



Proceedings of the International Symposium on

Reclamation, Rehabilitation and Restoration Towards a Greener Asia

3–5 July 2012, Kuala Lumpur, Malaysia



Editors

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Indonesia

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Status of Land and Forest Rehabilitation in Indonesia

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Introduction

Land and forest rehabilitation in Indonesia is conducted in degraded forest areas (except the Nature Conservation area and Core Zone of National Park) and degraded land outside the forest areas, which was aimed to improve the environmental, social and economic functions of the forest. Degraded land and forest areas are called critical land. Critical land refers to a piece of land which is severely damaged due to the loss of vegetation cover, and therefore its functions as water retention, erosion control, nutrient cycling, micro climate regulator and carbon retention are completely depleted. Besides the degradation on environmental functions, there are some impacts on socio-economic functions related to forest function in providing non-timber forest products (NTFT), source of income, food, and energy. In addition, in severely degraded conditions, the land and forest become poor in biodiversity, while other environmental and socio-economic functions will be affected. Forest degradation can be caused by legal activities (timber harvesting, forest conversion and mining activities) and illegal activities (illegal logging, and forest conversion to agricultural land and estate crops) or natural disasters (such as forest fires, drought and flooding).

Without appropriate handling, the land and forest degradation causes several environmental, social and economic losses. Environmental disasters include flood, erosion and global climate change. The social losses include losses in forest function in providing human basic needs, and job opportunities, while economical losses consist of the decrease in source of income of the local community in supporting national economic growth

The efforts of land and forest rehabilitation outside forest area (Land for Other Purposes) were conducted using community forest development scheme and greening movement, while rehabilitation of degraded forest and land in forest areas was conducted using reforestation programmes. These two programmes, since 2010 and up to now, have been supported by several greening movements, which among others are the Women Movement for Tree Planting and Maintenance (WMTPM), Simultaneous Planting Movement, Environmental Regreening Movement and One Man One Tree (OMOT) Movement, and One Billion Indonesia Trees for The World (Ministry of Forestry, 2010). Besides regreening and reforestation activities in rehabilitation of degraded land and forest, technical civil construction were also made available including dam control, infiltration well, gully plugs, terrace construction. The movement for Land and Forest Rehabilitation was started in 2003.

Rehabilitation of degraded forest and land in Indonesia provides a wide array of environmental benefits (flooding prevention, carbon sequestration and land covers), social benefits (job opportunity, environmental awareness), and economic benefits (source of income and poverty alleviation). The weakness of rehabilitation of degraded land and forest in Indonesia is that it should face technical and institutional problems, and land use change to estate crops, mining areas, and agriculture land. On the other hand, the strength of the programme is that it was supported by regulations and funding, while the opportunity was support from international agencies, NGOs and academicians.

Degraded land in Indonesia

The Indonesian Ministry of Forestry classifies degraded forest and land into three categories, namely slightly degraded, degraded and heavily degraded. Data in 2006 and 2010 indicate that the total area of degraded land increased by 4,369,562 ha, while that of heavily degraded land has decreased by 1,441,268 ha. Complete data on changes of degraded land areas in year 2006 and 2010 are presented in Table 1.

Table 1 Trend of degraded land and forest in year 2006 and 2010

Area size of degraded land							
Year 2006			Total	Year 2010			Total
Degradation level and area (ha)				Degradation level and area (ha)			
Slightly degraded	Moderately Degraded	Heavily degraded		Slightly degraded	Moderately Degraded	Heavily degraded	
47,610,081	23,306,233	6,890,567	77,806,881	52,259,832	23,955,162	5,449,299	82,176,443

Sources : Directorate General of Watershed and Social Forestry Development 2010.

Trend of forest and land rehabilitation in Indonesia (2006-2010)

In the period of 2006 to 2010, the Indonesian government had conducted land and forest rehabilitation over a large area of 2,561,182 ha in total, with locations inside and outside the forest areas in all provinces. The area of rehabilitated land and forest tended to fluctuate and had decreasing trend. The largest achievement was in year 2006 because in this year, land rehabilitation activities became a priority and there was a very huge fund being allocated. On the other hand, in the following year, the achievement of land and forest rehabilitation decreased due to decrease in funding allocation, and various technical and non-technical problems in the field. As a result, field activities were impeded and the allocated fund could not be used. Complete data on forest and land rehabilitation which have been conducted by the Indonesian government in the period of 2006-2010 are presented in Table 2.

Table 2 Compilation of land and forest rehabilitation activities in the period 2006–2010

Year	2006	2007	2008	2009	2010	Location
Activities	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	
Reforestation	246,042	76,718	266,921	113,041.41	149,422.75	Inside forest area
owned forest	248,403	127,532	227,913	56,950.8	23,697	Outside forest area
Mangrove forest	16,901	39,318	10,739	27,251.5	69,005.42	Inside forest area
Owned forest model	3,155	2,635	2,753	1,000	4,498	Outside forest area
Agroforestry	33,162	104,393	61,295	22,364.95	16,754.5	Outside forest area
Mulberry plantation	3,666.55	3,544.07	4,658.05	4,046.01	2,063.82	Outside forest area
Community forest	3,171	1,750	200	2,283	7,329	Inside forest area
National Movement on Forest and land rehabilitation	455,852	29,124	78,422	15,270	No activities	Inside and outside forest area
Total	1,010,353	358,014	625,901	242,208	270,707	2,561,182

Sources: Ministry of Forestry (2010)

Constraint for land and forest rehabilitation in Indonesia

Constraints (weakness and threats) of land and forest rehabilitation activities in Indonesia could be generally categorized into technical constraints and institutional constraints.

Technical constraints

Degraded lands which become the target of rehabilitation areas are generally located in remote areas with very poor accessibility. Such conditions are exacerbated by poor quality of the land, so that tree growth is not optimal and mortality rate is high. The limited access also hampers the maintenance and replanting of failing (dead) plants. Such technical constraints are very influential towards the low achievement of the land and forest rehabilitation target, and low rate of success in forest and land rehabilitation in Indonesia. Therefore, although the Indonesian government, people community and other concerned parties have attempted to perform land and forest rehabilitation as optimum as possible, the development of rehabilitation is still slower than the rate of deforestation and land degradation (Nurrochmat *et al.*, 2009).

Institutional constraints

Besides the technical constraints, there are also institutional constraints which are very influential towards the success of land and forest rehabilitation in Indonesia. Several main institutional problems which become constraints are as follows:

Mechanism of funding (Budgeting)

In general, the implementation of the reforestation and rehabilitation programmes, especially programmes sponsored by the Government, has been conducted through a project approach with limited time duration, for example one fiscal year, and major uncertainty whether this can be extended in subsequent years. There is also rigidity in the budget; the allocation for each item is fixed and the budget must be disbursed in accordance with the allocation. Practically, there is no room for budget allocation changes or modification, despite high probable changes in costs within one year, especially in the field (Nurrochmat *et al.*, 2009).

Disharmony between legality logic and forestry technicality logic

The next institutional problem is differences in point of views between those of legality logic and forestry technicality logic. For example, if in the initial plan, a certain area/territory will be planted with 1,000 trees, on the basis of legality logic, the area should be planted with 1,000 trees. However, there is a fact that the area is fully occupied with rocks, and according to forestry technicality logic, planting 1,000 trees in such location is useless, because it is nearly impossible to grow trees in such areas.

Inconsistency in policies

Some substantial incompatibilities and in some extent conflicts between national and local governments, the government and communities, between private companies and communities, and among communities with regard to reforestation and rehabilitation have lingered and affected the regulation and effectiveness of reforestation and rehabilitation programme implementation. The basic problem is lack of synchronization of laws and regulations at national and regional levels. This problem can be explained by sectoral overlapping, such as forest conversion into other usage, due to pressure from large plantation estates and the creation of million hectares of palm oil plantation. Most of the problems originate from conflict in government sectors that ignore the needs of others. Even among

MoF officials, policy synchronization continues to be weak, especially with regards to coordination in policy substance (Ridwansyah *et al.*, 2009).

Competition for land allocation

Competition for land allocation is also characterized by unending pressure from agricultural, oil palm plantation, and mining practices which are all threats to rehabilitation programmes. Besides competition for land allocation with other sectors, some areas designated for reforestation or rehabilitation programme are not meeting community expectations because the programme will “take” or reduce their farmlands. This situation has triggered activities that jeopardize forest rehabilitation programme because people are trying to fulfil their needs. This hampers the willingness of the community to participate actively in forest rehabilitation programmes (Nurrocmat *et al.*, 2009).

Factors which support land and forest rehabilitation in Indonesia

Besides the inhibiting factors, there are also supporting factors (strength and opportunity) for forest and land rehabilitation in Indonesia. For example, the government has clear legal umbrella and funding to perform rehabilitation. Besides funding from the government (State budget), there are also funding support from the private sector which has strong commitment toward environment sustainability. Support from NGO, which is mainly in the form of mentoring, is very great, as well as the support from universities/academician, which are mainly in the form of technical support. If these supports could be optimized, this will be very influential towards achieving the target and increasing the rate of success in land and forest rehabilitation in Indonesia.

Lessons Learned

Selection of locations

For improving the performance and success of land and forest rehabilitation, the selection of location for tree planting should be supported by appropriate planning, which is preceded with land inventory, mainly in terms of degradation level, socio-economic condition of the surrounding communities, and accessibility. Afterwards, land and forest rehabilitation can be started in locations with low level of land degradation that possess sufficient socio-economic support and possess relatively good accessibility. Therefore, level of achievement and success of rehabilitation is expected to be sufficiently high. The next step is conducting forest and land rehabilitation in more difficult locations.

Innovation in budget management

Forest and land rehabilitation is influenced very much by environmental factors, such as water availability and land condition. Water availability in the forest is influenced very much by season (dry/wet). Therefore, there is a need for more flexible budgeting management, so that there are possibilities for extension of the project duration to allow changes of expenditure items to address problems in a flexible manner in the field.

Harmonization of policies

Forest and land rehabilitation should become a national policy that is supported by all stakeholders, mainly the central and local governments, and also local people around the rehabilitation site. In order to gain support from all parties, the policy of forest and land rehabilitation should be made by involving all stakeholders. If a policy is made in a top down manner, this will likely be rejected by local government (and possibly the local government

create policy which is against it) and local people (possibly in the form of low participation, or in an extreme situation, in the form of destruction of the planted trees).

Community participation and distribution of benefits

Forest and land rehabilitation in privately owned land (people forest, HKM and others) tend to be more successful if compared with those in forest area. This is due to high level of participation by the people (land owners) and clarity of the benefit distribution. Land owners will obtain benefits from the planted trees in their land, either in the form of timber or non timber products. In Java island, development of community-owned forest is very rapid and most are derived from private investment, and are not from government programme. The same phenomenon occurs in the area of Mareje Bone (Central Lombok), where the local community practices land and forest rehabilitation by their own support, in programme of People Plantation Forest (Satyawan *et al.*, 2012).

Socialization of forestry technicalities for law enforcement officers

In the evaluation of activities and accountability of land and forest rehabilitation, there should be the involvement of institutions outside those of forestry, such as Indonesian Audit Board (Financial Inspection Agency), Corruption Eradication Commission and the State Police. Non-forestry institutions should receive socialization on technical aspects and constraints which can possibly occur during rehabilitation, so that the personnel could understand and possess an objective attitude during evaluation and investigation of suspected irregularities. Without such socialization, those non-forestry institution personnel will have a "textbook" attitude toward the existing regulations without due consideration toward field conditions. Such a condition will create fear in the person in charge of technical operation in the field. This will finally create a perception that it is better to return the funding, rather than carrying risk of being legally prosecuted.

Optimisation of supporting factors

Forest and land rehabilitation will not run properly without support from all related stakeholders. The supporting factors for land and forest rehabilitation should be inventoried, coordinated and include the involvement in accordance with their respective capacity to improve the achievement and success of land and forest rehabilitation.

References

- MINISTRY OF FORESTRY. 2011. Statistik Kehutanan Indonesia 2010. Departemen Kehutanan, Jakarta.
- MINISTRY OF FORESTRY. 2010. Forest Management Policy in Indonesia. Presented at the *Seameo Biotrop Bogor*, 5 August 2010.
- NURROCMAT, D.R., SUNDAWATI, L., SIREGAR, I.Z., DARUSMAN, D., TRISON, S., SUPRIYANTO, WILARSO, S., WIJAYANTO, N. & SUKENDRO, A. 2009. National Forest Assessment: Indonesia. Collaboration between Faculty of Forestry Bogor Agricultural University and AKECOP. Project Report.
- RIDWANSYAH, M., SUSANTI, A., NURROCHMAT, D.R., BUDIONO, P. & INDRAJAYA, Y. 2009. Constraint to the Effective Implementation of Community Forestry in Indonesia. Paper presented at the *Enhancing Forest Policy Education Writeshop, SEANAFE-ICRAF-RECOFTC*, 12–22 January 2009, Bangkok.
- SUNITO, S., SUHARDJITO, D. & PURWAWANGSA, H. 2012. Study on Good Practice of Social Forestry for Sustainable Forest Management and REDD+. Colaboration between Faculty of Forestry Bogor Agricultural University and JICA. Project Report

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