts on the ground.

¹ Based on a series of discussions in the Ministry of Forestry (2003, 2004), in expert group meetings (2004, 2005), and personal interviews with different experts (2003, 2004)

Up until the 1980s, only one rehabilitation project had been implemented in fire-affected areas. Rehabilitation initiatives in fire-affected areas began in earnest in the 1980s and 1990s following the destruction of millions of hectares of forest, caused by extensive forest fires in 1982/83 and 1997/98. In the most recent period (1991 to 2004), the number of projects implemented in burnt areas has increased threefold. The average project area (in fire-affected areas) was also significantly larger, i.e. 118,716 ha, than in logged-over areas, i.e. 40,535 ha.

In the 1980s and 1990s, logging operations became more intensive on the outer islands (Sumatra and Kalimantan), and rehabilitation programmes were directed towards increasing productivity and establishing plantation forests, using fast growing species under large-scale plantation management. Since the late 1990s the deforestation rate has become an increasingly serious problem, and earlier rehabilitation projects have not shown significant results. It has been estimated, from our preliminary database, that more than 150 rehabilitation projects were implemented in about 400 locations between 1950 and 2003. The number of projects and areas has increased sharply since the 1980s to more than double during the 1990s to 2004. As also reflected from Database 1, government agencies at national and provincial levels implemented 42% of the rehabilitation initiatives. However, starting in 1981, the projects were mostly implemented jointly, such as with NGOs or local governments.

In line with the increasing numbers of projects, the budget required to fund these activities has had to increase accordingly. In the 1980s there was no shortage of

Table 4-1. Distribution of projects by implementing agencies, 1960s–2004

Implementing agencies	Period				Total
	1960–70	1971–80	1981–90	1991–2004	
National and provincial government	8 (89%)	11 (85%)	12 (41%)	11 (22%)	42 (42%)
Private and state-owned companies ^a	0 (0%)	0 (0%)	3 (10%)	6 (12%)	9 (9%)
Joint initiatives ^b	0 (0%)	2 (15%)	14 (48%)	31 (62%)	47 (47%)
Other ^c	1 (11%)	0 (0%)	0 (0%)	2 (4%)	3 (3%)
Total	9 (100%)	13 (100%)	29 (100%)	50 (100%)	101 (100%)

Notes:

a. State-owned companies

b. Multi-agency initiatives, including local governments, NGOs

c. Independent initiatives by local governments or NGOs independently

Source: Database 1

international (and national) donors to fund various projects, which focused their efforts on secondary forests and logged-over areas. Then during the 1990s there was much greater involvement by donor agencies such as the Food and Agriculture Organisation (FAO), United Nations Development Programme (UNDP), Asian Development Bank (ADB), Finnish International Development Agency (FINNIDA), Japan International Cooperation Agency (JICA) and International Tropical Timber Organisation (ITTO). From the 1960s to 2003 (Figure 4-1), government-based projects accounted for as much as 45% of the projects included in the preliminary database (this study), while donor-based projects accounted for only 23% of these projects. In the mid-1990s, many joint projects were initiated, and private companies and their association (*Asosiasi Pengusaha Hutan Indonesia – APHI*) implemented various small-scale rehabilitation efforts independently.

More projects were also implemented outside state forest. These were, however, smaller in area, i.e. an average of 1,495 ha, compared to the projects inside state forest areas, i.e. an average of 127,067 ha. During the top-down approach period, projects covering a small area predominated. However, during the transition period (1990–97) and since the introduction of participatory approach (1998–present) most projects have been implemented on a large scale, particularly inside state forest. The involvement of communities in the rehabilitation initiatives enables large areas to be covered, since it is easier to recruit the necessary labour.

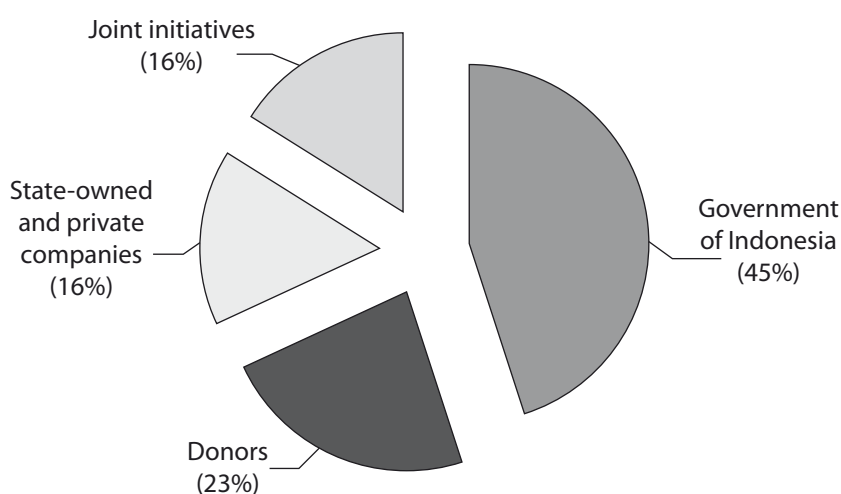


Figure 4-1. Project distribution according to funding sources (1960s -2003)

Source: Preliminary database

Table 4-2. Project distribution based on location and areas covered (1960s-2003)

Project location	Area covered (ha)			Total
	< 100	100–1000	> 1000	
State forest	4 (14%)	3 (10%)	22 (76%)	29 (100%)
Outside state forest	33 (77%)	6 (14%)	4 (9%)	43 (100%)
Inside and outside state forest	0 (0%)	3 (27%)	8 (73%)	11 (100%)

Source: Database 1

4.1.2. Rehabilitation objectives: from conservation to improving community welfare

The driving forces behind the rehabilitation initiatives, and their objectives, have been strongly influenced by the focus of the forestry management in the different periods. Those behind the rehabilitation initiatives during the pre-colonial period were culture and beliefs. During this period the objectives of rehabilitation were to protect human beings and to assure a better life for future generations by planting teak. At the project level, the driving factors behind rehabilitation initiatives, according to the perceptions of the community members and project staff, covered socio-economic, political and ecological aspects. The evolution of driving forces and the objectives of the national rehabilitation initiatives, in Indonesia, have focused mainly on soil and water conservation, improving forest and land productivity, and improving community welfare.

a. Soil and water conservation

The overexploitation of natural resources, during the Dutch and Japanese colonial periods, was the main driving force behind rehabilitation efforts during the colonial to 1960s period. The main objectives were to maintain the forest hydrology through soil and water conservation and forest regeneration, based on the *taungya* system.

Soil and water conservation have been defined as efforts to maintain, rehabilitate and increase land use capacity according to the land use classification (Departemen Kehutanan 1998). Therefore the aim of soil and water conservation practices is to increase land productivity and to minimise the negative impacts of land management (particularly tilling) such as erosion and sedimentation (BP2TPDAS 2002). In principle, there are three methods of soil and water conservation, i.e. vegetative, physical-mechanical and chemical (Agus and Widiyanto 2004; Arsyad 2000). The physical-mechanical method is more popularly called the civil structure method.

Soil and water conservation, particularly after the major floods in watersheds around Solo in 1966, was the main focus of rehabilitation initiatives until the 1970s. From the 1960s to 70s, natural disasters determined the need to overcome soil erosion in upland areas associated with serious flooding, due to inappropriate agricultural practices and deforestation. As a result of monitoring the increasing levels of sedimentation in several watersheds in West, Central and East Java (Mursidin *et al.* 1997), concerns were raised regarding soil erosion in the upstream areas of Java. During the 1970s and the 80s extensive logging practices that caused natural disasters and created more severely degraded areas, continued to be important driving forces behind rehabilitation initiatives. In the early 1970s most of the degraded areas were concentrated only on Java. Implementing conservation farming in sloping areas by applying soil and water conservation methods, which combine vegetative and physical-mechanical or civil structure techniques, were the most effective and wide spread, practiced particularly in Java.

Projects were initiated mostly to overcome the problems of soil erosion in steep upland areas and the associated severe flooding that resulted from deforestation and a range of agricultural practices. Agricultural intensification, to improve the community's ability to be self reliant in terms of food crop production, began to be incorporated also into project objectives in the mid 1970s and early 1980s. The first conservation project to include an income generation aspect was the initiative funded by FAO in 1973 (Mursidin *et al.* 1997). Under the Upper Solo Watershed Protection Project, different models for managing watersheds and soil and water conservation techniques were tested, with the objectives of controlling the floods and managing the land of the surrounding upstream watershed areas, in order to provide productive farm areas for local people (Ditjen RLPS 2003; Pasaribu 2003). Further discussion on conservation techniques implemented is included in Section 4.1.3d.

Since 1984, when the *TGHK* was implemented, conservation has become the specific objective of rehabilitation initiatives in protection and conservation forests. The main objective of rehabilitation initiatives in protection forests is to improve ecological functions, and in conservation forests to conserve biodiversity. However, the efforts have not been very effective and hampered by problems of illegal logging, forest fires and forest encroachment, due to increasing population pressures and land-use competition.

b. Improving forest and land productivity, and community welfare

Extensive areas of severely degraded forest, due to the irresponsible practices of logging companies, continued to be the main driving forces behind rehabilitation programmes in Indonesia during the 1980s and the 90s, not only on Java but also on outer islands such as Sumatra and Kalimantan. The main objectives of

the various rehabilitation initiatives then were to restore the productivity of forest land and to conserve the forest ecosystems. The programmes involved the rehabilitation of ex-logging concessions by establishing *HTI* with fast growing species, mainly in Sumatra, Kalimantan and Sulawesi (Widarmana 1984). This mainly aimed to increase productivity so as to reduce pressure on natural forests. However, as discussed in Chapter 3, not all the plantations were developed on degraded areas, resulting in more degraded forest areas that then needed to be rehabilitated.

At the project level, the driving factors have become more complicated since the 1980s, especially those regarding socio-economic aspects, which originated from low forest cover and productivity. They included poverty or low community income, limited livelihoods, a lack of timber supply, diminishing non-timber forest products, and at the same time there was also the need to raise awareness, and to deal with the high population growth. The main objectives of the rehabilitation projects were then to increase forest and land cover, to produce timber, fodder, and fuel wood, and at the same time to also protect watersheds in order to maintain the ecological function of the forest and to conserve soil and water. Increasing forest and land cover will reduce surface water-flow, and this in turn will contribute to reduced flooding and sedimentation. Increasing forest and land cover as well as conserving watersheds will increase timber and non-timber forest products.

During the 1980s and 90s low forest productivity and cover, soil erosion, floods, fires and a lack of water resources were some of the more dominant and complicated issues that resulted in the need for forest rehabilitation. Actually, erosion, floods and a lack of water resources are all impacts of low forest cover. Therefore, decreased forest cover and forest and land productivity were the main driving factors behind the ecological aspects of rehabilitation initiatives, while floods and sedimentation were indirect driving factors. Floods and landslides tend to be very strong and emotional driving factors for policy and project funding. Ecologically, where forest cover is low the forest cannot fulfil its role as a buffer to protect the environment, which it does mainly by protecting soil from erosion and conserving water. This may exacerbate the impact of natural disasters such as landslides, floods, etc. Basically, rehabilitation activities try to increase land cover by planting trees that provide optimal cover by forming a multi-structured canopy.

Since the 1980s, there has also been increasing pressure from the international community for better forest management, including the rehabilitation of degraded forest areas. Emerging initiatives from various agencies have forced the political body to address rehabilitation of degraded areas in order to reduce international criticism. This situation arose in the 1980s, when funding support from donors

and the emergence of multi-stakeholder initiatives (external pressures) were the dominant driving factors behind rehabilitation.

From the 1990s up to the present, the driving forces behind rehabilitation programmes have been more complicated problems to include severely degraded areas due to over-logging, forest fires, forest conversion, forest encroachment and illegal logging. Having multiple objectives has become an important feature of these initiatives from the late 1990s. Specifically, rehabilitation programmes have accommodated objectives that improve community welfare and produce more timber from plantation forests. This has been in order to meet the national demand for timber by rehabilitating critically degraded land both inside and outside state forest.

The factors influencing the rehabilitation projects have also become very complicated as a result of political changes. In the beginning of the Reformation Era, the transition from a centralised to a decentralised government system, and inappropriate forest management were followed by the revocation of the rights of many forest concessionaires and *HTI* concessionaires. The latter has left the government with a vast area of logged-over forest to be rehabilitated.

At the project level, respondents stated that creating employment or livelihood opportunities was very important for projects initiated from 1997 to 1999. Programmes were initiated with the objective of improving the economic situation of local communities by involving them in forestry management. Community forestry, under a variety of names, was an aspect of the *Hutan Kemasyarakatan (HKm)* programme in 2001 and *Usaha Perhutanan Rakyat* programme in 2002 (Ditjen RLPS 2003). *HKm* was a community forestry programme designed to give communities the opportunity to be involved in and to have access to forest management inside production and protection forests. Model forests were to be developed with species preferred by the community involved. *HKm* projects received funding from: the Japanese Overseas Economic Cooperation Fund (OECF) for 19,500 ha; the German Gesellschaft für Technische Zusammenarbeit (GTZ) for 6,731 ha in West Kalimantan; in collaboration with Perhutani, for 3,500 ha in West and East Nusa Tenggara; and from the Japan International Forestry Promotion and Cooperation Centre (JIFPRO) for 430 ha (Santoso 2005). Despite this growing intention to address the issues of improving the local economic conditions, only 19% of the projects in Database 1 identified the specific intended beneficiaries of their initiatives, which were the local community, farmers and farmer groups.

The beginning of the Reformation Era also influenced the objectives of rehabilitation programmes initiated after 2000. Issues that were to be addressed in

these programmes included: increasing the distribution of benefits to the people who live in and around forest areas and the involvement of the local communities in the programmes. As discussed in Chapter 3, two large programmes were initiated that emphasised increasing community participation: *GN RHL* (*Gerhan*) and *DAK-DR* programmes. Another initiative was the Seeds for People Programme. The Programme ‘Seeds for the People’ was one of the programmes initiated by the Directorate General of Land Rehabilitation and Social Forestry and was supported by Ministerial Decree No 973/*Menhut*-V/2001 (Ditjen RLPS 2003). Its main objectives were to accelerate the involvement of local institutions in producing seedlings to support planting activities, form seedling production units for superior/prime local species, and to undertake forest rehabilitation activities, thereby increasing the quality and quantity of plantations in community forestry areas. In this programme, the government acted as a facilitator while the community acted as the main implementer, undertaking activities ranging from planning – including proposal writing – to implementing the programme in the field. Under the programme the plan was to develop 30 demonstration plots in 15 provinces for the first 5 years of implementation (2002–06). In 2002, the first three demonstration plots were developed in Lumajang (East Java), Jembrana (Bali) and Sumedang (West Java).

Based on further analysis, it was observed that creating employment or livelihood opportunities was very important for past projects during the transition period due to the national economic crisis between 1997 and 1999. Community members and project staff agreed that projects implemented inside state forests provided more employment opportunities compared to projects implemented outside state forests. Securing access to land was important for projects involving communities in state forests, particularly those that are still on going. The project objective to increase the importance of rehabilitation projects as a part of the Raising Environmental Awareness Programme was significantly important for rehabilitation projects on community lands (outside state forests), since this often was not part of the project design.

4.1.3. Rehabilitation approaches: from promoting awareness to diversified technical intervention

During the pre-colonial period the main rehabilitation approach was a cultural one. People planted teak seedling because of cultural beliefs (see the first paragraph of this chapter). Then, in the colonial to the 1960s period, sporadic small-scale planting and use of natural regeneration techniques were used. From the 1960s to 90s the approach to rehabilitation changed direction dynamically. The focuses ranged from promoting awareness of the impacts of inappropriate agricultural practices and deforestation, to the development of large, fast growing plantations

using exotic species, such as *Acacia*, and farm forestry. However, government agencies at the central and provincial levels have always led the initiatives.

a. Management approach and leading agencies

In 1961, the Ministry of Agriculture and Agrarian formed a committee called the Committee to Save the Forest, Land and Water (*Panitia Penyelematan Hutan, Tanah dan Air*), whose task it was to plan the actions required by the government to preserve soil fertility, improve the hydrological cycle within watersheds and maintain the sustainability of biodiversity in Indonesia (Ditjen RLPS 2003). One of the results of this committee's recommendations was the decision to hold an annual National Afforestation Week; this was first launched in 1961 and was the main activity (*puncak kegiatan*) designed to disseminate information. It acted as an extension programme to promote/campaign for the importance of saving forests, soil and water.

Before 1964, the authority for managing forests was assigned to the Forestry Agency (*Jawatan Kehutanan*). However, the management of forests in East Java, Central Java, West Java, and parts of Kalimantan was assigned to a state company whose main activity was logging (Mursidin *et al.* 1997). In 1964, the MoF was formed, but it was immediately abandoned because the areas of activity that it was assigned overlapped with those of other institutions that had already been given the responsibilities (Ditjen RLPS 2003).

In 1983, the MoF was reformed (based on Presidential Decree, *Kepres* RI No. 4/M/1983) and five directorate generals were also formed, including the Directorate General of Reforestation and Land Rehabilitation - DG RLR (*Direktorat Jenderal Reboisasi dan Rehabilitasi Lahan - Ditjen RRL*) (Ditjen RLPS 2003). The field project-based technical unit, Afforestation and Reforestation Development and Planning Project for Watershed Management (*Proyek Perencanaan dan Pembinaan Reboisasi dan Penghijauan Daerah Aliran Sungai-P3RPDAS*), was promoted and became the technical management unit of the DG RLR and referred to as Centre/Sub-Centre for Land Rehabilitation and Soil Conservation (*Balai/Sub Balai Rehabilitasi Lahan dan Konservasi Tanah - BRLKT/Sub BRLKT*).

In 1999, this became The Watershed Management Centre (*Balai Pengelolaan Daerah Aliran Sungai -BPDAS*) assigned to support local authorities into the implementation of forest and land rehabilitation and soil conservation. This followed the restructuring of the Directorate General of Land Rehabilitation and Social Forestry - DG LRSF (*Direktorat Jenderal Rehabilitasi Lahan dan Perhutanan Sosial - Ditjen RLPS*) based on Ministerial Decree (*SK Menhut*) No. 245/Kpts-II/99) with the objective of increasing the roles and adjusting the authority of the staff to anticipate the complexities of rehabilitation and social forestry.

b. Watersheds as the unit of management and the focus in the rehabilitation initiatives

Watersheds have been the focus of rehabilitation efforts since colonial times, when the Dutch government introduced *Bosfonds*, which were fees/taxes collected for converting forest to agricultural and estate fields in the downstream areas. The fees were then used to rehabilitate the upstream areas (Ditjen RLPS 2003; Mursidin *et al.* 1997). The use of the watershed as the unit of planning for natural resource management was formalised in 1988 as part of the national development strategy, which has increased and clarified the role of the watershed (Baplan 2003). The US Environmental Protection Agency (EPA) defines a watershed as a geographic area in which water; sediments and dissolved materials drain into a common outlet (Reimold and Singer 1998). The common outlet may be a stream, lake, estuary or ocean. The watershed management principle is based on participatory management involving various sectors and sub-sectors interested in gaining the benefits from watershed management (Baplan 2003).

Degraded watershed areas have seriously affected the fluctuation of the maximum and minimum water debit, increasing sedimentation and decreasing land productivity, causing floods, drought and landslides. There are 62 priority watershed areas requiring rehabilitation in Category I, 232 in Category II and 178 in Category III (for definition of categories see Baplan 2003; Ditjen RLPS 2003). The watershed (integrated watershed) became the main unit in the management approach taken by the Master Plan for Forest and Land Rehabilitation developed in 2000 (Baplan 2003). The main reasons for this are that the watershed approach is more holistic; it can be used to evaluate the interrelations between biophysical factors and the intensity of social, economic and cultural activities from upstream to downstream; and the watershed approach can be used to evaluate environmental impacts faster and more easily (Ditjen RLPS 2003). Reasons for using watersheds as units of measurement of environmental quality also argued by NRC (1999) are: 1) A watershed provides a logical boundary system and conceptual unit for ecosystem management because the concept of a watershed recognises the important role of water in biological relationships, and 2) A watershed is easily recognised, and this enables the managers to measure and monitor the basic physical and chemical components of the ecosystem. Wibowo (2006) stated that the management of the upstream area is very significant as it affects the sustainability of environmental functions that support the life of people living downstream. In fact, the role of the upstream area has not been adequately appreciated. In the future, appreciation of and/or compensation for the sustainable management of the upstream area should be manifested in a contribution by the people living downstream to those living upstream.

However, there have been some problems in relation to watershed management: 1) uncertainty about the effectiveness and relevance of the planning system for watershed management; 2) planning being insufficiently powerful to be accepted at the field level; 3) planning being out of step with local government regulations; and 4) criteria and indicators for monitoring and evaluation being insufficiently comprehensive and not well-developed (Widyaningtyas 2005; BPDAS 2003; BTPDAS 2002).

c. Promoting awareness

From the early 1950s to the mid 1970s the main approach of the rehabilitation programmes initiated was to focus on promoting community awareness. The focus had been mainly on overcoming the negative impacts of inappropriate agricultural practices. This often included providing technical knowledge about soil and water conservation. Programmes initiated during this period used national campaigns and ceremonial events to influence the wider targeted community. One such programme was *Karang Kitri*, a movement initiated in October 1951 (1951–60), which was a national campaign for the community to plant up their home gardens and other land. No incentives were provided in this programme. A similar programme was the annual celebration of the National Rehabilitation Week, inaugurated by former President Soekarno, which started on 17 December 1961, in the Puncak, Bogor, West Java (See Appendix 4). More intensive programmes were implemented following the major flooding of the Solo Reservoir in Central Java in 1966. Since 1976 the dominant approach of the main rehabilitation projects has changed from soil and water conservation to integrated protection management of watersheds (Mursidin personal communication, 2004).

During the 1970s–80s, project approaches focused on promoting awareness through intensive forestry extension programmes, and incentives were given to the community to rehabilitate critical land along watersheds. One example was the National Crash Programme on Land Rehabilitation and Soil Conservation (*Rehabilitasi Lahan dan Konservasi Tanah – RLKT*), which was based on Presidential Instruction (*Instruksi Presiden - Inpres*) No. 8 in 1976 on Reforestation and Afforestation (Ditjen RLPS 2003; Mursidin *et al.* 1997). This initiative was widely known as the *Inpres* Project.

Forestry Extension Field Officers (*Penyuluh Kehutanan Lapangan – PKL*) played an important role during the initial implementation of the *Inpres* Project on Reforestation and Afforestation, with the focus on the Community Movement Programme (Santoso 1992). The approach was based on watershed management. The technical development was implemented by *P3RPDAS*. Provincial

governments (Forestry Services) undertook reforestation inside state forest, while district governments (Forestry and Land Conservation Services) undertook afforestation outside state forest.

The development of demonstration plots has always been an important part of community awareness programmes. The recent national programme used demonstration plots in an effort to sustain natural resources (*Unit Percontohan Usaha Pelestarian Sumberdaya Alam - UP UPSA*) and the sedentary farming system (*Unit Percontohan Usaha Pertanian Menetap - UP UPM*). This programme was implemented from 1990 to 2001, in degraded forest and on critical land to serve as a learning medium and raise awareness of land uses and agricultural practices with a focus on environmental sustainability. These demonstration plots were developed in 25 provinces. Other demonstration plots were used to study techniques for the rehabilitation of burnt areas, and the conversion of *Imperata* grassland to plantation forest. Research covering technical and socio-economic aspects of reforestation has been conducted at the demonstration plots, such as rehabilitation techniques, species trials on *Imperata* grassland, planting patterns and agroforestry systems etc. Gintings and Semadi (1980) established a demonstration plot at Tanjung Bintang, South Lampung, of about 10 ha on a former shifting cultivation area dominated by *Imperata* grass.

The Forest Research and Development Agency (FORDA) in collaboration with FAO/Asia Pacific Agroforestry Network (APAN) established a demonstration plot to study soil and water conservation techniques, both vegetative and 'civil structure' methods, in Pengaron Subdistrict, Banjar District, South Kalimantan Province. Murniati *et al.* (2001) reported that the vegetation and land cover of the demonstration plot changed significantly from *Imperata* grasses to a mixed tree plantation, including multipurpose tree and annual crop species. A multi-layer canopy had formed within four years. The project involved the local people and contributed to their income and conservation farming skills. Other plots demonstrated forest rehabilitation through agroforestry systems (in Parung Panjang in a Perhutani area, West Java) and conversion of *Imperata* grassland into productive agroforestry, in transmigration areas in East Kalimantan. Most of the demonstration plots were developed in order to increase the productivity of both forest and land as well as to empower the local communities.

d. Technical intervention

Historically, the Dutch from 1835 used, although it was unsuccessful, the enrichment planting technique for regeneration in teak forest, and then introduced assisted natural regeneration in 1854 but had little success in guaranteeing sustainable teak production (Ditjen RLPS 2003). Reforestation (*reboisasi*), aimed at establishing plantations, has been the main approach since the early 1960s. The

plantation approach to reforestation has included the development of *HTI* on degraded or non-forested areas, as either monoculture or intercropping systems, since 1985. During the Reformation Era, which began in 1998/99, the *HKm* community forestry projects, which were implemented on ca 19,000 ha in 10 provinces as a pilot project funded by OECF (Ditjen RLPS 2001), also used the plantation approach. This approach aims to rehabilitate degraded and/or occupied production and protection forests by planting trees (a mix of forest and multipurpose tree species). The forest rehabilitation programmes defined the forest rehabilitation approaches and technical intervention methods as: tree planting (monoculture, mixed tree planting and intercropping), enrichment planting and assisted natural regeneration.

Afforestation (*penghijauan*) or land rehabilitation was carried out via a range of technical approaches such as tree planting on degraded community land, developing demonstration plots (*UPSA* and *UPM*), implementing conservation farming, enhancing private forest development and increasing the role of forest extension workers by establishing the position of the Forestry Extension Field Officer (*Penyuluh Kehutanan Lapangan - PKL*). Technical intervention in afforestation/land rehabilitation focuses on the application of soil and water conservation methods by combining vegetative and physical-mechanical or civil structure techniques.

Suryodibroto (1991) evaluated the reforestation and afforestation programme according to five-year development periods. In the third 5-year development period, the organisation, methods and approaches to reforestation and afforestation were improved. The use of the 'civil structure' technique was widespread, and extension activities were improved through the recruitment of 5,560 Forestry Extension Field Officers during this period. During the fourth 5-year development period, the handling of degraded forest and land was improved by means of a priority scale. For this purpose, 36 catchment areas were selected from 70 districts in 23 provinces. The main activities were the establishment of demonstration plots (*UPSA* and *UPM*), building check dams, establishing community forestry, and setting up village seedling nurseries. Furthermore, reforestation activities started in production forests through the *HTI* programme. In the fifth 5-year development period, the previous reforestation and afforestation programmes were continued and improved by putting emphasis on activities that involved the community, such as holding a competition for self-funded rehabilitation initiatives, increasing local institutional capacity, and the capacity building of human resources, especially of women and the young.

The *taungya* system, introduced by the Dutch in 1873, has become an alternative to rehabilitation activities since the 1980s, especially in those activities with

intensive community involvement (Ditjen RLPS 2003). In Database 1, a similar trend can be concluded. Rehabilitation initiatives based on traditional knowledge, discovered through study and research conducted by national and international institutions, are also widely recognised; an example is the traditional rehabilitation initiative to conserve *damar* agroforest in Krui, Lampung (See Appendix 4).

HTI development was the main approach of large-scale government tree plantation projects in the 1980s and 90s, and this approach continues today. As stated in PP No. 7/1990, one of the goals of timber plantations is to increase forest productivity and environmental quality (Kartodihardjo and Supriono 2000). This approach mainly involved state companies, as discussed in Chapter 3. Due to the limited success of plantation development (for a comprehensive discussion

Table 4-3. Technologies and species used in different rehabilitation approaches

Rehabilitation approach	Technical method	Species used
Industrial Plantation Forest (<i>HTI</i>)	Planting; assisted natural regeneration	<i>Acacia mangium</i> , <i>Acacia auriculiformis</i> , teak (<i>tectona grandis</i>), mahogany (<i>Swietenia macrophylla</i> , <i>Swietenia mahagony</i>), <i>peronema</i> (<i>Peronema canescens</i>), eucalyptus (<i>Eucalyptus spp.</i>), <i>Gmelina arborea</i> , damar (<i>Agathis borneensis</i>), pine (<i>Pinus merkusii</i>), meranti (<i>Shorea spp.</i>), perupok (<i>Lapopetalum spp.</i>), and merbau (<i>Intsia bijuga</i>)
Community forestry, reforestation programme via agroforestry	Planting; enrichment planting; creating terracing on sloping areas	Mahogany, teak, rubber (<i>Hevea brasiliensis</i>), candle nut (<i>Aleurites moluccana</i>), cashew nut (<i>Anacardium occidentale</i>), falcata (<i>Paraserianthes falcata</i>), petai (<i>Parkia speciosa</i>), breadfruit (<i>Artocarpus brasiliensis</i>), jackfruit (<i>Artocarpus heterophylla</i>), tengkawang (<i>Shorea spp.</i>), jengkol (<i>Pithecellobium jiringa</i>), pinang (<i>Areca catecu</i>), and gamal (<i>Glirisidia sepium</i>)
Farm forestry (small-scale plantation)	Planting; enrichment planting; creating a simple terrace (<i>guludan</i>)	Falcata, teak, mahogany, tamarind (<i>Tamarindus indica</i>), damar (<i>Shorea javanica</i>), durian (<i>Durio zibethinus</i>), gambir (<i>Uncaria gambir</i>), cashew nut, jengkol, petai, melinjo (<i>Gnetum gnemon</i>), jackfruit, morinda (<i>Morinda citifolia</i>), breadfruit, candle nut, mango (<i>Mangifera indica</i>), and cassiavera (<i>Cinnamomum burmani</i>)
Watershed protection	Planting; creating terraces; planting along contour lines; grassing slopes; building waterfall channels, checking dams, gully head structures and gully plugs; stream-bank protection	Teak, mahogany, durian, falcata, cashew nut, mango, rambutan (<i>Nephelium lappaceum</i>), annual crops: maize (<i>Zea mays</i>), rice (<i>Oryza sativa</i>), beans (<i>Glyxin max</i>), and grasses for livestock fodder

of this, see Chapter 3), there has been growing criticism of the initiatives and pressure to accommodate local community income-generation objectives through partnership management. Approaches to plantation development were directed towards planting more varieties of hardwood species, such as teak and MPTS (Multi-purposes tree species), rather than fast growing species used in plantation. Social pressures, e.g. conflicts with the surrounding communities, also influenced the partnership approach. From the preliminary database, it is observed that since the start of the 1990s, rehabilitation projects have implemented many different techniques and approaches combining both economic and social (institutional) aspects of community empowerment (Table 4-3). These rehabilitation approaches have started to implement the Community Based Forest Management (CBFM) concept under collaborative or partnership schemes among the stakeholders involved. Farm Forestry is more developed in Java, while Community Forestry through *Hutan Kemasyarakatan (HKm)* programmes are undertaken in the outer islands.

4.2. The sustainability of rehabilitation initiatives: major impediments and constraints

As highlighted repeatedly by many experts, the main problem for rehabilitation initiatives, in Indonesia, is the sustainability of the efforts beyond the project time frame. Several major impediments and constraints identified originated from the short-term project-oriented initiatives, which subsequently led to other technical, economic, socio-cultural and institutional impediments and constraints.

4.2.1. Lack of long term management plans: project-based oriented

Management sustainability has been a relatively neglected aspect of rehabilitation activities, especially when the rehabilitation project has ended. There are three main indicators used for assessing the sustainability of project management in this study which are the existence of a long-term management plan, a plan for long-term monitoring and evaluation, and the existence of a feedback mechanism (Table 4-4). Only limited responses (17- 44%) were received in relation to these three indicators of project management sustainability. Among these responses, 92% considered that a long-term management plan was important, particularly for projects in state forests (63%), on logged-over areas (67%) and when a participatory approach is taken (54%). At a certain rehabilitation project, inadequate long-term planning, especially for the second rotation of the forest stand, has caused forest encroachment and forest fires. Some areas of the rehabilitated forest have even reverted to earlier vegetation, *Imperata* grassland.

Table 4-4. Respondents’ perceptions of indicators for sustainable long-term management

Indicator	Respondents perceiving that indicator is important	Trends
Long-term management plan is in place (n=26 respondents)	24 (92%)	Most important for projects in state forests (63%), on logged-over areas (67%), and when a participatory approach is being taken (54%)
Plan for long-term monitoring and evaluation is in place (n=68 respondents)	66 (97%)	Most important for projects on community land (53%), on logged-over areas (85%), and when a top-down (50%) or participatory (35%) approach is being taken
Feedback mechanism exists (n= 55 respondents)	52 (95%)	Most important for projects on community land (65%), logged-over areas (90%) and when a top-down approach is being taken (60%)

Source: Database 2

The existence of plans for long-term monitoring and evaluation was considered important by 97% of 68 respondents, especially for projects on community land (53%) and logged-over areas (85%), and when a top-down approach is being taken (50%). The importance of a feedback mechanism was agreed by 95% of 52 respondents, again, especially for projects on community land (65%), logged-over areas (90%) and when a top-down approach is being taken (60%). The ability to carry out long-term monitoring and evaluation and maintain a feedback mechanism may be influenced by the location of the rehabilitated area. Community land is usually located close to human settlements and is highly accessible, which enables continuous monitoring to be undertaken and there to be a feedback mechanism, whereas for remote areas undertaking these activities is difficult. The feedback mechanism is developed through opinion sharing or from monitoring and evaluation by the management. Feedback may also be obtained from informal internal meetings, especially meetings held outside forest areas.

The project-based oriented initiatives ensued inadequate focus on the maintenance of planted trees; the absence of long-term market strategies and other economic objectives in the project planning; inadequate consideration of socio-cultural aspects; ineffective capacity building for the community; limited community participation due to unresolved tenurial problems and ineffective community organisation; and on a broader level, there has been unclear distribution of rights and responsibilities among the stakeholders involved, particularly local government, community and technical forestry agencies.

4.2.2. Technical features at the project level: no significant positive results

Despite substantial emphasise on the technical aspects of past and on-going rehabilitation initiatives, long-term significant positive results are not often observed. This was found particularly in the assessment at the project level. Relevant features observed from the project implementation were: the site characterisation as part of the preparation step, consideration for species-site matching, seedling preparation, timely planting, site or land preparation, and planning for maintenance.

a. Site characterisation and land preparation

Site characterisation refers to a feasibility study of the area in which basic information on the biophysical condition and on the socio-economic and cultural needs of the community in the area is collected. In deciding the most ecologically suitable species for the rehabilitation area, it is important to be supported by adequate baseline data and basic maps of the area, covering information such as, topography, altitude, soil type, and soil fertility. However, this information has been lacking in most of the projects; only 14% of projects included in Database 1 had basic maps of the area and only 12% of projects conducted soil analysis either chemical or physical properties. This suggests that few projects allocated enough time and effort to the preparation stage, before starting the project activities.

Site or land preparation refers to the systems used in the preparation of the land prior to planting and or enrichment planting of rehabilitation areas. This should also include soil physical properties analysis to ensure appropriate treatments are used. However, as has stated above, only 12% of projects conducted soil analysis. This would suggest that rather a lot of guess work was used in deciding soil treatment and the right species to plant. From Database 2 analysis, the site preparation system varied across projects, at the project level. The systems most frequently used were total clearing, line cutting and a combination of total clearing and tillage (Table 4-5). Total clearing and tillage were usually practised in rehabilitation projects that use agroforestry techniques in order to plant annual crops, while line cutting is practised for the enrichment planting method and is often conducted in protection forest.

b. Species–site matching

Species–site matching may have to be considered, particularly for exotic species. Effective species–site matching should fulfil the ecological, economic, social and cultural requirements. Species used in the rehabilitation projects were mostly chosen by the government agencies, with the local communities, who were

Table 4-5. Site and land preparation systems used in various projects

Site and land preparation system	n	%
Total clearing	47	32
Line cutting (<i>tebas jalur</i>)	47	32
Tillage (<i>olah tanah</i>)	8	5
Total clearing and tillage	30	20
Total clearing and line cutting ^a	4	3
Line cutting and tillage ^a	4	3
Others	7	5
Total	147	100

Note: a. This was applied at different sites
Source: Database 2

involved in the project, rarely being consulted. Therefore, inappropriate species-site matching was assessed as being appropriate only at two out of ten projects as included in Database 2.

Community participants of the projects on outer islands did not like the long rotation of timber trees, such as teak and mahogany, since these species have no economic value in the short and medium-term. In addition, the species were not familiar to them. The choice of teak as the species to be planted at this rehabilitation project was apparently related more to the incessant promotion of teak than to the ecological requirements and community preference for the species. On the other hand, for projects implemented in Java, timber species such as teak and mahogany, are preferred by community participants due to their high economic values and also both species are suited to the biophysical conditions of the area. This effort could also be seen as an *ex-situ* conservation strategy for these species. However, local communities have not benefited from genetic improvement of these species.

In the last 10 years, most of the rehabilitation initiatives used both timber and fruit trees species. From observations at the project level, the dominant type of species that are naturally existing and planted were multi-purpose tree species (MPTS), and naturally existing forest and tree plantation species (Table 4-6). Naturally existing forest and tree plantation species are usually combined in enrichment planting, while MPTS are used in forest rehabilitation projects that involve community participation. The MPTS are expected to be of benefit to the community involved in the project, either for subsistence or as a source of income. Including species that are already part of a community’s culture and relevant to their livelihoods maintains their commitment to the long-term survival of the planted species. Even, if there is no budget allocated for tree maintenance by the project. However, commitment could be ensured if the project is designed and implemented participatively.

Table 4-6. Tree and crop species existed and planted at the project level

Existing and planted species	n	%
Existing natural forest and tree plantation species	144	39%
Multi-purpose tree species	140	37%
Fruits	83	22%
Vegetables	1	0%
Others	6	2%
Total	374	100%

Source: Database 2

c. Seedling preparation

The availability of a nursery in each rehabilitation project, as well as having a good seedling preparation process, is important for seedling preparation. However, these basic supporting facilities were also lacking in most of the projects, only 23% of the projects confirmed the availability of project nurseries and the techniques used in preparing the seedlings, 13% (of the projects) met the minimum standard for seedlings, and 20% had planned tree nurseries for viable seedlings. At the project level, there were mixed supporting information on the essential components of the project preparation. The availability of project nurseries was positively confirmed by 72% of all respondents who provided the information in Database 2. However, only 17% of the respondents confirmed that the minimum standard requirements for seedlings, which reflect the quality, had been met.

Further, less than 20% of the projects, included in Database 1, provided information on the number of seedlings planted, propagation and regeneration systems used. Most of the projects (56%) planted fewer than 300,000 seedlings. This was inadequate considering that rehabilitation initiatives tend to be implemented on a large-scale areas (See Section 4.1.1). The dominant propagation system used was generative (sexual) propagation, since this method is easier and faster than other methods. Most of the forest regeneration systems used in the rehabilitation activities combined total and enrichment planting. The cheapest option, natural regeneration, is rarely used.

d. Timely planting and planted tree maintenance

Planting seedlings at the right time is crucial, since this directly affects the survival of the seedlings in the field. The right time to plant tree seedlings is at the beginning or in the middle of the rainy season. However, many factors, such as the late arrival of seedlings or delayed budget release, still cause delay or mean that the seedlings are planted at the wrong time, e.g. at the end of the rainy season or during the dry season. No data on planting times are available in Database 1, while in Database 2 planting time was noted only in terms of seasons (no fixed planting times/months were given). The data show that most planting was carried

out during the rainy season, but it was not made clear whether this was at the beginning, in the middle or at the end of the season.

Besides planting time, the maintenance of newly planted seedlings in the field is a crucial project component that also affects the survival of the seedlings and the sustainability of rehabilitation initiatives. The minimum maintenance period required for forest rehabilitation is two years. Therefore, the budget for seedling maintenance has to be allocated for the first two years. However, only 11% of projects in Database 1 stated clearly that budget had been allocated for tree maintenance. Not surprisingly, most of the projects had a slow growth rate and low rate of survival.

The trends supported by the results from the project level analysis that only half of the projects maintained the plantation for two years, while the others maintained the transplanted seedlings for the first year only. In an extreme case, it was found that one rehabilitation project did not undertake any plantation maintenance at all, since the project managers left the rehabilitation site while the plantation was still in its initial phase of establishment (immediately after planting).

4.2.3. Institutional arrangements: unclear distribution of rights and responsibilities

Comparing the different roles of the actors involved in the rehabilitation programmes initiated during the top-down and participatory periods, it may be said that the role of communities and other local-level civil-society organisations improved gradually over time, as shown in Figure 4-2. In the top-down period, the authority of the central government was dominant, and the communities had no power at all. They were merely the implementers or the object of the development. They were mobilised to support activities initiated to serve central government interests. Regional-level governments functioned as the representatives of central government rather than supporting local interests.

There was a clear segregation of roles and responsibilities of government agencies at all levels during the top-down approach under a command and control system. The project hierarchy was well structured and depicted a command system that maintained the duty position in the project for a long term (Santoso 1992). This became less well defined during the transition and participatory periods. Control mechanisms then depended on central government initiatives, so the tendency was to have a weak control mechanism or no control at all.

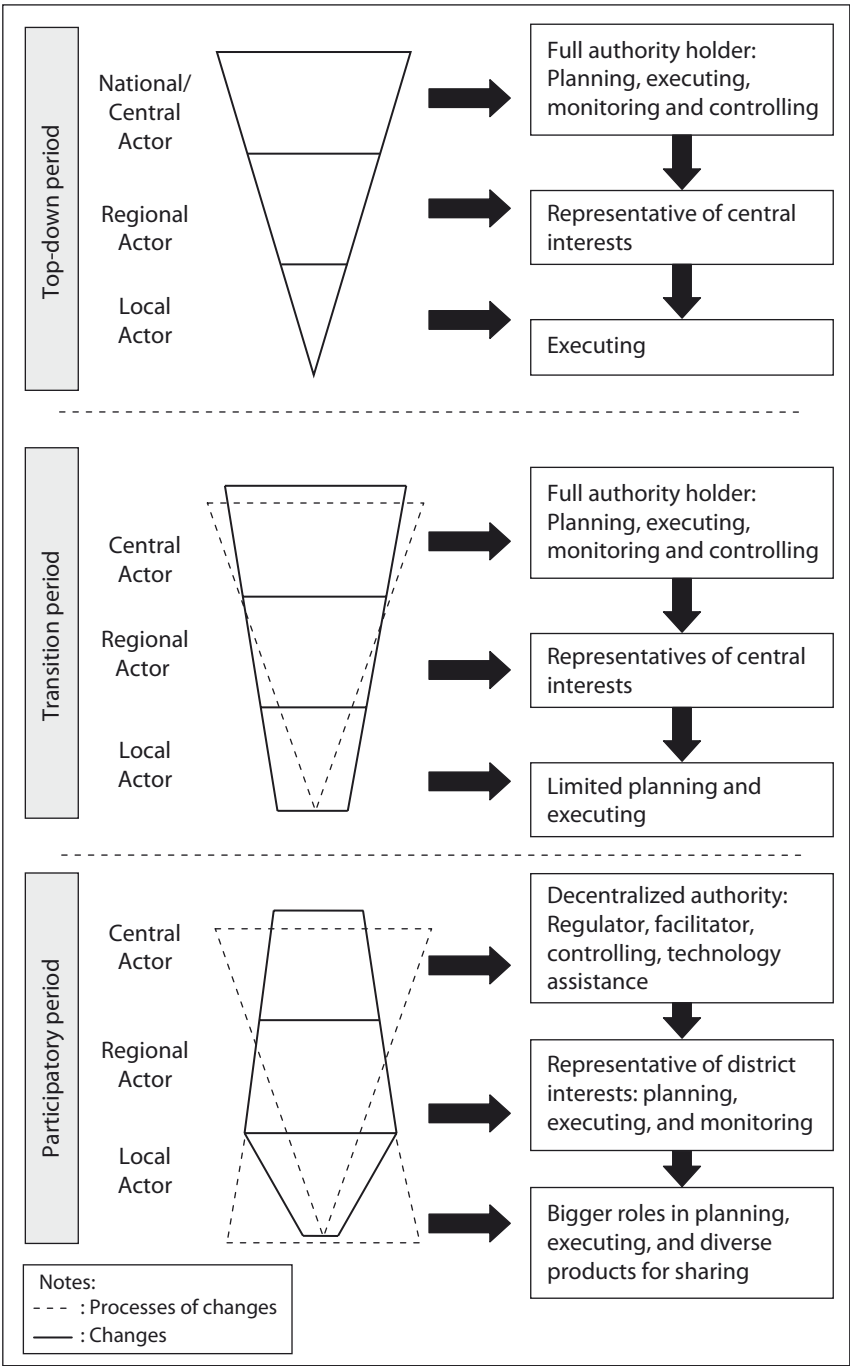


Figure 4-2. Roles of different actors at national, regional and local levels

During the transition period, there were no significant changes in relation to the government structure. The central government acted as the regulating authority in endorsing the policies on rehabilitation. During the participatory period, although a community's involvement in monitoring and evaluation is limited to some extent, tree growers are in a better position and are involved in various stages of planning and implementation. They are also entitled to a share of the production from the rehabilitation activities. A greater role was possible for the communities because structural transformations have been made to the bureaucratic system, so central government now plays a less prominent role than the district governments. However, the local communities still wield less influence than the regional governments (at provincial and district levels). Although the term 'participatory planning' has been used during the participatory period, in reality plans have been made using an authoritative approach rather than a participatory approach. This was particularly observed in the activities implemented under the *DAK-DR* Programme.

Conceptually, in the distribution of rights and responsibilities under the current projects, the government has divided the roles based on the principle of differentiation and specialisation. However, in the process, the distribution of 'who does what' and 'who has the responsibility' has been based mainly on centralised authority rather than on decentralised roles and responsibilities. Consequently, the concept of shared rights and responsibilities is not optimised when projects are implemented because of the lack of public consultation.

Further, the processes failed to consider the capacities of the institutions involved as the basis for giving them responsibility for implementing certain rehabilitation activities. Major roles were allotted to institutions that did not have enough capacity or authority to carry them out. Worse still, many institutions did not understand what they were expected to do. The statements on allocation of rights and responsibilities, to be used as the basis for implementation, were inclined to be based on formalities and often less clearly understood by related parties. For instance, in some projects the village-level government received no explanatory details in the project contract regarding their roles and responsibilities. The clear allocation of rights and responsibilities among stakeholders is crucial, particularly in the institutional arrangements for natural resource management. As observed from actual implementation, rights and responsibilities allocated in an unclear manner have frequently triggered conflicts of interest during the long period over which projects are implemented.

4.2.4. Community participation: major impediments

Despite a consistently high expectation for greater community participation from time to time, there have been major impediments for the rehabilitation projects to effectively provide opportunities for community involvement. Limited community participation is mostly due to the unclear nature of the economic incentives in the project, lack of consideration of social aspects in the project designs and implementation, and not enough capacity building of the community organisations before the technical intervention. The most important, however, is the half-hearted offer of involvement in managing the forest, which has caused unresolved tenurial problems.

a. Unclear economic incentives for stimulating greater community participation

Economic feasibility analyses was not conducted by all of the projects, as included in Database 2, nor were plans made for funding sustainability. Further, only 31% of the respondents confirmed that a marketing strategy had been part of the project design. However, the effectiveness of a marketing strategy was not clearly exceptional, except for the projects that have been implemented in Java. Clear integration between the project and the market was observed to be effective in the on-going projects, even though among these projects some were initiated 30 years ago.

Due to the lack of consideration of the essential economic aspects, limited long-term economic incentives could be generated. Some 71% of respondents from various stakeholder groups confirmed that project-based oriented economic and socio-cultural incentives were generated (Table 4-7). The perceived dominant economic incentives included short-term labour opportunities (16% of respondents), direct subsidies from the projects (17% of respondents), and packages of these two incentives with funds/budget for environmental services (18% of respondents). Projects implemented inside state forest provided more incentive schemes (46% of respondents), than the projects implemented on community private lands. This suggests that more effort is required to attract local communities to participate in the rehabilitation projects inside state forest.

On-going projects provide more incentives than those initiated in the past (54% of respondents), which are driven by the increasing complexities of the causes of forest degradation. This is mainly due to the poverty or low income of the communities living inside and in the surrounding forest areas, caused by low forest cover and productivity. The incentives were more project-based oriented and reached only limited segments of the community. The incentives

Table 4-7. Incentives provided by projects implemented inside state forest and on community lands

Type of incentive	Project location			Total
	State forest	Community land	On both state forests and community land	
Payment for labour	32%	0%	12%	23%
Subsidies	25%	36%	19%	25%
Credit scheme, profit sharing arrangement, incentives for environmental services, tax exemptions, and livelihood support schemes	15%	14%	4%	12%
Profit sharing, tax exemptions, and livelihood support schemes	12%	0%	0%	7%
Incentives for providing environmental services	0%	36%	0%	5%
Payment for labour, subsidies and incentives for providing environmental services	16%	14%	58%	26%
Other (land certificate, extension programme)	0%	0%	8%	2%
Total	100%	100%	100%	100%

Source: Database 2

were mainly received by farmers or farmer groups and participating community members (93%), in the form of payment for labour and direct subsidies. The incentives were provided primarily by central government (39%) and the district governments (22%). Other sources were private or state companies and funding from the project itself.

Less popular incentives included credit schemes, profit sharing arrangements, tax exemptions, and livelihood support schemes. The least popular incentives were the land certificate programme, and the extension services provided. The profit sharing arrangement is actually a very potential incentive mechanism, since it provides a straight forward reward for any initiatives and commitments to rehabilitation activities that have yielded successful results, such as timber production, while restoring the ecological function of the forest (further discussion on the profit sharing agreement is included in Chapter 5). Securing land ownership through the land certificate programme has not been used widely as an incentive, since land ownership is a sensitive subject.

Due to the project-based orientation of the programmes, most rehabilitation initiatives have not taken into account the economic aspects adequately, as part of the project designs and strategies. Important economic components to ensure sustainability, which have been lacking, are: funding sustainability beyond the

project period due to the absence of a reinvestment mechanism, an adequate economic feasibility analysis, and clear integration with the market. This is reflected in the unclear economic incentives that have discouraged local communities from participating voluntarily. Clear economic incentives are important in stimulating greater community participation. This could be ensured if the initiatives were economically sustainable in the long term, resulting from a self generated revenue mechanism that could support the activities beyond the project time.

b. Lack of consideration of socio-cultural aspects and an 'instantly formed' community organisation

It is widely perceived that taking into account the local socio-cultural aspects in the project approach significantly improve and secure a community's commitment to the initiatives in the long-term. However, this has not been clearly observed from the implementation on the ground. At the project level, less than half of the respondents (40%) claimed that the socio-cultural aspect was considered in the project. Slightly higher, confirmed by 54% of respondents, is that the needs and concerns of parties involved have been taken into account in the projects. One of the most relevant indicators is the consideration of local community preference in using local species that are culturally and economically important, such as the jungle rubber tree. In most rehabilitation sites in Sumatra and Kalimantan, the rubber plant is one of the species cultivated traditionally as an important source of community income in the area. In the current *GN-RHL/Gerhan* programme, the seedlings procured by central government, often do not meet the expectations of the local community, since the selected species are not always familiar to them (Gintings 2005).

The other indicator under the socio-cultural aspect is the recognition of the existence of a local community organisation as the project partner on the ground. Often, local customary institutions are not considered as potential organisations to implement the rehabilitation activities. Types of formed community organisations include Forest Farmer Group (*Kelompok Tani Hutan - KTH*), Forest Cooperative (*Koperasi Rimba Berseri - KRB*), Intervillage Cooperation Body (*Lembaga Kerjasama Antar Desa - LKAD*), and Community Business Unit (*Usaha Bersama Simpan Pinjam Pedesaan – UBSP*). Initiatives inside state forest involved forming varied local organisation types, in comparison to those initiatives on community lands, which usually just simply refer to farmer group. On-going projects put greater emphasis on empowerment programmes, including technical capacity building as confirmed by 86% of respondents in Database 2. External agencies have also been involved in facilitating the project planning and implementation, as indicated by 65% of respondents. The agencies involved are usually NGOs or village councils.

Table 4-8. New organisations formed on the basis of the three project location categories

Have new organisations been established?	Project location			Total
	State forest	Community land	In both state forest and community land	
Yes	41	8	19	68
No	40	5	7	52
Total	81	13	26	120

Source: Database 2

Activities implemented inside state forest, which are mainly government projects, initiate the formation of new community organisations more than the projects implemented on community lands (Table 4-8). Newly formed organisations are often formed instantly in response to project requirements, as in the cases of *DAK-DR* and *GN-RHL/Gerhan*. This is confirmed by 57% of respondents in Database 2. It is, therefore, unlikely that these new organisations were established with adequate institutional preparation (e.g. working plans), since they needed to rush to finish the planting activities before the end of the year, as required by the government budget system. Limited time between forming, or empowering, the local institution and the planting activities have resulted in a great deal of confusion among community members. This has then led to a lack of tree maintenance after planting.

c. Half hearted access rights and unresolved tenure problems

In line with the communities' increasing expectations of more participation, limited rights were awarded to the communities to manage the rehabilitated areas, particularly inside state forest. Types of formal rights assigned to the communities include Memorandums of Understanding (MoU), Letters of Agreement (LoA) or Letters of Agreement based on traditional land boundaries (*Surat Perjanjian Kerja Sama - SPKS*) (Table 4-9). The MoU is supported by a local government regulation (*Peraturan Daerah – Perda*), and it is considered to be more appropriate for granting community rights than the LoA, since the later is not backed-up by legislation. The MoU entitles the community to manage an area jointly with the District Forestry Services, while the LoA includes permits for managing the land based on the agreement with other farmer cooperatives. The MoU and LoA are often drawn up with little community involvement, and as a result the community neither respects nor trusts this form in granting the access. These common trends are supported by the responses as included in Database 2, only 6% said 'yes' on the matter of recognition over informal land ownership, and only 5% said 'yes' regarding the fact that formal land rights have been modified.

Table 4-9. Processes for assigning rights to stakeholders inside state forests and their impacts

Rights assigned to stakeholders in rehabilitation projects			Impact on the implementation of rehabilitation projects
Forms of acknowledgement of community rights	Rights assigned to project managers	Process of assigning rights	
Memorandum of Understanding (MoU) providing management rights	RLPS - MoF Decree with general guidelines (<i>Pedoman Umum – PEDUM</i>) attached	Top down – no public consultation	Unresolved conflicts (E.g. In Conserving a National Park Project)
No formal rights; rights based only on traditional boundaries	Specific MoF Decree on the extension of research forest areas	Top down – no public consultation	Unresolved conflict resulted in arson attacks on logging camp sites and continuing encroachment (E.g. In Fire-affected areas Project)
Letter of agreement (<i>Surat Perjanjian Kerjasama – SPKS</i>) based on traditional land boundaries	General guidelines (<i>PEDUM</i>) plus implementation and technical guidelines	Direct allocation with no ground verification process	Cooperatives or Farmer Groups formed rapidly to respond to project needs of local partner (E.g. In <i>DAK-DR</i> Kampar and Kubar Projects)
No formal rights; rights based only on traditional land boundaries	MoF Decree on project management of designated areas	Direct allocation and no public consultation	Arson attacks on logging camp and management rights withdrawn (E.g. In Rehabilitation of Logged-over Areas Project)
Memorandum of Understanding (MoU) and local government regulation (<i>Peraturan Daerah – Perda</i>)	Decree from the Director of the State Company (<i>Perhutani</i>).	Partial verification processes	Community disappointment (E.g. In Collaborative Forest Management Project)

Source: Database 2 and authors' field observation

As required in the processes for developing an MoU or LoA, a community is required to show papers such as land papers (*Surat Keterangan Tanah – SKT*), signed by the village head. To secure its rights a community will often rely on natural boundaries, such as trees, local burial areas and rivers, in addition to the *SKT*. These natural boundaries are very weak compared to those of the formally verifiable checklists included in government legislation such as the Basic Agrarian Law (*Undang-undang Pokok Agraria – UUPA*).

In the case of rehabilitation projects developed on community lands, the ownership of the land belongs clearly to the community. The relevant papers for

the community are the *SKT* and land rights certificate. The local District Forestry Services, as the project managers, are assigned rights based on General Guidelines (*PEDUM*), Implementation Guidelines (*Petunjuk Pelaksanaan – Juklak*) or Technical Guidelines (*Petunjuk Teknis – Juknis*). Although the community enjoys more secure land ownership, the local government, i.e. Forestry District Services and District Government, actually has more control, particularly in producing policies targeting forest products from community lands.

In the past, the government often produced policies or regulations with no adequate public consultation, nor was any attempt made to socialise the process, particularly by involving the local community. One such policy was on the procedures required to obtain permits to transport logs (*Surat Keterangan Sahnya Hasil Hutan – SKSHH*). Local governments also produce their own local regulations as the basis for collecting taxes on timber. Because of the complicated procedures and fees required, the community prefers to sell the timber illegally, without an *SKSHH* permit, as the Farm Forestry and Watershed Protection Project opted to do. The other impact has been an increase in the number of cases of forest encroachment due to increasing needs for planting cash crops.

The rights provided to agencies (mostly government) responsible for executing the rehabilitation programmes or projects are clearer and more formal. However, since there are few, if any, verification processes on the ground to check whether or not the areas to be rehabilitated are occupied, unexpected conflicts often occur. Lack of public consultation with the wider community often causes disappointment, and this can lead to more serious problems, such as serious conflicts between communities and the local authorities implementing the rehabilitation projects, e.g. in Riau. Unresolved conflict resulted in arson attacks on project camps, withdrawal of management rights, and continuing encroachment. As a result of in-depth observations on the ground, it was found that the greatest and most common problem in the field, with regard to tenure, has been that of different parties claiming the rights to the same piece of land, mainly forest land located inside state forest. The main reason for this is that there are conflicting policies for allocating rights, and this has led to overlapping management rights.

Permits awarded to community partners to manage rehabilitated areas inside state forest are often half hearted and give no clear formal rights. Where the community does not have secure access to the rehabilitated area there is a lack of interest and commitment to maintain the rehabilitation activities after the end of the project. Problems with the processes for assigning rights to communities included the fact that the rights assigned to the community were insubstantial, the processes were top down, there was no verification process on the ground, and there was no clear conflict resolution mechanism. The lack of a clear conflict resolution mechanism

leads to greater social unrest at the sites to be rehabilitated. The types of conflict inside state forests were more serious and larger in scale than those on community land, which often affected the sustainability of the rehabilitation projects. A typical conflict between individual community members on community land, for example, was over the agreement as to the borders of the land.

4.3. Summary

Forest rehabilitation in Indonesia has a long history dating back to the Dutch colonial period while forest management is even older. In approximately 200AD Hindu communities arriving in Java started planting and maintaining teak forests, which extended the length and breadth of the island and are still in evidence today. The rehabilitation and management initiatives from the arrival of the Hindus until present have, for this study, been divided into six periods for ease of discussion: pre-colonial to colonial, colonial to 1960s, 1960s to 70s, 1970s to 80s, 1980s to 90s, and 1990s onwards.

The most important initiative, during the Dutch colonial period, was the introduction of *Bosfonds* or rehabilitation funds. These were from taxes, levied on the conversion of downstream forest into agricultural lands, and used to rehabilitate the upstream areas. The pine forests of Aek Nauli in North Sumatra demonstrate the success of this tax system. Rehabilitation initiatives, during the 'top down' approach of the 1950s to 70s, were based on the implementation of actual forest rehabilitation policies, in response to floods and other natural disasters and characterised by the Mass Mobilisation Programme. A series of campaigns were used in this programme to encourage the public to plant trees in various areas including their home gardens.

Throughout the history of rehabilitation watersheds have been the unit of management. The watershed approach is more holistic; it can be used to evaluate the interrelations between biophysical factors and the intensity of social, economic and cultural activities from upstream to downstream; and is a quick and easy way to evaluate environmental impacts. However, problems have occurred: 1) the effectiveness and relevance of the planning system has been in doubt; 2) planning has been insufficiently powerful to be accepted at the field level; 3) planning has been out of step with local government regulations; and 4) criteria and indicators for monitoring and evaluation have not been comprehensive nor well-developed.

Degraded lands resulting from extensive logging activities, mainly in outer islands, and increasing numbers of devastating natural disasters were the main concern of rehabilitation initiatives during the transition period of the 1980s and 90s.

Following the major floods in the late 1970s in Solo, Central Java, the government was forced to introduce more serious rehabilitation initiatives. This was a major turning point for forest rehabilitation initiatives in more ways than one. The government was now being pushed to meet the increasing national demand for wood for the growing pulp and paper processing industries. The development of large-scale Industrial Plantation Forest (*Hutan Tanaman Industri - HTI*), as well as the rehabilitation of critically degraded land, both inside and outside state forest, became the government's new rehabilitation initiative. Degradation of Indonesia's forests continued unabated. There was, however, no end of international and national donors concentrating their efforts on the rehabilitation of secondary forests and logged-over areas during this period.

Having multiple objectives, such as community welfare and timber production from plantation forests, has become an important feature of government initiatives since the late 1990s. These initiatives or rehabilitation programmes are now being initiated in response to complex problems that include severely degraded areas due to over-logging, forest fires, forest conversion, forest encroachment and illegal logging. Political change has complicated the rehabilitation issues even further

In the beginning of the Reformation Era, the transition from a centralised to a decentralised government system, and inappropriate forest management were followed by the revocation of the rights of many forest concessionaires and *HTI* concessionaires. The latter left the government with a vast area of logged-over forest to be rehabilitated. Since the late 1990s the rate of deforestation has continued to escalate, and with few if any earlier rehabilitation projects showing significant positive results. It has been estimated, from our preliminary database, that more than 150 rehabilitation projects were implemented in about 400 locations between 1950 and 2003. The number of projects and areas has increased sharply since the 1980s to more than double during the 1990s to 2004. The budget required to fund these activities has had to increase accordingly. More projects were also implemented outside state forest. These were, however, smaller in area, i.e. 1,495 ha, compared to the projects inside state forest areas, i.e. 127,067 ha.

Despite substantial emphasises on the technical aspects of past and on-going rehabilitation initiatives, positive long-term results were not often observed. This was found particularly in the assessment at the project level. Relevant features observed from the project implementation were: the site characterisation as part of the preparation step, consideration for species-site matching, seedling preparation, timely planting, site or land preparation, and maintenance planning.

As part of the site characterisation, baseline data of the rehabilitation area, covering topography, altitude, soil type, and soil fertility is of paramount importance. It is

from this data that the most ecologically suitable species for an area are selected. However, only 14% of the projects had even basic maps of their area. Equally it is advantageous to select species that are already part of a community's culture and relevant to their livelihoods. This can help to maintain their commitment to ensure the long-term survival of planted species. Species used in the rehabilitation projects were mostly chosen by the government agencies and the local communities were rarely consulted.

The availability of a nursery, in each rehabilitation project, is important for seedling preparation. However, these basic supporting facilities were also lacking in most of the projects, only 23% of the projects confirmed the availability of project nurseries and the techniques used in preparing the seedlings, 13% (of the projects) met the minimum standard for seedlings, and 20% had planned tree nurseries for viable seedlings.

Planting seedlings at the right time is crucial to the survival of the seedlings in the field, the beginning or in the middle of the rainy season being the optimum times. However, many factors, such as the late arrival of seedlings or delayed budget release, still cause delay or mean that the seedlings are planted at the wrong time, e.g. at the end of the rainy season or during the dry season. The maintenance of newly planted seedlings in the field is then one of the most important components of the whole project as this affects the survival of the seedlings and equally the success of the rehabilitation initiatives. However, only 11% of projects in Database 1 stated clearly that budget had been allocated for tree maintenance. Not surprisingly, most of the projects had a low rate of survival.

Due to the project-based orientation of the programmes, most rehabilitation initiatives did not take into full account the economic aspects as part of the project designs and strategies. The most important being: funding sustainability beyond the project period due to the absence of a reinvestment mechanism, an adequate economic feasibility analysis, and clear integration with the market. This is reflected in the unclear economic incentives and a lack of voluntary community participation. The latter could be ensured if the initiatives were economically sustained in the long term from a self generated revenue mechanism; the activities would then be more likely to continue on beyond the project period. However, this has not been clearly observed from the implementation on the ground. At the project level, less than half of respondents (40%) claimed that the socio-cultural aspect was considered in the project.

The other indicator under the socio-cultural aspect is the recognition of local community organisations as project partners. Local customary institutions were not often considered for this role. Further, only limited half hearted rights

were awarded to the community to manage the rehabilitated areas, particularly inside state forest. Types of formal rights assigned to the community include Memorandum of Understanding (MoU), Letter of Agreement (LoA) or Letter of Agreement based on traditional land boundaries (*Surat Perjanjian Kerja Sama – SPKS*). The MoU is supported by a local government regulation (*Peraturan Daerah – Perda*), and it is considered to be more appropriate for granting community rights than the LoA, since the later is not backed-up by legislation. The MoU entitles the community to manage an area jointly with the District Forestry Services, while the LoA includes permits for managing the land based on the agreement with other farmer cooperatives. The MoU and LoA are often drawn up with little community involvement, and as a result the community neither respects nor trusts this form in granting access.

The clear allocation of rights and responsibilities among stakeholders is crucial, particularly in the institutional arrangements for natural resource management. As observed from actual implementation, rights and responsibilities allocated in an unclear manner have frequently triggered conflicts of interest during the long period over which projects are implemented. Despite a consistently high expectation for greater community participation from time to time, there are major impediments for the rehabilitation projects to effectively provide room for community involvement

Problems with the process for assigning rights to communities included the fact that the rights assigned were insubstantial, the process was top down, there were no verification processes on the ground, and there was no clear conflict resolution mechanism. The lack of a clear conflict resolution mechanism has led to greater social unrest at the sites to be rehabilitated. The types of conflict inside state forests were more serious and larger in scale than those on community land, which often affected the sustainability of the rehabilitation projects. Equally, where the community does not have secure access to the rehabilitated area there is a lack of interest and commitment to maintaining the rehabilitation activities after the project ends.

As highlighted repeatedly by many experts, the main problem for rehabilitation initiatives, in Indonesia, is the sustainability of the efforts beyond the project time frame. Several major impediments and constraints identified originated from the short-term project-oriented initiatives, which subsequently led to other technical, economic, socio-cultural and institutional impediments and constraints.

The project-based oriented initiatives ensued inadequate focus on the maintenance of planted trees; the absence of long-term strategies for long-term marketing strategies and other economic objectives in the project planning; inadequate

considerations of socio-cultural aspects; ineffective capacity building for the community; limited community participation due to unresolved tenure problems and ineffective community organisation; and on a broader level, there has been unclear distribution of rights and responsibilities among the stakeholders involved, particularly local government, community and technical forestry agencies.

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Chapter 5.

Portraits of rehabilitation projects in Indonesia: impacts and lessons learnt

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The historical national overview of rehabilitation initiatives suggests insignificant achievements from the high investments on a range of rehabilitation initiatives. The investments have not only covered funding, but also expertises, social and institutional contributions. In-depth observations and analysis on the impacts of rehabilitation initiatives on the ground were conducted of the ten selected rehabilitation projects. The discussion on impacts and lessons learnt focuses on the changes in land productivity, environmental conditions, community livelihoods, project management, institutional arrangements, and access to forest resources. The changes were focussed by comparing the conditions within two timeframes: up to five years after the projects had been initiated, and more than five years after the projects had been initiated up to the year this study was implemented. The assessment on changes was mainly based on the perception of project managers, project staff/observers and community members. Community members, selected for the interviews, included project participants and non-participants. To provide a better understanding of the situation about the ten selected case studies, the first section describes some important features of the ten selected case studies.

5.1. Overview of the 10 case studies

The projects selected, covering both past and on-going projects, were intended to represent projects from different periods since the 1970s, so comprehensive lessons learnt could be captured. Overviews of the 10 case studies are presented below.

Project 1. Collaborative Forest Management (*Pengelolaan Hutan Bersama Masyarakat – PHMB*) initiated by the State-owned Company of Perhutani in Sukabumi, West-Java (2001–present). Referred to as the Collaborative Forest Management Project

Perhutani, the State-owned Company, is responsible for managing 1,936,760 ha of production forest and 629,385 ha of protection forest in Java, a total of 2,566,145 ha. Perhutani has three areas: Unit I (Central Java) covering 646,720 ha, Unit II (East Java) covering 1,126,958 ha, and Unit III (West Java) covering 792,467 ha.

The Collaborative Forest Management Programme was initiated in 2002 under Decree No. 001/KPTS/DIR/2002, in response to the shift in the management approach, from timber-based management to forest-resource management and from state-based to community-based. The programme was initiated to encourage the participation and active involvement of communities in preventing illegal logging and forest encroachment occurring in Perhutani's areas. Following the Reformation in 1998 illegal logging and forest encroachment damaged at least 98,598 ha in West Java alone (Anonymous 2000). By the end of 2002, 177 forest villages had signed a collaboration agreement, and a further 170 forest villages had undergone a socialisation process to receive information introducing the programme (Anonymous 2000).

The Collaborative Forest Management Programme aims to provide guidance in forest management by integrating ecological, social and economic aspects. However, the status of the state forest areas does not change. More specifically the objectives of the project are:

1. To increase the responsibilities of Perhutani, local people and interested stakeholders for the sustainability of forest functions and uses
2. To improve the roles of Perhutani, local people and interested stakeholders in forest resource management
3. To increase the income of Perhutani, local people and interested stakeholders simultaneously
4. To improve the quality of forest resources in accordance with the characteristics of the areas, and

5. To adjust forest management activities to correspond with regional development and the dynamics of the social conditions of people living around the forest fringe.

The Collaborative Forest Management programme, implemented in 29 villages in Sukabumi Forest Management Unit (*KPH Sukabumi*) area, was initiated in 2001 and covers an area of 1,553 ha of degraded forest. The programme's main objective is to rehabilitate this land which is part of a 3,000 ha area of degraded forest, resulting from extensive illegal logging and forest encroachment. In this study, the surveyed villages were Buniwangi, Citarik and Tegal Buleud.

Under the Collaborative Forest Management arrangement, Perhutani has a contract agreement to jointly manage the area with the community. For the main timber species, the company covers the costs of production, while for other species the costs are shared between the company and community, based on an agreed arrangement. The agreement includes revenue sharing of a proportion of the timber production, and the products of the multi-purpose tree species between the company and community. Further discussion on the revenue-sharing agreement and its potential problems is included later in this chapter.

The project participants are members of 22 farmer groups, from the 29 villages, which have 20 to 30 members each. On average, each farmer has the right to manage 0.25 ha of land. The main species planted by the farmers are pine and mahogany. However, local villagers can also grow food crops and cash crops, such as coffee trees in the project area.

Important promising features of the Collaborative Forest Management Project include opportunities for the local community to be involved actively in managing the state forest areas, including timber, which was impossible in the past. The community participants have also received an increase of 30 to 40% in income, particularly from intercropping, such as vegetables and paddy.

In the development of this programme *Latin (Lembaga Alam Tropika Indonesia)*, a local NGO, has been intensively involved in the implementation processes. They have been working to link the conceptual and practical aspects of the project in order to empower the participating communities (Latin 2005). *Latin* has concentrated on various processes of facilitation, mediation, motivation, and supervision. In the process of facilitation they have been focusing on developing the concept, management planning, and implementation, included forming the Forest User Groups (FUG), which have regular meetings. In mediation they have been aiming to minimise communication barriers between the community and

other stakeholders. This has also included assisting with the agreement between the local communities and Perhutani. In motivating the communities, *Latin's* emphasis is on enhancing the stakeholders' motivation to keep their commitments to the project. They also supervise the capacity development process of forest farmer institutions, participatory monitoring and evaluation, and in the process of transferring knowledge and skills to local stakeholders (NGO, communities and government institutions).

However, there are some problems that need to be resolved quickly. These include: the lack of support from stakeholders at the district level, problems with internalising the project within Perhutani, short term project-oriented implementation, a lack of community capacity building, a lack of business orientation, the lack of capacity of forest farmers to provide seedlings, and to some extent there are some social cultural barriers within the local community, such as in adapting the transferred new knowledge in developing plantations and other crops, that need to be overcome (Latin 2005).

Project 2. Community Rehabilitation Project of the Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus-Dana Reboisasi - DAK-DR*) in Kampar, Riau (2001–present). Referred to as *DAK-DR Kampar*

Project 3. Community Rehabilitation Project of the Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus-Dana Reboisasi - DAK-DR*) in West Kutai (Kutai Barat or Kubar), East Kalimantan (2001–present). Referred to as *DAK-DR Kubar*

Project 2 and 3 were developed under the Programme of Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus-Dana Reboisasi - DAK-DR*). The District Government led the implementation of the programme and developed using *DR* (Santoso 2005; Departemen Keuangan *et al.* 2001). *DAK-DR Kubar* was perceived by interviewed stakeholders to be implemented better than the *DAK-DR Kampar*. In comparing these two cases the aim is to understand the conditions influencing the programme to be implemented, with various results.

The programme aims to support rehabilitation activities in critical forest and land within watershed priorities set by the government and also as a medium to enhance the capacity of the local communities. This fund serves as an incentive support from the government with the hope that the local communities will play a full and important role after the incentive period has ended. Thus, rehabilitation projects funded under this mechanism should be based mainly on the institutional development of the local communities. Policy discussion on *DAK-DR* is included in Chapter 3.

This fund is allocated to the district governments according to several criteria: revenue projection of the reforestation fund of the respective districts; critical forest and land within the watershed, priorities set by the government; upstream and downstream consideration of the critical level of the watershed; and continuation of former rehabilitation activities. Each district has to submit a proposal to the provincial government together with a plan and location map of the proposed rehabilitation project and an evaluation of the results of former rehabilitation activities. The evaluation committee, formed by the provincial government, with the Forestry Services acting as coordinator, will then assess the proposal. There has also been a lot of pressure on the District Forestry Services from both local communities and the People's Consultative Assembly at the district level (*Dewan Perwakilan Rakyat Daerah- DPRD*) to apply rehabilitation to all proposed sites. Initially there was no location selection based on priority, but rather on equity. Eventually, the District Forestry Services started to set up a system for prioritising the sites selected. They started constructing databases on the condition of the forest areas and mapping degraded forest and critical land areas in their districts.

At both sites (*DAK-DR* Kampar and Kubar), there are similarities in terms of constraints faced by the implementing agency, and also in the process and implementation as both follow the guidance set out by the central government in a ministerial decree. However, there are also differences in the two sites, especially in the implementation. The District Forestry Services of Kubar attempted to find the best system that could be applied efficiently. At first, the projects were implemented directly by the communities, but the results were very poor, much lower than expected. The District Forestry Services have since changed the system so that control is in their own hands and the local communities are paid when the planting is completed. Since there have been many complaints, concerning land status, from the local communities, the District Forestry Services then requires a clear land status of the proposed rehabilitation area before the proposal can be accepted. The proposal must then be accompanied by approval from the head of the village and the customary head of the village, and if the location is adjacent to neighbouring villages, additional approval from the heads of these villages is also required. Whereas in Kampar district, the Forestry Services are in charge of the whole implementation process and site selection is based on the availability of land owned by the local community.

Important promising features in the implementation of *DAK-DR* Kubar are the use of prime local species (*jenis unggulan setempat*) such as iron wood or *Ulin* (*Eusideroxylon zwageri*), and the development of a cooperative (as a collective business). It is then the job of the cooperative to take care of seedling preparation for the project. In contrast, the implementation of *DAK-DR* Kampar used newly introduced species such as teak (*Tectona grandis*) and mahogany (*Swietenia*

macrophylla), as well as a native species, namely rubber (*Hevea brasiliensis*). The communities were not familiar with the first two species and so they did not believe that the plants would be of any benefit to them. As a result, only the rubber plants were maintained.

The main constraint hampering the programme implementation has been the inefficient mechanism for disbursing the funds. The funding is transferred to the district government account and goes into the Regional Budget at the District Level (*Angaran Pendapatan dan Belanja - APBD*). Approval is given by the *DPRD* following a series of discussions, which often causes the delay of the received funds until sometime towards the end of the year. Because of the one-year budget cycle, these funds must be finished by the end of the year without giving enough time for appropriate planning and implementation. If the activities are not finished by the end of the year, the remaining funds must be returned to the head of the district government. This mechanism of funding disbursement has caused excessive delays in planting and associated activities, such as the socialisation and setting-up activities at the local level. However, the funding cannot be allocated for operational and administration costs. While the matching fund provided by the district government is often small and insufficient to support the planned rehabilitation activities. The lack of human resources capacity in terms of quality and quantity within the implementing agency, as well as, among the local communities, is also a major constraint. The lack of technical assistance is a result of the disengagement of the Ministry of Forestry (i.e. *RLPS*) in the *DAK-DR* Programme.

Project 4. Conserving Meru Betiri National Park in Jember District, East Java (1998–present). Referred to as ‘Conserving a National Park Project’

After the reformation, Meru Betiri National Park (MBNP) experienced severe pressures from illegal logging and forest encroachment, which resulted in severely degraded forest areas. The management of the national park initiated rehabilitation initiatives through a social forestry programme, inviting the surrounding communities to participate by initiating the Rehabilitation Farmer Groups (*Kelompok Tani Mitra Rehabilitasi – KTMR*). The programme aimed to rehabilitate devastated areas and to improve the ecological functions of the forest, increase local people’s awareness of the importance of the national park and raise their sense of belonging so they would want to protect the area, while at the same time increasing their income. The project involved land rehabilitation and enrichment planting with local commercial species. This was carried out in the rehabilitation zone of the national park, covering 4,023 ha.

In 1995-99 *Latin* (*Lembaga Alam Tropika Indonesia*), a local Indonesian NGO, and The Indonesian Agriculture University of Bogor (*Institut Patanian Bogor-IPB*) formed a consortium to act as the implementing agency of the social forestry project 'Conserving a National Park' funded by the MacArthur Foundation. The project included the establishment of a nursery and demonstration plots for medicinal plants, covering seven ha and involving 60 families. *Latin* also trained women within the villages to produce traditional forest medicines (*wanafarma*), including processing and marketing the herb products.

Facilitation of these activity were then continued by another NGO, Hammim, from 1999-2000, funded by the Kehati Foundation. At the same time, MBNP/ the national park was also carrying out rehabilitation-related activities in the four buffer villages. The activities were: identifying encroached-upon areas, identifying the socio-economic and cultural conditions of the local communities in the national park buffer zone, socialisation of the rehabilitation activities among the communities, setting up farmer groups (*KTMR*), and planting 400 ha with 12 species, involving 31 farmer groups. A local NGO (*Kail*), which was established to follow on from the *Latin-IPB* consortium, completed the facilitation activities. Members of this NGO consist of people recruited during the consortium period. *Kail* has facilitated some 53 farmer groups and carried out enrichment planting in the national park's 400-ha rehabilitation zone (in addition to the area covered by MBNP).

Conflict between the national park and local NGO started occurring in 2002 and had not been resolved when this case study was undertaken. The lack of good communication and appropriate approaches has hampered the resolution efforts of both parties. This unsolved conflict has had a negative effect not only on the rehabilitation project but also on the national park patrolling activities. Seedlings have been abandoned and left to waste in the villages, as the farmers have been too afraid to be involved in this project without any support from a local NGO. Patrolling by the national park rangers has also not been as regular as it had been which has resulted in further encroachment.

Another issue that has added to the poor relationship between the national park and the farmers is the agreement provided by the national park. There are some clauses that the farmers cannot accept such as the evaluation of the project after 5 years and that the decision to extend the agreement would be based on the evaluation result, the agreement would be cancelled upon the death of the agreement holder (*penggarap*) or if the MBNP needs the area back, for whatever purpose, those utilizing the area must return the land/forest voluntarily to the national park without claiming any compensation.

Poor communication and coordination have also led to poor relations not only between the national park and local government, but also between local NGO and local government. This institutional conflict triangle has made the rehabilitation efforts difficult to sustain and meet objectives. Good facilitation is urgently needed to bring all the conflicting institutions together to discuss their differences in order to reach a win-win solution. The latter is achievable through good collaboration, acknowledgement of the respective rights and responsibilities of the involved institutions, while the actual authority of the national park remains in the government's hands. Recently, the national park management has been trying to build good communications and approaches and to generally collaborate with the local government, in order to resolve marketing problems after the harvesting season.

Other constraints that need to be resolved quickly include: the low capacity of facilitator and extension personnel in terms of quantity and quality; personal offence, which has become an institutional problem and has led to extended conflict, must be eradicated; the role of the facilitator needs to be reduced, supporting infrastructure for extension activities needs to be provided and the rights and responsibilities of the involved institutions must be made crystal clear. One very important issue, among others, that must be taken into serious consideration, in order to support the rehabilitation activities, is consistent and strong law enforcement that must be respected by all related institutions. As the result of weak law enforcement, local community members participating in the rehabilitation activities have begun to sell their lands to others, despite the fact that the areas inside national parks are not transferable. The local community also tend not to plant tree species for rehabilitation purposes, since they want to keep the land for planting agriculture cash crops. There is also the view that rehabilitation activities will harm the national park itself, as the local community extend their lands beyond the allowed zone with the expectation that the national park would then grant them the additional lands as part of the rehabilitation activities.

Project 5. Rehabilitation of Logged-over Areas Conducted by the State-owned Company in Riau (1996–2000). Referred to as Rehabilitation of Logged-over Areas Project

This project was part of the MoF's programme that assigned the rehabilitation of 5.5 million ha of logged-over areas to state-owned companies, Inhutani I to V, based on Ministerial Decree No. 362/Kpts-II/1993. Following the closure of *DR*, the rehabilitation assignment was revoked and all activities were stopped completely by the end of 2002/03 (date of closure varied from company to company) (Directors and staff of Inhutani personal communication 2004).

One of the sites was in Riau Province, which covered 40,000 ha of the total 318,883 ha assigned to one of the state-owned companies in Sumatra. The objectives of the project were to increase forest cover and rehabilitate barren land in order to produce timber and rattan, which would then provide employment and livelihoods for local people. The rehabilitation project focused on developing plantations of *Shorea*, teak, rubber and rattans (on 40,000 ha) and was funded by the Reforestation Funds provided by the Ministry of Forestry (MoF). The expected impacts of the project included an improvement in land productivity and the protection of forests from encroachment and illegal logging, while livelihood opportunities would be created, improving community welfare.

The Rehabilitation project showed the complexities of land boundary conflicts involving more than three parties, namely the Forestry Services, estate crop companies, local communities and other interested groups. It was the cooperative groups that tended to trigger institutional conflicts. These groups were connected to the estate crop companies, which were interested in expanding their areas of operation.

The top-down approaches and failure of the state company to recognise the dynamics of the local communities and to empower the local institutions resulted in pseudo participation. Conflicts of interest arising amongst stakeholders led to a devastating situation. The conflicts expanded from being between individuals to communal and institutional, as a result of the lack of appropriate approaches and coordination. The conflicts occurred mostly after the annulment of the company's assignment in 2002/03; this resulted in demonstrations by the local community, arson attacks on the company's facilities, land claims, encroachment, and illegal logging. The company carried out little rehabilitation, as the conflicts arose before the planted seedlings had the opportunity to grow.

Furthermore, there was no clear coordination among key stakeholders at the local and provincial levels and an inadequate legal framework at the national level, as the rights awarded to the state company were revoked by the MoF. The rehabilitated areas were then handed over to the provincial government with no clear plan for follow-up activities. Despite the serious problems, several positive impacts or advantages were received by the communities, among others the development of infrastructures including roads, schools and electrical facilities. In addition, the community participants had the chance to work as temporary labourers in the nursery and planting activities in the field.

Project 6. Participatory Reforestation in Sanggau District, West Kalimantan (1994–99). Referred to as the Participatory Reforestation Project

In 1992, GTZ and the GoI jointly funded the Social Forestry Development Project (SFDP) to develop and test approaches used in community-based forest management in an area of some 102,250 ha, the Participatory Forest Management Area (PFMA), in the northern part of Sanggau District, West Kalimantan. Over the 12 years of implementation the project focused on institutional development, community empowerment and natural resources management.

The Participatory Reforestation Project was part of the big Community-based Forest Management Project. The objectives were to increase land cover and to improve land productivity by planting trees, fruits and rattans. It was intended that these trees would generate and increase incomes and open up new job opportunities for the local communities.

For the institutional development aspects, the project has developed a communications forum, Inter-village Cooperation Body (*Lembaga Kerjasama Antar Desa -LKAD*), which was a forum for discussion and communication among eight villages within the PFMA. Members of the forum comprised representatives from each village. The main task of the forum was to manage all aspects of conflict resolution and security, simplify the customary laws and government regulations, organise socialisation, and make arrangements for land utilisation and natural resource management. The community-based forest management cooperative Rimba Berseri was developed by the villagers from eight local villages. A joint project management and coordination forum for PFMA development was established and was used as a communication forum among project staff, the local community and local government; its remit included facilitation, evaluation and monitoring processes within the PFMA development. Second, a community empowerment effort was implemented by conducting training and education (providing scholarships for formal education, training etc.). Third, the natural forest management aspect was enhanced by conducting participatory village land-use mapping (*Tata Guna Lahan Desa Kesepakatan – TGLDK*). In addition to the mapping, a harvesting activity was implemented by the Rimba Berseri Cooperative, including the control and monitoring of rehabilitation programme on the ground.

Participatory mapping approaches, which resulted in the Forest Land Use Consensus at the Village Level (*Tata Guna Lahan Desa Kesepakatan - TGLDK*) increased the local people's awareness regarding appropriate land uses according to the different forest classifications. Shifting cultivation and forest fires were

subsequently reduced following the implementation of *TGLDK* as a result of participatory mapping activities.

The main motivation for farmers who joined this reforestation project was the incentives they were promised for the first two-year period of the project and the authority they would be given to manage the area. However, in the implementation the reality was quite different and much of what the farmers received could be classed as 'disincentives'. As part of the efforts to encourage the community to be involved actively in maintaining the planted trees, *BP DAS*, a government technical unit for managing watersheds, subsidised incentives of Rp 200 (less than USD 0.01) based on survived planted seedlings. Maintenance was required five times in two years, particularly when the trees reached 3, 6, 12, 18 and 24 months. Incentives were provided according to the number of trees surviving, as assessed by the officer (*Pembina Lahan Hutan*), a local community member trained by the project, and the staff of *BP DAS*. The incentive rates doubled for the second assessment (6-month old trees). However, the rates were reduced by using the 3-month rates for the third assessment to the final assessment at 24 months. With this arrangement, the communities felt discouraged. The expectation was that the rates should increase with the length of tree survival.

Other problems in the implementation included the chosen species that did not meet the communities' preference for planting rubber trees from the outset of the project. The rubber plant is a species cultivated traditionally as a source of community income in the area. However, during the first five years of the project, rubber trees were not on the list of species to be planted, since the recommend species were dipterocarps, fruit trees and *Acacia mangium* (particularly on *Imperata* grasslands). It was not forbidden to plant rubber trees, but if a community planted this species they did not receive the incentives as received by other communities who did not plant rubber trees. After a long negotiation processes, finally from year six (after the project ended), the communities were allowed to plant rubber trees and were provided with incentives. It is a pity that the high community demand for rubber trees was not recognised at the outset of the project.

Project 7. Rehabilitation of Fire-affected Forests through the Establishment of Demonstration Plots in East Kalimantan - ITTO project PD 84/90 (F) (1992-94). Referred to as Rehabilitation of Fire-affected Forests Project

In 1982–83 a serious drought caused severe forest fires that affected 3.2 million ha of forests in Indonesia, 2.7 million ha of which were dipterocarp lowland forests (FWI/GFW 2002). Immediately after these fires, GTZ/DFS conducted a preliminary assessment of the damage caused by the fire, for the Transmigration

Area Development Project. These severe fires were not only caused by the drought but also the slash and burn practices of shifting cultivators and other land-clearing operations. The change in the vegetation structure resulting from logging activities, which began in 1970, when the government first introduced the concession system, had led to dense ground vegetation, an accumulation of logging waste and reduced drought resistance in the forest.

Recommendations resulting from this study became the basis of the following project, i.e. Investigation of the Steps Needed to Rehabilitate the Areas of East Kalimantan Seriously Affected by Fire (1988–89), financed jointly by ITTO and GoI with GTZ as the implementing agency, together with the GoI. The scope of this project was to assess the damage caused by the large forest fires in 1982–83, to evaluate the effects of the fire on vegetation, the livelihoods of the people, soil, hydrology, fisheries and wildlife, and to define the steps necessary for the rehabilitation of the burnt areas. Outputs from this project were a report on the effects of the fires and a damage evaluation, an action plan for the rehabilitation of burnt areas, a 1:250000 vegetation classification map, a 1:250000 forest rehabilitation map and a proposal for a demonstration area for forest rehabilitation.

A follow-up project, Rehabilitation of Fire-affected Forests through the Establishment of Demonstration Plots in East Kalimantan was initiated in 1992, funded and implemented by ITTO and the Forestry Research and Development Agency. The specific objectives of this project were: to rehabilitate the forest area damaged by severe drought and fire, through planting with local commercial as well as exotic species; to find the best economic, ecological and social methods to rehabilitate forest areas that could be applied to different forest conditions, through silvicultural treatment of natural regeneration; and also to demonstrate rehabilitation methods for forest areas damaged by fire, in order to consolidated the knowledge of rehabilitation methods used for specific situations, a lack of which has always hampered the rehabilitation of degraded forests.

The expected impacts of the project were that it would help minimise the danger of future forest fires and contribute to the rehabilitation of disturbed forests in order to enable future economic production of timber on a sustainable-yield basis, taking ecological and environmental-political factors into consideration. It was also expected that the project would help prevent further degradation of forests that were still productive and therefore could contribute considerably to the national economy and people's welfare in the long term.

A 1,099-ha demonstration plot was allocated in the protected area of Wanariset Samboja, because of its easy access and the different degrees of burnt-over

forest in its dipterocarp lowland forest. The first steps of this project were to conduct a forest inventory of the demonstration plot, particularly as there was no reliable base maps (contour, soil and aerial photographs), no complete data of the actual condition of the damaged areas regarding tree species composition, structure, volume distribution and the size of the different burnt areas within the demonstration plot. It was subsequently found that of the total area of 1,099 ha of forest 7% of this demonstration plot was heavily burnt, 33% moderately burnt, 46% lightly burnt, 10% unburned and the remaining 4% was an area of shifting cultivation. It was also found that 313 different tree species were present in this area.

Field borders were then established and planted with *Peronema canescens*; a 20m wide green belt was also established, to serve as a fire prevention measure as well as an indication of the border. This was also planted with *Gmelina arborea*. Firebreaks of 8 m in width were cleared from the forest, and local villages located close to this area utilised the strips by planting fruit trees for their own use.

For rehabilitation purposes, the main species used were dipterocarps as these are the most important indigenous tree species in East Kalimantan. Fast, medium and slow-growing species were selected in order to minimise risk and ensure diversity for future purposes. Two exotic species were also planted: *Gmelina arborea* was used for an artificial green belt and *Paraserianthes falcataria* was planted as shading for the dipterocarps. A pilot silvicultural-approach project was also established in the demonstration plot, based mainly on the results of the forest inventory. The objective of the pilot project was to provide the methodology and techniques needed to rehabilitate the burnt forest.

Reforestation activities were conducted in shifting cultivation and heavily burnt areas by planting *Peronema canescens*, *Gmelina arborea*, *Tectonia grandis*, *Swietenia mahagoni*, *Duabanga moluccana*, *Antocephalus cadamba* and dipterocarp species. Enrichment planting was also implemented on the heavily and moderately burnt forest, and to some extent also in the lightly burnt forest, using 15 different species and various methods, including line planting, strip planting, gap planting, diffused planting, group planting etc.

Selective tending, consisting of underbrushing, refining and liberation activities, was also carried out in the demonstration plot, mainly in unburned and lightly burnt forest areas. This was to accelerate tree growth of the established or remaining stands after the fire. During the plantation trial in the demonstration area it was discovered that dipterocarp species (mainly *Shorea leprosula*, *Shorea ovalis* and *Dryobalanops lanceolata*) grew well in the open areas and in full light such as in the ex-shifting cultivation areas and heavily burnt forest.

As a result of the extended drought in 1997–99, East Kalimantan again experienced rampant fires. A study conducted by the GTZ supported the Integrated Forest Fire Management (IFFM) and the Promotion of Sustainable Forest Management in East Kalimantan Project (Hoffmann *et al.* 1999) identified an area of 5.2 million ha affected by the fires. Of this, 34% was heavily affected, 42% suffered moderate damage and 24% was lightly damaged. The forest plantation area suffered the most from this fire (64% of its total area was burnt), followed by estate crops (51% of the total area), natural forest concession (24%) and protection areas (10%).

The demonstration plot area was completely devastated by these fires with only 1% or about 10 ha surviving. A lack of firebreak maintenance and no sense of belonging on the part of the local communities resulted in little or no support or protection of the area. In addition to fire damage land claiming and encroachment have also impeded the success of the project and the protection of the forest. Claiming land started as early as the 1970s when the government decided to extend the Bukit Soeharto area from 504 ha to 3,000 ha, where some parts of the extension area were ex shifting cultivation areas. This conflict escalated during the reform period and resulted in the project facilities (base camp buildings, bridge and nursery) being damaged. Illegal logging and recurrent fire have also continued to plague the area.

Project 8. Upper Solo Watershed Protection Project in Wonogiri, Central Java (1988–95). Referred to as the Watershed Protection Project

The main objectives of this World Bank-funded project were to reduce erosion and sedimentation in Gajah Mungkur reservoir in order to protect its functions, increase land productivity by implementing soil and water conservation, and improve farming practices so as to increase farmer income. The project also aimed to strengthen and increase formal and informal institutional capacity in planning, executing and controlling soil conservation and land rehabilitation and to encourage and develop a self-sustaining community. The activities involved were: establishing check dams, slope greening, green belt planting, terrace rehabilitation and farm forestry. The state-owned company Perhutani, also carried out some reforestation.

The driving force for this project was erosion in the water catchment area that caused sedimentation; this continued to increase as a result of overexploitation, and highly intensive and unsustainable agricultural practices in the upstream area. This in turn led to a decline in the reservoir's life span from the 100 years planned to only 27 years.

This project has been assessed as having been successful in reducing the level of sedimentation flowing into Gajah Mungkur Reservoir. It was reported that, on average, soil erosion decreased by 46% between 1985 and 1994, therefore the lifetime of the dam is expected to increase from 27 years (1985 estimate) to 50 years (1994 estimate) (Anonymous 1995). This was achieved by means of the application of specific soil and water conservation methods.

Overall, significant achievements included terrace rehabilitation, which improved land productivity and subsequently fodder supply increased. The government provided farmers with a soft loan programme (a revolving fund mechanism and *KUK DAS*). The training and extension programme conducted during the project has also raised community awareness and knowledge of the importance of soil conservation, reforestation and the economic value of forest products for their livelihoods. Other positive impacts were observed such as: growing community interest in developing a nursery and selling seedlings (mostly teak, acacia and mahogany), increased capacity and their willingness to safeguard the forest. Other achievements included the recognition of formal community's landownership in the development of 5,000 ha of farm forestry. The local people responded positively to the policy for a free land certification scheme for people involved in the farm forestry activities.

Despite the achievements, some obstacles were identified during the period of the project implementation which could have a negative impact on the objectives, such as top-down approaches, community mobilisation, lack of a participatory approach from planning until the implementation phase, monitoring and evaluation, and also management sustainability, especially after the project ended, was not part of the initial planning process.

Project 9. Mechanised Nursery and Plantation – Reforestation and Tropical Forest Management, FINNIDA Project Phase II - VI, South Kalimantan (1983–96). Referred to as the Mechanised Plantation Project.

The first phase of this project was conducted in 1981 and funded by the Government of Finland; it was known as the Mechanised Nursery Pilot Project in South Sumatra. The Reforestation Technology Centre, Ministry of Forestry and Enso Forest Development Oy Ltd. acted as the implementing agencies. Experimental seedling production was started in South Sumatra, and preparations were made for a mechanised nursery with an annual production of 7 million seedlings, from a 10-ha nursery area. After this first phase was completed the project continued to the next phase and moved to South Kalimantan.

As part of six project phases, the objectives of Phase 2 (1983–85), then known as the Mechanised Plantation Project, were to develop economical nursery technology for large-scale production of high quality seedlings and to establish a large-scale forest plantation, which would meet the raw material needs of a pulp mill projected in the area.

Training for staff and workers was also arranged so that they were able to manage and run the nursery independently; field tests were also carried out to ascertain the effects of soil preparation, weeding and fertilisation on the growth of young seedlings. In this second phase, a nursery with a capacity of 2 to 3 million seedlings per year was built in South Kalimantan using Finnish reforestation techniques – the ‘pot-tray system’ – and the first field plantation was established (about 400 ha of the total 1,000-ha planned plantation). Species planted were *Eucalyptus urophylla*, *Pinus merkusii* and *Acacia mangium*.

In Phase 3 (1985–1988), there were four different activities: the development of nursery technology, modifying reforestation methods, pilot plantation and trial area, and fire protection (including clearing firebreaks and maintenance of fire-fighting equipment). During this phase the nursery was completed and the main interest was focused on the establishment of species provenance and silvicultural trials in the Riam Kiwa trial area (a site of c. 1,000 ha that served as a pilot plantation and trial area). Over 40 different species were planted at the nursery for trial purposes and several provenances were used (*Acacia mangium* – 29 provenances, *Eucalyptus deglupta* – 20 provenances and *Albizia falcataria* – 4 provenances). Both nursery and trial activities were carried out successfully.

The establishment of plantations continued during Phase IV (1989–1992) and Phase V (1993–1995), and the project was changed to the Reforestation and Tropical Forest Management Project. Other activities included natural forest management to develop systems for sustainable management (including rehabilitation and reforestation of logged-over forest), transfer of knowledge and dissemination of results. For the natural forest management activity, a site was developed in the Kintap concession area to establish a plantation of dipterocarps and hold trials in the management of logged-over forests. The fire-protection system in the Riam Kiwa trial area was also developed further, based on lessons learned from a devastating fire in 1991. However, a long and severe dry season was experienced in 1994 and this caused fires, also in the forest plantation area. The final phase (1995–1996) aimed at consolidating the experiences from both the reforestation system development and natural forest management system research, focusing mostly on handing over the project activities and dissemination of knowledge to the stakeholders.

The Mechanised Plantation Project has succeeded in converting *Imperata* grassland into forest vegetation by using certain fast growing species such as *Acacia mangium*, *Acacia crassicarpa*, *Peronema canescens*, etc. of the best provenance. The impact of the reforestation activities on the local environment has also been significant. Most of the respondents in the area mentioned that the micro-climate had improved.

After a project period of more than ten years, the objectives in every phase had been well met. A nursery, with a 2-3 million annual seedling capacity was established using modern technology, a pilot plantation was established, several species provenance and silvicultural, vegetative propagation trials etc. were established and maintained and the results were well reported. The trial results and key findings have also been introduced and disseminated through seminars, workshops, published in journals and technical reports etc. However, efficient dissemination of the results to the end users remains a problem and the need of much training and extension was also very crucial. Adoption of the technology developed by this project also remains a challenge. The local communities cannot use this technology, as it appears to be too costly to apply, while industrial companies also still consider the cost aspect instead of quality. For example using the pot tray technique costs Rp150/seedling compared to the common technique, which costs Rp 28/seedling.

Other challenges faced by the government, after the handing over process, were how to continue and to utilise the technology that had been successfully developed by this project, and to maintain the trials and plantation that had also been successfully established. Unfortunately little to no maintenance has been carried out since the end of the project, the nursery field and plantation area have been abandoned for quite some time and all the facilities are now in a bad condition. Some parts of the plantation trials have also been damaged by recurrent fire. The small budget allocated by the government for maintenance has been cited as the main reason for these problems up until now. If this condition remains the same and there is no significant follow up from the government to overcome these problems, all costs, time and manpower invested, for almost 13 years of project implementation, will have been totally wasted.

Project 10. Farm Forestry in Gunung Kidul, Yogyakarta (1970–present) Referred to as the Farm Forestry Project

This project was initiated using an authoritative, central government-led approach under the *Inpres* Programme, as were most of the other rehabilitation projects initiated at that time. However, the local communities responded to this initiative very well, since they had a strong motivation to ‘green’ Gunung Kidul. They could see that this could help provide a good supply of water and improve community

livelihoods. It is also important to note that the Farm Forestry Project is one of the few *Inpres* afforestation and reforestation projects that have been implemented successfully, as indicated by the national awards the community groups have received. The project has become well known as a community-owned initiative.

The main objective of the Farm Forestry Project has been to improve land and soil productivity and to conserve soil and water. Gunung Kidul used to be a dry area with a limited water supply and therefore a very poor region. Today, the communities in Gunung Kidul have a successful rehabilitation initiative. The communities and the local forestry agency implemented the activities, with primary funding support from the local government. The dominant species planted were teak and a few acacia. In 2003, the ceremony to launch the *GN RHL/Gerhan* by the President centred on this district. Instead of dried-out areas, people can now see a green landscape of 11,072 ha, providing teak production and ecological benefits.

The Farm Forestry Project had three important phases. Farmers planted teak around the edges of their land during the 1970s; during the 1980s they planted teak on unoccupied and barren or infertile land; and during the 1990s they planted teak on their productive land because of the increasing economic value of timber. During the project, despite a strong central government influence, the district government took action in response to local needs and provided strong institutional and financial support for community participation. Local institutions were supported and empowered, technical support was arranged, and the community was allowed to sell timber and to continue its activities. Rights and responsibilities were clearly divided among the government, the Forestry Services and community groups in the implementation of this effort. Two examples of locally specific regulations that work well in Gunung Kidul are *Polokromo Jati* and *Wiyata Jati*. *Polokromo Jati* is the rule imposed on all Gunung Kidul's inhabitants who marry to plant a minimum of 10 teak seedlings on their land. *Wijaya Jati* is the regulation imposed on every school to plant teak inside the schoolyard or on other land.

Elements for successful rehabilitation activities are:

- Due to past poor biophysical conditions in cultivating any plants, high community motivation and the culture of 'working hard' are quite dominant in successful rehabilitation activities, and with support from both formal and informal leaders. There is proportional local government intervention in the form of a legal framework (local regulations) in line with the local initiatives
- All stakeholders agreed to prioritise the group's best interests rather than individual interests; and the organisational structures were appropriate to deal with the existing problems (simple organisational structures but with clear and specific roles and responsibilities)

- There are continual funds for local activities, provided by many of the younger generation working in big cities
- Local needs and cultures are being accommodated in the rehabilitation activities, such as in deciding the species and techniques to plant
- Continuous incomes provide incentives for the sustainability of the local community initiatives.

There are current challenges to the initiative. The challenges have mainly come from the current harvesting practices that are based on immediate needs, which then result in the community having less bargaining power in selling the timber. Some recommendations that can be implemented include improving the community skills in post harvesting technologies, household income management, and increasing the community's economic capacity in obtaining better market information and hence a better bargaining position.

5.2. Impacts on land productivity

Planted tree survival and growth are the indicators used in assessing the improvement in land productivity on project sites observed. The silvicultural techniques employed, which covered seedling preparation, site preparation, planting time and level of maintenance, affect the survival rate and annual growth of planted trees. Project participants' commitments for tree maintenance depend on the products of the preferred species that can be harvested during or after the project has ended. Eventually, this affects the impacts on land productivity.

5.2.1. Survival and Growth

The tree species planted were divided into three groups namely forest or timber trees, multipurpose trees and fruit trees. Timber trees include pine, mahogany, acacia, eucalyptus, teak, meranti and dipterocarps. Multipurpose tree species included parkia, rubber, durian, morinda, candlenut, etc., while fruit trees planted included jackfruit, *mango*, and *rambutan*. Various crop species, such as annual food crops, vegetables, were also planted as intercrops.

Based on the perception of interviewed respondents in Database 2 (Table 5-1), multipurpose tree species were perceived to have slightly higher survival rates over 75% (stated by 23.4% of respondents) than the forest trees species (19.6%). However, the assessment, by way of respondent information, was only up to three years after planting.

More significant responses were collected from on-going projects than past-projects. Fruit tree species planted as part of the Collaborative Forest Management Project and Conserving a National Park Project were perceived to have the highest

Table 5-1. Respondents’ perceptions of survival rates of planted trees for the overall 10 projects

Tree group based on species planted	Perceptions based on survival rates group				
	<5%	5–25%	25–50%	50–75%	>75%
Forest trees species (e.g. timber)	0.0%	1.4%	7.1%	11.2%	19.6%
Multipurpose trees species	1.1%	2.5%	5.2%	6.0%	23.4%
Fruit trees species	0.0%	1.9%	2.2%	2.7%	15.8%

Source: Database 2

survival rates by more than 80% of surveyed respondents. On the other hand, multipurpose trees species was perceived to have the highest survival rates by more than 80% of the respondents who participated in the Participatory Reforestation and Farm Forestry projects. However, the community that participated in Farm Forestry development also thought forest species had a good survival rates (nearly 80%). Although *DAK-DR* Kubar and *DAK-DR* Kampar are newly initiated projects (in 2001), only less than 10% of responses provided information on the survival rates. Interviewed communities in *DAK-DR* Kampar perceived (67%) that forest tree species had better survival rates than in *DAK-DR* Kubar. However, multipurpose and fruit tree species were perceived to be more important to communities in both sites. It is important to note that survival rates were only monitored intensively during the first to third year of project timeframes, similarly for tree growth, which included information on annual increments in height and diameter of the tree species planted.

The average annual increment of timber trees was 0.54 m in height and 1.55 cm in diameter (Table 5-2). These values were moderate when compared to the annual increments of several forest tree species planted in various FORDA research forests on Java. For instance, the average annual increment of *Vatica* spp. planted at Haurbentes Research Forest in Java of the initial phase was 0.61 m in height and 0.97 cm in diameter (Masano *et al.* 1987). The growth pattern of timber trees in the rehabilitation areas differed to that of trees growing in a forest ecosystem, as found by Oldeman (1990) and Valkeman (1985). In the ten project areas, the diameter of the trees grew much faster than the height since the trees were planted in the open in full sun to ground level. The growth pattern of forest trees in a forest ecosystem conforms to a ratio of $h \approx 100.d$, in which h (height) is expressed in meters and d (diameter) in centimetres. In the ten projects, the growth pattern of the timber trees was $h < 100.d$ and may approach $h \approx 100.d/3$.

A comparison of the growth of the three tree groups shows that the annual increment, in both height and diameter, was lowest for the forest tree species. The highest annual increment was found in the multipurpose tree species. This is understandable, since most of the multipurpose tree species are leguminous pioneer

Table 5-2. Respondents' perceptions of the growth of trees planted

Tree group	Average height (m)		Annual increment in height (m/year)	Average diameter (cm)		Annual increment in diameter (cm/year)
	1 st year	3 rd year		1 st year	3 rd year	
Forest/timber trees	0.62	1.70	0.54	1.44	4.54	1.55
Multipurpose trees	0.51	3.00	1.2	1.11	9.11	4.0
Fruit trees	0.29	1.77	0.74	0.77	5.80	2.5

Source: Database 2

species, such as parkia (*Parkia speciosa*) and candlenut (*Aleurites moluccana*), but also because these species were more economically valuable for communities in the short-term.

5.2.2. Production from rehabilitated areas: a limited positive contribution to land productivity

Tree planting in rehabilitation projects involved a range of products, which can be classified into six categories based on products yielded. The survey found that usually projects produce more than one product. For instance, the Farm Forestry Project produced timber, fruit, fuelwood and food crops or vegetables as secondary crops. Based on the perceptions of interviewed stakeholders, the most important products were food crops and timber (Table 5-3).

Nearly half of respondents (48%) reported food crops and vegetables as products of the rehabilitation projects, while timber from natural forest and tree plantations was reported by more than 20%. Other significant products were derived from multipurpose tree species (10% responses), e.g. candlenut (*Aleurites moluccana*),

Table 5-3. Ranges of products resulted from rehabilitated areas based on perceptions of interviewed stakeholders

Product	N ^a	%
Production from natural forest and tree plantation species	31	20.9
Production from multipurpose tree species	15	10.1
Fruit	11	7.4
Fuel wood	3	2.0
Second crops (e.g. food crops and vegetables)	71	48.0
Others (e.g. resin, meat, seeds, honey, spices and silkworms)	17	11.5
Total	148	100

Note: a. Responses were from those who provided information from the total 156 interviewed respondents

Source: Database 2

durian (*Durio zibethinus*), clove (*Eugenia aromatica*), *melinjo* (*Gnetum gnemon*), *areca* (*Arenga pinnata*), and fruits such as mango (*Mangifera indica*), *rambutan* (*Nephelium lappaceum*), avocado (*Persea americana*), and jackfruit (*Artocarpus heterophyllus*).

Further observations showed the priority production was changed five years after the project was initiated. In this period, all of the interviewed people stated that timber and the products of the multipurpose trees increased, while the yield of second crops and vegetables declined. This is logical, since over the long term the opportunity to cultivate second crops and vegetables will reduce in proportion to the reduction in light to the understorey (crops). By this time, the canopy of multi-layered vegetation will have close, therefore only a limited amount of light will be transmitted to the forest floor. Despite the increasing importance of forestry and multipurpose tree species, all respondents felt that their fuel woods needs could not be fulfilled. Overall, more than 50% of the respondents stated that production of the rehabilitation projects had increased, either within or after the first 5 years, and only a few believed that production had decreased. This suggests that the rehabilitation projects have made a limited positive contribution to land productivity. Analysis at the project level also reflects that there were different levels of improved land productivity within the ten observed projects. More diversified products were observed at the Rehabilitation of Fire-affected Forests Project covering all of the forestry and multipurpose tree species, secondary crops, and fruit trees. This was due to the low intensity of the last forest fires, which did not damage the potential diversity of plants and fauna in the site.

5.3. Ecological impacts: impacts of rehabilitation on the burnt areas tends to be less sustainable compare to logged-over areas

The ecological impacts of rehabilitation initiatives were mainly focussed on past-projects, since it takes a considerable time for degraded forests and land to recover and to restore their function as environmental buffers. Ecological impacts observed included impacts on water resources, soil fertility, erosion and sedimentation, as well as, the dynamics of floral and faunal diversity. In this study, the ecological impacts of the rehabilitation initiatives were assessed by comparing the situation pre-project to the situation within the first 5 years and after the first 5 years of the project (long-term trends). The assessment used three categories of impacts: (-) for a negative impact, (=) for no impact and (+) for a positive impact. The number of projects in each category of impact, for each ecological variable, is shown in Table 5-4.

Table 5-4. Number of projects in each impact category of ecological variables

Variable	Number of projects					
	First 5 years			After first 5 years		
	(-)	(=)	(+)	(-)	(=)	(+)
1. Water quality	0	7	3	1	2	3
2. Water quantity	1	7	1	1	2	2
3. Water table (dry season)	0	7	2	0	3	2
4. Water table (rainy season)	0	7	2	0	3	2
5. Frequency of landslides	0	7	1	0	2	2
6. Floral diversity	0	2	8	1	1	4
7. Fauna diversity	0	6	3	1	1	3
8. Carbon stocks	0	2	8	1	1	4
9. Soil fertility	0	5	5	1	1	4
10. Soil erosion	3	5	2	1	1	4

Note: (-) = negative impact; (=) = constant (no impact); and (+) = positive impact

Source: Database 2

The negative ecological impacts at the beginning of the project period (in the first 5 years) were soil erosion (at 3 projects) and water quantity (at 1 project). These were caused by the heavy machinery used to prepare the land for planting the trees and crops, e.g. at the Mechanised Plantation Project. The negative ecological impacts for several variables were observed when projects had been running for more than 5 years, but these occurred only at certain projects, such as the Rehabilitation of Fire-affected Forests Project. This may have been the result of damage to the plantation caused by a major fire.

The perceptions of the project staff and the community living in and around the project areas, on ecological impacts within the first 5 years of the project and after the first 5 years, differed for several variables (Table 5-5). However, the differences were not significant and may have been caused by the level of observation. For instance, for the variable ‘minimum level of water table during the dry season’, the project staff’s observations may have observed at the watershed level, while the community observed at the plot level.

The quality of river water relates to the level of sedimentation or level of turbidity of the water; and these correlate closely to the level of soil erosion and frequency of landslides. Positive impacts on this variable were seen at the Watershed Protection Project and Participatory Reforestation Project during and after the first 5 years. At the Rehabilitation of Fire-affected Forests Project, a positive impact was seen only during the first period (first 5 years), after which water quality declined. This may be the result of damage to the plantation caused by a major fire after the first 5 years of the project.

Table 5-5. Perceptions of project staff and communities on the ecological impacts

Variable	Perception of project staff		Perception of community	
	First 5 years	After first 5 years	First 5 years	After first 5 years
1. Water quality	No change (69.2%)	Increased (57.1%)	No change (53.2%)	No changes (48.8%)
2. Water quantity (measured by average water debit)	No change (63.6%)	Decreased (50%)	No change (52.6%)	Increased (40.5%)
3. Minimum level of water table during the dry season	No change (70%)	No changes to Increased (50%)	Increased (39.5%)	Increased (39.5%)
4. Maximum level of water table during the rainy season	No change (63.6%)	Decreased (50%)	No change (53.4%)	No changes (39.5%)
5. Frequency of landslides	No change (81.8%)	Decreased (60%)	No change (63.6%)	No changes (55.6%)
6. Landscape (vegetation) diversity	-	-	Increased (77.6%)	Increased (81.1%)
7. Floral diversity	Increased (69.2%)	Increased (85.7%)	Increased (80.6%)	Increased (73.5%)
8. Fauna diversity	No change to Increased (41.7%)	Increased (83.3%)	No change (46.1%)	Decreased to No Changes (34%)
9. Carbon stock (tonne/ha)	Increased (90.9%)	Increased (85.7%)	Increased (70.8%)	Increased (90.9%)
10. Soil fertility	Increased (58.3%)	Increased (85.7%)	Increased (42.6%)	Increased (66.7%)
11. Rate of soil erosion	No change (50%)	Decreased (85.7%)	No change (46.3%)	Decreased (53.8%)

Source: Database 2

A decrease in water quantity in the rivers soon after rainfall was recorded as a positive impact only at the Watershed Protection Project. The development of Farm Forestry as a sub activity of this project assumed that the tree roots could absorb a large quantity of water during the rainy season. It was therefore believed that the quantity of water flowing into the rivers had declined compared to before the project started.

The variables upon which the most positive impacts were made at the past projects were floral diversity, carbon stock and soil fertility. In fact, an increase in floral diversity and carbon stocks are direct impacts of tree planting, while the other variables receive only indirect impacts. It is logical, therefore, that positive impacts were made on these two variables at most of the projects

The greatest number of positive impacts for all the variables, for both time periods (the first 5 years and the second five year period), was recorded for the Watershed

Protection Project. This is understandable since the Watershed Protection Project covers a wide range of activities such as rehabilitating terraces, developing Farm Forestry, grassing slopes, building gully plugs and constructing dams. Each activity contributed to each of the variables, and in turn strengthened each other.

The Mechanised Plantation Project took second place in terms of the number of positive impacts. Soil erosion in the first 5 years was a negative impact; however, over the long-term it became a positive impact since the frequency declined. This may have been caused by the methods used for land clearing: this was done in two different ways. Heavy machinery was used to clear part of the area and chemicals (herbicides) were sprayed on the rest. The vegetation did not recover well enough in the first 5 years to counteract the soil erosion.

The project that showed the third greatest number of positive impacts was the Participatory Reforestation Project in Sanggau. However, there was no positive correlation among the variables. For example, a positive impact on water quality was reported, but this contradicts the results for the soil erosion variable, which was assessed as increased or of being negatively impacted. The Rehabilitation of Fire-affected Forest Project recorded several positive impacts during the first 5-year period. However, a major fire subsequently damaged the plantation. As a result, nearly all the variables for which positive impacts had been recorded during the first period were negatively impacted in the long term.

The Rehabilitation of Logged-over Areas Project has not contributed any environmental benefits. Technically, this project was assessed as having failed, since no planted trees remain in the area. This was due to the lack of plantation maintenance and conflict with other concession holders over the concession area. While the state company held a concession right to the area, the Minister of Forestry released a concession right for the same area to other stakeholders. Policy inconsistencies at the central level have contributed to the lack of success of the rehabilitation efforts at the field level.

An assessment of the environmental impacts of the five ongoing case study projects have been assessed only for the first period (first 5 years), since they have only recently begun (c. 1999, 2000 and 2001), the exception being the Farm Forestry development in Gunung Kidul, which was started in the 1970s. For the four recently started projects, there are only two variables that have seen positive impacts, i.e. floral diversity and carbon stock. These projects' plantation areas are still in their initial phases of establishment, and the canopy is thin, narrow and only one layer deep. Furthermore, the plants' few roots are still short and shallow. The biomass of planted vegetation, both above and below the ground, does not yet have the capacity to contribute to the environmental variables listed above.

The Farm Forestry in Gunung Kidul is considered to be a successful project in terms of environmental impacts. It is a past participatory rehabilitation project that was recognised as making a positive impact on the five ecological variables in the first period (first 5 years) and on all 10 variables over the long term. This rehabilitation initiative has a positive multiplier effect on the environmental variables. Over the long term, the planted forest has improved the productivity of both forest and land. Further, the forest cover has increased and this has had a positive impact on the soil and water resources as well as the microclimate.

When the impact or sustainability of rehabilitation initiatives is compared in terms of causes of degradation such as fires and logged-over areas, it may be said that the impact of rehabilitation on the burnt areas tends to be less sustainable. Two successfully rehabilitated areas were always repeatedly damaged by the same cause, i.e. fire: the Mechanised Plantation Project when the stand had achieved maturity and the Rehabilitation of Fire-affected Forests Project when the plantation was 5 years old. In fact, many efforts have been made and techniques used in order to prevent and to control forest fires, as yet without success. An integrated effort and community participation are necessary to prevent forest fires. By contrast, rehabilitation initiatives on logged-over areas, such as the Farm Forestry Project, Watershed Protection Project and Conserving a National Park Project, are apparently more sustainable and had longer-term impacts.

The success of the rehabilitation efforts in the Fire-affected Forests was always affected by subsequent fires. An area that has been burnt is at increased risk of being burnt again as the air temperature is higher once the area is more open. Although the vegetation planted, may have begun to cover the area, until it reaches maturity it is not dense enough to inhibit fire. Therefore human intervention to protect the planted vegetation during the initial phase of the establishment, is crucial. Evidence from the field indicates that applying modern techniques to prevent and control fires such as the automatic measurement of air temperature and moisture followed by an alarm warning has not yet been totally successful. The active participation of the surrounding communities is also essential. This is achieved by creating a productive activity along the forest border.

Rehabilitation initiatives on logged-over areas tend to be more successful and sustainable and have had a sustainable positive impact on the environment. In the areas where the threat of fire is low, natural succession can return the vegetation of the logged-over area to the tropical forest climax phase. However, in some areas and in some cases, logged-over areas also have a high threat of fire as the air temperature increases. In fact, as long as the logged-over area is not in a phase of blocked development (a phase of ecological development), such as occurs on *Imperata* grasslands, human intervention is not necessary. A blocked development

phase is a phase that inhibits or at least slows down the processes leading to the next development phase. The blockage may be based on the absence of viable stumps, depletion of seed banks, and reduction of the inflow of seed from the surrounding landscape and/or soil conditions that do not allow for rapid growth of seedlings (Oldeman 1990, 2002). Under these circumstances human intervention is needed to prevent fire in both fire-affected and logged-over areas before a rehabilitation effort is undertaken.

5.4. Livelihood impacts: the community's short term project-based oriented benefits

The ideal ultimate goal of many rehabilitation initiatives is to have alleviated the poverty of the communities living inside and around degraded forest areas. In exploring the impacts of rehabilitation projects on local livelihoods, the impacts on the changes in the levels of dependence on forest and forest products, from household subsistence to the income generation level, and the impacts on income levels were analysed.

5.4.1. Changes in levels of dependence for subsistence needs and income generation

From Database 2 analysis, there had been a tendency for communities to depend on the forest and forest products for their subsistence needs before the projects started, and this gradually shifted to be more commercial in nature in line with the community's income earning objectives. This applies to all the projects analysed. These needs were driven by the common natural resource rehabilitation initiatives that were implemented and treated as a project, instead of being an ongoing activity. Once these activities became projects, members of the local community were usually hired as labourers, on a contract basis, e.g. for land preparation and tree planting.

It was easier for the communities involved in projects implemented outside state forest to generate incomes after the first 5 years of the project and beyond. This was indicated mainly by the fact that replanting activities continued after the project had ended. Replanting implies that there is a second rotation, particularly in timber-based rehabilitation projects, such as the Farm Forestry Project. In this project, funding to finance the second rotation came from a proportion of the revenues received from the teak harvested, and the local community now undertakes replanting in its forestry management.

Projects implemented inside state forest were less likely to generate significant incomes for local people, even after the first 5 years. In the short term (less than 5

years), incomes were generated mainly from project-based labour opportunities. In the long term, however, the surrounding community used the forest and its products to meet their subsistence needs only. This is also driven by the fact that communities do not have any (formal) right to harvest timber species planted inside state forest. For state forest-based rehabilitation projects, even after the first 5 years of the project, the forest and its products provide only limited subsistence use. This situation was observed from an impact analysis of case studies of past projects, which included the projects on Rehabilitation of Fire-affected Forests, Mechanised Plantation and Participatory Reforestation. In relation to the ongoing projects, which have been running for only 3–5 years, the need to meet the community's subsistence needs is still dominant in the rehabilitation areas of the Collaborative Forest Management and Conserving a National Park projects.

By comparison, current projects that have the watershed as the unit of management are designed with the objectives of meeting both the subsistence and income needs of the local community in the surrounding rehabilitated areas. The *DAK-DR* Projects in Riau and East Kalimantan are examples of projects aiming for both ecological and economic improvements.

The results of the cross-tab showed similarities and gaps in perception among project staff and community respondents about the various impacts on incomes (Table 5-6). This analysis supported by the results of the analysis of correspondence, shows related projects in which major changes had and have happened (Appendix 7).

In general, according to project staff and community respondents, cash income and savings both increased. However, more project staff than community members reported this increase. This was the case of Mechanised Plantation, *DAK-DR* Kubar, Watershed Protection, and the Collaborative Forest Management projects.

According to project staff, non-cash incomes that provided for subsistence needs increased, but the community responses did not report such a change. Non-cash incomes increased in the Participatory Reforestation and Watershed Protection projects. In Sanggau as the location of Participatory Reforestation Project, this occurred mainly because the areas were still partially forested, so that forest products were still available for harvesting even when the project had just begun. While at the site of the Watershed Protection Project the non-cash incomes were received long after the end of the project and came from production from the rehabilitated areas.

Employment opportunities first increased, but then ceased after two or three years of project implementation. This occurred in the Rehabilitation of Fire-affected

Table 5-6. Project staff and community perception of economic impacts of rehabilitation projects

Economic impact variables	Perception of project staff		Perception of community	
	First 5 years	After first 5 years	First 5 years	After first 5 years
1. Cash income	Increased (66.7%)	Increased (100%)	Increased (54.5%)	Increased (60.5%)
2. Savings	No change – increased (40%)	Increased (75%)	Increased (53.5%)	Increased (59.5%)
3. Non cash income	Increased (60%)	Increased (75%)	No change (51.3%)	No change (47.6%)
4. Secure food supply	No change (75%)	No change (66.7%)	No change (49.6%)	Increased (55.3%)
5. Employment opportunities	Increased (100%)	Increased (100%)	Increased (53.2%)	No change (46.2%)
6. Ownership of luxury goods	Increased (100%)	Increased (100%)	No change – Increased (45.8%)	Increased (57.5%)
7. Access to financial assistance	No change (80%)	No change (100%)	No change (53%)	Increased (57.1%)
8. Access to markets	Decreased (50%)	-	Increased (48.7%)	Increased (64.3%)

Note: The numbers in brackets represent the percentage of responses in each group and category of impacts

Sources: Databases 1 and 2

Forests and Conserving a National Park projects. Employment opportunities were still available after five years at the Mechanised Plantation Project, as a result of the need to maintain the project nurseries, collect seeds and develop private nurseries in order to sell seedlings to the ongoing rehabilitation projects. Of the ongoing projects, there are continuing employment opportunities at the Conserving a National Park Project, where employment is available to maintain the multi-cropping.

Secure food crop supplies and access to financial assistance increased, but only within the first 5 years after the project, this was mentioned by only half of the community respondents. This was an important long-term impact for the community involved in the Watershed Protection Project, in line with the project's main objective. The Farm Forestry Project has also had an impact on securing a supply of food crops, mainly as a result of intercropping with teak and other agricultural crops, such as cassava. Food crops were secure at the Mechanised Plantation Project in South Kalimantan mainly because the community was able to practise multi-cropping in the research areas of Riam Kiwa Research Forest.

According to the community responses, access to financial assistance increased after the first 5 years of the project. This was the case, in particular, with the communities involved in the Rehabilitation of Logged-over Areas, Watershed Protection, Conserving a National Park, Mechanised Plantation, and Farm Forestry. For example, in the Farm Forestry Project, community members receive financial assistance (borrowing) from their neighbours using the trees as their collateral.

5.4.2. Impacts on household incomes: low contribution to the community’s household incomes

Forty five per cent of community respondents stated that they received incomes from the activities initiated by the project in the first 5 years of the project, and 55%, mainly respondents from *DAK-DR* Kubar and *DAK-DR* Kampar said just the opposite (Table 5-7). However, in the long term (after the first 5 years of the project to the time of the survey), the number of community respondents receiving incomes fell to 38%. This relates mainly to the communities involved

Table 5-7. Community perceptions of income generation impacts of the 10 rehabilitation case study projects

First 5 yrs		After first 5 yrs – present	
Impact on generated incomes for the communities	Rehabilitation project	Impact on generated incomes for the communities	Rehabilitation project
1. Yes (45%)	<ul style="list-style-type: none">• Rehabilitation of Fire-affected Forests (73%)• Farm Forestry (64%)• Watershed Protection (60%)• Collaborative Forest Management (58%)• Rehabilitation of Logged-over Areas (57%)• Conserving a National Park (48%)• Mechanised Plantation (47%)	1. Yes (38%)	<ul style="list-style-type: none">• Farm Forestry (83%)• Watershed Protection (71%)
2. No (55%)	<ul style="list-style-type: none">• <i>DAK-DR</i> Kampar (71%)• <i>DAK-DR</i> Kubar (62%)	2. No (62%)	<ul style="list-style-type: none">• Rehabilitation of Logged-over Areas (100%)• Rehabilitation of Fire-affected Forests (89%)• Participatory Reforestation (80%)• Mechanised Plantation (67%)

Note: Percentage in brackets represents majority response

in the Farm Forestry and Watershed Protection projects. A higher number of respondents (62%) stated that they no longer received incomes after the first 5 years of the project; this related to the Participatory Reforestation, Rehabilitation of Logged-over Areas, Rehabilitation of Fire-affected Forests, and Mechanised Plantation projects. Under the Participatory Reforestation Project, incomes came mainly from maintenance incentives provided by the project, e.g. *BP DAS*. There was also a problem because this stipulated arrangement was not well understood by the community. For the Mechanised Plantation Project some of the observed facts conflict with the figures in the table, i.e. only a small proportion of the community involved in the project continued to receive incomes the first five years and beyond, while the figures show 67% respondents stated the opposite. The small portion of the community that continued to receive incomes does not represent the fact that the general community participated. This related in particular to community members who were involved in the Mechanised Plantation from the beginning of the project.

Further cross-tab analysis shows the average incomes received by the communities involved in both past and ongoing rehabilitation projects (Table 5-8). For both periods the range of average incomes derived from the past projects are lower than those from the ongoing projects. Again, in most of the projects (Rehabilitation of Fire-affected Forests, Mechanised Plantation, Rehabilitation of Logged-over Areas and Participatory Reforestation), in the first 5 years of the project the

Table 5-8. Incomes based on sources after five and more than five years after projects were initiated

Up to 5 years after the project	After 5 years – present
<u>Past projects:</u> USD 37 – 207 per year	<u>Past projects:</u> USD 44 – 52 per year
<u>Sources of income:</u>	<u>Sources of income:</u>
1. Agriculture (Watershed Protection)	1. Agriculture, <i>ecotourism</i> (Watershed Protection)
2. Labour for rehabilitation areas (Rehabilitation of Fire-affected Forests, Mechanised Plantation, and Rehabilitation of Logged-over Areas)	2. Nursery (Rehabilitation of Fire-affected Forests)
3. Incentives for maintenance (Participatory Reforestation)	3. Collecting acacia and eucalyptus seeds (Mechanised Plantation)
<u>Ongoing projects:</u> USD 207 – 294 per year	<u>Ongoing projects:</u> USD 272 per year
<u>Sources of income:</u>	<u>Sources of income:</u>
1. Selling timber and agricultural produce (Farm Forestry, Collaborative Forest Management)	Selling timber and agriculture (Farm Forestry)
2. Labour for rehabilitation areas (<i>DAK-DR</i> Kampar and <i>DAK-DR</i> Kubar)	
3. Agroforestry (Conserving a National Park)	

main income sources were wages (labour). For the past projects that continued to provide incomes after the first 5 years, sources of incomes were sales of agricultural crops, ecotourism, developing nurseries, and supplying seeds to the nurseries. Rehabilitation activities managed under the Farm Forestry Project have contributed significant incomes to the communities, mainly from selling timber and agricultural crops.

However, incomes generated from rehabilitation project activities play a less important role than other sources of household income, such as the sale of agricultural and non-agricultural crops (Table 5-9). The highest proportion of such income was reported from the Rehabilitation of Fire-affected Forests Project (42% of total household incomes) and the lowest proportion from the Participatory Reforestation Project (11% of total household income).

Based on in-depth observations in the Collaborative Forest Management Project areas, the study further examined the economic impacts of rehabilitation on marginalised groups and in terms of gender. To achieve the poverty alleviation objective of the rehabilitation projects, it is vital to take the marginalised groups into account at all stages of the project. This has not been well addressed, as indicated by the results from the field observations discussed in Box 5-1. Furthermore, a gender analysis shows that there were both positive and negative impacts for men and women; there were no significant differences between the two. However, it is

Table 5-9. Community perception of the contribution of rehabilitation projects to household incomes

Rehabilitation project (respondents)	Income source		
	Rehabilitation activities	Agriculture	Non agriculture
1. Collaborative Forest Management (n=60)	28	22	50
2. DAK-DR Kampar (n=10)	33	50	17
3. DAK-DR Kubar(n=13)	26	28	46
4. Conserving a National Park (n=26)	38	20	42
5. Rehabilitation of Logged-over Areas (n=25)	38	40	22
6. Participatory Reforestation (n=26)	11	68	21
7. Rehabilitation of Fire-affected Forests (n=11)	42	33	25
8. Watershed Protection (n=30)	35	35	30
9. Mechanised Plantation (n=19)	22	62	16
10. Farm Forestry (n=17)	27	33	40

Source: FGD

Box 5-1. Impacts on marginalised groups and gender groups at the Collaborative Forest Management Project

Impacts on marginalised groups. In order to understand the impacts on marginalised groups the following stakeholders were identified: 1) small farmers who participate in the programme, 2) small farmers who are non-participants, 3) landless farmers who participate in the programme, and 4) landless farmers who are non-participants. The stakeholders who receive more positive impacts of forest rehabilitation activities are programme participants, both small and landless farmers, because they have direct incomes from intercropping production. The stakeholders who tend to receive a negative impact are non-participants because they have lost their access to forest areas and the opportunity to increase their incomes.

Landless farmers who do not participate in the rehabilitation programme form a marginalised group that cannot benefit from the programme, although about 50% of them wish to join. They tend to be negatively impacted by the rehabilitation activities, e.g. they have difficulty finding firewood, timber and non-timber forest products (NTFPs). There are two factors, which prevent the marginalized groups from participating in and enjoying benefits from rehabilitation activities. First, their resources, such as time, money and health, are limited. They tend to be completely occupied with survival at the subsistence level and are unable to allocate time and money for additional activities like rehabilitation. They are vulnerable to illness due to the risk of malnutrition in a resource-poor setting. Second, their access to information is limited because they tend to miss information meetings as they are often away from the village or busy with their daily work. It was implied during focus group discussions that one negative impact of the Collaborative Forest Management Project was social jealousy, caused by the inequity in land distribution. Some participants received productive land while others had land with infertile soil or that was prone to landslides. Moreover, the farmers who already had enough land of their own also received large areas of land under the project. This happened because the land designated for the rehabilitation project was illegally occupied by the farmers before the start of the project.

Impacts of rehabilitation activities on men and women at the Collaborative Forest Management Project. The positive and negative impacts of rehabilitation activities, especially those that affect men and women, are summarized in the table below. The positive impacts of rehabilitation activities on both men and women in a household are: increases in income, land for agriculture, availability of school fees, and happiness and health. The positive impacts mentioned only by men are: the ability to gain employment and access to increased knowledge. The positive impacts felt only by women are: the ability to take part in activities outside the house, being able to interact with neighbours to their mutual benefit, and being more courageous.

Box 5-1. Continued

Positive impacts on	
Men	Women
<ul style="list-style-type: none">• Increased income (89%)• Employment opportunities (18.2%)• Availability of land for agriculture (16.4%)• Availability of money for school fees (12.7%)• Healthier, happier and have more friends (9.1%)• Increased access to knowledge (5.5%)	<ul style="list-style-type: none">• Increased income (82.1%)• Able to take part in activities outside the house (25%)• Ability to interact with neighbours to their mutual benefit (16.1%)• Availability of land for agriculture (3.6%)• Availability of money for school fees (3.6%)• More courageous (1.8%)• Healthier and happier (8.9%)
Negative impacts on	
Men	Women
<ul style="list-style-type: none">• More difficult to find firewood/timber• More difficult to find forest honey/birds	<ul style="list-style-type: none">• More difficult to find firewood/timber
Note: % = percentage of respondents answering	

Source: Field survey at the Collaborative Forest Management Project, 2005

important to note that when the study was carried out the Collaborative Forest Management Project had been running for only three years. Observations during the later stages of the project might give different results and interpretation.

5.5. Impacts on community’s access rights to forest resources and conflicts

The results of the data analysis show the interrelation between the impacts on tenure and improvements in other aspects of community institutions. These include the improvement in the institutional and traditional strengths of local communities, the strengthening of community institutions and clear representation of the community in all aspects of natural resource management.

5.5.1. Impacts on access to forest resources

Field observations show that security of tenure strongly influences the success and long-term sustainability of forest and land rehabilitation projects, even after the project has ended. Most respondents stated that security of tenure is the most important issue, and is even more important than technical problems. Security of tenure covers both rights over land and to manage forest and non forest land, which includes the rights to harvest the production from the trees initially planted

(i.e. timber and non-timber). However, from the analysis, based on a field survey and participatory rural appraisal (PRA), the issue of security of tenure has not been addressed in any depth.

Both project staff and community members who participated in the rehabilitation projects were questioned about the impacts that they perceived, up to 5 years and more than 5 years after the project was initiated, in terms of tenure and institutional change (Table 5-10). Project staff had a tendency to claim that the projects helped to increase the clarity of land ownership or status, access to forest land and trees, increased institutional capacity and representation of the community in various aspects of natural resource management, social cohesion and community institutions, and socio-cultural strengths. For example, the *DAK-DR* Kubar Project has had an impact on the informal recognition of community land tenure.

The community members' perceptions, on the other hand, tended to be more uniform in stating that the projects generally had no impacts in this respect. Specifically, there had been no change in either the short term (up to 5 years after the project was initiated) or long term (from 5 years after the project was initiated to the present day) in land ownership, clarity and security of rights to forest resources and trees, or social cohesion among community members. At the time the projects were being implemented they were effective in securing the community's access to collectively managed resources, but this impact did not last for more than 5 years after the start of the projects.

Table 5-10. Project staff and community perceptions of the impacts of the 10 case study projects on tenure and access

Tenure and access	Perception of project staff		Perception of community	
	First 5 years	After first 5 years	First 5 years	After first 5 years
Land ownership	Increased (75%)	Increased (100%)	No change (52.2%)	No change (57.1%)
Access to forest land and trees	Increased (66.7%)	Increased (66.7%)	No change (51.4%)	Increased (51.3%)
Clarity and security of rights to land	Increased (60%)	Increased (75%)	No change (55%)	No change (63.4%)
Clarity and security of rights to forest resources and trees	Increased (80%)	Increased (100%)	No change (49.1%)	No change (55%)
Access to collectively managed resources	Increased (60%)	Increased (100%)	Increased (49.1%)	No change (52.6%)

Note: The percentage (%) in brackets indicates the proportion of respondents who responded to the question

Source: Database 2

The analysis of correspondence supported the respondents' perceptions at the project sites. At the Rehabilitation of Fire-affected Forests and Participatory Rehabilitation projects, there was improved community access to forestland and planted trees within the forest. Specifically, this access related to the opportunity to be involved in project activities, such as in establishing nurseries and planting, while practising multicropping. However, only a limited number of community members could enjoy this access; the others were entering the forest to cultivate land illegally.

In the Participatory Rehabilitation Project, the community perceived its rights to land to be more secure after the first 5 years (Appendix 7). This resulted from the participatory process at the village level of having Consensus of Village Land Use Planning (*Tata Guna Lahan Desa Kesepakatan – TGLDK*). The process helped the community and project staff to have a clear understanding of the land status and different classification of land use, such as protection forest, production forest and a sedentary farming system (*Usaha Tani Hutan Menetap – UTHN*).

At the Mechanised Plantation Project there was improved clarity about secure rights to land after the first 5 years, since the project managers allowed more opportunities for multicropping in the project areas. At the Rehabilitation of Logged-over Areas Project there was no improved access to forestland and trees, either before or after the project ended. After the project was discontinued, the land status was not clear and the situation returned to the status quo; the land was available for any one to use illegally.

Among the past projects, the initiatives with similar impacts on tenure conditions were the Watershed Protection and Mechanised Plantation projects. Both of these projects had an influence on clarifying who had rights over the land on which the project was implemented. Among the ongoing projects, the Farm Forestry and Conserving a National Park projects are the two that are having long-term impacts by improving access to forestland and trees. The Farm Forestry initiative has increased land ownership: this has been made possible because the project is being implemented in a community forest area outside state forest. Closely related associated impacts are improved clarification of land ownership and security of rights to trees and other forest resources.

5.5.2. Institutional capacity: improved but there are still conflicts and low social cohesion

According to community members, in the long term the most significant impacts have been made on the community's institutional capacity, including community representation in various aspects of natural resource management, and on community institutions and socio-cultural strengths. However, about 50% of the

Table 5-11. Project staff and community perceptions of social and institutional impacts of the 10 case study projects

Social and/or institutional condition	Perception of project staff		Perception of community	
	First 5 years	After first 5 years	First 5 years	After first 5 years
Institutional capacity of community and community representation in various aspects of natural resource management	Increased (60%)	Increased (100%)	Increased (52.3%)	Increased (61%)
Social cohesion	Increased (60%)	No change – increased (50%)	No change (51.8 %)	No change (54.8%)
Community institutions and socio-cultural strengths	Increased (80%)	Increased (100%)	Increased (51.8%)	Increased (51.2%)

Note: The percentage (%) in brackets indicates the proportion of respondents who responded to the question from the total sample

Source: Database 2

community respondents had not perceived any change in the interrelation among community members or in social cohesion, while the perceptions of the project staff varied (Table 5-11).

However, the analysis of correspondence shows improved social cohesion at the Mechanised Plantation, Watershed Protection, Participatory Reforestation, Conserving a National Park and Farm Forestry projects. The Mechanised Plantation and Farm Forestry projects showed improved social cohesion during the first 5 years of the project (Appendix 7). Specifically, this was because the Mechanised Plantation Project developed infrastructure based on local needs, e.g. electricity supply and public health facilities. Under the Farm Forestry Project, social cohesion was due to the very strong support from the Head of district level government (*Bupati*). For the Conserving a National Park Project, social cohesion resulted from the continuing dialogues and participatory process involved in initiating and empowering the local organisation to manage the development of the medicinal plant business.

In addition to improved social cohesion, at the past projects, another significant impact was the improvement in community institutions based on local traditional cultural strengths. For the newly initiated projects, the important changes are an improvement in institutional capacity and the provision of opportunities for community members to voice their views in relation to all aspects of natural resource management.

The analysis shows that for more secure land ownership the empowerment of community institutions is important. Weak community institutions lead to the

under-representation of the community in project management, and this results in dissatisfaction, conflicts over land status and low social cohesion. There are three sources of conflict over tenure inside state forests: 1) conflicts of interest between customary institutions, private companies, NGOs and government, which is reflected in overlapping rights to use and manage land; 2) land boundaries that are not agreed; and 3) forest encroachment due to weak law enforcement and unclear management rights. Conflicts in state forests are often greater and more serious than those on community land. Outside state forests, disputes over land boundaries were the main causes of conflict. Strong competition for land outside state forest is the main problem leading to conflicts over land boundaries.

Under the decentralisation policy, local governments have set different priorities when making their policies on the allocation of management rights. At the Rehabilitation of Logged-over Areas Project, a conflict of interest between pushing for a high-return investment, such as an oil palm plantation, and rehabilitating the degraded forest areas was inevitable. Not only the allocation of rights inside production forest but also the allocation of rights to rehabilitate areas inside the conservation areas, e.g. elephant sanctuary areas, often conflict with management rights.

Problems of encroachment have become quite common since the Reformation era. Encroachment becomes a problem when it has been happening for a long time and the community occupies the land in order to cultivate agricultural crops. The encroachment is often the result of a lack of clarity about who has rights to use the land, and lack of law enforcement. Local communities, often supported by a local NGO, are usually reluctant to participate in rehabilitation projects implemented in these areas. The Rehabilitation of Fire-affected Forests Project demonstrated how many people claimed land by using customary laws to justify their ownership, although they did not originally come from the area; they wanted to receive reimbursement fees from the project. Arson at project camps, one of the problems experienced at this project site, provided a good lesson in showing that these overlapping land-use problems should be resolved before the project is initiated. Dialogues were begun and solutions implemented, but they did not resolve the conflict.

On community land, conflicts usually originated from the different interpretations of land boundaries used as the basis by the different parties for claiming land ownership. Due to strong competition for land to be used for various purposes and the limited area of available community land, including land for agricultural crops, the rehabilitation of degraded forest areas is often of less importance to the community. The Farm Forestry and Watershed Protection projects both suffered from this problem. Planting long-term forest species under a rehabilitation project

is not the best option for many communities, particularly if they need more land in order to cultivate food and cash crops for their basic needs.

Conflicts have affected rehabilitation activities while projects were being implemented and have even threatened their long-term sustainability. It was noted in field observations that the impacts on rehabilitation activities of unresolved conflicts included:

- Rejection by the community of the main species recommended for rehabilitating the areas
- Reluctance to maintain the main species planted
- The withdrawal of management rights to rehabilitate the areas
- Arson at project camps, and other social unrest.

Most of the projects (seven of the ten case study projects) developed alternative dispute resolutions by strengthening local knowledge. The Rehabilitation of Fire-affected Forests and Logged-over Areas projects used legal instruments to resolve conflicts. However, this was detrimental to the problems on the ground. The repressive approach used by the military provoked local community resistance. Furthermore, this was more expensive than the Alternative Dispute Resolution (ADR) approach, which employed negotiation and discussions. Common sense, persuasion and good faith are key ingredients in reaching a solution. Although the ADR approach is simple, most of the projects have not made optimal use of it to obtain a win-win solution. The Participatory Reforestation Project is one of the projects that succeeded in developing local strengths to facilitate conflict resolutions on the ground.

Improvement in the institutional and traditional strengths of local communities correlates with the impact in resulting in better land ownership conditions of more clear and secure rights to individual lands and access to collectively managed resources, and improved social cohesion. Further, clarification and security of rights not only to land, but also on trees and other forest resources, and the strengthening of community institutions lead to clear representation of the community in all aspects of natural resources management.

5.6. Community participation: overly high expectations

Almost all of the initiated programmes and projects have relied on the active participation of the communities in making the projects successful. Despite the importance of the programme in raising a community's awareness, as part of the efforts to encourage their participation, this programme has been very limited.

Only 5.8% of responses in Database 2 stated that this programme has been conducted to support the rehabilitation project. In general, there have been overly high expectations of community participation, yet approaches and incentives to encourage this have been lacking.

5.6.1. Community participation: still mobilisation instead of participation

The result of an analysis of the level of community participation in the case study projects shows that seven projects relied on mass mobilisation rather than on interactive community participation (Table 5-12). Participation is defined as: a process through which stakeholders influence and share control over development initiatives and the decisions and resources that affect them (The World Bank 2001).

Mass mobilisation is often referred to as pseudo participation, and interactive participation as genuine participation. Surprisingly, one successful project, i.e. the Watershed Protection Project, encouraged community involvement under the mass mobilisation system. Characteristics of the mobilisation system include the immediate termination of community participation at the end of the project cycle, high community dependence on the project – particularly for funding, and a low level of community initiatives emerging from the project.

Three projects can be identified as having taken the interactive participatory approach in encouraging community involvement: the Collaborative Forest Management, Farm Forestry, and Conserving a National Park projects. In the Collaborative Forest Management Project, there has been very strong community participation at every stage of the project activities, such as determining species,

Table 5-12. Types of participation in the 10 case study projects

Projects	Type of participation	
	Mobilisation	Interactive
1. Collaborative Forest Management		✓
2. DAK-DR Kampar	✓	
3. DAK-DR Kubar	✓	
4. Conserving a National Park		✓
5. Rehabilitation of Logged-over Areas	✓	
6. Participatory Reforestation	✓	
7. Rehabilitation of Fire-affected Forests	✓	
8. Watershed Protection	✓	
9. Mechanised Plantation	✓	
10. Farm Forestry	✓	✓

Source: Database 2

implementation and institutional designing processes. In the Farm Forestry Project, strong community participation was driven mainly by the need to improve the poor biophysical conditions of the project areas, mainly for cultivating plants and obtaining adequate water supplies. The local government has provided an appropriate legal framework (local regulations) in line with local community involvement. In the Conserving a National Park Project, an NGO played a dominant role in facilitating community participation from the project initiation stage through to project implementation.

At present, although certain rehabilitation initiatives were intended to be community-based, those who initiated the initiatives chose to mobilise people rather than invite them to become involved in the projects in an interactive approach; e.g. in the establishment of community involvement in both *DAK-DR* Kampar and *DAK-DR* Kubar. There are several reasons why the mobilisation approach rather than the alternative was chosen: it is a more practical and cheaper option, and it is less time consuming since it requires fewer engagement processes.

The level of community involvement in rehabilitation activities also varied according to the location of the initiative (Table 5-13). Inside state forest, the community has been involved mainly in land preparation and planting activities. However, when it comes to tree maintenance, which is most important in ensuring a high tree survival rate, there has been a low level of community involvement; therefore the community is indifferent to whether or not the fragile seedlings survive. Another reason is that most of the projects paid wages to community members involved in land preparation and planting, but no long-term wages were provided for tree maintenance. However, the most important reason has been the lack of security of tenure, together with the lack of guaranteed access to the products harvested, mainly timber. Because of secured ownership of community land outside state forest, a different situation can be observed where rehabilitation programmes are implemented outside state forests. The local community is deeply involved in almost all activities.

It has been most difficult to gain community involvement in institutional building processes. Inside state forest there has been no community involvement in this aspect, while in the projects implemented outside state forest, the community was involved. However, the community was involved for only a short period, and this has not been sustainable. A good example of successful community involvement in small-scale business development is shown from the Conserving a National Park Project. Facilitated by an NGO, the community has been able to market the production from medicinal trees planted inside the national park areas.

Table 5-13. Community involvement in rehabilitation activities according to project location

	Rehabilitation activity	Project	
		Outside state forest	Inside state forest
Technical	Planting techniques for timber and non-timber species (mahogany, vanilla, pepper, MPTS)	Farm Forestry, <i>DAK-DR</i> Kampar	Collaborative Forest Management
	Planting space and pattern, and tree composition	<i>DAK-DR</i> Kampar	<i>DAK-DR</i> Kampar, Conserving a National Park
	Intensive maintenance techniques (intercropping, Rotton F treatment, propagation of plants, stump clearing, land mapping, and applying manure)	<i>DAK-DR</i> Kubar	<i>DAK-DR</i> Kubar
	Establishing nurseries and simple maintenance techniques (including pruning)	Farm Forestry	
	Terracing and terrace maintenance (included constructing control dams/gullies)	Watershed Protection	
	Developing seedlings, agro forestry practices, controlling fire		Mechanised Plantation Fire-affected Forests
	Logging		Rehabilitation of Logged-over Areas
Institution	Institutional and cooperative development	Farm Forestry, Watershed Protection, <i>DAK-DR</i> Kampar	Collaborative Forest Management, <i>DAK-DR</i> Kampar, <i>DAK-DR</i> Kubar, Mechanised Plantation
	Administrative management	<i>DAK-DR</i> Kubar	<i>DAK-DR</i> Kubar
Economic	Cooperative	Watershed Protection	Collaborative Forest Management
	Small-scale business development		Conserving a National Park

Source: Database 2

Top-down projects, implemented under the mass mobilisation approach, tended to be less successful in influencing the community to become involved in various activities over the longer term. However, several projects were able to adapt to local inspirations, and the project design was adjusted to accommodate higher community participation during project implementation, e.g. endorsing supportive local regulations, as in the Farm Forestry and Watershed Protection

projects. These particular projects generated higher community participation and influenced the adoption of various rehabilitation techniques.

It is interesting to look further at the difference between men's and women's involvement in various rehabilitation activities at the Collaborative Forest Management Project (Box 5-2). Both men and women are actively involved. However, the men are involved predominantly in specific activities related to the development of the main species used in rehabilitation. Women, on the other hand, are involved mostly in the production of secondary crops, such as rice. Men tend to dominate most decision-making processes. Women tend to be excluded because they are often not invited to attend the planning meetings.

Box 5-2. Involvement of the community according to gender in rehabilitation activities at Collaborative Forest Management Project in Sukabumi

The survey of gender roles found that both men and women were involved in almost all stages of rehabilitation activities, as presented in the first table below. For example, clearing land, in which the heaviest work is done mainly by men, is also supported by women (37.5 %). Men are involved mainly in planting timber trees and fruit trees, making holes for planting, and spraying pesticides, because this work is too heavy for women. Women are involved mainly in weeding and intercropping, such as planting and harvesting crops (rice, corn, beans and vegetables). Other intercropping work, such as planting and harvesting rice, is done by men and women together, or by community self-help groups (*gotong royong*), arranged by neighbours and acquaintances. Women undertake about 40% of a household's work on rehabilitation activities; this means that women undoubtedly share the responsibility for forest rehabilitation. In general, in poor households, women play a greater role in rehabilitation activities.

From the second table, below, it can be seen that men play a greater role in decision making than women. However, this does not necessarily mean that women have no power and influence in decision-making processes in the family. Decisions are generally made through discussion between husband and wife. This means that women also have bargaining power in decision making, within the household. The men's role is to attend formal meetings. Although women would be willing to attend meetings, it is difficult for them to do so because only men are invited to attend. This means that women have little opportunity to join the decision-making processes within a community, so that their decision-making power within the community remains limited.

Box 5-2. Continued

Activity	Gender (%)				
	M	M/f	M/F	F/m	F
Clearing land	29.2	37.5	8.3	4.2	20.8
Digging planting holes	66.7	4.2	0.0	0.0	8.3
Planting tree seedlings	58.3	16.7	4.2	4.2	12.5
Weeding	0.0	8.3	33.3	16.7	41.7
Monitoring	41.7	4.2	16.7	4.2	25.0
Applying fertilizer/manure	37.5	4.2	20.8	4.2	33.3
Spraying pesticides	58.3	4.2	0.0	0.0	8.3
Planting fruit trees	54.2	8.3	0.0	0.0	16.7
Planting/harvesting rice	0.0	0.0	45.8	20.8	33.3
Planting secondary crops	0.0	0.0	8.3	8.3	66.7
Harvesting secondary crops	0.0	4.2	25.0	0.0	50.0

Activity	Gender (%)				
	M	M/f	M/F	F/m	F
Participating in the programme	45.8	12.5	20.8	8.3	12.5
Attending meetings	54.2	25.0	4.2	4.2	4.2
Planting species	25.0	12.5	50.0	0.0	12.5
Deciding on manures	37.5	8.3	29.2	0.0	12.5
Deciding on planting location	50.0	0.0	25.0	4.2	20.8
Harvesting	37.5	0.0	29.2	4.2	29.2
Deciding on where to market	58.3	0.0	16.7	8.3	16.7

Notes: M: exclusively male M/f: predominantly male

M/F: equally male/female F/m: predominantly female F: exclusively female

Source: Field survey in Collaborative Forest Management Project in Sukabumi 2005

5.6.2. Impacts on access to public facilities: inequitable distribution of benefits and indirectly influencing community level commitment

Most of the case study projects developed various kinds of infrastructure usually roads and buildings as part of the rehabilitation projects as confirmed by 56% respondents in Database 2 (Table 5-14). These developed infrastructures were found mainly at the projects that were initiated to implement rehabilitation activities inside state forest and the projects were on-going. The infrastructures development was also funded by community project participants in the form of contributed labour to construct the facilities. The main sources of infrastructure funding were the project itself, district governments and NGOs. The project that funded the infrastructure themselves was the Fire-affected Forests and Mechanised Plantation Project. District governments and NGOs tend to fund nurseries.

Table 5-14. Types of infrastructure developed in all projects

Type of infrastructure	Respondents reporting that an infrastructure has been developed in their project (n)	%
1. Roads	33	39%
2. Water facilities and buildings	2	2%
3. Buildings	10	12%
4. Electricity and roads	9	11%
5. Nurseries	2	2%
6. Roads, water facilities, buildings and electricity supply	4	5%
7. Roads and buildings	14	16%
8. Roads, buildings, water facilities and nurseries	6	7%
9. Roads, buildings, recreation/sports facilities and schools	5	6%
Total	85	100%

Source: Database 2

Table 5-15. Project staff and community perceptions of impacts of rehabilitation projects on access to public facilities

Public facility	Perception of project staff		Perception of community	
	First 5 years	After first 5 years	First 5 years	After first 5 years
Health facilities	Increased (75%)	Increased (66.7%)	Increased (51.8%)	Increased (52.5%)
Clean water, electricity and communication facilities	Increased (100%)	Increased (100%)	No change –increased (48.6%)	Increased (52.4%)
Education, skills improvement and training organised by the project	-	Increased (100%)	Increased (52.3%)	No change – increased (48.7%)
Access to education outside the project	Increased (87.5%)	Increased (75%)	Increased (54.5%)	Increased (64.4%)
Availability of information	Increased (80%)	Increased (66.7%)	Increased (54.9%)	Increased (66.7%)

Based on an analysis of correspondence, the perceptions of project staff and the community indicated that the rehabilitation projects had had a positive impact in terms of access to public facilities, such as health facilities, clean water, electricity and communication facilities, improvement in education and knowledge, as well as the availability of information (Table 5-15). In general, project staff perceptions of the impacts were higher than that of the community. This may indicate that there has been inequitable distribution of benefits among all community members, and that benefits had not reached all the potential beneficiaries. The infrastructure

facilities developed and appreciated by community project participants, which indirectly influenced their commitment to the project, may not necessarily guarantee the sustainability of the rehabilitation initiatives, as shown from the observation of the Logged-over Areas Project in Riau.

5.6.3. Adoption by community: technical more than institutional and social aspects

One of the expected impacts in a rehabilitation project is that the community adopts the rehabilitation techniques and approaches. Of the total number of community members interviewed, 97% stated that they had adopted some, but not all, of the rehabilitation techniques they had learned. ‘Adopted’ here simply means that the community followed and implemented the approaches or certain techniques. Of these respondents, 66% were participating in rehabilitation projects inside state forest, and 12% were involved in the projects on community lands. The remaining 22% were those participating in projects implemented both on community land and inside state forests.

More technical aspects were adopted in projects initiated during the top-down period than in the periods when transitional and participatory approaches were taken (Table 5-16). However, these related predominantly to technical aspects rather than to institutional and social aspects. The mechanism adopted for organising cooperatives in top-down projects was introduced 20–30 years after the projects were initiated. Small-scale business development was brought in by some of the projects initiated during the transition period, and this continued into the participatory period. Due to the increasing occurrence of forest fires during

Table 5-16. Techniques adopted at different periods according to the rehabilitation approach

Rehabilitation approach		
Top-down	Transition from top-down to participative	Participatory
1. Planting techniques	1. Planting techniques	1. Planting techniques
2. Cultivating fodder and grasses	2. Establishing nurseries	2. Establishing nurseries
3. Establishing nurseries	3. Small-scale business development	3. Land mapping
4. Constructing gullies	4. Forming cooperatives	4. Forming cooperatives
5. Terracing and controlling dams	5. Forest fire prevention	5. Small-scale business development
6. Maintenance (including pruning) ^a	6. Grassland conversion	
7. Forming cooperatives ^a	7. Logging	

Note:

a. Introduced to the community 20–30 years after the projects were initiated. The community adopted these approaches.

the transition period, the communities responded more positively by adopting the techniques learned to control forest fires. However, having seen the intensive logging practices of the concessionaires, the community has also adopted their techniques for felling timber. During the participatory period fewer technical aspects have been adopted, and there has been a move towards adopting more of the institutional and socioeconomic aspects.

Observations indicated that there is a relationship between project timeframe and the level and types of techniques and approaches adopted. Complicated and difficult techniques and approaches are most likely to be adopted by communities taking part in projects with longer timeframes (more than 5 years). The communities mostly adopted the rehabilitation planting techniques, particularly in relation to pattern and space (Figure 5-1). There was a lower response from communities in adopting techniques for determining different tree species to be planted (tree composition), species treatment and establishing nurseries. Adoption was also lower in communities who participated in projects of less than 5 years. Initially, the adoption of specific techniques was often forced on the community by the projects, instead of adoption being voluntary and driven by increasing awareness of the importance of the rehabilitation efforts.

For projects implemented for both up to 5 years and for more than 5 years, communities mostly adopted the institutional and cooperative aspects. However, the local institutions initiated under the projects do not usually have clear

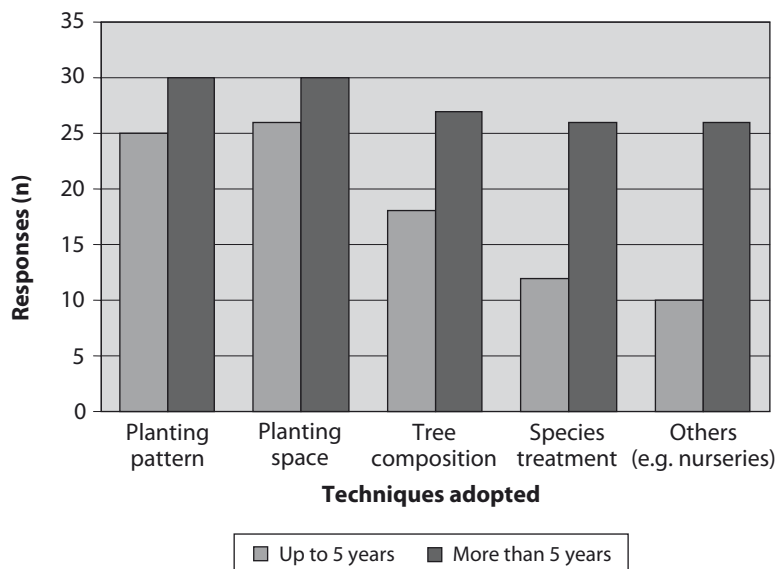


Figure 5-1. Planting techniques adopted in relation to project period

programme agendas, and only few of them were able to continue their activities once the project had ended. Some community organisations were formed with no proper preparation in relation to administrative requirements and organisational capacity, e.g. the projects initiated under reforestation funds (*DAK-DR*). Misuse of authority by the cooperatives' managerial staff was often a problem that affected the sustainability of the institutions initiated.

Most projects had difficulty in strengthening the local economic institutions, such as small-scale business units (*Usaha Bersama*). Some major difficulties were the lack of start-up capital, insufficient business sense, skills and knowledge, and a lack of skills to set up business networks. Building the trust required to run a business, among all the cooperative members, was another serious problem. The establishment of local economic institutions is becoming important as a prerequisite to ensuring that rehabilitation activities are continued after the end of the projects.

The lowest levels of adoption occurred in the Rehabilitation of Logged-over Areas Project, although the logging techniques were adopted (Appendix 7). Project introduction sessions and extension programmes were not widespread. This was the main cause of low adoption. Moreover, this project came to an end before the project term ended. There was limited local community involvement, as people had been paid only for planting.

5.6.4. Ensuring benefits for the community through benefit-sharing agreements: helps to increase the community's level of commitment

In securing the community's participation in a rehabilitation programme or project, the need to make clear the benefit and cost-sharing mechanism, is crucial. This is particularly important for projects with significant community involvement in their activities. Communities are increasingly aware of their rights to fair benefit sharing in return for their participation and contribution to the projects. The benefit/cost-sharing agreement is a very important element in accelerating partnerships in forest management. If this issue is not addressed, it will be an obstacle to maintaining collaborative forest management in rehabilitation projects.

In the case study project sites, the benefit/cost-sharing agreement is particularly important in the Conserving a National Park and Collaborative Forest Management Projects. These two projects show how the good faith of the community can be lost if the benefit/cost-sharing mechanism serves only as an instrument to repress local communities. The problems become more serious if the establishment of benefit/cost-sharing agreements is not transparent and lacks participatory processes.

Table 5-17. Benefit-sharing agreements

Collaborative Forest Management Project		
Production	Benefit sharing proportion (%)	
	Community	State company
1. Wood/timber stand	25	75
2. Multipurpose Tree Species (company provides the seedlings)	80	20
3. Multipurpose Tree Species (community provides the seedlings)	100	0
4. Production under <i>taungya</i> system	90	10
Conserving a National Park Project		
Production	Benefit sharing proportion (%)	
	Community	National Park
5. Multipurpose Tree Species (MPTS)	100	0
6. Production under <i>taungya</i> system	100	0

Source: FGD

**Picture 5-1.** Multicropping system under benefit-sharing agreements (Location: Collaborative Forest Management Project in Sukabumi, West Java)

The benefit-sharing mechanisms applied in the Collaborative Forest Management show a higher proportion of benefits go to the state company, particularly for timber production (Table 5-17). In the two projects, for Multipurpose Tree Species (MPTS) and production under the *taungya* system, the community receives a higher proportion of or all of the benefits from the production.

The result of the Focus Group Discussion (FGD) with community participants showed that the agreement needs to be reviewed otherwise the long-term sustainability of the project will be uncertain. Interviews showed that, although most of the key informants endorsed the agreement, it was not clear to them on what considerations the agreement had been based.

During the interviews, critical points emerged in relation to this agreement. It was felt that the agreement should be based more on the principle of equity than merely on an economic rationale. It is crucial that shared input–output is used as the main consideration in determining the distribution of benefits and costs between the parties involved, and that this should be done in a transparent and participatory manner. Therefore, trust and transparency on agreements are the main conditions for collaborative management. This is important to ensure fairness between the local community and stakeholders who are responsible for managing the projects.

For communities that lack knowledge and experience, empowerment is important, particularly in ensuring that they understand the issues being negotiated and the implications of the agreement on the benefits they may receive. Community members interviewed in Meru Betiri National Park suggested that a series of interactive dialogues be held before and during the development of the agreement as part of the empowerment process. Community members felt that the existing agreement is unfair, because they were strongly pressured to endorse it. Further, most of the local communities believed that only the stakeholders who were responsible for organising the projects had drawn up the agreement or MOU, with no community participation. The communities were very concerned about a clause included in the agreement that stated, ‘The right to manage state forest land will be revoked automatically if the holder of the right passes away’. This clause made the local community feel very insecure.

Equity and fairness should be defined together with all stakeholders involved. Values and levels of fairness vary for different stakeholders, depending on individual or group perceptions of their shared and invested contributions to the project. The project initiator should give the local communities a wide range of opportunities to create a proposal for an agreement based on their points of view. The finished draft can then be negotiated transparently and democratically. Public consultations should be held and involve a wide range of concerned stakeholders.

5.7. Governing the rehabilitation initiatives: evolution from top-down to participatory approaches and its impacts

The different approaches to forest rehabilitation fall into three periods: top-down (1950s–70s), transition from top-down to a more participatory approach (1980s–mid 90s), and participatory (late 1990s to present). Mapping-out the case study projects in the three rehabilitation initiative periods indicates that two projects were initiated during the top-down period, four during the transition period, and three under the participatory period (Figure 5-2). The distribution of rights and responsibilities of local organisations that were not properly established was a major problem for these projects, regardless of the rehabilitation period (Table 5-18). Tenure conflicts, caused mostly by encroachment problems, occurred in all the projects during the transition and participatory periods. During the participatory period, encroachment problems have occurred mainly because of inconsistent policies that have resulted in overlapping management rights, as in the Rehabilitation of Logged-Over Areas Project. Here the rights of Inhutani VI (for timber plantation), WWF (for elephant conservation) and Lancang Kuning University (for a Land Grant College Project) overlapped.

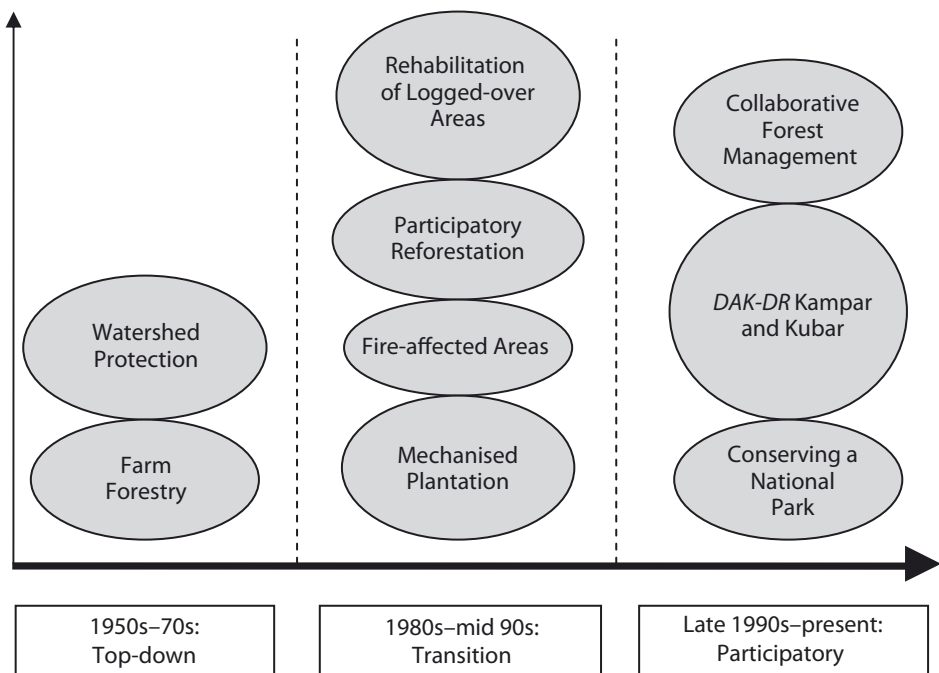


Figure 5-2. Changing profiles of forest and land rehabilitation



Picture 5-2. Unclear distribution of rights and responsibilities between National Park management and NGO left the community uncertain as to their participation (Location: Conserving a National Park Project in Meru Betiri, East Java)

Projects undertaken during the transition period had more problems than those undertaken during the other periods, particularly in relation to a lack of capacity building, limited social approaches, unclear/unsecured long-term management, and unsuccessful transfer of knowledge to local communities. Projects undertaken during the participatory period had a wider range of problems. Specific problems for the *DAK-DR* Kampar and *DAK-DR* Kubar projects were: the pre-mature pre-project preparation, particularly institutional set-up; the budget allocation from central government did not take sufficient account of local needs and conditions; and there was a tendency for the local elite, who had the authority to manage the project, to misuse their authority in the process of preparing the contract., i.e. *SPKS- Surat Perjanjian Kerjasama* between the community and the Forestry District Services. In the case of the Conserving a National Park Project, the problems related to limited public consultation in preparing the contract agreement between the community and National Park Management. In particular, agreements were made without the involvement of the farmers and there was no consultation with the wider public. For example, in the contract, one of the clauses stated that management rights could not be transferred to the owners' heirs. This has caused concern among the cooperative members who manage the medicinal trees; it triggered farmers' dissatisfaction in such a way that it led to serious conflict. In another example, the Collaborative Forest Management

Project, in which the contract was designed hastily for ceremonial purposes to launch the project, consultation with the local community was not conducted properly.

The inconsistency of central and local government policies has been a problem for two projects (*DAK-DR* and the Conserving National Park). In the former, a standard price for seedlings was established that was different from that of *GN RHL/Gerhan*. This provided an opportunity for the abuse of power in supplying seedlings. To date, the Conserving a National Park Project allows private commercial agricultural businesses into the national park area, where the law is unclear. However, the role of the NGOs in the Conserving a National Park Project, in strengthening local institutions, has been quite prominent.

Even in the rehabilitation activities implemented during the participatory period, the budgetary system was still split between centralised and decentralised procedures. There was a significant change in the system following the implementation of Government Law No. 22 on decentralisation in 1999, Government Law No. 25 on financial balancing between central and district governments in 1999, and Government Regulation No. 25 on the autonomy of provincial governments in 2000. According to these regulations, the role of central government is more that of regulator, facilitator and manager. In reality, however, while planning and implementation had been handed over to the districts, central government still planned the budgets, e.g. it set the seedling prices for the *DAK-DR* Kampar and *DAK-DR* Kubar projects.

However, the projects implemented during the different periods also demonstrated some positive features (Table 5-18). Observed after more than 30 years, projects initiated during the top-down period had more positive features than those initiated under the transition and participatory approaches. This occurred because multiplier effects and impacts have been generated, in which the implementation has been throughout the following implementation periods of the transition and participatory approaches.

There are five important factors that are significant in motivating and increasing the success of forest and land rehabilitation, seen especially in the Farm Forestry case study project: (1) policy support from the head of the district government, (2) the rise in critical awareness of various parties, particularly NGOs (since the 1990s) so that local institutions are developed, (3) the feudal patron–client culture, (4) capital to support Farm Forestry development from remittances, and (5) strong commitment from the community to develop Farm Forestry plantations considering previous considerations, identified as local commitment or *karang pejaten*. Unlike the Watershed Protection Project, farmers in the Farm

Table 5-18. Problems encountered and positive features in the implementation of rehabilitation projects

Problems encountered										
Key factors	Top-down period		Transition period				Participatory period			
	WFP	FFM	LoAP	MPP	FaFP	PRP	DAK-DR	ConNP	CFMP	
1. Rights and responsibilities distributed with no local institution established	✓	✓	✓	✓	✓		✓			
2. Rights and responsibilities distributed with no clear communication or feedback mechanism			✓	✓	✓		✓	✓		
3. Inconsistent policy resulted in the overlapping of management rights			✓				✓	✓	✓	
4. Tenure conflict/encroachment problems			✓	✓	✓	✓	✓	✓	✓	
5. No capacity building for local/customary institutions			✓		✓	✓				
6. Limited social approach	✓		✓	✓	✓		✓			
7. Unclear long-term management			✓			✓				
8. Unsuccessful transfer of knowledge to local community groups				✓						
9. Contract agreed with limited public consultation			✓	✓	✓		✓			✓
10. Misuse of power by the local elite in preparing the contract							✓			
11. Inadequate preparation before the project started			✓				✓			
12. Budget allocation lacked consideration for local needs and conditions							✓			
13. Insignificant NGO role	✓	✓	✓	✓	✓		✓			
Positive features										
Key factors	Top-down period		Transition period				Participatory period			
	WFP	FFM	LoAP	MPP	FaFP	PRP	DAK-DR	ConNP	CFMP	
1. Important role of local government at the village level	✓	✓								
2. Important role of the agricultural field extension services	✓	✓								
3. The community as a manager with clear land ownership status	✓	✓				✓				
4. The community as a partner								✓	✓	
5. Supportive policies from the district government		✓								
6. Local institutions are well developed.		✓				✓		✓	✓	

Notes:

WFP Watershed Protection Project

FFM Farm Forestry Project

LoAP Rehabilitation of Logged-over Areas Project

MPP Mechanised Plantation Project

FaFP Rehabilitation of Fire-affected Forests Project

PRP Participatory Reforestation Project

DAK-DR DAK-DR Kampar and DAK-DR Kubar

ConNP Conserving a National Park Project

CFMP Collaborative Forest Management Project

Sources: Observation during fieldwork and Database 2

Forestry Project were still intellectually dependent on government officials, and the establishment of forest farmer groups still depended on the initiative of implementing agencies or government staff. In the participatory period, a positive aspect of the Collaborative Forest Management Project and Conserving a National Park projects is that they treat farmers as collaborators in the projects. In the Collaborative Forest Management Project, the district government has provided legal and political support in the form of district regulations.

Projects implemented during the transition period were still characterised by their strongly centralised setting and culture. For example, implementation always had to be based on approval from the highest authority, often only as a formality, such as letters of decree signed by high-level authorities under a top-down process. As a result, there were always conflicts of interest among stakeholders, and it was mainly the interests of the local communities that were not accommodated. Such conflicts were an inherent part of rehabilitation activities in the transition period.

During the transition period, the roles of local communities and civil-society groups, such as NGOs and traditional or local organisations, increased slightly. These changes occurred mainly as a result of strong pressures from the groups for more community involvement in all development activities. Although the word ‘participatory’ has been included in the Guidelines for the Direction of National Development (*Garis-garis Besar Haluan Negara – GBHN*) since 1984, in practice the government bureaucratic system has yet to accept a greater role for civil society groups or local communities.

During the participatory period, the Participatory Reforestation Project was an example of the change from a centralised to a more decentralised bureaucratic system. *BP DAS* transferred greater rights and responsibilities to farmers, and attempted to develop the capacity of local institutions to implement forest rehabilitation based on the experience and capacity of the existing organisations.

5.8. Summary of lessons learnt

Among the ten selected case studies, five past and five on-going projects were included in the analysis of the impacts of rehabilitation initiatives on the ground. These case studies were selected to represent the rehabilitation initiatives that were located in the 10 provinces with the largest area of degraded forest. This allowed for a comparative analysis of the successful and failed project cases according to: general perceptions, different approaches used (top-down, transition from top-down to participatory, and with strong emphasis on a participatory approach), and a representative sample of project clustering in Database 1.

The on-going projects included Collaborative Forest Management, *DAK DR* Kampar (in Riau Province) and *DAK-DR* Kubar (in East Kalimantan Province), Conserving a National Park, and Farm Forestry. The last two projects mentioned are on-going projects that were initiated during the 1970s and are considered to be successful.

In 2002, Perhutani, the State-owned Company, initiated the Collaborative Forest Management Programme. With the management pendulum swinging to a more community-based strategy, the programme aimed to encourage the participation and active involvement of local communities in combating illegal logging and forest encroachment, in Perhutani areas. *DAK-DR* projects in Kampar and Kubar were developed under the Programme of Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus-Dana Reboisasi - DAK-DR*). This government programme, set within watershed priorities, aimed not only to support rehabilitation activities but also to build the capacity of local communities. Under the Conserving a National Park Project, the management of Meru Betiri National Park in East Java invited the surrounding communities to participate in the Rehabilitation Farmer Groups (*Kelompok Tani Mitra Rehabilitasi – KTMR*) a social forestry programme, in order to establish rehabilitation initiatives inside the national park. The Farm Forestry Project was initiated using an authoritative, central government-led approach under the *Inpres* Programme, as were most of the other rehabilitation projects initiated at that time. The promise of a good supply of clean water and improved community livelihoods was an excellent incentive for these communities. Over the years the Gunung Kidul communities have won a number of national awards related to this project. Now well known nationwide, it is one of the few successful *Inpres* afforestation and reforestation projects.

Past projects included: Rehabilitation of Logged-over Areas, Participatory Reforestation, Rehabilitation of Fire-affected Forest, and Mechanised Plantation.

The Rehabilitation of Logged-over Areas Project, as part of the MoF's programme and based on Ministerial Decree No. 362/Kpts-II/1993 was assigned to the state-owned companies Inhutani I to V and initiated in 1996. The main objective was the rehabilitation of 5.5 million ha of logged-over areas. Following the closure of *DR*, the rehabilitation assignment was revoked and all activities were stopped completely by the end of 2002/2003. The Participatory Reforestation Project was part of the bigger Community-based Forest Management Project initiated and funded by GTZ and the GoI The Social Forestry Development Project (SFDP), within this bigger project, was assigned the task of developing and testing approaches used in community-based forest management in an area of some 102,250 ha, the Participatory Forest Management Area (PFMA), in the northern

part of Sanggau District, West Kalimantan, in 1992. The objectives were to increase land cover and to improve land productivity by planting trees, fruits and rattans. It was also anticipated that this would in turn create new job opportunities for the local communities. In 1992, the Rehabilitation of Fire-affected Forest Project, funded and implemented by ITTO and the Forestry Research and Development Agency, was initiated. Their main objective was to rehabilitate the forest areas that had been severely damaged by drought and extensive fires during 1982-3. The main objectives of the Watershed Protection Project, funded by the World Bank, were to reduce erosion and sedimentation in Gajah Mungkur reservoir (in Solo, Central Java) in order to protect its functions, increase land productivity by implementing soil and water conservation, and improve farming practices so as to increase farmer income. The Mechanised Plantation Project was developed as part of six project phases, the objectives of this Phase 2 (1983-85), then known as the Mechanised Plantation Project, were to develop economical nursery technology for large-scale production of high quality seedlings and to establish a large-scale forest plantation, which would meet the raw material needs of a pulp mill projected in the area.

On land productivity impacts, significant responses were collected more for on-going projects than past-projects. Fruit tree species planted as part of the Collaborative Forest Management Project and Conserving a National Park Project were perceived to have the highest survival rates by more than 80% of surveyed respondents. On the other hand, multipurpose tree species were perceived to have the highest survival rates by more than 80% of the respondents who participated in Participatory Reforestation and Farm Forestry Projects. However, the community that participated in Farm Forestry development also thought forest species have good survival rates (nearly 80%). Of the responses from *DAK-DR* Kubar and *DAK-DR* Kampar, two newly initiated projects (in 2001), less than 10% provided information on the survival rates. Interviewed communities in *DAK-DR* Kampar perceived (67%) that forest tree species had better survival rates than in *DAK-DR* Kubar. However, multipurpose and fruit tree species were perceived to be more important to communities at both sites. It is important to note that survival rates were only monitored intensively during the first to third year of the project timeframes, similarly for tree growth, which included the information on annual increments in height and diameter of the tree species planted.

In assessing impacts of rehabilitation initiatives on land productivity, tree planting in the rehabilitation projects involved a range of products, which were classified into six categories based on the products yielded. It is common for projects to produce more than one product. For instance, the Farm Forestry Project produces timber, fruit, fuel wood and food crops or vegetables as secondary crops. Nearly

half of the respondents (48%) reported food crops and vegetables as products of the rehabilitation projects, while timber from natural forest and tree plantations was reported by a little more than 20%. Other significant products were derived from multipurpose tree species (10% of responses), e.g. candlenut (*Aleurites moluccana*), durian (*Durio zibethinus*), clove (*Eugenia aromatica*), melinjo (*Gnetum gnemon*), areca (*Arenga pinnata*), and fruits such as mango (*Mangifera indica*), rambutan (*Nephelium lappaceum*), avocado (*Persea americana*), and jackfruit (*Artocarpus heterophyllus*). A comparison of the growth of the three tree groups, shows that the annual increment, in both height and diameter, was lowest for the forest tree species. The highest annual increment was found in the multipurpose tree species.

In relation to ecological impacts, rehabilitation initiatives on logged-over areas tend to be more successful and sustainable and have had a sustainable positive impact on the environment. In the areas where the threat of fire is low, natural succession can return the vegetation of the logged-over area to that of tropical forest at the climax phase. However, in some areas and in some cases, logged-over areas also have a high threat of fire as the air temperature increases. In fact, as long as the logged-over area is not in a phase of blocked development (a phase of ecological development), such as occurs on *Imperata* grasslands, human intervention is not necessary. A blocked development phase is a phase that inhibits or at least slows down the processes leading to the next development phase. The blockage may be based on the absence of viable stumps, depletion of seed banks, and reduction of the inflow of seed from the surrounding landscape, and soil conditions that do not allow for rapid growth of seedlings. Under these circumstances human intervention is needed to prevent fire in both fire-affected and logged-over areas before a rehabilitation effort is undertaken.

In assessing rehabilitation impacts on livelihoods, it can be concluded that it was easier for the communities involved in projects implemented outside state forest to generate incomes after the first 5 years of the project and beyond. This was indicated mainly by the fact that replanting activities continued after the project had ended. Replanting implies that there is a second rotation, particularly in timber-based rehabilitation projects, such as the Farm Forestry Project. In this project, funding to finance the second rotation comes from a proportion of the revenues received from the teak harvested, and the local community now undertakes replanting in its forestry management. Projects implemented inside state forest were less likely to generate significant incomes for local people, even after the first 5 years. In the short term (less than 5 years), incomes were generated mainly from project-based labour opportunities. In the long term, however, the surrounding community used the forest and its products to meet their subsistence needs only. This is also driven by the fact that local communities do not have

any (formal) right to harvest timber species planted inside state forest. For state forest-based rehabilitation projects, even after the first 5 years of the project, the forest and its products provide only limited subsistence use. This situation was observed from an impact analysis of case studies of past projects, which included the projects on Rehabilitation of Fire-affected Forests, Mechanised Plantation and Participatory Reforestation. In relation to the ongoing projects, which have been running for only 3–5 years, the need to meet the community's subsistence needs is still dominant in the rehabilitation areas of the Collaborative Forest Management and Conserving a National Park projects. However, incomes generated from rehabilitation project activities play a less important role than other sources of household income, such as the sale of agricultural and non-agricultural crops. The highest proportion of such income was reported from the Rehabilitation of Fire-affected Forests Project (42% of total household incomes) and the lowest proportion from the Participatory Reforestation Project (11% of total household incomes). To achieve the poverty alleviation objective of the rehabilitation projects, it is vital to take the marginalized groups into account at all stages of the project. This has not been well addressed, as indicated by the results from the field observations in the case of the Collaborative Forest Management Project.

Among the past projects, the initiatives with similar impacts on tenure conditions were the Watershed protection and Mechanised Plantation projects. Both of these projects had an influence on clarifying who had rights over the land on which the project was implemented. Among the ongoing projects, the Farm Forestry and Conserving a National Park projects are the two that are having long-term impacts by improving access to forestland and trees. The Farm Forestry initiative has increased land ownership; this has been made possible because the project is being implemented in a community forest area outside state forest. Closely related associated impacts are improved clarification of land ownership and security of rights to trees and other forest resources. Improvement in the institutional and traditional strengths of local communities correlates with the impacts that result in better land ownership conditions, where there are more clear and secure rights to individual lands and access to collectively managed resources, as well as improved social cohesion. Further, clarification and security of rights not only to land, but also trees and other forest resources, and the strengthening of community institutions will lead to clear representation of the community in all aspects of natural resource management.

According to community members, in the long term, the most significant impacts have been made on the community's institutional capacity, including community representation in various aspects of natural resource management, and on community institutions and socio-cultural strengths. However, about 50% of the community respondents had not perceived any change in the interrelations among

community members or in social cohesion, while the perceptions of the project staff varied. The analysis shows that for more secure land ownership the empowerment of community institutions is important. Weak community institutions lead to the under-representation of the community in project management, which can and often does result in dissatisfaction, conflicts over land status and low social cohesion. There are three sources of conflict over tenure inside state forests: 1) conflicts of interest between customary institutions, private companies, NGOs and government, which is reflected in overlapping rights to use and manage land; 2) land boundaries that are not agreed; and 3) forest encroachment due to weak law enforcement and unclear management rights. Conflicts in state forests are often greater and more serious than those on community land. Outside state forests, disputes over land boundaries were the main causes of conflict. Strong competition for land outside state forest is the main problem leading to conflicts over land boundaries.

Problems of encroachment have become quite common since the Reformation era. Encroachment becomes a problem when it has been happening for a long time and the community occupies the land in order to cultivate agricultural crops. The encroachment is often the result of a lack of clarity about who has rights to use the land, and lack of law enforcement. Local communities, often supported by a local NGO, are usually reluctant to participate in rehabilitation projects implemented in these areas. The Rehabilitation of Fire-affected Forests Project demonstrated how many people claimed land by using customary laws to justify their ownership, although they did not originally come from the area; they wanted to receive reimbursement fees from the project. Arson at project camps, one of the problems experienced at this project site, provided a good lesson in showing that these overlapping land-use problems should be resolved before the project is initiated. Dialogues were begun and solutions implemented, but they did not resolve the conflict.

The results of an analysis of the level of community participation in the case study projects shows that seven projects relied on mass mobilisation rather than on interactive community participation. Mass mobilisation is often referred to as pseudo participation, and interactive participation as genuine participation. Surprisingly, one successful project, i.e. the Watershed Protection Project, encouraged community involvement under the mass mobilisation system. Characteristics of the mobilisation system include the immediate termination of community participation at the end of the project cycle, high community dependence on the project – particularly for funding, and a low level of community initiatives emerging from the project.

However, the projects implemented during the different periods also demonstrated some positive features. Projects initiated during the top-down period had more positive features in relation to technical intervention than those initiated under the transition and participatory approaches. This occurred because the projects were initiated more than 30 years ago and multiplier effects and impacts have been generated. There are five important factors that are significant in motivating and increasing the success of forest and land rehabilitation, seen especially in the Farm Forestry case study project: (1) policy support from the head of the district government, (2) the rise in critical awareness of various parties, particularly NGOs (since the 1990s) so that local institutions are developed, (3) the feudal patron–client culture, (4) capital to support Farm Forestry development from remittances, and (5) strong commitment from the community to develop Farm Forestry plantations taking into account previous considerations, identified as local commitment (*karang pejaten*). Unlike the Watershed Protection Project, farmers in the Farm Forestry Project were still intellectually dependent on government officials, and the establishment of forest farmer groups still depended on the initiative of implementing agencies or government staff. In the participatory period, a positive aspect of the Collaborative Forest Management Project and Conserving a National Park case study projects is that they treat farmers as collaborators in the projects. In the Collaborative Forest Management Project in Sukabumi, the district government has provided legal and political support in the form of district regulations.

Projects implemented during the transition period were still characterised by their strongly centralised setting and culture. For example, implementation always had to be based on approval from the highest authority, often only as a formality, such as letters of decree signed by high-level authorities under a top-down process. As a result, there were always conflicts of interest among stakeholders, and it was mainly the interests of the local communities that were not accommodated. Such conflicts were an inherent part of rehabilitation activities in the transition period.

During the transition period, the roles of local communities and civil-society groups, such as NGOs and traditional or local organisations, increased slightly. These changes occurred mainly as a result of strong pressure from the groups for more community involvement in all development activities. Although the word ‘participatory’ has been included in the Guidelines for the Direction of National Development (*Garis-garis Besar Haluan Negara – GBHN*) since 1984, in practice the government bureaucratic system has not accepted a greater role for civil society groups or local communities. The distribution of rights and responsibilities to local organisations that were not properly established was a major problem for these

projects, regardless of the rehabilitation period. Tenure conflicts, caused mostly by encroachment problems, occurred in all the projects during the transition and participatory periods. During the participatory period, encroachment problems occurred mainly because of inconsistent policies that resulted in overlapping management rights, as in the Rehabilitation of Logged-over Areas Project.

The active involvement of local people and the careful selection of technical intervention, designed with specific ecological causes of degradation, which often acted as continuing disturbances to rehabilitated areas, in mind and indeed those that concern local people, are of paramount importance and key elements for the survival and success of rehabilitation projects. Only one of the ten projects surveyed was considered totally unsuccessful. The Rehabilitation of Logged-over Areas Project was inundated with major problems that were not conducive to success. The other nine varied considerably in their degree of success.

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Chapter 6.

Reorientation of the rehabilitation programme in Indonesia: where to after more than three decades?

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Rehabilitation activities in Indonesia have a long-history dating back to well before the Dutch Colonial period. However, the study reported in this book has focused on the more recent times of the last three decades, where formal programmes and projects have been implemented in more than 400 locations. Based on the observations made in this study, the rehabilitation activities have been more reactive than proactively embedded in implemented or imposed forest management policies. For example, among a few integrated precautionary policies, was the regulation on silvicultural systems of *TPTI*, *THPA*, *THPB*, and *TPTJ* as discussed in Chapter 3. Following their logging practices, concessionaires should implement these silvicultural systems. However, serious problems arose during the practical implementation due to a lack of government supervision; consequently results on the ground have been unsuccessful.

Rehabilitation programmes in Indonesia need to be thoroughly reviewed. This review could then be used as a basis for future rehabilitation strategies, taking into account lessons learnt from implementing the initiatives for more than three decades. In particular, efforts should be made more cost effective with regard to

budget allocation, considering the reduced budget. Meanwhile degraded areas have increased significantly, and donors are becoming less interested in funding rehabilitation initiatives.

6.1. The rates of rehabilitation have lagged behind degradation with a low cost-effective budget allocation

With regard to the target areas being rehabilitated, the achievements of the different rehabilitation programmes have varied considerably between 19% and 93% (Table 6-1). Farm Forestry and the development of village seedling areas (*Kebon Bibit Desa*) were programmes with the highest achievements; more than 80% of their target areas were rehabilitated. Apparently, these two programmes were developed on community lands. The lowest rate of achievement was for the Rehabilitation of Logged-over Areas by the state-owned company (Inhutani

Table 6-1. Area targeted and actual area rehabilitated by the main rehabilitation programmes, 1961–2004 ^a

Rehabilitation programme	Period	Area targeted (000 ha)	Area rehabilitated (000 ha)
Annual Afforestation Week (<i>Pekan Penghijauan Nasional</i>) ^a	1961–95	455	n.a.
<i>Inpres</i> Reforestation ^a	1976/77–1999	2,628	2,086 (79%)
<i>Inpres</i> Afforestation (farm forestry) ^a	1976/77–1999	5,091	4,208 (83%)
Village seedling areas (<i>Kebon Bibit Desa</i>) ^a	1984/85–2001	1,148	1,062 (93%)
Plantation development on logged-over areas by state-owned company (Inhutani I to V) ^b	1994/95–99	5,540	1,100 (19%) ^b
Community Forestry (<i>HKm</i>) ^c	1996/97–2003	399	n.a.
Donor initiatives ^d	Since 1974	1,201	n.a.
Other rehabilitation initiatives ^d	1979/80–2001	704	617 (88%)
Specific Allocated Funds – Reforestation Funds (<i>DAK-DR</i>) ^c	2001–02	528	n.a.
National Rehabilitation Movement (<i>GN RHL/Gerhan</i>) ^e	2003–04	800	545 (68%)

Sources:

- Area rehabilitated according to government evaluation, as given in the MoF statistics publication (Direktorat Bina Programme RLL 1998). *Inpres (Instruksi Presiden)* was a rehabilitation programme based on instruction from the president.
- Based on interviews with Inhutani I to V, and DG Land Rehabilitation and Social Forestry, and Ditjen RLPS 2001
- Ditjen RLPS 2001
- Preliminary database
- Santoso 2005w

I to V), with only 19% of the target areas being planted due to the official termination of the rehabilitation assignment¹. This project also faced a number of problems on the ground, such as a lack of clarity of forest and land status, and long-term planning, as well as emerging conflicts with local communities during the Reformation Era. Other programmes appear to have achieved an adequate level of rehabilitation, mostly more than 70%. However, there was no available information for some major programmes, such as the *DAK-DR*. However, the data was only based on planted trees in the target areas. No further follow-up information was available to indicate whether the areas planted could be maintained and eventually become forested areas. More over, the assessment was not conducted by external independent agencies to ensure objectivity and freedom from a conflict of interests. The limited data available on the survival of standing trees, where an evaluation was conducted in 1977 for the *Inpres* Programme, indicated that trees planted during 1971/72 and 1972/73 covered only 26–29% of the total area, with a growth rate of more than 25% (Mursidin *et al.* 1997).

Regardless of the successful rates of rehabilitation of targeted areas, the area of degraded forest has continued to increase, and the forested area diminished from 143.97 million ha in 1991 to 108.57 million ha 10 years later (Baplan 2001). The rate of rehabilitation has lagged behind the increasing rates of degradation. Compared with the area of forest degraded in the 1970s, by 2004 the degraded area had more than doubled, to 43.6 million ha (Figure 6-1). The total accumulated area targeted by the government for rehabilitation by 2004 was 18.7 million ha. If all the government's rehabilitation targets had been achieved, by 2004, the actual degraded area remaining would have been only 24.9 million ha rather than 43.6 million ha. This provides an indication that rehabilitation initiatives and projects have not successfully restored the degraded forest areas, while the policies and programmes to address the underlying causes of forest degradation have not been integrated or very effective. So, the achievement of targeted areas at the programme level has not been supported by trends at the national level.

Furthermore, these problems with rehabilitation have been mainly at the expense of the government budget. The total government budget spent on rehabilitation projects may account for as much as 85% of the total government forestry budget since the start of the *Inpres* programme in 1976/77 (H. Pasaribu, personal communication, 2004). This is confirmed by the distribution of the projects analysed: 41% relied on government funding, 31% received funding from donors, 19% received funding from private companies and 8% were funded

¹ More detailed discussion on the government-initiated rehabilitation programme that was implemented by the state-owned company Inhutani is included in Chapter 3.

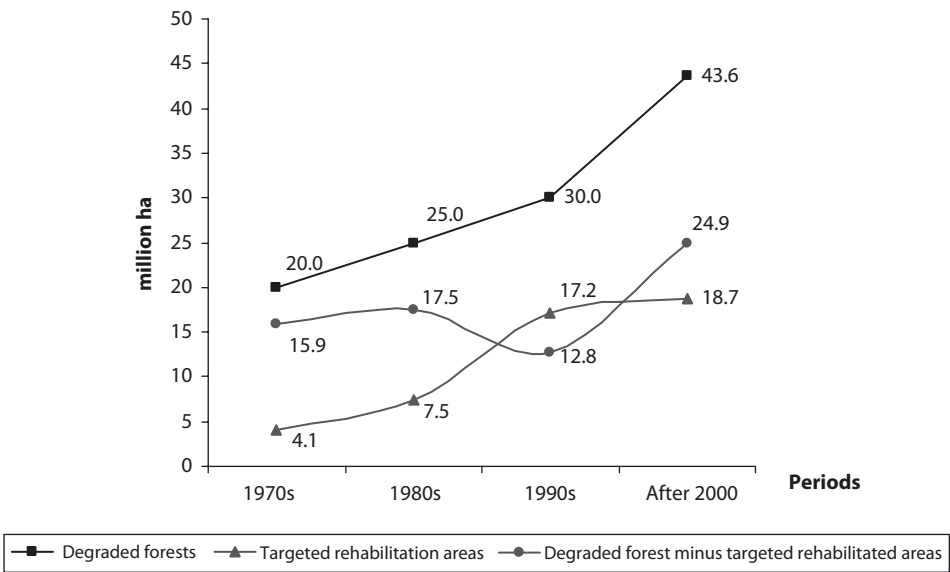


Figure 6-1. Comparison between degraded and targeted rehabilitation areas

by a combination of government, donors and private companies. The non-government funding sources did not begin until the 1980s–90s, which came from joint-sources and private companies and provided funding for initiatives inside state forest. More projects were funded for logged-over areas than for fire-affected areas, indicating more serious problems due to logging practices. The government financed more top-down projects, while the other funding sources financed more projects and imposed a more participatory approach (Table 6-2).

The rehabilitation cost per ha turned out to be higher than the *HTI* establishment costs. The cost per ha ranged from USD 43 to 15,221 per hectare depending on the sources of funding (Table 6-3). For comparison, the *HTI* plantations standard cost is Rp 5 million per hectare (USD 550). The government project had the lowest cost while those financed by international donors were the highest, due to the high cost of technical expertise and usually calculated as a part of the project costs. The government projects implemented inside state forests were more expensive than those located outside state forest or community land. For example, the *GN-RHL/Gerhan* that is implemented on community lands costs Rp3 million (USD 335) per ha (Prasetyo *et al.* 2005).

Together, the significant amount of forestry budget allocated to rehabilitation initiatives, low rehabilitated areas of major government programmes, and high cost per ha, are a strong indication of the low cost effectiveness in the implementation of the rehabilitation activities and therefore wasted budget. This is reflected in

Table 6-2. The distribution of projects according to funding sources by forest status, condition of the area before projects started, and approaches used

Forest status, condition of the area before projects started, and approaches used		Percentage of projects based on funding sources (%)				
		Government (n: 58)	International funding agencies (n: 12)	Joint sources (n: 22)	Private companies (n: 7)	Total (n: 99)
Forest status	State forest (n: 35)	37	9	40	14	100
	Outside state forest (n: 49)	76	12	8	4	100
	Inside and outside state forest (n: 15)	53	20	27	0	100
Condition of the area before the project	Fire-affected areas (n: 16)	25	25	50	0	100
	Logged-over areas (n: 78)	69	10	12	9	100
	Fire-affected and logged-over areas (n: 5)	0	0	100	0	100
Approaches	Top down (n: 46)	85	2	9	4	100
	Transition (n: 13)	23	8	62	8	100
	Participatory (n: 40)	40	25	25	10	100
Total (n: 99)		59	12	22	7	100

Source: Database 1

Table 6-3. Rehabilitation costs by funding source

Funding source	Total project costs (USD)	Area (ha)	Costs per ha (USD)
Government	4,320 – 1.3 billion	4 – 9 million	43 – 7,320
Donors	30,441 – 34 million	2 – 478,348	366 – 15,221
Private and state-owned companies	4,340 – 502,412	8 – 32,000	115 – 8,500

Note: Figures from various years have been adjusted in accordance with the inflation rate (Base year: 2003)

Source: Preliminary database

the amount spent on rehabilitation compared to the actual results. For example, the total allocated budget of Rp 600 billion (USD 68.3 million) resulted in only 19% of actual planted areas in the rehabilitation programmes, implemented by state-owned companies initially aiming for 5.5 million ha. Another example is the allocation of *DR* under the Programme of *DAK-DR* that has also reflected a low cost-effective budget allocation for the rehabilitation programme, since there has been an indication of the misuse of Rp 1 trillion (USD 109.3 million) for non-rehabilitation purposes by district governments (Anonymous 2006).

6.2. Sustaining rehabilitation initiatives beyond the project: important aspects to be taken into account

Sustainability of rehabilitation activities is important, particularly beyond the project period. Different and often conflicting perceptions of a community and project implementers regarding important indicators of sustainability have become one of the main problems in sustaining the initiatives. Another challenge is that the time laps from initiation of the project to impacts are often too long, so incentives for sustainability, particularly in the form of clear economic returns, cannot be clearly identified. This is important to encourage the continued participation of the local communities. Based on the analysis of the lessons learnt from the project implementation, this section discusses important aspects to be taken into account in ensuring the rehabilitation initiatives in the long term.

6.2.1. *Addressing the causes of deforestation and degradation in the rehabilitation initiatives*

Rehabilitation efforts in Indonesia have found it impossible to catch up with the increasing rates of forest and land degradation, due to the complexities of the driving factors causing the degradation. Various rehabilitation activities have been initiated with the objectives to address the various causes of degradation. Further, a more important question is whether the projects have also effectively addressed the causes of deforestation. If the causes of degradation or deforestation are not adequately addressed, it is unlikely that the project will be sustained.

The underlying causes of deforestation often also act as continuing disturbances, such as forest fires, that affect the sustainability of rehabilitation initiatives in the long-term. As discussed in Chapter 2, there are direct and indirect underlying causes of deforestation. However, observations based on Database 1 and the case study analysis show that direct causes receive more attention than the indirect causes, particularly in the process of defining the objectives to be addressed by the rehabilitation projects/initiatives. Most of the projects in Database 1 (65%) mentioned that the combination of intensive logging, forest conversion and intensive agricultural practices were the main causes of forest and land degradation, which subsequently caused severe soil erosion. More complicated combinations of causes were observed from Database 2 based on in-depth analysis of ten case study projects; they were intensive logging, forest conversion, repeated fires, intensive agriculture, shifting cultivation, illegal logging, and forest encroachment/occupation.

Responding to the identified causes of deforestation, ideally, the driving forces behind the rehabilitation projects should be in line with the objectives to overcome these causes of deforestation. However, the observations in this study show mixed results as to whether or not each project had considered addressing these causes as part of the project objectives and implementation. Apparently, there are no straightforward linkages from direct causes to the initiation of rehabilitation objectives/initiatives. Database 1 analysis showed the driving factors behind the rehabilitation projects included poverty/low income, low forest productivity (including timber) and low forest cover. There were also emerging initiatives from various agencies and sectors due to increasing funding support, and the intention to raise awareness, which included problems due to population growth.

The objectives of the projects were often difficult to identify, since they were often not clearly defined, particularly in most of the project documents. Therefore, further in-depth observations on the ground were required. From Database 2, the main physical objectives of the ten case study projects identified were: to increase forest and land cover, to create integrated production systems, to increase timber production, and to protect watersheds/conservate soil and water, and to conserve biodiversity. On the other hand, the main non-physical objectives of the ten cases studied could be identified as being: to increase community incomes, to create employment/livelihood opportunities, to empower the local communities, to secure community access to land and to raise environmental awareness/education. The project objectives are more diversified than the issues captured as the causes of deforestation and driving forces behind the rehabilitation projects. These are mainly influenced by the current projects initiated within the period of participatory rehabilitation initiatives (from the end of the 1990s onwards), which specifically influenced the objectives of empowering the local communities, securing community access to land, and raising environmental awareness/education. However, intentionally addressing these causes of deforestation was not explicitly part of the project objectives.

Unintentionally, as a result of the correspondence analysis, the causes of forest and land degradation have been addressed by several projects as part of the outcomes of the implementation of rehabilitation projects (Table 6-4). Projects with participatory approaches have a tendency to address non-technical causes, such as illegal logging and repeated fires by involving community participation in the efforts. Another example is the Conserving a National Park Project, which has high community and NGO involvement. This project addressed the problems of forest conversion and cases of over logging inside the national park. Current projects have to address non-technical problems first before tackling challenges that are more technical. Projects initiated during the 1970s have tended to address

Table 6-4. Dominant responses on causes of deforestation, driving forces, and objectives of rehabilitation projects

Aspects	Responses
Dominant causes of degradation ^a	Intensive logging, forest conversion, intensive agriculture and soil erosion
Dominant causes of degradation ^b	<ol style="list-style-type: none">1. Intensive logging, conversion2. Repeated fires, intensive agriculture and logging, shifting cultivation, and conversion3. Intensive agriculture and logging, conversion, and soil erosion4. Intensive logging and agriculture, and soil erosion5. Illegal logging, forest encroachment/occupation
Dominant driving factors behind rehabilitation projects, 1960s–2004 ^a	<ol style="list-style-type: none">1. Poverty/low income2. Diminishing forest production (including timber), raising awareness and population growth3. Funding support from donors and the emergence of multi-stakeholder initiatives (external pressures)4. Low forest productivity and cover
Dominant driving factors behind the three main aspects of rehabilitation projects ^b	<ol style="list-style-type: none">1. Decreased forest cover and productivity2. Poverty/low income and limited livelihoods3. Common initiatives and support from donors4. Government initiatives
The main non-physical objectives of the 10 case study projects ^b	<ol style="list-style-type: none">1. Increasing incomes2. Creating employment/livelihood opportunities3. Community empowerment4. Securing access to land5. Raising environmental awareness/education
The main physical objectives of the 10 case study projects ^b	<ol style="list-style-type: none">1. Increase forest and land cover2. Create integrated production systems3. Produce timber4. Protect watersheds/conserve soil and water5. Conserve biodiversity

Sources:

- a. Database 1
- b. Database 2

the technical problems better, such as the Farm Forestry and Watershed Protection projects that reduced the problem of soil erosion.

However, it is not clear to what extent the direct and indirect underlying causes of deforestation have been addressed by the projects, specifically by involving the community actively in the projects. The objectives to address the underlying causes of deforestation should be embedded explicitly in the overall rehabilitation project designs. This is important, since the underlying causes of deforestation usually serve as continuing disturbances. Indirect causes are usually complicated and should be addressed systematically in a more integrated way. Therefore, coordination with the relevant authorities is important to support the community's efforts.

6.2.2. Levelling the perceptions of sustainability of a community and project staff

The communities' perceptions on the most important indicators influencing the sustainability of rehabilitation initiatives differ considerably from that of the project staff. Project staff and community members, involved in the projects, were asked about the indicators that they believed were important in influencing the sustainability of the rehabilitation initiatives indicated by the scoring system from the most important (less than and equal to 1.5) to the least important (more than and equal to 2.0). A summary is presented in Table 6-5.

According to the communities, the most important indicator that has significantly affected the sustainability of the rehabilitation initiatives is indicator E, which focuses on the secured market and its supporting conditions such as low tariff or less bureaucratic marketing requirements. However, this indicator is less important to the project staff. Some indicators were assessed by the communities as being of less important, where as the project staff believe these to be the least important. These include indicators F (Effective mechanism for responding to feedback), G (The new organisation is effectively introducing rehabilitation efforts), and H (Effective mechanism for conflict resolution among stakeholders). On the other hand, the most important indicators according to the project staff are considered to be of less importance to the communities. These are: clear framework and law enforcement (Indicator A), effective monitoring and control system (Indicator B), full and continuous support from the government and other institutions (Indicator C), and minimum threat or pressure on degraded forest being rehabilitated, such as forest fire, forest encroachment, and illegal logging (Indicator D).

The indicators 'Clear framework and law enforcement' and 'Effective monitoring system and control' are recognised by project staff as the most important indicators in sustaining the rehabilitation efforts. However, these had not been conducted optimally in practice, for two possible reasons. First, laws pertaining to certain infractions may not have been adjusted to include concrete or precise punishments. Second, the project supervisors and/or apparatus used in the application of the law often do not work in accordance with good governance principles. This includes inconsistencies in enforcing the law. Equally a participative monitoring system should be promoted in order to increase community participation in the project monitoring.

Full and continued support from the government and other institutions is also considered a crucial indicator that has to be implemented in rehabilitation activities. However, this has been difficult, since in reality, the project supervisors, the project facilitators or extension workers did not stay with or close to the local

Table 6-5. Indicators that have significantly affected rehabilitation sustainability according to the staff of the executing agencies and the communities

Average score (level of influence)	Indicators	
	Assessed by executing agencies (multi stakeholders)	Assessed by the communities involved
< 1.5 (Most important)	<ol style="list-style-type: none"> 1. Clear framework and law enforcement (Indicator A) 2. Effective monitoring and control system (Indicator B) 3. Full and continuous support from the government and other institutions (Indicator C) 4. Minimum threat or pressure on degraded forest being rehabilitated, such as forest fire, forest encroachment, illegal logging (Indicator D) 	Stability of the market and its supporting conditions for marketing the rehabilitation products (Indicator E)
1.5 – 2.0 (Less important)	Stability of the market and its supporting conditions for marketing the rehabilitation products (Indicator E)	<ol style="list-style-type: none"> 1. Clear framework and law enforcement (Indicator A) 2. Effective monitoring and control system (Indicator B) 3. Full and continuous support from the government and other institutions (Indicator C) 4. Minimum threat or pressure on degraded forest being rehabilitated, such as forest fire, forest encroachment, illegal logging (Indicator D) 5. Effective mechanism for responding to feedback (Indicator F) 6. The new organisation is effectively introducing rehabilitation efforts (Indicator G) 7. Effective mechanism for conflict resolution among stakeholders (Indicator H)
>2.0 (Least important)	<ol style="list-style-type: none"> 1. Effective mechanism for using and implementing feedback (Indicator F) 2. The new organisation is effectively promoting the introduced rehabilitation efforts (Indicator G) 3. Effective mechanism for conflict resolution among stakeholders (Indicator H) 	

Source: Database 2

community involved in the rehabilitation efforts. Therefore, the facilitation or communication process between these parties was not intensive. The other fact is that the government support, in any form, was often discontinued or interrupted during the rehabilitation period. So, the community was not convinced of the sustainability of the rehabilitation activities. The indicator 'Effective mechanism for information sharing' should be supported by the availability of the project facilitators or extension workers. However, they would need to stay with or close to the community to facilitate this mechanism effectively.

The role of forestry extension services should be revitalised and clarified. Clearer coordination between the Ministry of Forestry and District Forestry Services is also urgently required. Since regional autonomy was implemented, based on Forestry Law No. 41/1999, forestry extension services are now under the coordination of the District Forestry Services, which is the agency under the coordination of the local district government. Clearer coordination is required when defining good Terms of Reference (TOR), as well as forestry extension materials that are tailored to specific rehabilitation programmes. In the past, forestry extension services, such as encouraging community participation, were acknowledged by the wider stakeholder groups as having a prominent role to play in ensuring the success of rehabilitation initiatives, such as during the implementation of the *Inpres* Programme in Java, back in the mid-1970s.

Further, important indicators for the sustainability of rehabilitation activities implemented inside state forests and on community lands (outside state forest) are also perceived quite differently (Table 6-6). Overall, technical and economic aspects are perceived as less important in comparison to institutional and management aspects. Fire prevention by using the fire break system is considered to be a more important factor for sustaining rehabilitation inside state forest than in community areas. Indicators under institutional aspects that are important for long-term rehabilitation inside state forest, but not on community lands, are: ensuring mutual agreement and understanding, resolving conflicts completely, and forming new institutions. However, strengthening the existing organisations is more important than forming new ones this includes cooperative and business unit development.

In line with the aim to reduce conflicts, under the management aspect, the indicator to involve the neighbouring community in forest management and in securing the areas is important for sustaining a rehabilitation programme inside state forest. Participatory planning development is more important for sustaining community rehabilitation initiatives on private lands than the activities inside state forests.

Table 6-6. Indicators influencing the sustainability of rehabilitation initiatives

Inside state forest	Scores	On community lands	Scores
Technical aspect			
1. Tree maintenance	1	1. Tree maintenance	1
2. Fire break system	1	-	
Institutional aspect			
1. Existing organisation and business development, including cooperatives	1	1. Existing organisation and business development, including cooperatives	2
2. Improving the capacity of executing agencies/stakeholders		2. Improving the capacity of executing agencies/stakeholders	2
3. Social cohesion does exist with minimal social conflict	1	3. Social cohesion does exist with minimal social conflict	1
4. Mutual agreement and understanding	1	-	
5. Good relationship between project staff and community	1	4. Cooperation between cooperative and district forestry agencies	1
6. Conflicts over lands should be resolved completely	1	-	
7. Lands are available for the community to manage	1	-	
8. Cohesiveness among cooperative/ members of community organisations	2	5. Cohesiveness among cooperative/ members of community organisations	2
9. Forming new institutions	2		
Management aspect			
1. Transparency	1	1. Transparency	1
2. Clarity in natural resource management	1	2. Clarity in natural resource management	2
		3. Participatory planning development	1
		4. Reducing /low logging rates	1
3. Neighbouring community is involved in the forest management and security	1		
4. Clear government support	1	5. Clear government support	1
5. Community awareness building processes	2	6. Community awareness building processes	2
6. Clear rules of the game	2	7. Clear rules of the game	2
7. Forestry extension	2	8. Forestry extension	2
8. Manageable disturbances or pressures on forest and lands	1	9. Manageable disturbances or pressures on forest and lands	3
		10. Organisational empowerment	2
		11. Innovation on technical and institutional aspects	1
Economic aspect			
1. Clear reinvestment mechanism	2	1. Clear reinvestment mechanism	1
2. Secured market for any production coming from rehabilitation activities	2	2. Secured market for any production coming from rehabilitation activities	1

Notes: Score 1: very important; Score 2: important; Score 3: less important

Source: Focus Group Discussion

Managing disturbances or pressures over forest and land is another indicator that is more important to state forest situations than on community lands. Levelling the perceptions on the ingredients required to sustain rehabilitation initiatives, among community members and project staff, is essential during the earlier stages of a project. Different and often conflicting perceptions of a community and project staff have become one of the main problems in sustaining the initiatives.

6.2.3. Project design for possible multiplier effects: ensuring long-term economic and livelihood benefits

Resulting from the discussion on project characteristics, based on Databases 1 (Chapter 4) and 2 (See section on Impacts on Livelihoods, Chapter 5), the most sustained rehabilitation projects are those activities that address the ecological problems that are relevant to the local people, in which significant economic impacts are subsequently generated as result of improved ecological conditions. Two examples from case study projects are the Farm Forestry and Watershed Protection. These two projects also have the highest area of forest cover and forest productivity (annual increment in tree size). Successful farm forestry development in Gunung Kidul, Yogyakarta, has not only increased forest and land productivity, but also provided a supply of timber, fodder and fuel wood. Simultaneously, the increase in forest cover was also one of the ecological benefits. This has resulted in the availability of increasing water resources, and better microclimates in the surrounding areas. As a result of improved household incomes, the community has better access to education, health facilities and even funding for social needs, such as organising wedding ceremonies. On average, around 40% of the community's total household income comes from farm forestry. Continuing incomes have provided the incentives for the sustainability of local community rehabilitation initiatives. The flows of ecological and economic multiplier benefits are presented in Figure 6-2.

Similarly, the Watershed Protection Project also has multiplier effects of rehabilitation initiatives. This project has succeeded technically in protecting the Gajah Mungkur Reservoir. As a result, forest cover has increased and the local community has been able to implement a land-terracing system as part of their agricultural practices. The impacts snowballed, the sedimentation rate decreased, and land productivity improved, which eventually increased agricultural production and contributed to the increase in community incomes. Ecologically, due to the high increase in forest cover, a greener landscape and greenbelt have been created. Downstream floods and erosion have also been prevented. This has in turn created better microclimates in the surrounding environments. Economically, this has created an opportunity for the community to gain a source of income through ecotourism.

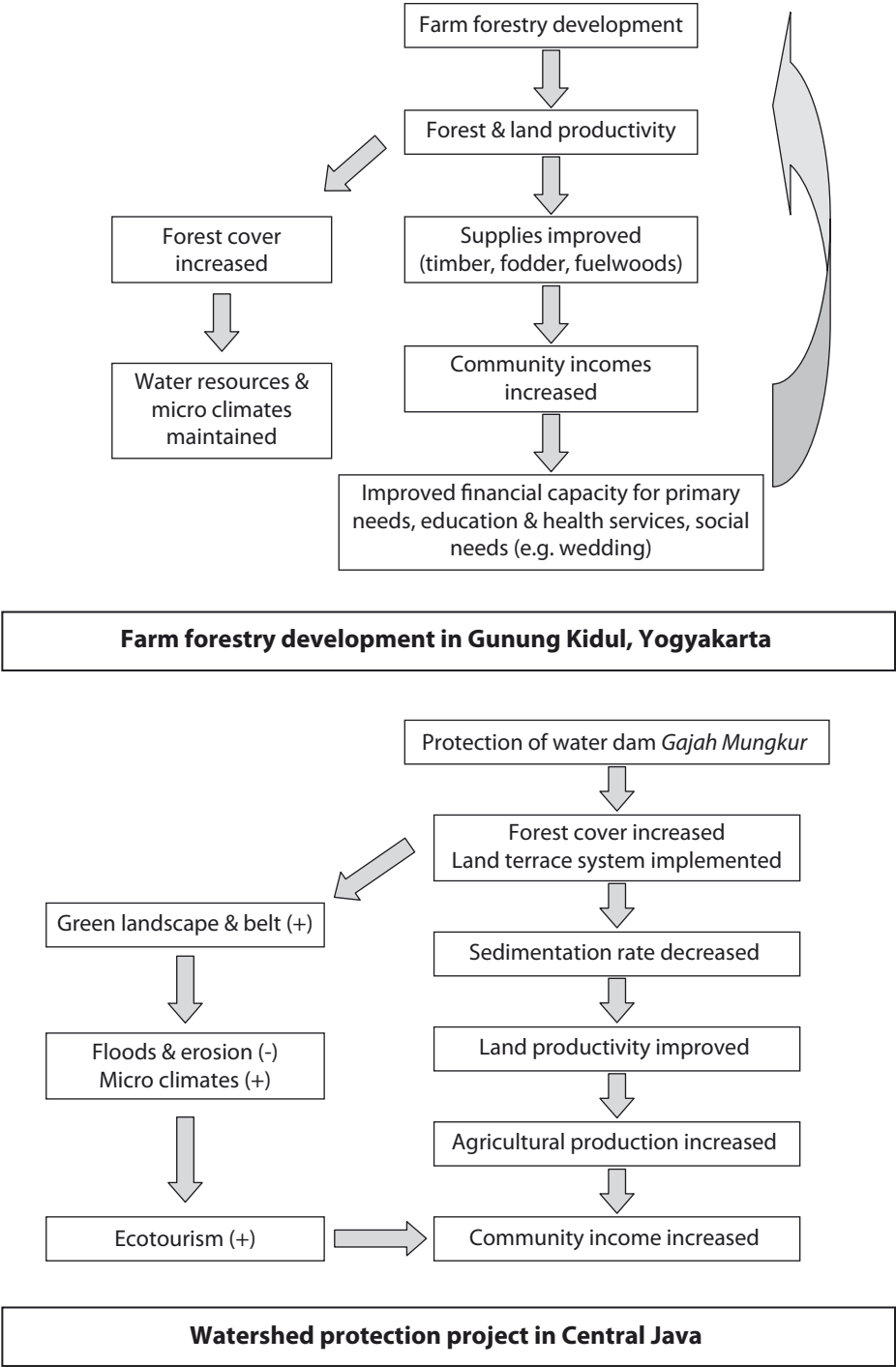


Figure 6-2. Multiplier effects of the Farm Forestry Project and Watershed Protection Project



Picture 6-1. The teak here is growing successfully on stony farmland. Inset: teak wood ready to sell (Location: Gunung Kidul, Yogyakarta – Farm Forestry Project)

Specifically, from a technical aspect, the Watershed Protection Project has met its objectives. It has successfully reduced critical land by 62.17% and increased land productivity up to 37% as a result of terrace rehabilitation (22,000 ha), slope regreening (21.3 ha), community forestry (5,000 ha), greenbelt planting activities (600 ha) and also reforestation, conducted by the state company Perhutani, covering 2,903 ha. This has then significantly reduced erosion by 75% and sedimentation in the water catchment area by 49% and eventually it is anticipated that this will increase the operational period of the reservoir from 27 years, as predicted in 1985, to 50 years (Inspektorat Jenderal 1996).

Understanding the flow of goods, services and the multiplier effects from the ground up has provided valuable lessons for improving the design of rehabilitation activities. Considering the overall integrated economic, ecological and social aspects, scenarios for multiplier effects can be embedded in the project design as target impacts to be achieved by the projects, within a reasonable and clear timeframe. These will underlie the process of defining the project strategy and approach. Applying the most suitable technical intervention that fits with the underlying problems of degraded areas is important, so significant ecological improvement impacts can be achieved. The economic and livelihood benefits generated from the ecological improvements are proven to be more sustained in the long term, beyond the project period. On the contrary, most of the projects

tended to generate short-term cash incomes for the communities involved, mainly from project-based employment opportunities, such as by working as labourers for seed planting.

Further, project designs should cater several crucial components, which include: incentive mechanisms that should be designed to encourage community participation and one of these is a defined marketing strategy; and ensuring the economic feasibility of the rehabilitation initiatives through pre-project arrangements. The design should also define the best approach to ensure adoption by community members (see section c below for more discussion). Detailed descriptions on these different aspects are discussed in the following sections.

a. Incentive mechanisms should be designed to encourage community participation

Instead of direct payments or granting a significant amount of funds, which have often created greater community dependence on the project; it is better in the long term to design economic incentive mechanisms. In addition to economic incentives, socio-cultural incentives are also important. In defining the right economic incentives, it is important that the set-up incentives should be based on the results of a preliminary assessment of the local economic conditions, community organisation capacity, and the existence of markets; and they should fit with the overall project feasibility. Understanding the local economic conditions helps in defining tailored incentives that are relevant. A well-developed community organisation is more ready to deal with market-oriented economic incentives and business development. With the existence of a local market, there is a great possibility of engaging with the existing market for particular commodities produced by the project; this is even more advantageous for the project as it does not have to define its own marketing strategy. Incentives should not be generalised over all areas, especially over a wide range of areas with various social-cultural, economic and ecological conditions.

While incentives have been focused on tangible production (e.g. timber and NTFPs), Payment for Environmental Services (PES) is a promising incentive mechanism to compensate for the environmental services provided by the community as part of the rehabilitation project they are involved in. The ecological benefits resulting from the Farm Forestry and Watershed Protection Projects presented in Figure 6-1 above, provides an example of uncompensated services provided by the community by continuing the rehabilitation activities after the project term. For projects based on a watershed, as the area of management, the PES scheme is a promising incentive mechanism (Box 6-1). For example, the downstream community provides compensation to the upstream villages

for conserving the water resources. In this scheme, the government has a role to play in facilitating stakeholder negotiations and conducting monitoring and supervision activities.

Box 6-1. Payment for Environmental Services (PES) as an incentive mechanism

The PES scheme is defined as a *voluntary* transaction, under several conditions: based on a *well-defined* environmental service (or a land use likely to secure that service); is being 'bought' by an (minimum of one) environmental-service *buyer*; from an (minimum of one) environmental-service *provider*; and if and only if the service is provided continuously (*conditionality*). The mechanism normally does not involve any changes in land tenure, and it complements other conservation approaches, e.g. command-and-control, as in the case of the Kyoto Protocol – carbon trading.

The core idea of implementing PES is that external ES (Environmental Services) beneficiaries make direct, contractual and conditional payments to local landholders and users for adopting practices that secure ecosystem conservation and restoration. The traded ES are valued by using a contingency method, specifically on the scarce ES that potentially are subject to trade. Examples of current PES schemes are: carbon sequestration and storage, biodiversity protection, watershed protection, and landscape beautification.

Types of PES applications:

1. Bases for contracts/PES arrangements:

Area-based: land and/or resources used as the basis for contract in PES (e.g. protected catchments, forest-carbon plantations)

Production-based: consumers pay a 'green premium' (certified products to be environmentally friendly – especially biodiversity). e.g. organic farming

2. Based on buyer groups:

Private schemes: buyers pay directly to ES providers (private companies in carbon schemes)

Public schemes: the state acts on behalf of ES buyers by collecting taxes and grants and pays alleged ES providers

3. Based on objectives:

Use-restricting: rewards provided for conservation (including natural regeneration) for not carrying out resource extraction & land development (paid for conservation opportunity costs)

Asset-building: PES schemes aim to restore the ecosystem in certain areas (e.g. replanting trees in deforested areas)

Source: Wunder 2005

Examples of other types of incentives are presented in Table 6-7. It is important to consider the best conditions, in which the right incentives could be applied. For example, subsidies in a monetary form should be applied with the aim of creating revolving funds, so the funding sustainability can be ensured after the project has ended. One of the most important incentives is to have a defined and secured market for any production coming from rehabilitation initiatives. Thinking carefully about the strategy to link up with the market should be part of the process of defining project designs. A pre-project assessment of the existing market schemes in the area might be useful in the process of deciding the timber and non-timber species to be planted in the rehabilitation areas. A marketing strategy should be defined separately for timber and non-timber species, due to the nature of the products. Understanding the structures of the existing market (competitive free market, monopoly or oligopoly) is also important to improve knowledge for dealing with buyers and in setting prices.

Certainly, the species chosen based on the market preference should also fit the condition from a technical point of view. An example of a case study project

Table 6-7. Examples of incentive types and conditions for application

Type of incentives	Conditions to be considered for application
1. Subsidies provided to a community (physical assistance), and creating employment opportunities	For areas isolated from economic activities (or remote areas)
2. Subsidies provided to a community (monetary assistance)	This should be aimed at creating revolving funds. In this case, contract agreements may be necessary. This could include outlining the penalty or sanction if the project were to fail or if the subsidies were used for non-rehabilitation activities.
3. Tax exemption	With the aim of encouraging private companies to participate in rehabilitation projects
4. Credit schemes	Needs cooperative or business management unit with good capacity
5. Defined and secured market for timber production	For projects where tree cutting is allowed
6. Creating or engaging NTFP market	For projects on state forestland where tree felling is not allowed
7. Reward schemes	Could be applied in any case by considering the local condition
8. Free land certification programme	For timber based rehabilitation initiatives that are implemented on community lands
9. Extension services programme	Essential components that could be applied in any condition, and provided by non-government parties, such as an NGO and the private sector
10. Net revenue sharing agreement	Essential for all rehabilitation initiatives involving shared investments in any form from other parties, such as a community

that has defined a marketing strategy as part of the planning processes of the rehabilitation programme is Conserving a National Park Project in Meru Betiri, East Java. The NGO and national park management have assisted community groups in marketing the NTFP, especially traditional medicines (*jamu*) through standardised packaging and introducing or exposing the products to all visitors who come to the rehabilitation areas.

Set-up incentives should also be directed to create an alternative to the funding mechanism for implementing forest and land rehabilitation efforts. Rehabilitation initiatives potentially could be managed as businesses that are market and industry-oriented in order to gain the interest and involvement of the communities while at the same time ensuring the sustainability of the project. The incentives should be planned at the local level by identifying local potential and needs when designing the proposal. See also more discussion on a reinvestment mechanism in Section b.3 under 6.2.3.

b. Ensuring the economic feasibility of the rehabilitation initiatives

An economically unfeasible programme is the most serious problem in sustaining initiatives beyond the project timeframe. Therefore, it is important to conduct a financial analysis prior to the process of putting together the project design. The latter should be based on the most cost-effective technical interventions tailored to address the degraded ecological conditions at the local level. Thinking ahead about a reinvestment mechanism, as part of the efforts to maintain the funding sustainability, is equally important. In ensuring economic feasibility, it is also important to secure a community's commitment through a fair and equitable mechanism for sharing the costs and benefits among the stakeholders involved. Further, wider economic impacts that reach out to marginalised groups are important in contributing to the sustainability of rehabilitation initiatives.

b.1. A financial analysis is conducted prior to the project implementation

A feasible rehabilitation programme is more likely to be sustained in the long term than a project that has not considered the financial and economic aspects. Therefore, a financial analysis under a participatory approach is very useful in the project design. With a Cost and Benefit Analysis (CBA), the design can be revised and improved to be more feasible financially and economically if the results from the first design turn out not to be feasible. In line with the analysis, the potential major costs of implementing the project can also be identified. With this understanding, a strategy to manage the highest cost components could be identified. Small projects with low establishment and operational costs are more likely to be successful in the long term than large-scale projects that require a large budget for rehabilitation. Providing a series of training programmes on a

tool to be used for rapid financial and economic analysis, for local district forestry staff, is a low cost preparation for more feasible designs of various rehabilitation initiatives.

b.2. Cost-effective technical interventions

Technical intervention has been the focus of rehabilitation activities since the 1960s. However, technical interventions are also increasingly expected to contribute, socially and economically, to the livelihoods of the communities. Although extensive technical rehabilitation projects were implemented, at the community level there are still gaps in technical knowledge. This reflects the fact there is little advanced adoption of the different technical approaches being implemented on the ground. Technical interventions involve high investment costs therefore they should be made in a more cost-effective way, with the aim of having the optimum adoption of the technical knowledge by the community. Based on a range of case studies analysis, the dominant conditions in terms of technical aspects include:

1. Nurseries are built as part of the rehabilitation programme
2. Seedlings provided meet minimum standards
3. Funds for tree maintenance are included in the rehabilitation programme budget
4. Funds are provided to protect the sites from disturbances affecting the rehabilitation activities
5. Basic maps capturing information on land cover and uses and topography are available (Note: basic maps tend to be more available for projects inside than outside state forests)
6. An analysis of the soil condition is made early in the rehabilitation programme (Note: this was noted particularly in the Mechanised Plantation, Rehabilitation of Fire-affected Forests, and Rehabilitation of Logged-over Areas projects)
7. Techniques for the second regeneration stage are well designed and thought through (Note: particularly observed in the Watershed Protection and Farm Forestry projects).

Therefore, for optimum cost effectiveness, technical interventions should be implemented by considering:

- a. A preliminary assessment to identify the most appropriate and cost-effective interventions (locally specific)

For cost-effective approaches, it is important to conduct a preliminary assessment to find the best technical interventions to suit the local ecological, social and economic conditions. By having a better understanding of local conditions, effective locally specific approaches can be implemented. Chosen techniques of

enrichment planting, naturally assisted regeneration and natural regeneration could be used depending on the forest function, nature of degradation, and causes of degradation. Priority has to be given to locations that are easy to access in order to ensure proper maintenance and for control and demonstration purposes, and availability of a good database (basic data) as a basis for good planning (e.g. maps with clear boundaries, and appropriate scale – 1: 10,000). Planning should be supported by accurate data, such as maps of critical land, mapping of the project areas covering ecological information, potential funding, as well as seedling supply and institutional capacity at the local level.

- b. Appropriate ecological and socioeconomic conditions for species–site matching identification

With the aim that rehabilitation initiatives generate incomes and livelihood options for the local community, the process of species site-matching identification should consider both the socioeconomic and ecological aspects. The economic considerations should cover the species that are marketable locally and have potential to be marketed outside the region at a good price. Socially, any new species planted in the rehabilitation activities should be ones that the community have experience with, hence local species might be more appropriate.



Picture 6-2. Mechanised nurseries abandoned due to unclear hand over after the project ended and a lack of long term plans as part of the project design (Location: Banjarbaru, South Kalimantan – Mechanised Plantation Project)

- c. Long-term plans integrating nursery establishment, planting activities, second-rotation management, and product utilisation/marketing

Commonly, projects did not apply integrated management planning to technical aspects of the programmes. Where management plans were made, they were designed for only a short period once the project had ended. It is important, therefore, to emphasise the need for long-term and integrated management planning, including technical aspects. The second rotation might need a different technical intervention; this could be identified after an evaluation, involving all stakeholders, of the effectiveness of the technical intervention applied to the first rotation.

- d. An effective dissemination mechanism for the latest silvicultural techniques to address information gaps

As mentioned earlier in this section, there has been only limited adoption of the rehabilitation approaches, even technical aspects. However, literature based on advanced research into these techniques is widely available. There appear to be gaps in the dissemination of information to the project implementers about the latest techniques to be implemented in the field.

- e. More emphasis on practical multi-cropping techniques on the ground

Developing plantations has been the main technique used in most of the rehabilitation projects. In current and future rehabilitation projects a greater focus is required on multi-cropping techniques. There have been many recommendations, but good practical implementation has been limited. Consequently, this should be one of the priorities to be developed and implemented in the field.

b.3. Reinvestment mechanisms - plans have been made for funding sustainability

Ensuring the exit strategy by designing a reinvestment plan in the funding scheme is another important aspect to ensure sustainability. If the project generates revenues, ideally a certain portion of these revenues can be allocated for follow-up project activities. Government-based projects have mostly caused higher community dependence on financial assistance, therefore the rehabilitation activities ceased as soon as the project term ended. Ideally, the government funding should be used as 'seed money' in generating revolving funds for continuing activities. Looking at the example of the Farm Forestry Project, the community will eventually be able to implement a self-funded rehabilitation project, as a certain proportion of the total revenues are allocated for replanting. Creating a business development unit

as part of the project design is another alternative for securing potential funding for the rehabilitation project. Developing a PES scheme is another promising alternative.

b.4. There is a mechanism for sharing the costs and benefits among stakeholders

For the projects with significant community involvement, it is important to secure the community's commitment as an approach to sustaining the rehabilitation activities. One way to secure community commitment is by designing a fair mechanism to share the costs and benefits. As part of the process of designing the fairest mechanism for cost-and-benefit sharing, important steps include (Nawir *et al.* 2006, Nawir *et al.* 2003):

1. The term 'fair' should be defined together with all stakeholders involved
2. Participatory processes should identify the components of costs and benefits to be included and shared based on invested contributions of all stakeholders involved
3. Whenever possible, the mechanism should be based on the calculation of both tangible (financial) and intangible (environmental and social) costs and benefits.

However, having secure access to harvest any kind of tree that the community has planted in the rehabilitation areas, particularly timber, should support the mechanism. Without this guarantee, the sharing mechanism cannot be applied. A sharing mechanism can also potentially be applied to a funding arrangement between different parties, such as between the government and a private company. This could definitely reduce the burden on the government. The government usually bears all of the expenses for implementing a range of rehabilitation programmes.

b.5. Reaching out to ensure economic impact for marginalised groups

Even though 42% of projects included in Database 1 claimed that the main beneficiaries of their projects were the local community, marginalised groups often miss out on the benefits from the rehabilitation project activities, particularly the landless. This was clearly observed based on an in-depth study at the site of the Collaborative Forest Management Project. Identifying the potential obstacles, in the pre-project assessment processes, for this group to gain benefits from the project will be useful in designing projects that include the marginalised or poorest groups. For example, economically marginalised groups are usually landless. Marginalised groups commonly include women groups as well, which is important to be taken into account, since it is mostly women who have the most important roles in successful rehabilitation initiatives.

c. Ensuring adoption: addressing the gap in knowledge by understanding the determining factors influencing a community's adoption behaviour

Understanding the motivation of the community to adopt (or not adopt) certain rehabilitation techniques and approaches is very useful when designing the extension programme. Communities involved in projects implemented inside state forests and on community land were motivated by the objectives of generating incomes, improving land productivity and conserving the forest. For those who were involved in the rehabilitation projects inside state forest, in addition to wanting to reduce the frequency of soil erosion and landslides, the economic determining factors for adopting rehabilitation techniques and approaches were:

1. Limited land availability. Communities saw the opportunity to gain access to land and to generate an income by joining the rehabilitation projects
2. Opportunities to work as labourers on the projects (e.g. in planting and logging)
3. Opportunities to implement intercropping and planting multipurpose tree species by having access to the land for cultivation and management.

Similarly, the communities who were involved in the projects on community land also mentioned preventing floods during the rainy season and maintaining the water supply during the dry season as the main determining factors for adopting rehabilitation techniques and approaches. More important determining factors were driven mainly by economic objectives, including:

- Opportunities provided within the projects to cultivate high-price commodities (e.g. rubber) and to gain income for secondary household needs (e.g. schooling)
- Improved land productivity (e.g. soil fertility).

However, there are also external determining factors that influenced the community's adoption of the rehabilitation approaches, and these included:

- The increased market demand and high prices for commodities produced by the projects (e.g. timber for the furniture industry, particularly from the Farm Forestry and Watershed Protection projects)
- Intensive forestry extension programmes that were implemented by the local government agencies
- Rules imposed by the farmer associations
- Government assistance provided as part of the rehabilitation initiatives (e.g. *DAK- DR* Kampar).

In general, the level of adoption depends on the extent of the sessions to introduce the projects (project socialisation programme), and how the local community perceives the project as being relevant to it. The existing condition of their forest

resources affects the motivation for local people to adopt new knowledge and skills, in particular in the forest-rich situation on the outer islands (e.g. Sumatra and Kalimantan) compared to the situation on Java, where limited forest remains. On the outer islands, the adoption of rehabilitation techniques is not an issue, since there are plenty of timber resources to fulfil the communities' needs. People on Java, on the other hand, are more receptive to adopting the rehabilitation techniques and approaches because of the urgent need to restore the condition of the degraded areas. They want to cultivate timber and food crops to generate incomes, as well as to prevent serious environmental disasters such as floods and landslides.

Capacity development and community empowerment are very important in ensuring adoption. Unfortunately, project initiators often have pre-judgment over low local community capacity. Many projects are implemented by government officials, contractors and academic institutions. Moreover, communities are often excluded from the planning and project-design processes. Community forestry development (inside and outside state forest) should be integrated and supported by encouraging community participation through capacity building and community empowerment. Training in entrepreneurial, management and organisational development should be offered to communities to empower them. Capacity building should be undertaken on individual, organisational and networking levels.

6.2.4. Project management and institutional arrangements for sustainable rehabilitation activities

As summarised in Chapter 4, due to the urgent need to rehabilitate the increasing area of degraded land, the number of rehabilitation projects implemented increased six-fold between the 1960s-70s and the 1990s-2004. Project management and institutional arrangements are important aspects of ensuring smooth implementation during the project period, and its sustainability after the project term has ended. Ideally, project management should be differentiated based on the main important conditions of the projects, whether the project is implemented inside state forest or on community land outside state forest, on logged-over areas or on fire-affected areas, the scale of the area to be rehabilitated (small, medium or large), and on the executing agency.

Some facts from the analysis of Database 1 that provide a better understanding of the project characteristics are useful for the process of defining management strategies. For example, unlike the pre-1990s-2004 period, in earlier years more projects were implemented inside state forest than on community land or outside state forest. Among the projects implemented inside state forest, more projects were implemented on logged-over areas (80 projects) than on fire-affected areas

(16 projects). This reflects the serious problems of the management in production forest, particularly in relation to logging activities. As reflected from the higher target areas for rehabilitation outside state forest, the MoF has always prioritised rehabilitation activities on community land. In view of the fact that degradation has been more serious inside state forest, rehabilitation should be given greater priority in these areas.

Another fact is that, increasingly, there have been more joint initiative projects (47%) than government-only initiatives (42%). Joint initiative projects tend to be implemented over a larger project area (more than 1.000 ha – 23 projects) than government-based projects, which have a lower project area (less than 100 ha). However, more importantly, the process of defining the management framework should be a participatory process and involve all stakeholders. Experiences drawn from forest and land rehabilitation activities have shown that competent institutions play an important role in the success of rehabilitation activities, hence a clear role is needed for the institutions involved at each level (central, provincial, district and village). The following section discusses the important conditions that form part of the project management and institutional arrangement as aspects to be considered in the process to define the project management framework.

a. Project management

From the analysis of the case studies, it could be seen that there are several main important conditions under the heading of ‘project management’ to ensure the sustainability of rehabilitation activities. These are discussed below.

a.1. There is long-term management planning of the rehabilitation projects to ensure sustainability

Having a long-term management plan is important to ensure the sustainability of a project, and it is important to cover the period after the project. The impacts of failures in having this management plan were observed from the observations of four past projects i.e. Mechanised Plantation, Rehabilitation of Fire-affected Forests, Participatory Reforestation and Watershed Protection, and one ongoing project i.e. Collaborative Forest Management.

A clear example was observed at the Mechanised Plantation Project in South Kalimantan. Reforestation of *Imperata* grasslands, also a part of the Mechanised Plantation Project in South Kalimantan, was successful in converting the grasslands to forest vegetation by means of selecting and using the best provenance of certain forest tree species. The project was also successful in preventing and controlling forest fires, so the plantation grew safely until it was ready for harvesting. However, long-term planning, especially for the second rotation, was not done well. When it came time to harvest the first rotation, the cutting was not carried out in time.

As a result, the forest stands were subject to fire, encroachment and illegal logging. Furthermore, parts of the plantation areas returned to *Imperata* grasslands. Again, the long-term sustainability of a rehabilitation initiative is greatly affected by long-term planning, including planning for the second rotation.

Further, the Mechanised Plantation Project in South Kalimantan was developed to support and to supply high quality seedlings for reforestation of *Imperata* grassland and industrial plantation forest. The nursery used high-tech 'Enso-pot trays' to produce a lighter seedling with cohesive roots, so the seedlings could be transported to more distant sites. However, the large nursery was not well integrated into the multi-years long-term planting. At the same time, the demand for seedlings was insufficient and much lower than the capacity of the nursery. Eventually, this modern nursery had to be closed. A lesson learnt from this experience is that modern technology cannot be used in forest nurseries in a sustainable way without well integrated planning of the planting activities, harvesting and channels to market the produced seedlings and timber. Long-term management planning should cover every stage of the pre-project, project implementation and post-project activities.

a.2. The project activities are implemented as planned (no discontinuation of project activities before the project term ends for any reason)

There were many examples of programmes or projects that were discontinued after having been implemented for several years. The reasons for this included policy failures i.e. withdrawing the rights for rehabilitation assigned to Inhutani, and unresolved conflicts due to overlapping rights to rehabilitation areas e.g. the Rehabilitation of Logged-over Areas Project in Riau.

Halting the programmes or projects has often led to wasted investment in the first two or three years, and with no clear direction on alternative follow-up plans, not to mention investment on social capital that might be larger than that actually seen on the ground. The community participating in this activity was most affected and was often not well informed. This type of situation can lead to a community having a lack of trust in the project staff. The justification for discontinuing the programme was often based on a short-term-oriented evaluation, however, it takes longer to see the actual impacts of rehabilitation on the ground. For example, the *Inpres* Project in Java that was initiated in the 1970s was claimed 20–30 years later to have been a successful initiative, which was not the case according to the evaluation at the time (See Box 6-2).

At this point, MoF or other government ministerial-level authorities should consider carefully before halting a project or programme, while the activities

Box 6-2. *Inpres*^a Reforestation and Afforestation Projects in all districts of Indonesia (23-year project, 1976–99)

Project description

Coverage:	60 catchment areas
Funding agency:	Gol
Implementing agency:	Local government
Beneficiaries:	Local people
Project costs:	USD 1.3 billion

The main objective was to implement reforestation (of state forest) over a target area of 300,000 ha per year, and afforestation (on community land) of 600,000 ha per year on Java, Sumatra and other islands.

Lessons learnt

The intended impact was improved community knowledge of reforestation/afforestation through intensive forestry extension programmes.

Failures identified

- An assessment was conducted soon after the projects ended that looked at the physical criteria (infrastructure, survival rate, etc). It showed that the projects had performed poorly.
- Coverage (planted) areas were not clearly identified.
- Maintenance costs were not part of the funding schemes (problem of funding sustainability).
- Locally specific management was not considered in the forestry extension programme.

Successes (more than 20–30 years after the project was initiated)

- The landscape had been greened at various sites in Java.
- The economic opportunities provided from harvested timber (e.g. Falcata in Java). The growing local processing industries and increasing domestic use have generally created economic benefits for farmers.
- Tree growers emerged spontaneously, together with the associated supporting systems (vendors of seedlings in the local markets)

Note: a. Presidential Instruction (*Instruksi Presiden*)

Sources: Mursidin, personal communication 2004; preliminary database; Santoso 1992

continue, a participatory evaluation could be conducted to provide inputs to improve the implementation. The decision to discontinue a certain programme or project should be taken only for areas that have not begun the socialisation or project introduction stages.

a.3. Infrastructure development is part of the rehabilitation programme and a cost-effective investment

According to the community, the development of infrastructure, such as road construction, as part of the rehabilitation programme tends to be one of the indicators of a successful rehabilitation project. This was observed from five projects in the case study project analysis (four past projects – Mechanised Plantation, Rehabilitation of Fire- affected Forests, Participatory Reforestation, and Watershed Protection, and one ongoing project, Collaborative Forest Management). Infrastructure is important, particularly if these areas were formerly isolated and the infrastructure has assisted the community to trade their crops for cash incomes. However, infrastructure development is very expensive and not all projects are able to fulfil this demand. Lower-cost options that are more relevant to the rehabilitation activities are alternatives to be included in the management plans.

a.4. It is necessary to protect the rehabilitation areas from continuing local disturbances, such as fires and grazing

The sustainability of the rehabilitation activities is determined by an integrating strategy and efforts in the management plan to deal with ongoing disturbances. Disturbances include ecologically related problems or more complex cases, such as illegal logging or forest encroachment with the purpose of converting forest areas for agriculture. The high price to be obtained for certain crops often interests the community in using the rehabilitation areas for intensive cultivation e.g. oil palm, in the case of the Rehabilitation of Logged-over Areas Project. Therefore before the project starts it is important to have a process in place to identify potential disturbances. By understanding the disturbances better, a strategy to overcome them can be appropriately embedded in the management plan. However, there are quite complicated problems that need not only a good management plan but also coordination with the authorities and good law enforcement. The government should play a greater role in this situation.

a.5. Reconciling the land status before the project starts

The most sensitive issue in initiating and implementing a project is the problem of land status or land tenure. A number of projects could not be continued due to unresolved conflicts over land status, particularly overlapping land rights. The problems arose mainly because of the different rights provided to different stakeholders, based on what was understood on paper but never confirmed on the ground. Often, different authorities have different basic documents to work with, so overlapping rights to similar areas are unavoidable. At the regional level, the correspondence analysis showed, as an important indicator, that the

rehabilitation programme should correspond with and be integrated into regional spatial planning (*rencana tata ruang*). Successful integration was observed at the ongoing Conserving a National Park Project, in particular. However, regional spatial planning is often not based on the actual conditions on the ground, and local government priorities often differ from those of central government. Local government prefers investments that can generate local revenues, while central government puts rehabilitation as the first priority.

The Rehabilitation of Fire-affected Forest Project was one example of a forest rehabilitation programme disrupted by unsettled tenure issues. The plantation was made on an area of forest burnt by a major fire in Kalimantan in 1983. In the initial establishment phase, in the first 5 years, it was possible to maintain the plantation and protect it from repeated fires. However, a major fire in 1997 burnt most of the plantation area. Poor maintenance of firebreaks and low support from the surrounding community may be claimed as the cause of this unsustainable rehabilitation effort. The low level of support from the surrounding community was an impact of existing conflict over the forestland. The community claimed the land was private land since they had practised shifting cultivation in the area for many years. This conflict found no satisfactory resolution.

It is important, therefore in the earlier stages of the project, to deal with the problems of overlapping of land rights and resolve land conflicts before a project starts. The project initiator should have a good understanding of the land ownership/management status, so that potential conflicts can be anticipated. In some cases, the adjustment includes the recognition of informal land rights, and revision of formal land ownership/occupation rights.

a.6. Participatory monitoring and evaluation

As discussed in various fora, participatory monitoring and evaluation have been lacking in many of the implemented rehabilitation projects. Taking stakeholder inputs into account is a very useful way of improving implementation and learning from mistakes and unsuccessful strategies while the project is still ongoing. However, it is important to emphasise that monitoring and evaluation should not emphasise only physical indicators but also institutional and socioeconomic indicators.

Indicators of integrated aspects for monitoring and evaluation should be based on local indicators, as agreed during processes involving all stakeholders. The indicators should be reviewed jointly on a regular basis. In addition, a transparent feedback mechanism should be established as part of the regular monitoring and evaluation processes.

Monitoring and evaluation of forest and land rehabilitation initiatives should involve independent third parties, such as academic institutions, NGOs and local communities to ensure improved accountability of the implementation. Facilitation and supervision are necessary in order to monitor possible violations including corruption, collusion, and nepotism (*Korupsi, Kolusi dan Nepotisme-KKN*). This is crucial to forming an independent monitoring organisation (to reduce corruption and other violations) as current rehabilitation practices are vulnerable to *KKN*. Therefore, the ethical values of the implementers have to be taken into account. Sustainable monitoring and evaluation are very important to avoid overlap in project implementation, therefore supervision of the National Rehabilitation Movement (*GN-RHL/Gerhan*) has to be clearly managed in order to avoid consecutive inspections by the monitoring agency in charge. Legal action should be taken against those who commit violations when implementing forest and land rehabilitation initiatives. However, sanctions for violators also have to be balanced by a reward scheme for those who have contributed to the success of rehabilitation activities in certain areas.

b. Institutional arrangements for greater and active community participation

Increasingly, the community is expected to participate more and play a greater role in rehabilitation projects. In terms of institutional aspects, four important conditions should be met to ensure greater community participation, as observed from the analysis of the 10 case study projects. These include:

- a. A local (or other) organisation is involved in implementing rehabilitation activities, or alternatively, there is a newly formed community organisation
- b. There are programmes to empower the community's institutional and technical capacities to support the rehabilitation programmes
- c. There are multi-stakeholder facilitation processes at various stages of the rehabilitation programmes, i.e. planning, implementation, monitoring and evaluation.

It is common in new projects to form a new institution, without adequate assessment of the existing local organisations that might provide a good basis for development or empowerment. The formation of a new community organisation is important if there is no other established organisation. However, setting up a good community organisation in a participative way also takes considerable time and effort, but is essential and worthwhile. Adequate pre-conditioning stages to set up the new institution before the project start, ideally this should be implemented one year (t-1) or two years (t-2) before the planting activity and focussing on processes to introduce the project (socialisation) and institutional development.

Failing to take aspects mentioned above into consideration could result in the discontinuation of the initiated efforts and wasted funding. For example, at the Mechanised Plantation Project programmes were aimed at empowering the community's institutional and technical capacities to support the programme. However, there were no multi-stakeholder facilitation processes at the various stages of the rehabilitation programmes, i.e. planning, implementation, monitoring and evaluation. This resulted in ineffective transfer of knowledge. Moreover, the distribution of rights and responsibilities during and after the project period was not clarified. This should be clear and based on participatory processes involving the stakeholders concerned, particularly community groups. Further, this will only be effective if all parties also respect the agreement on rights and responsibilities.

At the project level, institutional arrangements should be continued once the project has finished, in particular, the arrangements made among the institutions responsible for managing the project. However, it would be better if a capacity-assessment process were undertaken to ascertain the most appropriate and capable local agencies or institutions to take over responsibility for managing the rehabilitation activities after the project ends. Unfortunately, the project approach used in rehabilitation efforts has a counterproductive effect on strengthening and improving institutional effort at the local level. In order to support institutional development, institutional arrangements for forest and land rehabilitation activities must be specific to the local area; therefore institutional strengthening and capacity building in each area will also differ according to local needs.

Institutional arrangements should also include the clear roles and responsibilities of the forestry government agencies at all levels. Central government should play the role of facilitator and regulator in forest and land rehabilitation activities, with the main duty of determining criteria and indicators agreed by all stakeholders. As facilitators, regional governments and policies should contribute proportionally to planning and the formulation of regional regulations that support local initiatives and social forestry programmes. Provincial governments are responsible for overall regional planning and developing operational procedures for forest and land rehabilitation activities. District governments are responsible for technical operational procedures for implementing forest and land rehabilitation activities. Village governments could be involved in the direct implementation of the programme.

6.2.5. Reorientation of the policy framework: policy devolution to improve rehabilitation outcomes

The existence of an effective policy framework is essential to the sustainability of the rehabilitation initiatives and also to ensure long-term impacts. As discussed in Chapter 3, since 1998, under the decentralisation policy, forest management has

focused on balancing socioeconomic and environmental/ecological objectives, in which rehabilitation of the production and conservation forests has been the main target. The main strategy has been to prioritise community-based forest management, including forest rehabilitation. Under the current policy framework, emphasis should be focused on lessons learnt from the past to avoid similar policy and governance failures. In line with this, the following sections present suggestions for redirecting the rehabilitation policy framework.

a. Towards different scenarios for rehabilitating logged-over areas

Rehabilitating the state forest, particularly the logged-over production forest, is the main government priority at the moment. However, the initiatives should not be applied in a general way to all logged-over areas by disregarding the main causes of forest degradation, population density levels and other socioeconomic conditions.

By allowing natural regeneration to take place, logged-over areas have the potential to become secondary forests, as long as they are not subject to encroachment, occupation and/or conversion, all of which cause conflicts over land status (Figure 6-3). Thus secondary forests could be developed if it were made clear who was responsible for securing the areas after a *HPH* concession has been revoked. The establishment of plantations has been the most usual approach to rehabilitating logged-over areas since 1985, and this approach has been promoted by the MoF's provision of interest-free funding from the Reforestation Fund under the *HTI* Scheme. However, more abandoned, degraded forest areas have resulted from unsuccessful plantation development due to the lack of professional plans drawn up by those wishing to develop *HTI* plantations or lack of funding, which was the experience of the state company, Inhutani I to V (discussed in Chapter 3).

Under the regional autonomy system, local governments often see in these areas opportunities to develop more rapid income-generating options by converting the forest areas to oil palm or other alternatives that are more profitable. However, there has been an initiative to coordinate the MP-RHL (Master Plan for Forest and Land Rehabilitation) with the aim of synergising forest and land-use management planning at central and provincial/district levels. Therefore, developing integrated rehabilitation planning is still one issue that has not been solved. More importantly, it is essential to coordinate efforts to rehabilitate and address the most serious underlying causes of deforestation, i.e. illegal logging and forest encroachment, in an integrated manner.

In view of the above-mentioned conditions, it is best not to generalise rehabilitation efforts, even though they may be implemented within the same production forest or logged-over area. Considering different baseline conditions should develop

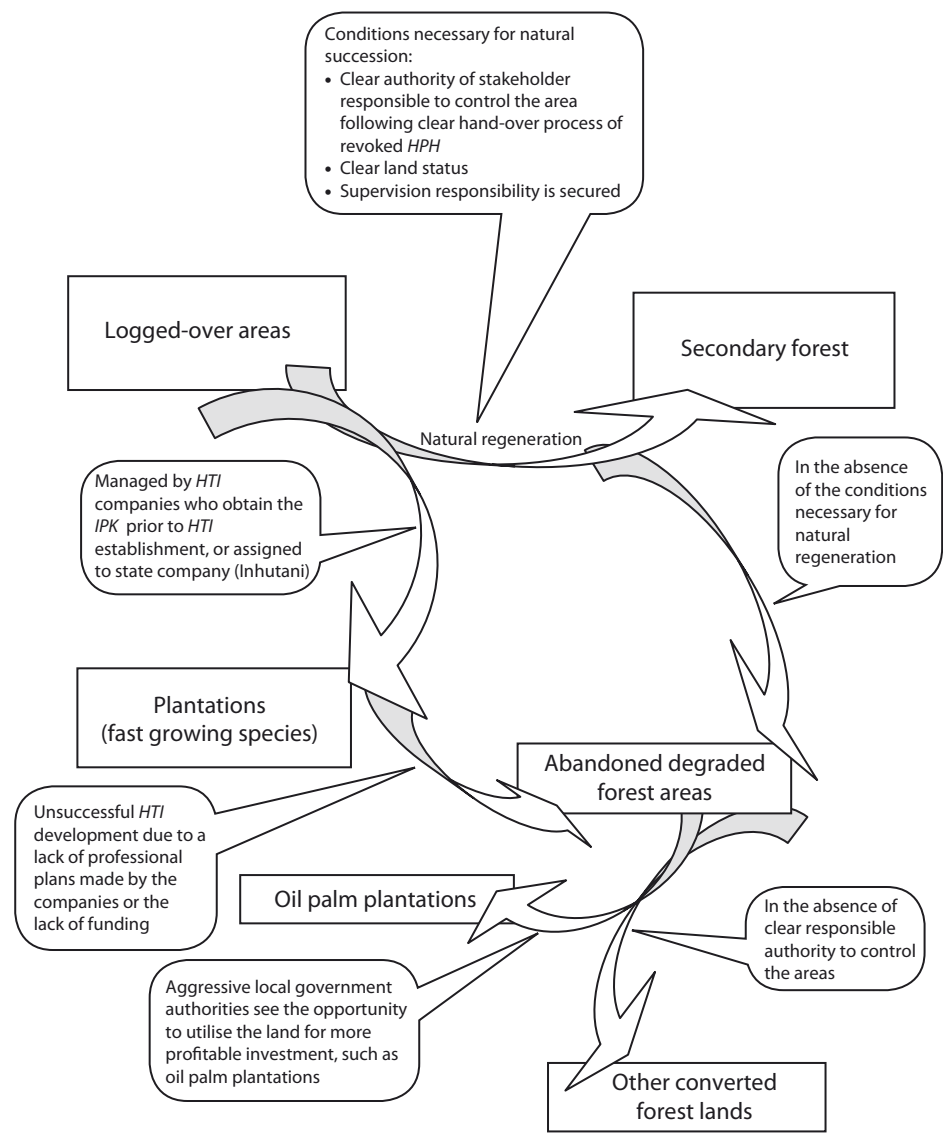


Figure 6-3. Different management conditions of logged-over areas

different rehabilitation scenarios. For example, baseline and external conditions include population density, location of the area in terms of markets or economic activity, and ecological or other disturbances affecting the rehabilitated area.

Using the baseline information, a scenario for natural regeneration is an option for rehabilitating the area related to the condition of an isolated area with low population density and low ecological disturbance. Under this scenario, no advanced technical intervention is required. However, it is essential to have good supervision and law enforcement to make sure the area is undisturbed for natural regeneration to occur.

In the case of high continuing disturbances, naturally assisted regeneration or enrichment planting could be undertaken if a good strategy is in place to manage disturbances, which are often fires. Where population densities are high and a market is accessible, an integrated strategy to generate livelihood options and link up to the market should be considered.

As an alternative to dominated government-based initiatives, it is often suggested that the government should focus on rehabilitation activities with no commercial objectives, such as inside protection forest. Instead, the government could encourage and facilitate, with clear and strict supervision, state-owned or private companies in more prominent and productive roles in rehabilitating logged-over areas. However, the redirection of the previous state-owned company's rehabilitation approach should be seriously and carefully considered. Taking into account the lessons learnt from the studied project on Rehabilitation of Logged-over Areas by the State-owned Company in Riau, the approach should be redirected to include adequate time for setting up the institutional arrangement within the community, between community and local authorities, and between local authorities and private investors that are interested in investing in the areas for non-forestry purposes. Reconciling the land status before the project starts is an essential step. Therefore, clear coordination among stakeholders is necessary to avoid any overlapping rights to the same areas.

b. Rehabilitation of degraded forest areas on community land: creating the right incentives

Increasingly, the MoF has placed the focus of the rehabilitation programme on state forest, particularly production forest; this has been a change in direction since the 1960s. Many people perceive the rehabilitation initiatives on community land outside state forest to have been more successful than similar initiatives implemented inside state forests². The reasons for this include the security of

² Based on a series of discussions in the Ministry of Forestry (2003, 2004), in expert group meetings (2004, 2005), and personal interviews with different experts (2003, 2004).

land status, which leads to less conflict over land and a high commitment by the community to maintain the trees planted. Clear land status provides a guarantee to community members that they will be able to harvest anything they have planted on their land.

Considering the potential for community initiatives to rehabilitate degraded areas outside state forest, to further advance the community's initiatives on a larger scale the government's role in creating the right incentives is very important³. It is crucial also that the government (local government, and local government with support from central government) should respond to the local initiatives by providing the right policy framework.

For optimal livelihood impacts, attaching rehabilitation initiatives to other ongoing project development initiatives is another good option. Integrated strategies and planning directed by the local government is the key in this situation.

c. Making the most of the decentralisation policy

The decentralisation policy, which also influences forestry management regimes, has been implemented since 1998. Despite the many drawbacks highlighted by the experts, the decentralisation policy actually provides an opportunity for a new direction in designing a strategy for forest and land rehabilitation. In view of the fact that local governments have better knowledge of their areas and their forestry management priorities, it is best if the local governments themselves i.e. the forestry services at provincial/district level, lead the process of designing the most appropriate local rehabilitation programmes. This function can be assigned to the regions that have proved to be successful in managing their forest areas and implementing the rehabilitation projects in the past. Central government (e.g. MoF) should have a role in facilitation, monitoring, supervision and evaluation. As facilitator, central government has a role in developing the generic guidelines or models, to help the local governments design the right programmes. This may include conducting risk assessments of the different scenarios chosen and providing inputs to the local government to find the lowest investment risks. With the chosen programme, the local government can then make a proposal for budget allocation. With this arrangement, fewer national programmes would then be implemented. Cost sharing should also be one of the principles in implementing this system.

Another important point is that there are policy frameworks with specifically consistent and secured policies to ensure long-term impacts, in which the aims are for an integrated approach, particularly the integration of centralised and

³ See also Section a under 6.2.3 on Incentive mechanisms should be designed to encourage community participation.

decentralised rehabilitation planning. Therefore, it is important to synchronise the priorities of central and local government, in which under the decentralisation policy, local priorities, in generating revenues for local government, are more important than rehabilitation objectives. It is also essential that central government policies support the local government policies, which more often assist in the success of the projects than do central government policies.

d. Reforming the funding mechanism policy to avoid project-oriented funding mechanisms

As discussed in Chapter 3, reforestation funds, as the main funding source for government-based initiatives, are channelled to fund the rehabilitation programmes through the Ministry of Finance and Ministry of Forestry. The Ministry of Finance channels the funds for implementing rehabilitation projects, such as the *DAK-DR* (Specific Allocated Funds – Reforestation Funds) scheme, whereas the Ministry of Forestry for example provides funding to implement rehabilitation projects under the *GN-RHL* (*Gerakan Nasional Rehabilitasi Hutan dan Lahan*). Devolution for better coordination is required, specifically between the Ministry of Finance, as the responsible department for releasing the budget, and the Ministry of Forestry as the responsible technical department for controlling the activities on the ground. Supervision and control to ensure the funds have been used for rehabilitation purposes are of utmost importance. This is also important in order to overcome the ineffective budget allocation due to the funds being used for non-rehabilitation purposes, mainly by revitalising the coordination between the District Forestry and the local district government on the ground. However, as Oka and William (2004) interpreted, based on PP No. 35/2002, the central government actually has more flexibility to use the received funds for non-rehabilitation purposes. This also needs to be better controlled.

The complicated annual procedures for proposing the activities to be funded (defined in the Ministerial Forestry Decree No. P.01/Menhut-II/2006) urgently need to be reformed. More simple procedures are required which do not include the long series of discussions with, and obtaining approval from, the People's Consultative Assembly (*Dewan Perwakilan Rakyat - DPR*), National Development Planning Board (*Badan Perencanaan Pembangunan Nasional - Bappenas*), and the Ministry of Finance. Allowing the budget that has been allocated to be carried over to the following year is a possible solution to this problem. The actual implementation could then be well planned instead of simply trying to finish the budget before the end of the year. A regular independent audit, based on simple procedures, should be conducted for a more objective evaluation of the effectiveness of the budget allocation. Clear sanctions should also be imposed following any violations of the budget allocation identified during an audit.

Further, in view of the classic problems of project-oriented funding mechanisms, the funding mechanism policy should be reformed. Funding mechanisms for forest and land rehabilitation activities should be reformed as a multi-year system so that funding can be less bureaucratic e.g. revision of PP 104 and adjusted to the planting season and local conditions. Budget approval should be given for at least 5-10 years then integrated into the rehabilitation planning, and not based on an annual approval system. For example, for the current *GN RHL/Gerhan* Programme planting is affected by the local conditions in different regions therefore a multi-year funding mechanism should be developed so that each region can arrange its own budget based on local conditions. Further, budget is required so planted seedlings can be tended until they are well established by extending the maintenance period beyond the current two year period, as currently practised in most rehabilitation projects.

To change the direction of rehabilitation initiatives in Indonesia, the devolution in *DR* management is urgently required: First, this could be initiated by having allocations that are more in line with the management approach in using *DAS* as a basis for initiating a rehabilitation programme. The budget allocation system should be designed and better coordinated across government administrative boundaries (e.g. district and provincial) and government agencies responsible.

Secondly, there should be a clear mechanism and an agreement for the government and communities to utilise products resulting from rehabilitation activities in order to create sustainable funding after the project term. For example *GN RHL/Gerhan* activities could be followed by a community-based forestry programme that could arrange clear rights for the community over income from products resulting from rehabilitation activities and marketing.

Thirdly, new funding mechanisms for forest and land rehabilitation initiatives should be explored, such as: a link should be made with the Clean Development Mechanism, a proposal should be developed to allocate Forest Resource Rent (*Provisi Sumber Daya Hutan - PSDH*) or within the regional budget (*APBD*) mechanism for forestry activities, and policies that offer incentives for private sector involvement should be developed. Aspects that should be taken into consideration, based on the experience of the rehabilitation efforts and successful industrial plantations: species selection, wood quality, linking up with markets and looking at the most profitable economies of scale. The 'Collaborative Forest Management Project is an alternative approach that was developed based on the partnership between a company and a community (Nawir and Gumartini 2003). This approach is used for rehabilitating state forest areas that local communities have laid claim to by giving them rights over products resulting from the

rehabilitation activities. Another alternative is to rehabilitate areas outside state forest (community forestry) under a benefit-sharing arrangement.

And fourthly, there should be a new vision that rehabilitation efforts are not 'cost centres', but directed more along the lines of 'revenue centres'. Forest and land rehabilitation activities should involve multi-stakeholders based on a cost sharing and risk analysis. Further, forest and land rehabilitation programmes should be more practical and more focused on the quality rather than quantity of the planting target. Current rehabilitation efforts, such as *GN-RHL/Gerhan*, are carried out mostly based on equal distribution, whereby all forest and critical land to be rehabilitated in an area are prioritised by the Ministry of Forestry. There are also many demands from local communities requesting that their land be rehabilitated, although they are not in priority areas. In determining a priority area for forest and land rehabilitation activities, with limited funding and human resources, priority should be given to projects that: have taken into account good planning; appropriateness of the target area and timing; have placed emphasis on quality, based on the availability of human resources and funding; plan to use species that are suitable to the local biophysical conditions; have conducted a proper economic analysis; have existing established local institutions or adequate pre-conditioning stages to set up a new institution before the project starts with the planting activity; have locations that are easy to access in order to ensure proper maintenance and for control and demonstration purposes; have an available accurate database, such as maps of critical land and the project areas covering ecological information; have potential funding; have a seedling supply and institutional capacity at the local level.

6.3. Summary

Although there seems to have been a concerted effort by the Indonesian Government during the last three decades to address the growing rate of forest degradation and the ramifying consequences of this degradation, forest degradation is still clearly beating the government hands down. If the government had achieved its target of 18.7 million ha for rehabilitation of degraded forest by 2004, there should have been 24.9 million ha of degraded forest remaining. Instead forest degradation has double to 43.6 million ha since the 1970s. This suggests that rehabilitation initiatives and projects have not been successful nor have policies and programmes really addressed the underlying causes of forest degradation.

Ineffective rehabilitation initiatives have been mainly at the expense of the government budget. The total government budget spent on rehabilitation projects may account for as much as 85% of the total government forestry budget since the

start of the *Inpres* programme in 1976/77 (H. Pasaribu, personal communication, 2004). The rehabilitation cost per ha was higher than the *HTI* establishment costs. The cost per ha ranged from USD 43 to 15,221 per hectare - depending on the sources of funding. For comparison, the *HTI* plantations standard cost is Rp 5 million per hectare (USD 550). The government projects cost the least while those financed by international donors cost the most, due to the high cost of technical expertise and usually calculated as a part of the project costs. The government projects implemented inside state forests were more expensive than those located outside state forest on community land. Together, the significant amount of forestry budget, allocated to rehabilitation, low rehabilitated areas of major government programmes and the high cost per ha, are a strong indication of the low cost effectiveness in the implementation of the rehabilitation activities and therefore wasted budget. This is reflected in the amount spent on rehabilitation compared to the actual results.

Reforestation funds are channelled to fund the rehabilitation programmes through the Ministry of Finance and Ministry of Forestry. The Ministry of Finance channels the funds for implementing rehabilitation projects under the *DAK-DR* (Specific Allocated Funds – Reforestation Funds) scheme, whereas the Ministry of Forestry provides funding to implement rehabilitation projects under *GN-RHL/Gerhan* (Gerakan Nasional Rehabilitasi Hutan dan Lahan) or National Movement for Forest and Land Rehabilitation. In view of the classic problems of project-oriented funding mechanisms, the funding mechanism policy should be reformed. Funding mechanisms for forest and land rehabilitation activities should be reformed as a multi-year system so that funding can be less bureaucratic (e.g. revision of PP 104) and adjusted to the planting season and local conditions. Budget approval should be given for at least 5-10 years and integrated into the rehabilitation planning, and not based on annually budgeting approval system.

Rehabilitation initiatives in Indonesia are in urgent need of change. This should ultimately include a degree of reformation within *DR* management while the management approach could use *DAS* as a basis for initiating rehabilitation programmes. Both the government and communities then desperately require a clear mechanism for the utilisation of products resulting from these rehabilitation programme activities. This should provide long term sustainable funding of the initiatives post project. Equally new funding mechanisms for forest and land rehabilitation initiatives should be explored; whether policies oriented to provide incentives for private sector involvement or an alternative approach such as the Collaborative Forest Management Project. Lastly, rehabilitation efforts should be viewed not so much as ‘cost centres’, but as ‘revenue centres’. Forest and land rehabilitation activities would then involve multi-stakeholders based on a cost sharing and risk analysis.

From this study the success of the various rehabilitation programmes ranged between as little as 19% and 93% of the target areas being rehabilitated. It is believed that those projects implemented on community land tend to have a higher success rate than those in state forest. This would seem to be mainly due to the clearer ownership of the land and freedom from overlapping government policies. Clear land status means less conflict over land, a high commitment by the community to maintain the trees planted and a guarantee to community members that they will be able to harvest anything they have planted on their land. Success is almost assured.

Although, since the 1960s, the main physical objectives of the rehabilitation programmes, in state forests, have been to increase forest and land cover, to protect watersheds (conserve soil and water), and to conserve biodiversity, there has also been more concentrated effort on timber production in production forest. Equally from the ten case studies it can be seen that the project objectives are now more diversified than the issues captured as the causes of deforestation and driving forces behind the rehabilitation projects. This has been mostly true of recently initiated projects (from the end of the 1990s onwards) where the focus of the objectives has been more on empowering the community, securing community access to land, and raising environmental awareness (education).

Based on the observations made in this study, rehabilitation activities have been more reactive initiatives than proactive in conjunction with implemented or imposed forest management policies. For example, among a few integrated precautionary policies, was the regulation on silvicultural systems of *TPTI*, *THPA*, *THPB*, and *TPTJ* as discussed in Chapter 3. Following their logging practices, concessionaires should implement these silvicultural systems. However, serious problems arose during the practical implementation due to a lack of government supervision.

Identifying the direct and indirect underlying causes of land and forest degradation should be conducted during the preliminary planning stage. This would of course include detailed planning of how these would be addressed in the initiated projects. By understanding the flow of goods, services and the multiplier effects from the ground up the design of rehabilitation activities can be greatly improved. While considering the overall integrated economic, ecological and social aspects, scenarios for the multiplier effects can then be incorporated into the project design as target impacts to be achieved by the projects, within a reasonable and clear timeframe. These will underlie the process of defining the project strategy and approach. Applying the most suitable technical intervention that fits the underlying problems of degraded areas is important, so significant ecological impacts can be achieved.

It can be seen from the case study analysis that the projects tended to generate short-term cash incomes for the communities involved from project-based employment opportunities, mainly by working as labourers for transplanting seedlings. This is not conducive to the sustainability of a community-based project. Even ecological improvements that can generate some form of livelihood benefits should be designed to be sustainable – far beyond the project period. To ensure long-term economic benefits, as shown by the correspondence analysis, a number of economic aspects should ideally be integrated into project designs such as: incentive mechanisms designed to encourage community participation; the definition of a marketing strategy in the planning process; a financial analysis should be conducted prior to the project implementation; a reinvestment mechanism should be designed; a costs and benefits sharing mechanism for the stakeholders should be designed; and reaching out to ensure economic impact for marginalised groups. Equally for greater community participation it is important for there to be: a local (or other) organisation involved in implementing rehabilitation activities; alternatively, a newly formed community organisation; programme (s) aimed at empowering the community's institutional and technical capacities to support the rehabilitation programme; and a multi-stakeholder facilitation processes at various stages of the rehabilitation programmes, i.e. planning, implementation, monitoring and evaluation. Further, institutional arrangements should be directed for allowing greater community participation at all project stages.

Although extensive technical rehabilitation projects have been implemented, at the community level there are still gaps in technical knowledge and very few of the different technical approaches, implemented on the ground, have been adopted. This has been mostly due to the high cost of the introduced technology, which is often way out of the reach of most community-based projects. It is therefore highly recommended that a preliminary assessment to find the best technical interventions to suit the local ecological, social and economic conditions and to meet the capacity and budget of the communities involved, be conducted.

The importance of the government's role in creating the right incentives for community initiatives, to rehabilitate degraded areas outside state forest on a larger scale, cannot be emphasised enough. However, the role of the government should be that of facilitator only, and the community and other local stakeholders should implement the initiatives. In the role of facilitator, it is crucial also that the government (local government, and local government with support from central government) should respond to the local initiatives by providing the right policy framework. For optimal livelihood impacts, attaching rehabilitation initiatives to other ongoing project developments is another option. Integrated strategic planning directed by the local government is of course the key to this situation.

Other important considerations are long-term plans, for cost-effective technical intervention, integrating a nursery establishment, planting activities, second-rotation management, and product utilisation and marketing; nurseries should be built as part of the rehabilitation programme; minimum requirement standards are met in providing seedlings; funds for tree maintenance are included in the rehabilitation programme budget; funds are available to protect the areas from disturbances affecting the rehabilitation activities; basic maps giving information on land cover and uses, and topography are available; the soil condition should be analysed at an early stage of the rehabilitation programme; and techniques for the second regeneration stage are well thought through.

It is also important to understand a community's motivation to or not to adopt a technique or approach when assessing a project or designing an extension programme. The level of adoption may simply be related to the introduction process of a project and the relevant technology in the initial socialisation phase of a project. Also how the community participants perceive the relevance of the technology, and the project itself, to their livelihoods and the community. Important conditions to ensure adoption are: the existence of education or a raising awareness programme for the general public that supports the rehabilitation activities, tailored to the needs of the local community; the needs and concerns or conflicts of interest between stakeholders are taken into account; there are significant supporting socio cultural conditions for the rehabilitation programme to achieve its objectives; and local socio cultural conditions are taken into account in the implementation of the rehabilitation activities.

However, more importantly, the process of defining the management framework should be a participatory process and involve all stakeholders. There are several main important conditions under the heading of 'project management' to ensure the sustainability of rehabilitation activities. These are: activities must continue after the project ends; the project activities must be implemented in accordance with the terms of the project (no discontinuation of project activities before the project term ends, for any reasons); the rehabilitation programme corresponds with and is integrated into regional spatial planning (*rencana tata ruang*); there is long-term management planning of the rehabilitation programme to ensure sustainability; plans are made for long-term monitoring and evaluation; a feedback mechanism exists; efforts are made to protect the rehabilitated areas from continuing local disturbances, such as fires and grazing; infrastructure development is part of the rehabilitation programme; there is recognition of informal land rights; and formal land ownership or occupation is revised.

The existence of an effective policy framework is also essential if the rehabilitation initiatives are to be sustained and long-term impacts are ensured. Rehabilitating the state forest, particularly the logged-over production forest, is the main government priority at the moment. However, the initiatives should not be applied in a general way to all logged-over areas by disregarding the main causes of forest degradation. Generalising rehabilitation efforts, even though they may be implemented within the same production forest or logged-over area is not in anyway effective. Considering different baseline conditions should develop different rehabilitation scenarios, for example, baseline and external conditions include population density, location of the area in terms of markets or economic activities, and ecological or other disturbances affecting the rehabilitated areas.

The decentralisation policy, which also influences forestry management regimes, has been implemented since 1998. Despite the many drawbacks highlighted by the experts, the decentralisation policy actually provides an opportunity for a new direction in designing a strategy for forest and land rehabilitation. In view of the fact that local governments have better knowledge of their areas and their forestry management priorities, it is best if the local governments themselves (i.e. the forestry services at provincial/district level) lead the process of designing the most appropriate local rehabilitation programmes. The central government, i.e. Ministry of Forestry would ideally act as a facilitator and provide the necessary policy framework.

The efforts for ensuring 'the new direction of the rehabilitation programme needs forceful efforts from the government, together with all key stakeholders, to address and to take into account the various highlighted aforementioned components. Since the government does not have enough capacity and resources to do all of the activities on the ground directly, it is important to allow other sectors to be involved in the forest rehabilitation by providing the right incentives, such as the private sector. Equally in reforming the management of the reforestation funds and budgeting system, and in seriously empowering local community, so a project-based orientation can be avoided.

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Chapter 7.

Conclusions and recommendations

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1.1. Conclusions

The development of forest and land rehabilitation initiatives in Indonesia has been dynamic and complex. Therefore, there are also complicated and interrelated aspects that may well influence the effectiveness and the sustainability of rehabilitation initiatives now and in the future. Rehabilitation activities in Indonesia have a long-history of more than three decades, implemented to restore degraded areas, amounting to 96.3 million ha (54.6 million ha inside state forest and 41.7 million ha outside state forest). With the rates of realisation in rehabilitation efforts varying between 19% and 93% across various programmes since 1961, it would seem that rehabilitation initiatives and projects have not all been as successful as they might have been nor have policies and programmes really addressed the underlying causes of forest degradation. Equally rehabilitation efforts have not been able to keep pace with the increasing rates of deforestation and land degradation. By 2000, the targeted rehabilitation areas reached only 18.7 million ha, only one fifth of the estimated total of degraded areas.

It is believed that near on 85% of the government's total forestry budget has been lost to ineffective rehabilitation initiatives since the start of the *Inpres* programme in the 1970s. The cost per ha has ranged from USD 43 to 15,221 per hectare, which is mostly higher than the *HTI* plantations' standard cost of USD 550 per hectare (Rp 5 million). The government projects cost the least while those financed by international donors cost the most. The government projects implemented

inside state forests were more expensive than those located outside state forest on community land. This and the insignificant area actually rehabilitated by the major government programmes indicates that the cost effectiveness, in the implementation of the rehabilitation activities, is considerably low and may, in economic terms, have even been a total waste of time, money and effort.

Of all the projects surveyed none really stood out as having been a complete success or failure, according to the stakeholders' perceptions, outputs and approaches, and the period of assessment after the project ended. Most successes were limited to the project timeframe. For example, the technological achievements observed at the Project of Mechanised Plantation in South Kalimantan, which successfully converted *Imperata* grasslands into a forest plantation. This was achieved through technological development in nurseries and plantation by finding the best provenances. However, due to poor long term plantation planning (including nurseries and second rotation), ineffective fire breaks, and low plantation maintenance, the good impacts were not sustained.

Initiatives that continued far beyond the project timeframe included two projects Farm Forestry in Gunung Kidul and Watershed Protection in Wonogiri, both located in Java. These two projects were initiated during the 1970s-1980s, when the main approach in the initiation of rehabilitation initiatives was still top down. In both projects the local people, have been actively involved and the technical interventions used have been designed specifically to address the ecological causes of degradation, particularly those that concern the local people. These successful efforts, in overcoming specific ecological problems, have resulted in associated economic impacts providing important income generation for the local communities. However, the initiatives mentioned only responded to single ecological aspect as the driving factors of deforestation to be considered before initiating rehabilitation activities. While taking into account varied causes of degradation and driving forces, the most recent promising initiatives are characterised by a strong vision of participatory approaches by involving local multi stakeholders and intensive facilitation processes by NGOs.

Sustaining the positive impacts beyond the project timeframe is still the biggest challenge, even until now. This has been mainly challenged by several long-standing factors resulting in ineffective rehabilitation programmes, which cover: 1) the country's changing focus in targeting forest resources as the main source of national income, still a priority for local governments; 2) dynamic transitions of direct and indirect causes of deforestation and degradation from single to more complex issues; 3) transition and implementation of policies affecting rehabilitation initiatives; and 4) project-based oriented approaches, which meant inadequate maintenance of planted trees; a lack of funding sustainability

beyond the project period due to the absence of a reinvestment mechanism, an inadequate economic feasibility analysis, and clear integration with the market; initiatives not economically sustained in the long term from a self generated revenue mechanism; unclear economic incentives leading to a lack of voluntary community participation; limited community participation due to unresolved tenure problems and ineffective community organisation; ineffective capacity building for the community; inadequate considerations of socio-cultural aspects; and on a broader level, there has been unclear distribution of rights and responsibilities among the stakeholders involved, particularly local government, community and technical forestry agencies.

The dynamic changes in government policies aimed at improving the economic condition of the country have affected the rate of deforestation and subsequently relevant ecological and livelihood aspects. Noted forest management policies include: prioritising the agricultural expansion (during 1950s to 1975), realising permits for commercial logging concessions (during 1975 to 1990s), and focussing on forest management outside state forest (during 1990s to 1997). Since the economic crisis that hit the Indonesian economy in 1998, rates of deforestation and land degradation have increased due to the increasing forest land cleared to meet local needs for land-based income alternatives.

Due to the complexities of the driving factors causing the increasing rates of deforestation and land degradation, rehabilitation initiatives have been unable to keep up. Initially, the latter were responding to single issues of natural disasters caused by the expansion of agriculture. Currently, there are more complex driving factors of deforestation to be considered before initiating rehabilitation activities. The main direct causes have been logging operations, illegal logging and unmanageable intensive reoccurring fires, mainly during long dry seasons. The indirect causes include market failures (e.g. under pricing of timber), policy failures (e.g. the 20-year logging permit granted to concessionaires as a disincentive for enrichment planting), and other socioeconomic and political issues in a broader sense, such as the transition period from a centralised to decentralised governance system, forest conversion for other uses (e.g. oil palm plantation), illegal logging and extensive forest encroachment. Therefore, addressing the causes of deforestation and land degradation, which usually are also the continuing disturbances threatening sustainable rehabilitation activities, should be part of the initiating process of rehabilitation programmes or activities.

Transitions in the implementation of rehabilitation policies have also been counter productive and have actually contributed to the increasing rates of deforestation and degradation. Forest rehabilitation policies took a mainly 'top down' approach from the 1950s to the 1970s and then towards the end of the 1990s, they became

more conceptually participative. Between the 1980s and the mid 1990s, the rehabilitation initiatives were in transition. Rehabilitation started to be managed intensively once the Ministry of Forestry (MoF) became an independent ministry in 1983 (separated from the Ministry of Agriculture). Since 1955, the government divided rehabilitation efforts into two categories reforestation (*reboisasi*) and afforestation or regreening (*penghijauan*). Reforestation has focused on formerly state forested areas; and afforestation on unforested community areas outside state forest. The number of projects and areas has increased sharply since the 1980s to more than double during the 1990s to 2004. More projects have also been implemented outside state forest. However, these have been smaller in area, i.e. 1,495 ha, compared to the projects inside state forest areas, i.e. 127,067 ha.

Policies framing the rehabilitation initiatives have been well conceptualised in nature, but poorly implemented in practice, mainly due to conflicting regulations, weak supervision and unclear responsible coordinating agencies on the ground with adequate authority. Important policy frameworks include: 1) the forest classification system following the policy on Forest Land Use by Consensus (*Tata Guna Hutan Kesepakatan - TGHK*), which aims to better target rehabilitation inside state forests, but has been ineffective due to conflicts over land boundaries; 2) the development of *HTI* using fast-growing tree species aimed to rehabilitate logged-over areas, but has led to more areas to be rehabilitated; 3) policies that result in higher risks as logged-over areas become 'open access', such as low supervision in the implementation of the Indonesian System of Selective Cutting and Planting (*TPTI*) and the System of Selective Cutting and Line Planting for lowland forests (*TPTJ*), unclear handover of authority for revoked logged-over areas, and the halting of the rehabilitation programme assigned to state-owned companies (Inhutani I to V) after only the first three years, due to changing policies at the ministerial level and conflicts on the ground.

Further, the political change from the New Order Era to the Reformation Era (from 1998 to the present) has also affected the rehabilitation programmes that are now being primarily led by the district governments since the new Regional Autonomy Policy was implemented in 1999, while the problems of illegal logging and forest encroachment continue to throw dark shadows over the initiatives. The Master Plan for Forest and Land Rehabilitation (*Master Plan Rehabilitasi Hutan dan Lahan - MP-RHL*) was developed in 2000 and used as the basis for planning. The current government regulation on Reforestation Funds (*Dana Reboisasi - DR*) is PP No. 35, was introduced in 2002 to replace PP No. 6/1999. The main programme developed under this funding is called the Specific Allocated Funds – Reforestation Funds (*Dana Alokasi Khusus – Dana Reboisasi - DAK-DR*). This has been in operation since 2001 under the coordination of the district governments, but no coordination with the local Forestry Technical Implementation Unit (*UPT-*

Unit Pelaksana Teknis) or The Watershed Management Centre (*BPDAS-Balai Pengelolaan Daerah Aliran Sungai*). No recorded data on the realisation of the area rehabilitated under this programme could be obtained. It is widely perceived that the district governments have used this funding for non-rehabilitation purposes. The recent MoF rehabilitation initiative, the National Movement for Forest and Land Rehabilitation (*Gerakan Nasional Rehabilitasi Hutan dan Lahan -GN RHL/ Gerhan*), was launched at the end of 2003, in response to the need to rehabilitate the increasing area of degraded forest and land.

Actively involving local communities is perceived, without doubt, to be a key to the most promising approach in implementing rehabilitation initiatives and can effectively build the social capital that will ultimately address the underlying causes of deforestation and degradation, e.g. preventing illegal logging and forest encroachment. However, the scenarios looking at this promising approach should consider several given condition, in particular the MoF's two forest area divisions inside state forest and outside (on community lands with secure ownership rights).

Community participation, on community forest land (outside state forest), is easier or more practical to implement and more likely to materialise. However, accelerating the efforts to scale up the initiatives requires the right incentives, in which the government's role, mainly as the regulator in creating the right incentives for community initiatives, is essential. In order to increase community participation in the implementation of rehabilitation initiatives, inside state forest, there should be a clear mechanism, and an agreement, for the government and communities to utilise products resulting from rehabilitation activities. This would create incentives for greater community participation and provide sustainable funding after the project term. Further, a mechanism for sharing the costs and benefits among stakeholders should be formed, particularly in securing community commitment. Specific types of incentives and conditions to be considered are:

1. **Subsidies or direct assistance provided to a community (non-monetary), and creating employment opportunities**, particularly for areas isolated from economic activities (or remote areas), are important
2. **Subsidies allocated to a community (monetary assistance)** should be aimed at creating revolving funds. In this case, contract agreements may be necessary. This could include outlining the penalty or sanction if the project were to fail or if the subsidies were used for non-rehabilitation activities
3. **Credit schemes** need a cooperative or business management unit with the required capacity
4. **A defined and secured market for timber production** is needed for projects where tree felling is allowed

5. **Creating or engaging a market for NTFP** is needed for projects on state forest where tree felling is not allowed
6. **Reward schemes** could be applied by considering the local condition
7. **A free land certification programme** is needed for timber based rehabilitation initiatives that are implemented on community lands
8. **An extension services programme** is an essential component that could be applied in any condition, and provided by government and/or non-government parties, such as an NGO and the private sector
9. **A net revenue sharing agreement** is essential for all rehabilitation initiatives involving shared investments from various parties, such as a community.

Technically, during the 1970s-1980s intervention implemented to address specific ecological causes of degradation, that were of particular concern for local people, was a more effective and promising approach than current technical approaches, which mainly focus on plantation development. Multiplier effects then resulted from improved ecological conditions that subsequently generated economic and social benefits.

It is best not to generalise rehabilitation efforts, even though they may be implemented within the same production forest or logged-over area. Considering different baseline conditions should develop different rehabilitation scenarios. Baseline and external conditions may include population density, location of the area in terms of markets or economic activities, and ecological or other disturbances affecting the rehabilitated area. Using baseline information, natural regeneration is an option for rehabilitating an area, which is isolated and both the population density and ecological disturbance are low. Under this scenario, no advanced technical intervention is required. However, it is essential to have good supervision and law enforcement to make sure the area is undisturbed for natural succession to occur. In the case of high continuing disturbances, naturally assisted regeneration or enrichment planting could be undertaken if a good strategy is in place to manage the disturbances, which are often fires. Where population densities are high and a market is accessible, an integrated strategy to generate livelihood options and link up to the market should be considered. Alternatively, a small-scale plantation scheme, in collaboration with a private company, is the most promising approach to rehabilitate Production Forest (limited and regular production forests).

As an alternative to dominated government-based initiatives, it is often suggested that the government should focus on rehabilitation activities with no commercial objectives, such as inside protection forest. A community forestry reforestation programme that develops agroforestry and pays compensation for environmental

services (e.g. water) resulting from the community's efforts in maintaining the resources, is a possible option for Protection Forest. In Conservation Forest, efforts could be focussed on creating buffer zones and watershed management by developing agroforestry, conducting enrichment planting, and creating terraces on steep land.

Equally, state-owned and private companies need to be provided with incentives and clear supervision while implementing productive rehabilitation of logged-over areas. However, the redirection of the previous state-owned company's rehabilitation approach should be seriously and carefully considered. Of particular importance is the allocation of time for setting up institutional arrangements and conflict resolution with and among all stakeholders involved and interested in investing in areas for non-forestry purposes. Tax or *DR* exemption is a possible incentive that may well entice the private sector to implement direct rehabilitation activities in their concessions.

7.2. Key recommendations

Summarising key recommendations as discussed in detail in Chapter 6 – 'Reorientation of the rehabilitation programme in Indonesia: Where to after more than three decades' – , below are strategic and operational recommendations for various key stakeholders in the process of effectively reorienting rehabilitation initiatives.

7.2.1. *People's Consultative Assembly (DPR – Dewan Perwakilan Rakyat), National Development Planning Board (Bappenas – Badan Perencanaan Pembangunan Nasional), and Ministry of Finance*

1. In consultation with the relevant ministerial departments, develop a long-term enabling policy framework, for integrated rehabilitation programmes, as the basis for planning and implementation by the Ministry of Forestry and other government agencies
2. Simplify the annual procedure in proposing the funding for planned rehabilitation activities to allow enough preparation time, particularly for the pre-conditioning stages to introduce the project (socialisation) and institutional development before the planting activities commence
3. Revise the policy, pertaining to the budget allocation, so that the allocated budget can be carried over to the following year. This should provide sufficient time for planning and implementing the initiatives, to avoid 'quick spending' so as to finish the budget before the end of the year.

7.2.2. Ministry of Forestry and other government agencies at national level

1. Emphasise the roles as regulator and facilitator, and not as the direct implementer, particularly in facilitating the involvement of potential stakeholders by creating the right specific incentives for different parties to actively participate in designing and implementing the rehabilitation initiatives, such as provincial and district government, companies (state-owned and private), NGO, and community group. The set-up incentives should be based on the results of a preliminary assessment of the local economic conditions, the capacity of the community organisation, and the existence of markets, which should fit the overall project feasibility
2. In consultation with the provincial and district governments, design integrated rehabilitation initiatives and programmes, to address the main causes of deforestation (often continuing disturbances), such as illegal logging, forest encroachment and forest fires. In conjunction with this recommendation forestry law enforcement must be strengthened
3. Respond to the local initiatives by providing the right policy framework, with specifically consistent and secured policies to ensure long-term impacts, in which the aims are for an integrated approach, particularly the integration of centralised and decentralised rehabilitation planning
4. Design various scenarios for rehabilitating the logged-over areas (e.g. technical intervention of natural regeneration/naturally assisted regeneration/enrichment planting/plantations or an integrated strategy to generate livelihood options and links to the market) while taking into account basic and external conditions including population density, location of the area in terms of markets or economic activities, and ecological or other disturbances affecting the rehabilitated area
5. Consider carefully before halting a project or programme that is in the process of being implemented as this could lead to wasted investment. A participatory evaluation could be conducted to provide inputs to improve the implementation rather than completely abandoning the programme
6. Revitalise and clarify the role of forestry extension services at the field level by ensuring an improved coordination between the Ministry of Forestry and District Forestry Services (under the coordination of the local district government), particularly in defining good Terms of Reference (TOR), as well as forestry extension materials that are tailored to specific rehabilitation programmes
7. Reform the *DR* management, with specific emphasis on a multi-year system. This should be more in line with the management approach using *DAS*, as a basis for initiating a rehabilitation programme, for a better budget allocation system and better coordination across government administrative boundaries (e.g. district and provincial) and the government agencies responsible

8. Improve the cost-effectiveness of rehabilitation approaches, particularly those implemented inside state forest, by applying different standard costs based on the condition of the sites and in accordance with the planting season
9. Explore new funding mechanisms for forest and land rehabilitation initiatives such as designing a clear mechanism for the government and communities to utilise products obtained from the rehabilitation activities; or involve multi-stakeholders based on a cost sharing and risk analysis
10. Define criteria for priority areas, for forest and land rehabilitation activities, that have: taken into account good planning, appropriateness of the target area and timing; placed emphasis on quality, based on the availability of human resources and funding; a plan to use species that suit the local biophysical conditions; conducted a proper economic analysis; existing local institutions or adequate pre-conditioning stages to set up a new institution before the project starts with the planting activities; locations that are easy to access in order to ensure proper maintenance and control and for demonstration purposes; an available accurate database, such as maps of critical land and the project areas covering ecological information; potential funding; a seedling supply and institutional capacity at the local level.

7.2.3. Forestry Services at provincial and district levels

1. In consultation with MoF, proactively design integrated rehabilitation initiatives and programmes, in which a strategy to address the local causes of deforestation (often continuing disturbances) and strengthen the forestry law enforcement, must be included
2. Respond to local initiatives by providing the right policy framework at provincial and district levels that is consistent and secured to ensure long-term impacts
3. Improve the cost-effectiveness of *DR* management in implementing rehabilitation activities by applying different standard costs, based on the condition of the sites and in accordance with the planting season
4. Create the right incentives for different stakeholders to actively participate in designing and implementing the rehabilitation initiatives, and explore new funding mechanisms, such as designing a clear mechanism for parties involved to utilise products obtained from the rehabilitation activities; or for costs and benefits sharing
5. Improve the coordination between the District Forestry Services (under the coordination of the local district government) and the MoF, at the national level, to revitalise and clarify the role of forestry extension services in the field
6. Develop a good understanding of the land ownership/management status and resolve problems of overlapping land rights and land conflicts before a project starts

7. Improve coordination with other stakeholders involved in initiating and implementing rehabilitation activities to ensure integrated planning, such as The Watershed Management Center (*BPDAS - Balai Pengelolaan Daerah Aliran Sungai*), NGOs, private/state-owned companies.

7.2.4. Academics and research institutions

1. Explore, synthesise and recommend to the government and companies the most cost-effective and socially acceptable rehabilitation programmes and approaches, including technical intervention
2. Explore and recommend to the government ways of improving the effectiveness of the Reforestation Fund (*DR*) management, including budget allocation mechanisms
3. Design various effective dissemination mechanisms for the latest silvicultural techniques. These should address any information gaps in order to ensure the community's adoption of the rehabilitation approaches, taking into account the determining factors influencing the community's adoption behaviour
4. Design and provide recommendations on various scenarios for rehabilitating logged-over areas while considering the basic and external conditions. This should include population density, location of the area in terms of markets or economic activities, and ecological or other disturbances affecting the rehabilitated area
5. Design and facilitate the processes of participatory action research for collaborative forest management, as the overarching framework to implement forest rehabilitation. This should include monitoring and evaluation processes to ensure improved accountability of the implementation.

7.2.5. State-owned and private companies

1. Improve the state-owned company's reliability and image, as a leading agent, in assisting the government in implementing rehabilitation programmes, and ultimately as a good example for other companies
2. Develop project designs that cater to several crucial components, which include: incentive mechanisms to encourage community participation, such as a defined market strategy; pre-project arrangements to ensure the economic feasibility of the rehabilitation initiatives; and the best approach to ensure adoption by community members and economic impact for marginalised groups
3. Create the right incentives for different stakeholders to actively participate in designing and implementing the rehabilitation initiatives. Set-up incentives should also be directed to create an alternative funding mechanism for implementing forest and land rehabilitation efforts
4. Develop and implement the most cost-effective technical interventions tailored to address the degraded ecological conditions at the local level

5. Develop a good understanding of the land ownership/management status and resolve problems of overlapping land rights and land conflicts before a project starts. In some cases, some adjustment is required to include the recognition of informal land rights, and revision of formal land ownership/occupation rights
6. Ensure the adoption of rehabilitation approaches by a community, e.g. by addressing the gap in knowledge and understanding the determining factors influencing a community's adoption behaviour
7. Determine an integrated strategy in the management plan to deal with ongoing disturbances, and reach out to ensure economic impact for marginalised groups
8. Seek funding alternatives to subsidies provided by the government, such as Payment for Environmental Services (PES) to compensate for the environmental services provided by the community as part of the rehabilitation project they have implemented.

7.2.6. Project managers and staff

1. Have a good understanding of the land ownership/management status of stakeholders involved directly and indirectly, so that potential conflicts can be anticipated
2. Ensure the community and project staff have the same or similar perceptions so that their combined efforts can be implemented to ensure the long term sustainability of the rehabilitation initiatives
3. Develop good baseline information and understanding of the local ecological, socioeconomic and cultural aspects, as well as the specific characteristics of community partners
4. Implement adequate pre-conditioning stages to set up the new institution before the project starts. Ideally this should be implemented for one (t-1) or two years (t-2) before the planting activities commence and should focus on introducing the project (socialisation) and institutional development
5. Ensure the project supervisors, facilitators or extension workers stay with or close to the local community involved in the rehabilitation efforts
6. Ensure the economic feasibility of the implemented rehabilitation initiatives
7. Ensure that the species chosen are based on the market preferences that will also help to address ecological problems and conditions from a technical point of view.

7.2.7. NGOs

1. Maintain integrity as independent facilitators in bridging the gaps between the community and government agencies/companies, and act as implementers in monitoring and evaluating in order to monitor possible violations including corruption, collusion, and nepotism (*Korupsi, Kolusi dan Nepotisme-KKN*)

2. Together with the project initiator, participate in the pre-conditioning stages to set up a new institution before the project starts, i.e. one (t-1) or two years (t-2) before the planting activities. The main focus should be on introducing the project (socialisation) and institutional development
3. Facilitate the process of resolving problems of overlapping land rights and land conflicts before the project starts
4. Link the conceptual and practical aspects of the project in order to empower the participating communities, by conducting a series of training programmes tailored to the project activities
5. Assist in defining a strategy to market and add value to all products from the rehabilitated areas, e.g. training in post harvest technology of NTFP, such as in producing traditional medicines and handy crafts.

7.2.8. Community groups or Cooperative

1. A local (or other) organisation should be identified and involved in designing, planning, implementing, monitoring, and evaluating rehabilitation activities, or alternatively, there is a newly formed participative community organisation as agreed by participating community members
2. Resolve the problems of overlapping land rights and land conflicts between community members and other stakeholders before the project starts
3. Carefully identify the right incentives provided by the government/project initiator in inviting the community's participation, and have a good understanding of the risks and consequences of the initiated activities before joining
4. Participate in the programmes to empower the community's institutional and technical capacities to support the rehabilitation programmes tailored to the local needs and considerations
5. Participate in selecting the tree species to be planted, and in defining the marketing strategy and agreement for costs and benefit sharing between the community and the government/project initiator
6. Actively participate in identifying and addressing the continuing disturbances to the initiated rehabilitation activities (causes of deforestation/degradation).

Appendices

Appendix 1. Assessment indicators¹

The assessment indicators used in this study cover technical, environmental, socioeconomic, institutional, and management aspects. These aspects were included for the description of basic project information, implementation activities, and impacts and outcomes. In assessing the implementation of rehabilitation projects and their impacts on the ground, the focuses were on analysing the changes of certain indicators. Therefore, questions were asked to help respondents recall past conditions, situations or events, in survey and focus group discussion, to cover two timeframes: up to five years after the project had been initiated and more than five years after the project had been initiated up to the present. The first time frame aimed to understand the condition based on various indicators during the time just after the projects were initiated. The second time frame aimed to understand the condition during the time after the project ended, since the projects were usually implemented for only one to three years. A ranking system and scores were used in quantifying qualitative answers. In assessing the impacts and outcomes, categorisation was used: no changes, significant decline, and significant improvement. Underlying reasons for each outcome and change were also asked. Different stakeholders (project managers/staff, participating community and non-participating community members) were asked sets of questions to analyse the differences and similarities.

a. Basic project information

1. Project information: name, no/phase, duration, geographic location, GPS coordinates, and target area (in hectares)
2. Driving factors/major reasons that led to the rehabilitation initiative:
 - a. Socioeconomics: production, poverty/low income, wood shortage (timber, fuel-wood), livelihoods, indigenous knowledge systems, and others
 - b. Ecological: flooding, water shortage/drought, soil productivity, soil erosion,

¹ The assessment indicators were designed by CIFOR Rehab team for all six countries studied, and adjusted to each country condition based on a series of discussions with the country's stakeholders.

- decline in productivity, forest fires, loss of forest cover (biodiversity), carbon sequestration, and others
- c. Political/institutional: NGO Initiatives, congressional initiatives, multi-sectoral initiatives, international donor influence, development projects, community initiatives, and others
- 3. Target beneficiaries: private individuals/farmers, local communities, private companies, general public (environmental benefits), other stakeholders
- 4. Project objectives (stated based on rank of importance):
 - a. Socioeconomics: increased income, fuel wood, provides employment/livelihoods, agroforestry, integrated production system (aquaculture, agroforestry and livestock.), NTFPs (rattan and bamboo), timber production (pole, pulp, sawn, and plywood), and others
 - b. Ecological: watershed protection, soil and water conservation, biodiversity conservation, Increasing forest cover/ regreen bare land, fire control, carbon sequestration, and others
 - c. Political and institutional: tenure security, gender equality, community empowerment, capacity building, leadership qualities, organisation formation/strengthening, environmental awareness/education, and others
- 5. The expected outcomes/impacts of the project
- 6. Responsible agencies in initiating, implementing, providing funding, monitoring and evaluation, which could include: foreign agencies, NGOs, national government, local communities, local governments, private companies, individuals/households, and others.

b. Technical and ecological aspects

b.1. Project description

1. Availability of the baseline maps (land cover, topography and land use)
2. Topographical condition: steep slope (>50%), moderately steep (31-50%), plain (0-18%), and rolling (18-30%)
3. Altitude or elevation (lowest and highest)
4. Soil condition: type, fertility (organic matter content, nitrogen, phosphorous, and potassium), texture (sandy, sandy loam, loam, clay loam, and clay)
5. Number of dry months, total rainfall (year, mm), temperature (year, average, maximum, and minimum), original or climax forest type (dipterocarpaceae, non-dipterocarpaceae, mixed agathis, pine forest, coastal forest, and others)
6. Land cover of project site based on % area covered (< 5%, 5-25%, 25-50%, 50-75%, and > 75%). Types of land cover: barren, grassland, shrubland, cultivated crops, natural forest, planted trees, and others
7. The period the site has been degraded for, and the causes or sources of site degradation: intensive logging, mining, repeated fire, overgrazing, flooding, drought, intensive agriculture, over extraction of fuel-wood, and others

8. Production of forest products on project site, and reasons for change: timber from natural forest and plantations, fuel-wood, resin, fruits, and wildlife
9. Remaining forest cover (woody vegetation > 5m tall) in the surrounding area based on comments from project manager/s or land cover maps: < 5%, 5-25%, 25-50%, 50-75%, and > 75%.

b.2. Implementation activities

1. Protection efforts from disturbance such as fire, grazing, squatting and illegal logging
2. Site preparation activities: site clearing activities (strip brushing, spot brushing, slashing and burning, and others)
3. Soil treatments: soil scarification, chemical treatment, and others
4. Practices of water and soil conservation measures: vegetative (cover cropping, hedgerows, and mulching), mechanical (rock wall and terracing), and others
5. Method(s) of revegetation and area in hectares for each method: natural regeneration, planting trees, then allowing natural regeneration to occur, assisted natural regeneration with enrichment planting, planting trees (monoculture/mixed) with crops, planting trees (monoculture/mixed) without crops, and others
6. Details of planted trees within the project site: type of species, native or exotic, reasons for planting, area planted, average survival (%), and reasons for survival
7. Planting and plantation management (please describe if possible): plant spacing, silvicultural treatments applied in plantations (cleaning/weeding, replanting due to low survival, thinning, pruning, other treatments), fertilization, pests and diseases incidence and control
8. Indicators of second generation regeneration methods/ plantation renewal: harvesting wood at the project site, harvesting methods, the scheduled harvest frequency or rotation period, regeneration methods.

b.3. Impacts and outcomes

1. Indicators for environmental outcomes: base water flow, short and long after the start, dry season water flow, peak flood levels, average water quantity, land slide risk, flora diversity, fauna diversity, carbon stocks, chemical and physical soil properties, soil erosion, and landscape diversity
2. Indicators for productivity outcomes: forest cover (% area), dominant vegetation type and cover (% area in each category), actual production from timber, fuel-wood, resin, fruits, etc (amount/ha), seedling survival (%), volume growth rate (m³/ha per year), weed growth in or out of control, pests and diseases in or out of control, general health and condition of trees, regeneration, wildlife supply (kg or amount per household per year).

c. Socioeconomic and management aspects

c.1. Project description

1. Population density per km²
2. Demographic composition of project sites: tribal/indigenous, migrants, seasonal labour, and others
3. Average income on site per household or per capita per year based on various sources
4. Level of dependence of local people on forest/tree products for subsistence and monetary income
5. Type of land use of the site, the purpose of land uses (e.g. subsistence, commercial), and the reasons for any changes
6. Indicators of pre-existing development or remoteness of the area indicated by the degree of presence or quality of the indicator (very high, high, low, very low): market access, transport, health facilities, education, road/infrastructure.

c.2. Implementation activities

1. Marketing strategy as part of the project design, market opportunities for the products generated through rehabilitation: products, nature of the market, first buyer, price per unit, the end-user, price per unit, and location of end-user
2. The economic or socio-cultural incentives for rehabilitation: credit schemes, direct payments for planting, profit sharing arrangements, subsidies, tax exemptions, supportive schemes for livelihood enhancement, rewards for actual environmental services generated, and others
3. Financial analysis was/was not done to assess the feasibility of the rehabilitation projects
4. A plan to ensure long-term sustainability of the rehabilitation project. For example: a reinvestment mechanism
5. Infrastructure development during the rehabilitation initiative and its funding sources: roads, canals, transport systems, buildings, communications, electricity, water system, nursery, recreation facilities
6. The process of planning/decision making for site identification, site inclusion, rehabilitation methods, rights decisions, responsibility decisions, authority decisions, benefit and cost sharing arrangements
7. Involvement or deliberate facilitation by an outside agency of discussions and agreements among key stakeholders of the planning, implementation and monitoring. Examples: meetings and workshops
8. Taken into account: the needs/concerns and conflicts of interest among targeted beneficiaries and other stakeholders, and indigenous knowledge and socio-cultural practices

9. Existence of the benefit and cost sharing arrangements among the different stakeholders, including wages for labour
10. The mechanism to divide rights, authority and responsibilities among the different stakeholders.

c.3. Impacts and outcomes

Livelihood outcomes: cash income, savings, non-cash income, diversity of cash income as the livelihood sources – including from rehabilitation initiative or project sites; alternative opportunities; level of dependency on rehab initiative for livelihood sources; food security; health conditions; access to health care; access to housing; acquisition of luxury goods; access to educational skills, training, and capacity; clarity and security of ownership over land; clarity and security of ownership over forest and trees; access to financial capital; access to common pool resources (land, water, timber and non timber products); access to and availability of information; empowerment; representation; decision making control over different aspects of livelihoods and market access (travel time, cost and mode of transport).

d. Institutional and project management aspects

d.1. Project description

1. The legal status of land at the site level indicated by % area in each category: limited production forest, fixed production forest, conversion production forest, protection forest, community lands, reserve forest, village forest, customary forest, and others
2. The land rights, e.g. no tenure (state forests), concessions, informal tenure and privately owned lands
3. Socio-cultural significance of the site that supported or did not support the rehabilitation effort e.g. ancestral values, educational functions and traditional cultures
4. Existing local organizations or committees related to the rehabilitation effort, type of involvement, degree of access to relevant project information, technical capacity, and level of influence. Example of local organisation: informal network, farmers' cooperatives, and local business representative groups.

d.2. Implementation activities

1. Different agencies involved in the forest rehabilitation project and the level of their organizational capacity to implement the project: adequacy of manpower, technical capacity, and logistic support
2. Institutional arrangements among stakeholders involved regarding the long term management of the project area and the corresponding benefit sharing

3. The rehabilitation initiative a part of integrated land use planning of the larger area/watershed
4. Long-term management plan for the rehabilitation effort: a long-term monitoring and evaluation plan; feedback mechanism; a mechanism for adoption of feedback in the management plan
5. Initiation or strengthening of new/existing organizations or committees related to rehabilitation: institutions, by whom and how it was done
6. Technical assistance, extension or capacity building exercises in support of the rehabilitation effort
7. Education or awareness building campaign in support of the rehabilitation effort
8. Project recognition of informal tenure arrangements that existed on the site: type of tenure, tenure holder (by whom and the mechanism of recognition)
9. Formal land tenure revisions that affect the rehabilitation effort: type of tenure, tenure holder (by whom and the process of revision)
10. The types of conflict and conflict resolution mechanisms that existed among the different stakeholders involved in forest rehabilitation
11. The effects of unresolved conflicts in the forest rehabilitation efforts
12. Pre-existing government policies that constrained or promoted the forest rehabilitation effort
13. Policy or regulation changes that affected (constrained or promoted) the rehabilitation effort, e.g. the transfer of authority to the district government for the management of the rehabilitation fund with decentralisation
14. Clear laws and effective enforcement related to the rehabilitation effort
15. Strong political support for the initiative.

d.3. Impacts and outcomes

1. Overall project performance: rate of success of the project; positive and negative major outcomes; positive and negative underlying reasons; and recommendations
2. Management sustainability: clarity of decision making; control over resources; clarity of legal framework; stable market and support structures for rehab products; effective monitoring and control; is feedback assimilated and used in the management; a good management plan; effective management implementation (disaggregate); reinvestment mechanisms; room for flexibility/adaptability to changing conditions; social cohesion/conflict; local institutions for support, regulations, planning, and monitoring
3. Adoption: adoption of rehabilitation approaches/techniques by participants; adoption of this by non participants inside the project area; adoption of this by non participants outside the project area; and supportive government.

Appendix 2. Methodology

In order to collect preliminary information on past and on-going rehabilitation projects in Indonesia, three approaches were taken: a literature review, questionnaire surveys, personal interviews and website search. A questionnaire was prepared and mailed to key persons who were believed to have experience of rehabilitation of degraded lands in Indonesia. Key questions in the questionnaire were project profiles, impacts, publications, and project staff names and contact details. Personal interviews were conducted to complement the questionnaire survey and to obtain more information from the key persons who were available for interview. A website search was also used to collect necessary information. After these activities, more than 150 projects were found and the information was assembled in a preliminary data base. The preliminary database was used as the basis for the preliminary analysis and to develop Database 1 and 2. The earliest projects identified in this study were initiated during the 1950s. Due to the difficulty in collecting old project documents and data and the possibility of an information bias since there is more documented information from recent projects than the older ones, the latter were not selected for this survey.

The processes in developing and completing Database 1 and Database 2 also included a series of discussions to identify the assessment indicators for these databases. The discussions were held with members of the expert group and participants of the first national workshop¹, representing stakeholder groups of academics, research institutions, NGOs, private/state-owned companies and government agencies from central, provincial and district levels. In Database 1 and 2 assessment indicators cover technical, social, and economic aspects. Assessment indicators in Database 1 were reviewed against project documents, and if the project documents were not available, the indicators were assessed based on interviews with the project managers and/or project staff by using questionnaires. Assessment indicators in Database 2 were focused and directed more to analyse the impacts on the ground of the ten case study projects. The results of the analysis were presented in the second national workshop² aimed to have direct feedback by inviting all of the stakeholders involved, particularly in the field work of the ten projects studied.

1. Sample frames for survey and focus group discussions

Personal interviews and Focus Group Discussions (FGD) were carried out during the field surveys. The sample frames for each project site are presented in Table A2-1.

1 The first national workshop was held on 22-23 October 2003

2 The second national workshop was held on 22-23 February 2005

Table A2-1. Sample frame (the number of respondents)

Project name	Survey			Focus Group Discussion (FGD)	
	Project manager	Project staff, observers	Community members	Number of groups	Total participants
1. Collaborative Forest Management	1	4	26	5	58
2. <i>DAK DR</i> -Kampar	1	3	9	2	11
3. <i>DAK DR</i> Kubar	1	1	11	2	13
4. Conserving Meru Betiri National Park	1	1	13	4	26
5. Rehabilitation of Logged-over Areas	1	0	11	2	25
6. Participatory Reforestation	1	2	12	3	26
7. Rehabilitation of Fire-affected Forests	0	1	14	1	11
8. Watershed Protection Project	1	2	7	4	32
9. Mechanised Plantation	0	2	14	3	19
10. Farm Forestry	0	2	14	2	17
Total	7	18	131	28	238

Source: Survey data

Personal interviews were carried out with three key stakeholder groups: project managers, project staff/observers and community members. Project managers are the persons who are/were responsible for the whole implementation of the project. It was impossible to find such responsible persons for the past projects which ended several years ago i.e. Mechanised Plantation and Rehabilitation of Fire Affected Areas projects. Project staff/observers are the persons who actually work/worked for the implementation at the field level such as field coordinators and field officers. Community members who were selected for interview included project participants and non-participants. For the past projects, community members who remembered or observed the project were also interviewed.

Focus group discussions were conducted to understand the general conditions of the project and to cross check the data from the personal interviews. The group discussions were carried out with a total of 28 groups. The number of group discussions in each site ranged from one to five groups and depended on the availability of and the participation of community members. Based on the field conditions, project participants were classified into: head of forest farmer groups and/or his/her staff, and community members, including women groups. Group discussions were usually set out in the afternoon or at night, after farmers finished working. Each discussion was conducted in a familiar atmosphere and facilitated by a few moderators.

Key questions for discussions in FGD were: motivation to implement rehabilitation activities; objectives of rehabilitation projects (physical and non-physical); mechanism for recruiting project participants; degree of involvement of participants in planning, implementation and monitoring; the rate of income from rehabilitation activities in whole incomes; sharing rate of products from rehabilitation activities between participants and implementing agency; the length of working rights; impact from rehabilitation activity (positive and negative); adoptability of lessons learnt (technical, socio-economic and institutional); evaluation of the project; and ideas or suggestions to improve future rehabilitation initiatives.

2. Methods for data analysis

There were a total of about 300 variables from 251 cases in Database 1 and 2. Using SPSS software, Cross Tabulation, Kruskal-Wallis Test, and Correspondence Analysis were run to analyse the data set. Cross Tabulation is quite straight forward, so further explanation is needless.

Kruskal -Wallis Test, an extension of the Mann-Whitney U test, is a nonparametric analogue of a one-way analysis of variance and detects differences in distribution. In this study, for example, the test was used to understand the ranking of importance among responses for the physical and non-physical objectives of the project. One of the goals of the correspondence analysis is to describe the relationships between two nominal variables in a correspondence table in a low-dimensional space, while simultaneously describing the relationships between the categories for each variable. For each variable, the distances between category points in a plot reflect the relationships between the categories with similar categories plotted close to each other. Projecting points for one variable on the vector from the origin to a category point for the other variable describes the relationship between the variables. In this study, for example, the correspondence analysis was used to analyse the most important conditions of a project to ensure the long-term sustainability from various aspects of management, tenure, technical, adoption, and policy.

Appendix 3. Charges for the Reforestation Fund according to the species and area of origin per cubic meter of logged timber

Area of origin and species logged	Presidential Decree (Keputusan Presiden – Keppres) and Government Regulation (Peraturan Pemerintah – PP)											
	Keppres 24/1997, June 97			Keppres 53/1997, Dec-97			Keppres 32/1998, Feb-1998			PP 92/1999, Oct-99		
	Currency	Rate	Unit	Currency	Rate	Unit	Currency	Rate	Unit	Currency	Rate	Unit
Kalimantan and Maluku												
Meranti	USD	16	m ³	IDR						USD	16	m ³
50 cm							IDR	80,000	m ³			
40 cm				IDR	48,000	m ³	IDR	50,000	m ³			
30-39 cm				IDR	15,000	m ³						
less than 29 cm				IDR	6,000	m ³						
Mixed species ^a	USD	13	m ³							USD	13	m ³
50 cm							IDR	65,000	m ³			
40 cm				IDR	39,000	m ³	IDR	45,000	m ³			
30-39 cm				IDR	15,000	m ³						
less than 29 cm				IDR	6,000	m ³						
Sumatra and Sulawesi												
Meranti	USD	14	m ³							USD	14	m ³
50 cm							IDR	70,000	m ³			
40 cm				IDR	42,000	m ³	IDR	45,000	m ³			
30-39 cm				IDR	15,000	m ³						
less than 29 cm				IDR	6,000	m ³						
Mixed species	USD	12	m ³							USD	12	m ³
50 cm							IDR	60,000	m ³			
40 cm				IDR	36,000	m ³	IDR	42,500	m ³			
30-39 cm				IDR	15,000	m ³						
less than 29 cm				IDR	6,000	m ³						

Area of origin and species logged	Presidential Decree (Keputusan Presiden – Keppres) and Government Regulation (Peraturan Pemerintah – PP)									
	Keppres 24/1997, June 97		Keppres 53/1997, Dec-97		Keppres 32/1998, Feb-1998		PP 92/1999, Oct-99			
	Currency	Rate	Unit	Currency	Rate	Unit	Currency	Rate	Unit	Rate
Papua and Nusa Tenggara										
Meranti	USD	13	m ³				USD	13		
50 cm						m ³				m ³
40 cm				IDR	39,000	m ³	IDR	65,000		m ³
30-39 cm				IDR	15,000	m ³	IDR	45,000		m ³
less than 29 cm				IDR	6,000	m ³				
Mixed species	USD	10.5	m ³				USD	10.5		m ³
50 cm						m ³	IDR	52,500		m ³
40 cm				IDR	31,500	m ³	IDR	38,500		m ³
30-39 cm				IDR	15,000	m ³				
less than 29 cm				IDR	6,000	m ³				
Nationally										
Meranti										
30 cm				IDR	25,000	m ³				
less than 30 cm				IDR	10,000	m ³				
Ebony	USD	20	ton	IDR	60,000	ton	IDR	100,000	ton	USD
Teak from natural forest	USD	16	m ³	IDR	48,000	m ³	IDR	80,000	m ³	USD
Exotic wood (<i>Kayu indah</i>)	USD	18	m ³	IDR	54,000	ton	IDR	90,000	ton	USD
Sandal wood	USD	18	ton	IDR	54,000	m ³	IDR	90,000	m ³	USD
Chips - raw material	USD	2	ton			ton	IDR	10,000	ton	USD

Notes: a. Mixed-species or *rimba campuran*

1. Exchange rate 1997, USD 1 equal to IDR 2,953
2. Exchange rate 1998, USD 1 equal to IDR 9,875
3. Exchange rate 1999, USD 1 equal to IDR 7,809

Source: Departemen Kehutanan. *Perbandingan iuran Dana Reboisasi berdasarkan Keputusan Presiden dan Peraturan Pemerintah 1997-99*.
[Http://www.dephut.go.id](http://www.dephut.go.id). 17 June 2005.

Appendix 4. Overview of past and current government rehabilitation initiatives and programmes

Box A4-1. Rehabilitation programmes and projects with conservation objectives (1950s-1980s)

The objectives of most programmes and projects were to conserve soil and water resources, specifically to reduce the rate of sedimentation, and to maintain a water debit in rivers.

Rehabilitation programmes

- The *Karang Kitri* movement was initiated in October 1951 (1951–60); it was a national campaign to persuade the community members to plant trees in their home gardens and other areas. No incentives were provided
- A rehabilitation programme on watershed management and land conservation was implemented throughout Indonesia (1972–78). It focused on 36 prioritised catchment areas and received government funding of USD 8.5–17.2 million. The executing agencies were government agencies and farmer groups, with local people being the target beneficiaries
- One of the programmes initiated in the 1970s was the *Inpres* (Presidential Instruction) Programme on Reforestation and Afforestation (1976/77–1998/99), which was a community movement programme. The approach was based on watershed management. The technical aspects of the programme were implemented by P3RPDAS (*Proyek Perencanaan dan Pembinaan Reboisasi dan Penghijauan Daerah Aliran Sungai*), which later became the Forestry and Land Conservation Services at the District Level (*Dinas PKT*). Reforestation was also implemented by provincial governments and afforestation by district governments.

Rehabilitation projects

- The Ministry of Agriculture implemented Project No. 001, which covered the Solo watershed areas. This project was soon followed by more projects up to Project No. 037, an example being the project at Gunung Kidul in Yogyakarta
- After the major floods in Solo, efforts were made from 1970 to 1976 under the World Food Programme (WFP) to rehabilitate the most critically degraded land by providing assistance in the form of seedlings and food crops
- Still focusing on Solo, the Upper Solo Watershed Management and Upland Development TA. INS/72/006 Project was implemented with the assistance of funding from FAO/UNDP. Under this project, different models for managing watersheds and soil and water conservation techniques were tested (1973–79)
- USAID funded the *Citanduy* I and II projects (1981–89), which were implemented in West Java and resulted in the establishment of norms, criteria and standards for soil and water conservation/farm models.

Sources: Preliminary database, Santoso 2005, Ditjen RLPS 2003, and Mursidin *et al.* 1997

Box A4-2. The rehabilitation programme implemented by Perhutani state company

As the largest state-owned forest enterprise operating mainly in Java, Perhutani manages 2.4 million ha of state teak plantations. In Java, Perhutani manages 1.6 million ha of production forest and 0.6 million ha of protection forest. Java is home to 60% of the population of Indonesia; the plantations are surrounded by more than 6,000 marginal villages and comprising 21 million poor people. In 1994 the MoF gave the company the assignment to rehabilitate the state forests in West and East Nusa Tenggara through community forestry schemes.

Rehabilitation activities implemented by Perhutani are:

Routine reforestation: replanting

Development reforestation: expanding plantations

Protection forest rehabilitation: restoring vegetation in protection forests

Social forestry: developing plantations together with local communities

Terracing: conserving upstream areas by developing a terracing system to prevent soil erosion.

Rehabilitation by Perhutani Unit I, II, and III (1993–2001)

Type of reforestation	Area (ha)
Routine reforestation	86,287
Development reforestation	395,991
Protection forest rehabilitation	26,245
Social forestry ^a	54,845
Terracing	248,524
Total	811,892

Note ^a: Social Forestry programmes (*Program Perhutanan Sosial*) have been implemented since 1988

Sources: Perhutani 2005; Staff of Perhutani personal communication 2004.

Box A4-3. The Seeds for the People Programme

The Seeds for the People Programme was one of the Directorate General of Land Rehabilitation and Social Forestry programmes that was supported by Ministerial Decree No 973/Menhut-V/2001. Its main objectives were to accelerate the involvement of local institutions in producing seedlings to support planting activities, form seedling production units for superior/prime local species, and to undertake forest rehabilitation activities, thereby increasing the quality and quantity of plantations in community forestry areas.

In this programme, the government acted as a facilitator while the community acted as the main implementer, undertaking activities ranging from planning – including proposal writing – to implementing the programme in the field.

Under the programme the plan was to develop 30 demonstration plots in 15 provinces for the first 5 years of implementation (2002–06). In 2002, the first three demonstration plots were developed in Lumajang (East Java), Jembrana (Bali) and Sumedang (West Java).

Source: Ditjen RLPS 2003

Box A4-4. Demonstration plots for sustaining natural resources (*Unit Percontohan Usaha Pelestarian Sumberdaya Alam – UP-UPSA*) and demonstration plots for sedentary farming systems (*Unit Percontohan Usaha Pertanian Menetap – UP-UPM*)

Demonstration plots for sustaining natural resources (*UP-UPSA*) and sedentary farming systems (*UP-UPM*) were developed both as demonstration plots (*Unit Percontohan – UP*) and as a medium for extension activities to increase community awareness and active participation in sustaining natural resources and using soil conservation techniques in their land utilisation activities.

UPSA and *UPM* were funded through an *Inpres* Special Assistance Programme (*Bantuan Khusus – Bansus*), and 9,705 units were developed successfully within the period 1990/91–2000. Since then, these programmes have been funded from the Specific Allocated Funds (*DAK-Dana Alokasi Khusus*) and are implemented by the district governments.

Source: Ditjen RLPS 2003

Box A4-5. Annual celebration of National Rehabilitation Week

The annual celebration of National Rehabilitation Week was inaugurated by President Soekarno on 17 December 1961, in the Puncak, Bogor, West Java. The event then took place annually in December. It was intended to be a prime week for extension and dissemination activities with regard to the importance of forest, land and water conservation. The community participants were provided with seedlings to plant.

Programme description:

Programme period:	35 years (1961–95)
Total area:	1,024 ha
Location:	Java, Sumatra, Sulawesi, Kalimantan, Aceh, Bali, Ambon, West and East Nusa Tenggara (35 sites)
Funding agency:	Gol
Implementing agency:	Gol
Beneficiary:	Local community
Species planted:	Fast growing species, such as <i>Acacia mangium</i> , <i>Acacia auriculiformis</i> , <i>falcata</i> (<i>Paraserianthes falcataria</i>), and pine (<i>Pinus merkusii</i>); and fruit trees, such as mango (<i>Mangifera indica</i>), jackfruit (<i>Artocarpus heterophylla</i>), durian (<i>Durio zibethinus</i>), and rambutan (<i>Nephelium lappaceum</i>).

Objectives:

The objectives of this programme were to increase and develop community participation in forest, soil and water conservation efforts and to increase and develop community-led initiatives to maintain the condition of natural resources (forest, soil and water)

Main benefits of the programme:

1. The programme was a means of extension
2. The areas planted were used for recreation by the local communities
3. The programme areas were rehabilitated and reforested.

Main impacts of the programme:

1. The local communities' awareness of the importance of forest, land and soil conservation was increased
2. The communities applied soil conservation techniques on their own land
3. Reforestation and afforestation activities also took place in the surrounding areas
4. Self-supported afforestation, agroforestry and community forestry activities were undertaken on private land
5. An increased number of city greening programmes were undertaken by local communities
6. The stability of forest functions was increased, especially the hydrological functions, to maintain water supplies
7. Increased job opportunities.

Sources: Ditjen RLPS 2003; Mursidin *et al.* 1997

Box A4-6. Traditional rehabilitation initiatives in conserving *damar* agroforest in Krui Lampung, Sumatra

Damar agroforests are man-made *damar* or resin plantations in which a number of either timber or fruit trees are mixed. The best species for *damar* production are *Shorea javanica* and *Hopea dryobalanops*, which produce *damar mata kucing*, a high quality resin.

The initiative:

Begun:	1920s
Driving factor:	Destruction of pepper gardens by a serious plant disease
Development method:	Reforestation (plantation) and assisted natural regeneration
Present area covered:	50,000 ha
Locations:	Western part of Lampung Province (consisting of three districts: Pesisir Selatan, Pesisir Tengah and Pesisir Utara)
Implementing agency:	Local communities
Funding mechanism:	Community self funding

At present, Indonesia is the only resin producer in the world, and 80% of Indonesia’s resin is produced by *damar* agroforest in Krui. Some resin is exported to overseas countries such as Singapore. In 1984, the local market absorbed two-thirds of the resin production.

Main benefits:

1. Contributes to forest and land rehabilitation
2. Contributes 70–100% of household income in 46 villages involved in resin production
3. Enforces biological diversity
4. Contributes to national resin production and foreign exchange

Source: De Foresta *et al.* 2000

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Appendix 5. Features of past rehabilitation initiatives as recorded in Database 1

Table A5-1. Distribution of projects from 1960s to 2004

Implementation period	Number of projects recorded in Database 1	
	N	%
1960s–70s	9	8.9
1970s–80s	13	12.9
1980s–90s	29	28.7
1990s–2004	50	49.5
Total	101	100.0

Table A5-2. Distribution of projects based on the condition of the degraded area before the rehabilitation initiative, 1960s–2004

Period	Condition of the area before the project					
	Fire-affected areas		Logged-over areas		Fire-affected and logged-over areas	
Pre 1960–70	0	0%	9	11%	0	0%
1971–80	0	0%	13	16%	0	0%
1981–90	4	25%	22	28%	3	60%
1991–2004	12	75%	36	45%	2	40%
Total	16	100%	80	100%	5	100%

Source: Database 1

Table A5-3. Distribution of projects based on the project location, 1960s–2004

Period *	Locations of rehabilitation projects			
	Inside state forest (reforestation)	Outside state forest (afforestation)	Both inside and outside state forest	Total
Pre 1960–1970	1	7	1	9
1971–1980		11	2	13
1981–1990	10	14	5	29
1991–2004	24	18	8	50
Total	35	50	16	101

Note: * Refers to the year in which the project was initiated

Table A5-4. Distribution of projects according to funding sources, 1960s–2004

Funding source	Period				Total
	1960–70	1971–80	1981–90	1991–2004	
Government	9 (16%)	13 (22%)	13 (22%)	23 (40%)	58 (100%)
International funding agencies	0 (0%)	0 (0%)	2 (17%)	10 (83%)	12 (100%)
Joint sources	0 (0%)	0 (0%)	10 (45%)	12 (55%)	22 (100%)
Private companies	0 (0%)	0 (0%)	3 (43%)	4 (57%)	7 (100%)
Total	9 (9%)	13 (13%)	28 (28%)	49 (49%)	99 (100%)

Table A5-5. Distribution of projects according to causes of forest and land degradation

Cause of degradation	Number of projects affected	
	N	%
Intensive logging, forest conversion	4	8%
Intensive logging, repeated fires, shifting cultivation, forest conversion and intensive agriculture	7	13%
Intensive logging and agriculture, and soil erosion	5	10%
Intensive logging, forest conversion, intensive agriculture and soil erosion	34	65%
Other e.g. mining	2	4%
Total	52	100%

Table A5-6. Distribution of projects according to the focus of the rehabilitation activities

Focus of rehabilitation activity	N	%
Plantations	49	77%
Watershed management	8	13%
Agroforestry	3	5%
Enrichment planting	2	3%
Other (e.g. survey)	2	3%
Total	64	100%

Table A5-7. Distribution of projects based on the project area covered and implementing agency

Project implementer	Project area (ha)			Total
	< 100	100-1000	> 1000	
National and provincial governments	31 (82%)	2 (5%)	5 (13%)	38 (100%)
Private and state companies (Perhutani, Inhutani)	2 (25%)	1 (13%)	5 (63%)	8 (100%)
Joint initiatives (including between local governments and NGOs)	4 (11%)	9 (25%)	23 (64%)	36 (100%)
Other (either local governments or NGOs)	0 (0%)	0 (0%)	1 (100%)	1 (100%)
Total	37 (45%)	12 (14%)	34 (41%)	83 (100%)

Table A5-8. Distribution of projects according to the forest status of the project location, condition of the area before the project, and approaches used

		Area covered (ha)			Total
		< 100	100-1000	> 1000	
Forest status of the project location	State forest	4 (14%)	3 (10%)	22 (76%)	29 (100%)
	Outside state forest	33 (77%)	6 (14%)	4 (9%)	43 (100%)
	Inside and outside state forest	0 (0%)	3 (27%)	8 (73%)	11 (100%)
Condition of the area before the project	Fire-affected area	0 (0%)	2 (17%)	10 (83%)	12 (100%)
	Logged-over area	37 (54%)	9 (13%)	23 (33%)	69 (100%)
	Fire-affected and logged-over area	0 (0%)	1 (50%)	1 (50%)	2 (100%)
Approach	Top down (1950 - 89)	26 (63%)	6 (15%)	9 (22%)	41 (100%)
	Transition (1990 - 97)	3 (30%)	1 (10%)	6 (60%)	10 (100%)
	Participatory (1998 - present)	8 (25%)	5 (16%)	19 (59%)	32 (100%)

Table A5-9. Average project areas covered according to the forest status of the project location, condition of the area before the project, and approaches used

Forest status of the project location, condition of the area before the project, and approaches used		Average project area (ha)
Forest status of the project location	State forest (n=35)	127,067
	Outside state forest (n=50)	1,495
	Inside and outside state forest (n=16)	47,056
Condition of the area before the project	Fire-affected areas (n=16)	118,716
	Logged-over areas (n=80)	40,535
	Fire-affected and logged-over areas (n=5)	3,500
Approach used	Top down (n=47)	54,714
	Transition (n=13)	123,057
	Participatory (n=41)	18,302
Total projects (n=101)		51,156

Table A5-10. Dominant driving factors behind the three main aspects of rehabilitation projects

Aspect	Dominant driving factor
Socioeconomic (n=43)	Poverty/low income
Ecological (n=41)	Low forest productivity and forest cover
Political and institutional (n=43)	Initiatives emerging from various agencies/sectors

Table A5-11. Dominant driving factors according to different sources of data and project participants

Source of data	Aspect		
	Ecological	Socioeconomic	Political/Institutional
Documents and project managers	Decreased forest cover and productivity (71%)	Poverty/low income and limited livelihoods (70%)	Common initiatives and support from donors (56%)
Project staff	Decreased forest cover and productivity (30%)	Poverty/low income (40%)	Government initiative (25%)
Community	Decreased forest cover and productivity (40%)	Poverty/low income and limited livelihoods (71%)	Government initiative (35%)

Sources: Database 1 and Database 2

Table A5-12. Dominant driving factors behind rehabilitation projects, 1960s–2004

Driving factor	Period			
	1960s–70s	1970s–80s	1980s–90s	1990s–2004
Dominant socioeconomic aspect/s	Poverty/low income	Poverty/low income	Poverty/low income, lack of timber supply	Poverty, diminishing forest production (including timber), awareness raising and population growth
Dominant ecological aspect/s	Low forest productivity and cover	Low forest productivity and cover	Low forest productivity and cover, soil erosion, fires, floods, lack of water resources	Low forest productivity and cover
Dominant Political and institutional aspects			Funding support from donors	Funding support from donors and the emergence of multi-stakeholders initiatives (external pressures)

Table A5-13. Intended project beneficiaries

Beneficiaries	Projects		Type of benefits
	n	%	
Farmers and farmer groups	5	26	Income
Local communities	8	42	Income and employment opportunities
Private companies	3	16	Income
District government/s	2	11	Strengthening management capacity
Other	1	5	Taxes
Total	19	100	

Table A5-14. Technical requirements fulfilled by the projects

Technical indicator	Projects with available information	
	N	%
Availability of project nurseries (n=23 – 23% of projects)	20	19.8
Meets minimum standard for seedlings (n= 13 – 13% of projects)	13	12.9
Basic maps of the project available (n=14 – 14% of projects)	14	13.9
Soil sample analysis conducted (n=18 – 18% of projects)	12	11.9

Appendix 6. Features of the ten case study rehabilitation initiatives as recorded in the Database 2

Table A6-1. Respondents' perceptions of the type of rehabilitation activity according to the project location

Rehabilitation activity	Number of responses for each project location			Total
	State forest	Community land	Both state forest and community land	
Establishing plantations	86	50	6	142
	71%	96%	17%	68%
Watershed management	6		11	17
	5%		31%	8%
Agroforestry	2	1	1	4
	2%	2%	3%	2%
Enrichment planting	15		1	16
	12%		3%	8%
Community forestry	10		16	26
	8%		44%	12%
Other e.g. survey	2	1	1	4
	2%	2%	3%	2%
Total	121	52	36	209
	100%	100%	100%	100%

Table A6-2. Respondents' perceptions of causes of forest and land degradation

Cause of degradation	Number of respondents reported (n)	%
Intensive logging, conversion	38	21%
Repeated fires, intensive agriculture and logging, shifting cultivation, and conversion	39	21%
Intensive logging and agriculture, and soil erosion	26	14%
Intensive agriculture and logging, conversion, and soil erosion	34	18%
Illegal logging, forest encroachment/ occupation	18	10%
Social conflict	7	4%
Biophysical condition	6	3%
Forest conversion and shifting cultivation	9	5%
Intensive agriculture and logging	4	2%
Other, e.g. mining	3	2%
Total	184	100%

Table A6-3. Respondents' perceptions of the relative importance of the physical objectives

Selected physical objective	Level of importance ^a
Increasing forest land cover	Consistently important for a project focussing on developing plantations on <i>Imperata</i> grassland (Mechanised Plantation Project), and community rehabilitation projects of reforestation funds in state forests Consistently important to have rehabilitation projects in both fire-affected and logged-over areas
Creating integrated production systems	Consistently important for projects during the transition period
Producing timber	More important to community members than project staff Consistently important for projects in logged-over areas, community rehabilitation project of reforestation funds on state forest (<i>DAK-DR</i> Kampar) and farm forestry
Biodiversity conservation	Significantly important for projects in plantation development of <i>Imperata</i> grassland (Mechanised Plantation) and fire-affected areas
Controlling forest fires	Consistently important for rehabilitation projects in fire-affected areas, both inside and outside state forest
Producing fuel wood	More important for community members than project staff Consistently important for rehabilitation projects in logged-over areas and farm forestry projects Important for rehabilitation projects regardless of the status of the areas (state or non-state forest)

Note: a. Based on Kruskal-Wallis Test

Table A6-4. Respondents' perceptions of the rank of non-physical objectives

Non-physical objective	Respondents ranking this objective as important (n)	%	Mean rank
Increasing incomes	89	26	70
Creating employment/livelihood opportunities	55	16	142
Community empowerment	38	11	179
Securing access to land	26	8	188
Raising environmental awareness/education	41	12	222
Capacity building	31	9	235
Forming/empowering local organisations	29	9	240
Gender equity	14	4	283
Leadership empowerment	14	4	297
Total	338	100	

Table A6-5. Respondents’ perceptions of the relative importance of non-physical objectives

Selected non-physical objective	Level of importance ^a
Creating employment/ livelihood opportunities	Significantly important for past projects during the transition period
	Provided more employment opportunities in projects implemented inside state forests compared to outside state forests
Securing access to land	Significantly important for rehabilitation projects involving communities (community participation) in state forests
	Significantly important for rehabilitation projects in state forests
	Significantly important for on-going projects
Raising environmental awareness/ Education	Significantly important for rehabilitation projects on community lands (outside state forests)

Note: ^aBased on Kruskal-Wallis Test

Appendix 7. Impacts of the projects on the ground based on the analysis of Database 2

Table A7-1. Level achieved in implementing technical aspects of the rehabilitation activities

Project name	Species–site matching	Silvicultural techniques				Soil and water conservation practices	Total score
		Seedling preparation	Site characterisation and preparation	Planting time	Level of maintenance		
Collaborative Forest Management	2	3	3	3	3	1	15
DAK-DR Kampar	2	2	2	2	2	1	11
DAK-DR Kubar	3	3	3	2	2	1	14
Conserving a National Park	3	2	3	2	3	2	15
Rehabilitation of Logged-over Areas	3	3	3	2	1	1	13
Participatory Reforestation	2	3	3	2	2	1	13
Rehabilitation of Fire-affected Forests	3	3	3	2	2	1	14
Watershed Protection	3	2	2	3	3	3	16
Mechanised Plantation	3	3	3	3	3	1	16
Farm Forestry	3	2	2	3	3	3	16

Notes:

Scores based on the level of implementation of each variable. Score for each variable as follows:

1. Species–site matching: Suitable (3); Less suitable (2); Unsuitable (1)
2. Seedling condition and preparation: Well prepared (3); Less prepared (2); Unprepared (1)
3. Site characterisation and preparation: Well prepared (3); Less prepared (2); Unprepared (1)
4. Planting time: On time (3); Delayed (2); Not at the right time (1)
5. Level of maintenance: Up to second year (3); Up to first year (2); No maintenance (1); each with consideration of how the maintenance was carried out
6. Soil and water conservation practised: Existing terraces with strengthening plants (3); Existing terraces without strengthening plants (2); No terraces (1).

Table A7-2. Environmental impact assessment of the five past case study projects

Variable	Mechanised Plantation Project		Rehabilitation of Logged-over Areas Project		Watershed Protection Project		Rehabilitation of Fire-affected Forests Project		Participatory Reforestation	
	First 5 years	After first 5 years	First 5 years	After first 5 years	First 5 years	After first 5 years	First 5 years	After first 5 years	First 5 years	After first 5 years
Water quality	(=)	(=)	(=)	(=)	(+)	(+)	(+)	(-)	(+)	(+)
Water quantity	(=)	(=)	(=)	(=)	(+)	(+)	n.a.	n.a.	(-)	(-)
Minimum level of water table during the dry season	(=)	(=)	(=)	(=)	(+)	(+)	n.a.	n.a.	(=)	(=)
Maximum level of water table during the rainy season	(=)	(=)	(=)	(=)	(+)	(+)	n.a.	n.a.	(=)	(=)
Frequency of landslides	(=)	(=)	(=)	(=)	(+)	(+)	n.a.	n.a.	n.a.	n.a.
Floral diversity	(+)	(+)	(=)	(=)	(+)	(+)	(+)	(-)	(+)	(+)
Faunal diversity	(+)	(+)	(=)	(=)	(+)	(+)	(+)	(-)	n.a.	n.a.
Carbon stock	(+)	(+)	(=)	(=)	(+)	(+)	(+)	(-)	(+)	(+)
Soil fertility	(+)	(+)	(=)	(=)	(+)	(+)	(+)	(-)	(+)	(+)
Soil erosion	(-)	(+)	(=)	(=)	(+)	(+)	(-)	(+)	(-)	(-)

Notes: Score (-) = negative impact; (=) = constant (no impact); and (+) = positive impact

Table A7-3. Environmental impact assessment of the five ongoing case study projects

Variable	Collaborative Forest Management	DAK-DR Kampar	Farm Forestry		DAK-DR Kubar	Conserving a National Park
	First 5 years	First 5 years	First 5 years	After first 5 years	First 5 years	First 5 years
Water quality	(=)	(=)	(=)	(+)	(=)	(=)
Water quantity	(=)	(=)	(=)	(+)	(=)	(=)
Minimum level of water table during the dry season	(=)	(=)	(+)	(+)	(=)	(=)
Maximum level of water table during the rainy season	(=)	(=)	(+)	(+)	(=)	(=)
Frequency of landslides	(=)	(=)	(=)	(+)	(=)	(=)
Floral diversity	(+)	(+)	(=)	(+)	(+)	(+)
Faunal diversity	(=)	(=)	(=)	(+)	(=)	(=)
Carbon stock	(+)	(=)	(+)	(+)	(+)	(+)
Soil fertility	(=)	(=)	(+)	(+)	(=)	(=)
Soil erosion	(=)	(=)	(+)	(+)	(=)	(=)

Notes: Score (-) = negative impact; (=) = constant (no impact); and (+) = positive impact

Table A7-4. Economic impacts of ongoing rehabilitation projects

Ongoing projects	Period	
	First 5 years	After first 5 years
Collaborative Forest Management Project	Increased cash incomes and savings Secured food crops	
DAK-DR Kampar	n.a.	n.a.
DAK-DR Kubar	Increased cash and non cash incomes	
Conserving a National Park	Increased employment opportunities	1. Increased access to financial assistance 2. Increased non cash incomes 3. Increased employment opportunities 4. Increased ownership of luxury goods.
Farm Forestry	Increased cash incomes, access to financial assistance, markets and infrastructure development	Increased access to financial assistance

Table A7-5. Economic impacts of past rehabilitation projects

Past project	Period	
	First 5 years	After first 5 years
Mechanised Plantation	Increased cash incomes and savings	<ul style="list-style-type: none"> • Increased cash incomes and savings • Increased employment opportunities • Secured food crops • Increased access to financial assistance.
Rehabilitation of Fire-affected Forests	Increased employment opportunities	n.a.
Participatory Reforestation	Increased cash and non cash incomes	n.a.
Rehabilitation of Logged-over Areas	Increased access to financial assistance and infrastructure development	n.a.
Watershed Protection	Secured food crops and incomes	<ul style="list-style-type: none"> • Increased cash and non-cash incomes • Improved access to markets and infrastructure development • Increased access to financial assistance.

Table A7-6. Impacts on the institutional condition of the case study projects

Past project	Period	
	First 5 years	After first 5 years
Mechanised Plantation	Improved social cohesion	<ul style="list-style-type: none"> Improved social cohesion Better institutional and traditional cultural strength.
Rehabilitation of Fire-affected Forests	n.a.	Social fragmentation
Participatory Reforestation	Better institutional and traditional cultural strength	<ul style="list-style-type: none"> Improved social cohesion Better institutional and traditional cultural strength.
Rehabilitation of Logged-over Areas	Social fragmentation	n.a.
Watershed Protection	n.a.	Improved social cohesion
Ongoing project	Period	
	First 5 years	After first 5 years
Collaborative Forest Management	Improved institutional capacity and representation in all aspects of natural resource management	n.a.
DAK-DR Kampar	n.a.	n.a.
DAK-DR Kubar	n.a.	n.a.
Conserving a National Park Project	Improved institutional capacity and representation in all aspects of natural resource management	Improved social cohesion
Farm Forestry	Better institutional and traditional cultural strength Improved social cohesion	<ul style="list-style-type: none"> Better institutional and traditional cultural strength Improved institutional capacity and representation in all aspects of natural resource management Improved social cohesion.

Table A7-7. A comparison of techniques adopted in relation to the project period

Technique adopted		Years since project initiation	
		First 5 years	After first 5 years
Technical	Planting techniques for timber and non-timber species (mahogany, vanilla, pepper, MPTS)	Collaborative Forest Management	Conserving a National Park
	Planting space and patterns, and tree composition	DAK-DR Kampar	Conserving a National Park
	Extensive maintenance techniques (intercropping, Rotton F treatment, breeding, stump clearing, land mapping, manuring)	DAK-DR Kubar and Mechanised Plantation	n.a.
	Establishing nurseries and simple maintenance techniques (including pruning)	n.a.	Farm Forestry
	Terracing and terrace maintenance (included constructing control dams/gullies)	n.a.	Watershed protection
	Developing seedlings, agro forestry practices, controlling fires	n.a.	Mechanised Plantation
	Logging	Logged-over area	Logged-over area
Institutional	Institutional and cooperative development	DAK-DR Kubar and Kampar, and Collaborative Forest Management.	Farm Forestry, Watershed protection, Conserving a National Park, and Participatory Reforestation.
	Administrative management	DAK-DR Kubar	n.a.
Economic	Small-scale business development	Conserving a National Park	n.a.

Table A7-8. Impacts of projects in reducing the causes of degradation

Past projects	Causes of degradation	
	First 5 years	After first 5 years
Mechanised Plantation	<ul style="list-style-type: none">• Reduced forest land conversion cases• Reduced over logging• Reduced repeated fires.	<ul style="list-style-type: none">• Reduced repeated fires• Reduced social conflicts.
Participatory Reforestation	Reduced illegal logging cases	<ul style="list-style-type: none">• Reduced repeated fires• Reduced illegal logging cases.
Watershed Protection Project	Reduced soil erosion	Reduced soil erosion

On-going projects	Causes of degradation	
	First 5 years	After first 5 years
Collaborative Forest Management	<ul style="list-style-type: none">• Reduced social conflicts• Reduced forest encroachment• Increased planting activities	n.a.
DAK-DR Kampar	Reduced shifting cultivation practices	n.a.
Conserving a National Park	Reduced social conflicts	<ul style="list-style-type: none">• Reduced social conflicts• Reduced over logging cases
Farm Forestry	Reduced soil erosion	Reduced soil erosion

Table A7-9. Impacts on tenure and access at the case study projects

Past project	Period	
	First 5 years	After first 5 years
Mechanised Plantation	n.a.	Clarification of secured rights over land
Rehabilitation of Fire-affected Forests	Improved access to forestland and trees	<ul style="list-style-type: none"> • Clarification of secured rights over land • Improved land ownership and access to forestland and trees.
Participatory Reforestation	Improved (secured) land ownership	Clarification of secured rights over land
Rehabilitation of Logged-over Areas	n.a.	n.a.
Watershed Protection	<ul style="list-style-type: none"> • Clarification of secured rights over land • Improved access to jointly managed natural resources. 	<ul style="list-style-type: none"> • Clarification of secured rights over land • Improved access to jointly managed natural resources.
Ongoing project	Period	
	First 5 years	After first 5 years
Collaborative Forest Management	<ul style="list-style-type: none"> • Clarification of secured rights over land • Improved access to forest land and trees. 	n.a.
DAK-DR Kampar	Clarification of secured rights over land	n.a.
DAK-DR Kubar	Improved access to forest land and trees	n.a.
Conserving a National Park	<ul style="list-style-type: none"> • Improved access to forest land and trees • Improved access to jointly managed natural resources. 	Improved access to forestland and trees
Farm Forestry	n.a.	<ul style="list-style-type: none"> • Improved access to forestland and trees • Increased land ownership.

Table A7-10. Impacts of the institutional situation on the case study projects

Past project	Period	
	First 5 years	After first 5 years
Mechanised Plantation	Improved social cohesion	<ul style="list-style-type: none"> Improved social cohesion Better institutional and traditional cultural strength.
Rehabilitation of Fire-affected Forests	n.a.	Social fragmentation
Participatory Reforestation	Stronger institutions and traditional culture	<ul style="list-style-type: none"> Improved social cohesion Stronger institutions and traditional culture.
Rehabilitation of Logged-over Areas	Social fragmentation	n.a.
Watershed Protection	Improved social cohesion	
On-going project	Period	
	First 5 years	After first 5 years
Collaborative Forest Management	Improved institutional capacity and representation in all aspects of natural resource management	n.a.
DAK-DR Kampar	n.a.	n.a.
DAK-DR Kubar	n.a.	n.a.
Conserving a National Park	Improved institutional capacity and representation in all aspects of natural resource management	Improved social cohesion
Farm Forestry	<ul style="list-style-type: none"> Stronger institutions and traditional culture, and Improved social cohesion. 	<ul style="list-style-type: none"> Stronger institutions and traditional culture Improved institutional capacity and representation in all aspects of natural resource management Improved social cohesion.

Table A7-11. A comparison of techniques adopted in relation to the project period

Techniques adopted		Years since project initiation	
		First 5 years	After first 5 years
Technical	Planting techniques for timber and non-timber species (mahogany, vanilla, pepper, MPTS)	Collaborative Forest Management	Conserving a National Park (including establishing nurseries)
	Planting space and pattern, and tree composition	DAK-DR Kampar	Conserving a National Park
	Extensive maintenance techniques (intercropping, Rotton F treatment, breeding, stump clearing, land mapping, manuring)	DAK-DR Kubar, and Mechanised Plantation.	n.a.
	Establishing nurseries and simple maintenance techniques (including pruning)	n.a.	Farm Forestry
	Terracing and terrace maintenance (included constructing control dams/gullies)	n.a.	Watershed Protection
	Developing seedlings, agro forestry practices, controlling fires	n.a.	Mechanised Plantation
	Logging	Ex-logging concession	Ex-logging concession
Institutional	Institutional and cooperative development	DAK-DR Kubar and Kampar, and Collaborative Forest Management.	Farm Forestry, Watershed Protection, Conserving a National Park, and Participatory Reforestation.
	Administrative management	DAK-DR Kubar	n.a.
Economic	Small-scale business development	Conserving a National Park	n.a.



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Rehabilitation activities in Indonesia have a long-history of more than three decades, implemented in more than 400 locations. Successful projects are characterised by the active involvement of local people, and the technical intervention used tailored to address the specific ecological causes of degradation that concern local people. However, sustaining the positive impacts beyond the project time is still the biggest challenge.

Rehabilitation efforts have been lagging behind the increasing rates of deforestation and land degradation. This has been largely due to the complexities of the driving factors causing the degradation, which neither projects nor other government programmes have been able to simultaneously address. Initially, the rehabilitation initiatives were responding to straightforward issues of natural disasters caused by the expansion of agriculture. Currently, there are more complex driving factors of deforestation to be dealt with, such as illegal logging and forest encroachment. Therefore, addressing the causes of deforestation and land degradation, which usually are also the continuing disturbances threatening sustainable rehabilitation activities, should be part of the project's priorities.

Sustainable rehabilitation initiatives depend on crucial factors: project design in ensuring multiplier effects can be generated; good forestry extension to ensure adoption by communities; enabled policy frameworks; well-planned funding mechanisms to effectively use the reforestation funds; and an effective mechanism to reconcile the land status before the project starts. Increasingly, communities are being expected to have greater roles in rehabilitation initiatives. Designing the right economic and social incentives then becomes important. Project derived economic and livelihood benefits, generated from ecological improvements, tend to sustain in the long-term more than the benefits from project-based economic opportunities.



Review of Forest Rehabilitation Lessons from the Past

This publication is part of a series of six country reports arising from the study "Review of forest rehabilitation - Lessons from the past" conducted by CIFOR and partners simultaneously in Indonesia, Peru, the Philippines, Brazil, Vietnam and China. The content of each report is peer reviewed and published simultaneously on the web in downloadable format (www.cifor.cgiar.org/rehab). Contact publications at cifor@cgiar.org to request a copy.

