

**REVIEW EXISTING SCHEMES AND LESSONS LEARNED
FROM THE SURROUNDING AREAS**

**Mega Lugina
Ervizal A.M. Zuhud
Kirsfianti Ginoga**

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By: Mega Lugina, Ervival A.M. Zuhud, and Kirsfianti Ginoga

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Collaboration between:

- Pusat Penelitian Sosial Ekonomi dan Kebijakan Departemen Kehutanan (Center For Socio Economic and Policy on Forestry Research Ministry of Forestry)
Jl. Gunung Batu No. 5 Bogor West Java Indonesia
Phone : +62-251 -8633944
Fax. : +62-251-8634924
Email : conservation_redd@yahoo.com
Website : <http://ceserf-itto.puoslitsosekhut.web.id>
- LATIN – the Indonesian Tropical Institute
Jl. Sutera No. 1 Situgede Bogor West Java Indonesia
Phone : +62-251-8425522/8425523
Fax. : +62-251-8626593
Email : latin@latin.or.id and aaliadi@latin.or.id
Website : www.latin.or.id
- Meru Betiri National Park Department of Forestry
Jalan Siriwijaya 53, Jember, East Java, Indonesia
Phone : +62-331-335535
Fax. : +62-331-335535
Email : meru@telkom.net
Website : www.merubetiri.com

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SUMMARY

In this study, the existing literature on engaging schemes of local communities on sustainable conservation and associated carbon changes is reviewed. The impacts of the engagement would be identified and assessed, based on their impact on benefit and costs to the communities, as well as conservation purposes. In reviewing the communities schemes literature on forest conservation, a web search, reports and journal would be carried out to obtain publications and large amounts of literature. Some authors were contacted directly for clarification of findings.

MBNP is surrounded by twelve villages, eight villages located in Jember district, and four villages in Banyuwangi district. It can be seen that most income generated from farming activity and plantation workers.

There have been some schemes or activities inside and around Meru Betiri National Park area which involve communities in order to achieve the goal of conservation, including community rehabilitation program, collaborative forest management, development of family's medicinal plant (Tanaman Obat Keluarga), collaborative forest management, and livestock assistance program.

It is concluded that (i) MBNP Official cannot work independently to empower its surrounding communities in order to improve their livelihood and economically independent, (ii) regardless of the productivity and distributional equity of the schemes, the sustainability of the choosing scheme would likely depend on reward from schemes, absence of threat for losing rights, and guardianship, (iii) designing good schemes requires clear understanding of land ownership, planting systems, and commodity involved accompanied by promoting community self regulation, self documentation, and self monitoring, and (iv) generate and disseminate of simple information for self educating in conservation, agroforestry system, processing and marketing of agricultural products, ecotourism, and alternative applicable technology.

RINGKASAN

Dalam kajian ini, beberapa literature terkait apa dan bagaimana melibatkan masyarakat lokal dan para pihak dalam pengelolaan kawasan konservasi yang berkelanjutan, serta kaitannya dengan perubahan iklim telah direview. Dampak dari pelibatan masyarakat akan diidentifikasi dan dikaji berdasarkan dampaknya terhadap manfaat, biaya dan konservasi lingkungan. Untuk review ini, literature diperoleh dari internet, laporan dan jurnal. Beberapa penulis telah dihubungi secara langsung untuk klarifikasi dan mendapatkan informasi yang lebih aktual.

Taman Nasional Meru Betiri (TNMB) dikelilingi oleh dua belas desa, delapan desa berada di Kabupaten Jember, dan empat desa berlokasi di Kabupaten Banyuwangi. Hasil kajian menunjukkan bahwa sumber mata pencarian umumnya adalah petani dan buruh perkebunan.

Selama ini telah ada beberapa pola kerjasama dan kegiatan yang dilakukan di sekitar TNMB yang antara lain melibatkan masyarakat di dalam dan sekitar taman nasional yang bertujuan untuk meningkatkan partisipasi masyarakat dalam kegiatan konservasi, seperti program rehabilitasi, pengelolaan hutan bersama masyarakat (PHBM), pengelolaan Tanaman Obat Keluarga (TOGA), dan program bantuan ternak.

Dari hasil kajian terhadap kerjasama yang telah ada dengan masyarakat sekitar dapat disimpulkan bahwa (i) TNMB tidak dapat bekerja secara independent untuk meningkatkan kesejahteraan, dan menjaga partisipasi masyarakat dalam kegiatan konservasi, peran dan dukungan para pihak terutama pemerintah desa, kecamatan dan swasta sangat diperlukan untuk meningkatkan produktivitas dan pasar hasil pertanian, (ii) terlepas dari produktivitas hasil dan kesetaraan kerjasama, kelangsungan kerjasama akan tergantung pada sistem pemberian insentif, kejelasan hak pengelolaan, dan pendampingan, (iii) perancangan skema memerlukan pengertian yang sama tentang kejelasan lahan, bagi hasil, sistem pola tanam, kesesuaian komoditas, yang diikuti dengan pengaturan mandiri antara kelompok tani tentang pencatatan, pengamanan, dan pemantauan, dan (iv) memberikan dan mendistribusikan informasi sederhana untuk pendidikan konservasi, sistem agroforestry, proses dan pemasaran hasil pertanian, ekowisata, dan teknologi alternative yang aplikatif.

I. INTRODUCTION

1.1. Background

Gazetement of some forest areas to be national parks brings direct and indirect impacts on how to manage the areas and local livelihood, both local communities inside and outside the parks. By allocating an area to be a national park, all regulations on national park matters must be taken into consideration in the management and communities especially living around forest areas. In order to accommodate local communities in national park and to prevent people rejection on the existence of national park, local communities must be engaged in national park activities to achieve its objectives to conserve the area. There have been some programs or activities inside and around Meru Betiri National Park area which involve communities in order to achieve the goal of conservation, i.e., sustainable forest and improved livelihood. Different approach has been made for community involvement scheme in Meru Betiri National Park although all of those schemes are having similar target, i.e., improvement of community livelihood and conservation based practised, including community rehabilitation program, collaborative forest management, development of family's medicinal plant (*Tanaman Obat Keluarga*), collaborative forest management, and cattle assistance program. These activities are conducted either by National Park Office or other institutions such as University, NGOs, District Forestry Office, and *Perhutani* (State Forestry Corporation). The design, impact, factors influencing the success and failure of the schemes as well as how to improve these schemes is one of the objectives to be discussed in this paper. There are strengths and weaknesses from each scheme that are useful for the lessons learned for REDD or REDD plus¹ implementation in national park, especially in Meru Betiri National Park, that would be discussed in this paper.

¹REDD is Reduction of emissions from deforestation and forest degradation (REDD) in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries. Scope of activities includes all activities which result in reducing emissions, increasing removals, and stabilization of carbon stocks in forestry sector at national level. Within sub national level include reduction in deforestation rate, reduction in forest degradation, maintaining and enhancing forest carbon stocks through forest conservation, incremental change in forest cover, sustainable management of forest, increase forest cover due to afforestation and reforestation, and other land management.

The possibility of national park as one activity to be included in REDD has started since the promulgation of Bali Action Plan in the 13th UNFCCC meeting in 2007. The insertion of “the role of conservation” as one activity related to reducing emissions from deforestation and forest degradation means that conserving national park are counted to be eligible receiving positive incentive (UNFCCC, 2008). Currently, the mechanisms on how conserving national parks can be paid in frameworks is still in negotiation process.

1.2. Objectives

The objective of this paper is therefore to determine: (i) the design and natures of the communities' engagement for conservation, and (ii) the impact to stakeholders by those engagements, (iii) factors influencing success and failure of the schemes, and (iv) lessons learned to engage community in international scheme of REDD plus. In this study, the existing literature on engaging local communities on sustainable conservation and associated carbon changes would be reviewed.

II. METHODS

In reviewing the communities' schemes on forest conservation, a web search, reports, and journal would be carried out to obtain publications and large amounts of literature. Some authors were contacted directly for clarification of findings. Structured and unstructured questionnaire was used for general interview with communities and stakeholders involved in selected schemes in the MBNP.

III. OVERVIEW OF MERU BETIRI NATIONAL PARK

3.1. History

The allocation of Meru Betiri as a conservation area has been started since The Netherland's occupation in the country. The Netherland Governor General for Indonesia as protection forest stated based on Besluit van den Directeur van Landbouw Neverheiden Handel in July 29th 1931 No: 7347/B, and Besluit

Directur van Economische Zaken in April 28th 1938 No: 5751. Then in 1972 through Ministry of Agriculture Decree 276/Kpts/Um/6/1972, its status changed into wildlife sanctuary which main objectives is to provide a protection area for Javan tiger (*Panthera tigris sondaica*).

Through the Ministry of Agriculture Decree No: 529/Kpts/Um/6/1982 promulgated in June 21st 1982, Meru Betiri Sanctuary area was expanded into 58.000 Ha. The addition area included the estate plantations in Bandalit and Sukamade Baru which covered 2.155 Ha, protection forest areas in the north and marine region along the south coast which covered 845 Ha.

Meru Betiri sanctuary was candidated to be a national park statement letter of Ministry of Agriculture No: 736/Mentan/X/1982 issued October 14th 1982. In 1997, the area was appointed as a national park through the Ministry of Forestry Decree No 277/Kpts-VI/1997, covers area of 58,000 hectares which located in two districts: Jember and Banyuwangi (GoI MoF, 1997). Changing status of the national park is described in Figure 1.

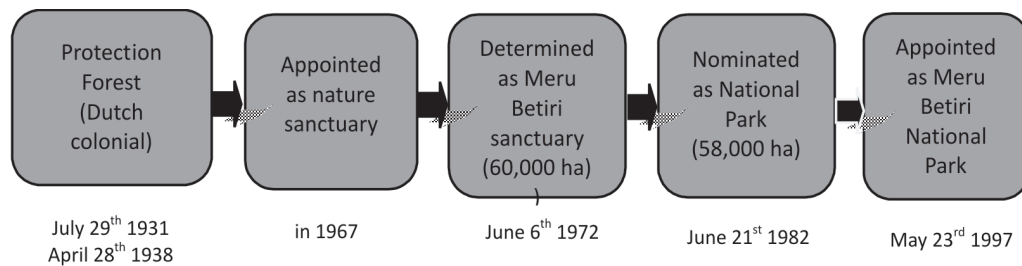


Figure 1. Historical Status of Meru Betiri National Park

3.2. Site Description

Meru Betiri National Park (MBNP) lies at 113° 37' - 113° 58' East Longitude and 08° 21' - 08° 34' South Latitude, located in two districts i.e. Jember and Banyuwangi. The park consists of five vegetation types: beach, mangrove, swamp, rheophyt, and lowland tropical rainforest (MoF DGFPNC, 2010a).

MBNP is one of four National Parks in East Java, and located near Bromo Tengger Semeru National Park, Baluran National Park and Alas Purwo National

Park. The national park has several uniqueness including different forest ecosystems, rare plants, medicinal plants, and wild animals (Meru Betiri National Park, 2009). It is the habitat for endemic plant *Rafflesia zollingeriana*, leopard (*Panthera pardus*), wild bull (*Bos javanicus*), deer (*Muntiacus muntjak*), peacock (*Pavo muticus*), some turtle species, primates, and aves (MDGFPNC. 2010a).



Figure 2. Location of Meru Betiri

Topography of MBNP area is various, ranging from flat, hilly along sea sides to mountainous areas with the elevation up to 1223 meter above sea level at the top of Mount Betiri (MoF DGFPNC, 2010a). The park is influenced by monsoonal season, from northwest wind on November to March which causes rain season, whilst from end of April to October is the drought season. Rainfall is various between 1252 – 2818 mm per year, and based on Schmidt and Ferguson the park consists of two climate types: type B for north and east (Sukamade – Malangsari) and is type C (south and west areas) (MoF DGFPNC, 2010a). The park region in type B classification is an evergreen tropical rainforest while the region in type C classification is a transition from tropical to monsoon forest which often experiences a significant drought.

3.3. Socio-Economic Condition Surrounding MBNP

MBNP is surrounded by twelve villages, eight villages located in Jember district, and four villages in Banyuwangi district. Jember is the third largest city in East Java, with average population density about 937 persons per km². While Banyuwangi has about 265 persons per km², compare to the average population density in East Java of 799 persons per km² (Statistic of East Java, 2009). There are twelve village surrounding Meru Betiri National Park, as can be seen in Table 1. It can be seen that there four sub districts surrounding MBNP, namely Tempurejo and Silo Sub districts in Jember, and Pesanggrahan and Kalibaru sub districts in Banyuwangi. It can also be seen that 82.6 per cent of the villages is located in Tempurejo Sub District, Jember and 75.2 per cent located in the sub district of Kalibaru. It is therefore important to put more attention on the development happened in this two sub district to keep up with the dynamic of sub district government program.

Table 1. Villages and Area Surrounding MBNP

No.	District, Village, Sub District	Area (km ²)	Percentage of the Area
	Jember	870.33	
1	Curahnongko, Tempurejo	283.39	32.6
2	Andongrejo, Tempurejo	262.79	30.2
3	Wonoasri, Tempurejo	6.18	0.7
4	Sanenrejo, Tempurejo	88.95	10.2
5	Curahtakir, Tempurejo	77.86	8.9
6	Mulyorejo, Silo	48.41	5.6
7	Pace, Silo	51.29	5.9
8	Sidomulyo, Silo	51.46	5.9
	Banyuwangi	182.06	
9	Sarongan, Pesanggrahan	27.00	14.8
10	Kandangan, Pesanggrahan	18.06	9.9
11	Kebonrejo, Kalibaru	83.15	45.7
12	Kalibaru Kulon, Kalibaru	53.85	29.6
Total		1,052.39	

Source: MBNP, 2009 (processed).

Table 2 shows the income generation activities in the villages surrounding MBNP. Simultant with employment in Jember district, in this villages, source of income generated from farming activities accounting for 83.7 per cent in Jember, and 713 per cent in Banyuwangi. Followed by estate crops plantation and trader, amounting to 8.4 per cent and 3.9 per cent in Jember, and 18.1 per cent, and 3.5 per cent in Banyuwangi, respectively.

Table 2. Source of Income for Villages Surrounding MBNP

Village	Source of income (persons)								Σ
	Farmers		Trader	Gove off.	Construction	Fishermen	Service	Private	
	Owner	Labour							
Jember									
Curahnongko	142	470	118	190	53	-	46	42	1,061
Andongrejo	163	561	74	24	52	17	36	18	945
Wonoasri	3,166	2,177	277	57	289	-	22	-	5,988
Curahtakir	6,388	4,011	137	65	60	-	-	138	10,799
Sanenrejo	3,265	1,906	319	43	109	-	8	56	5,706
Mulyorejo	304	1,693	153	32	26	-	29	1,084	3,321
Pace	661	3,335	120	52	40	-	25	1,573	5,863
Sidomulyo	260	1,410	210	67	39	-	30	80	2,096
Total	14,349	15,563	1,408	530	668	17	196	2,991	
Banyuwangi									
Sarongan	1,026	1,050	39	32	19	94	16	1,065	3,341
Kandangan	3,200	1,411	177	37	80	-	39	1,242	6,129
Kebonrejo	375	543	102	33	128	-	75	93	1,349
Kalibaru Kulon	604	1,316	150	104	146	-	147	18	2,521
Total	5,205	4,320	468	206	373	94	277	2,418	

Source: MoF, DGFPNC, 2010.

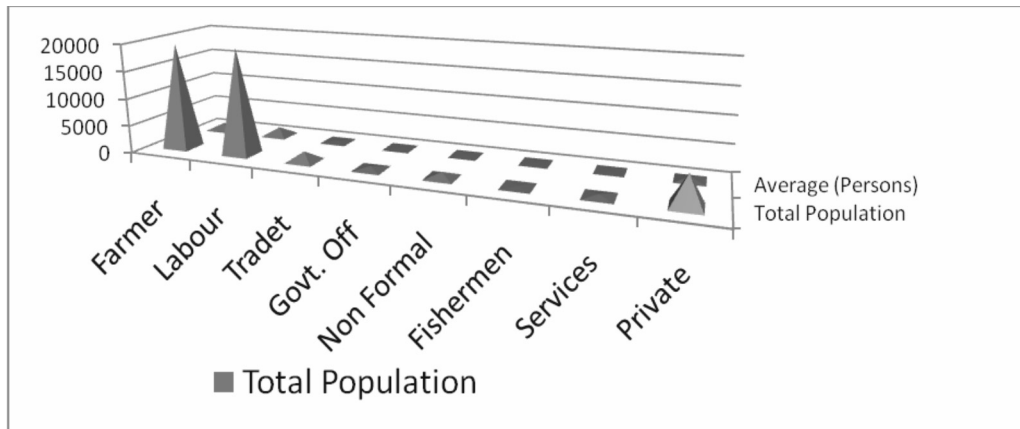


Figure 3. Occupation of communities living surrounding the MBNP

While condition of communities inside MBNP can be seen in Table 3. As can be seen in the Table, there are four location of settlement inside MBNP. Three location located in Jember district, and one location in Banyuwangi district. In addition, there are trans location of Army and two plantation estate situated in Bandalit and Sukamade Baru.

Table 3. Communities Inside MBNP

No	Problem	Location	Area (Ha)
1.	Settlement		
	A. Bandalit, Andongrejo	Bandalit, Andongrejo	1,048.00
	B. Sumbersalak Andongrejo	Sumbersalak, Andongrejo	7,125.00
	C. Andongrejo	Bandalit,	2.02
	D. Rajegwesi, Sarongan	Rajegwesi, Sarongan,	29.57
2.	Trans location for ARMI	Sarongan, Pesanggaran	156.63
3.	Plantation Estate		
	A. Bandalit	Bandalit, Andongrejo	1,057.00
	B. Sukamade Baru	Sukamade, Sarongan	1,098.00

Source: MoF, DGFPNC, 2010.

3.4. Zoning System

For sustainable management purposes, Ministry of Forestry through Director of Forest Protection and Nature Conservation established the zoning management system. For MBNP, the zoning system is declared through the issuance of decree No 185/Kpts/DJ-V/1999 the area of MBNP are divided into five zones including core zone, forest zone, intensive utilisation zone, rehabilitation zone and exclusive utilisation zone (buffer zone) (MoF DGFPNC, 2010b). The area and percentage of each zone are described in Table 4 and Figure 4.

Table 4. Zoning systems within MBNP, 1999

No.	Forest Ecosystem	Zone (Ha)					Total
		Nucleus	Forest	Intensive Utilization	Buffer	Rehabilitation	
1.	Mangrove	-	7 (0.03)	-	-	-	7 (0.01)
2.	Coastal	620 (2.22)	675 (2.98)	925 (71.98)	-	-	2,220 (3.83)
3.	Swamp	-	25 (0.11)	-	-	-	25 (0.04)
4.	Tropical Rainforest	23,870 (85.51)	20,340 (89.91)	-	2,155 (100.0)	3,573 (88.81)	49,938 (86.10)
5.	Bamboo Rainforest	3,425 (12.27)	1,575 (6.96)	360 (28.02)	-	450 (11.19)	5,810 (10.02)
Total Area (Ha)		27,915 (48.13)	22,622 (39.00)	1,285 (2.22)	2,155 (100.0)	4,023 (6.94)	58,000 (100.00)

Notes : Figure in parantheses is percentage of the area.

Source: Based on Directorate General Forest Protection and Nature Conservation Decree No. 185/99.

Zone division is based on different necessity and function, therefore each zone is managed through different approach (MoF, 2002). Within core zone area, human-interventions are prohibited, since it will causes change in the national park 's ecosystem; while in utilization zone it is possible for human-intervention (MoF, 2002). It can be seen from the Figure 4, that nucleus or core zone is the largest area within the national park, accounting for more than 48 per cent. Within this zone,

the largest ecosystem is the tropical rainforest, amounting to 85.5 per cent, followed by bamboo and coastal ecosystems, amounting to 12.3 per cent and 2.2 percent, respectively. Rehabilitation and utilization zone amounting to about 6.9 percent and 2.2 per cent, respectively. In 1999, most of the rehabilitation zone is covered by tropical rainforest, amounting to 88.8 per cent and bamboo forest amounting to 11.2 per cent. At the current condition, changes might had occurred to facilitate the need of local communities, as can be seen in land cover changed described in the analysis.

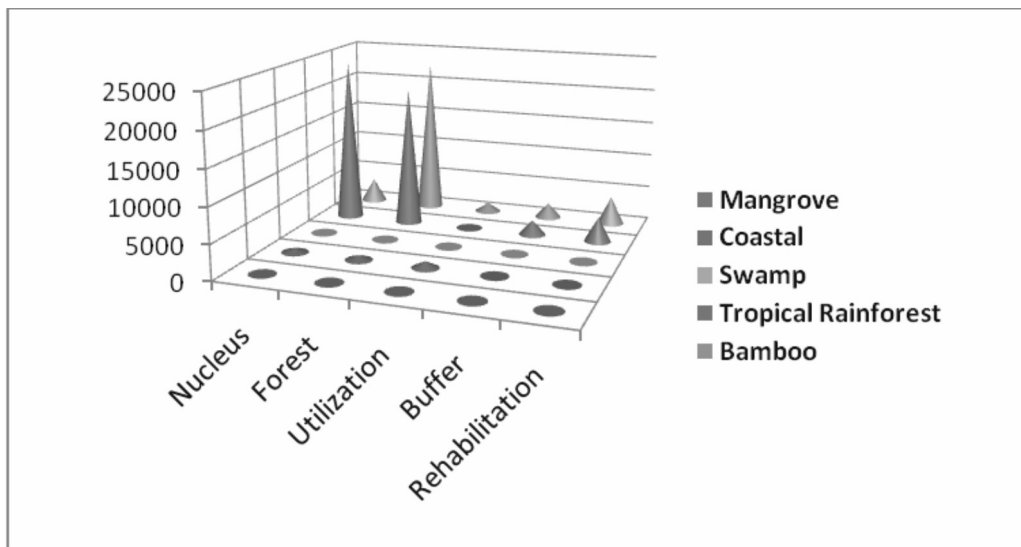


Figure 4. Forest Ecosystem within of Each Zone in Meru Betiri National Park
Source: MoF DGFPNC, 2010b (processed)

IV. REVIEW OF COMMUNITY SCHEMES ON FOREST CONSERVATION IN MERU BETIRI NATIONAL PARK

Clarifying terminology is needed to provide distinction of meaning that often used interchangeably. First, in this section, it need to distinguish between involvement, participation, and engagement as follows:

Involvement is about involvement in community activities in a variety of different ways. Community involvement often starts with agendas and

programmes that originate outside the community. While participation is about people being active partners in the regeneration of communities – contributing and sharing in the decisions that affect their lives. Participation should enable people to have a degree of power and control in the processes with which they are involved. The term engagement is about continuous dialogue – the development and maintenance of relationships between communities and organizations (public or private) where decisions are shared and based on mutual and growing understanding. Therefore, based on this definition, it can be seen, that community engagement is the highest hierarchy of interaction between communities, public and private holders ([Http://Changesuk.net](http://Changesuk.net)).

Without “authentic and willingness” community engagement, change occurs but the process and outcome are unlikely to be an empowering experience for both stakeholders and community. Many research shows that if public policies, or communities work in non empowering ways, there will be lack of reciprocity. Where stakeholder, both public and private agencies become service providers and communities, receivers of services, with each party having unrealistic expectations one to the other and often leading to mutual distrust and blame. This phenomena is clearly stated in (Zuhud, 2007), lack of community engagement in conservation behavior from communities and management of MBNP are due to: (i) lack of understanding of bio-ecology of bio-diversity that needed human intervention, for example spreading of kedawung in nature, (ii) unclear ownership and legal basis for land uses right which lead to minimal investment and gain or benefit, and (iii) minimal religious and socio-cultural spirit as a stimulus for conservation behaviour and action. These three-lacks, based on the so called “three Underlying Stimulus for Conservation” or *tri-stimulus amar konservasi*. Aliadi (2010) also stressed the need for legal basis as an instrument to increase securities for conservation activities in rehabilitation zone.

In this review, four schemes had been selected to be assessed for lesson learned in conserving forests. These four schemes are as follows:

4.1. National Park' Community Rehabilitation Program

4.1.1. Design

As the population increased, the forest degradation in MBNP was also increased as a result of high intensity of forest encroachment (MoF DGLRSF, 2003) and this condition hit the highest point in 1997/1998 during the reform era where some areas of Meru Betiri National Park had been logged illegally in a large scale (MoF DGLRSF, 2004; Subagiadi, 2008). The chaos situation was misused by irresponsible people that large number of trees in the National Park, especially teak trees, were being cut down and followed by land occupation (MoF DGLRSF, 2004). This unlawful cutting had left 4 023 ha of land found to be uncovered, which then the management MBNP had allocated as the rehabilitation zone through the issuance of Director of Forest Protection and Nature Conservation decree No 185/Kpts/DJ-V/1999 (MoF DGLRSF, 2004; MoF DGLRSF, 2003).

Responding to the bare forest areas left, MBNP Office conducted a program called Community Rehabilitation Program. In general, the program aims to recover and return the destroyed ecosystem so that its function can be restore and managed properly based on its roles as a supporting buffer life system. While the community involvement in buffer area aims to increase their livelihoods' level (Subagiadi, 2008). The objectives of rehabilitation program specifically are: (i) To rehabilitate damaged area of MBNP through community involvement, (ii) To reduce community dependence on forest resources inside MBNP, (iii) To empower community around MBNP through partnership formation, (iv) To raise communities' awareness and sense of belonging of MBNP, (v) To engage related stakeholders in MBNP rehabilitation program, (vi) To improve level of income of communities in buffer zone area, and (vii) To carry out sustainable forest resource management and to balance MBNP ecosystem that can support community prosperity around the Park in accordance with MBNP Office vision.

The rehabilitation scheme initiated in year 2000, with lesson from a demonstration plot of 7 ha that was established in 1994. The communities name the rehabilitation land as *tetelan*. The involvement of local communities is organised through the setting up rehabilitation farmer groups (*Kelompok Tani Mitra Rehabilitasi – KMTR*). Those rehabilitation farmer groups were entitled to utilise the rehabilitation zone that had been damaged, but the land status is still

forest jurisdiction belong to the state and cannot be converted into personal proprietary or other status. This activity is also limited to farmers from surrounding villages in the buffer zone which having direct borders to MBNP. Farmers are granted land of about 0.25 hectare, and after five years need to be evaluated and regranted. However, in some cases, land right had been sold or re-granted to other farmers without punishment.

Within the program, farmers have the obligation to plant wood species that endemic to MBNP area combined with medicinal plants, or encourage to apply agroforestry systems. Seedling of this woody species were provided by MBNP and it is possible if farmers wanted to provide seedlings by themselves. Farmers have to maintain the security of the park and they have the responsibility to maintain the main trees as those trees belong to MBNP and are not allowed to be cut down. However, farmers are still allowed to harvest fruits of the main trees. Several fruit species planted as the main trees are durian (*Durio zibethinus*), candlenut (*Aleuriteus moluccana*), kedawung (*Parkia roxburghii*), jackfruit (*Artocarpus integra*), petai (*Parkia speciosa*), nephelium (*Nephelium lappaceum*), and sukun (*Artocarpus altilis*). Moreover, farmers are allowed to plant crops under woody species such as rice, corn, and peanuts. Several species which require direct sun shine or clean ground surface (eg. coffee, chocolate and tobacco) are not allowed to plant as these species susceptible to main trees' mutilation.

Communities involved with this scheme until 2005 is about 3556 households, consist of 108 *tetelan* farmers group from five villages with rehabilitated land ammounting to 2250 hectare. ***Tetelan*** can become a rehabilitation forest model with *agroforesty* system unique to Meru Betiri, i.e., agroforestry system with high diversity of medicinal plants. This system, however, need to be followed by developing agroindustry with household basis.

Medicinal plants that has been developed by local communities are many. No less than 16 medicinal species had long been cultivated and harvested, such as kedawung (*Parkia timoriana*), cabe jawa, kemiri (*Aleurites moluccana*), kluwek, joho lawe (*Vitex quinata*), pule pandak, kemukus, pule etc. Communities involves in rehabilitation land or ***tetelan*** could make a jungle forest, similar to that in *kebun*

repong that has been developed for 100 years by communities forest in Pesisir Krui, Lampung. Table 2 shows a number and variety of plant that has been cultivated from 1994 to 2005 in rehabilitation zone.

Table 5. Type of Main Tree in Tetelan (Land Rehabilitation)

No.	Types of Main Tree	Villages			
		Wonoasri		Andongrejo and Curahnongko	
		Total	%	Total	%
1.	Jackfruit (<i>Artocarpus integra</i>)	1,008	40.9	347	19.6
2.	Pete (<i>Parkia speciosa</i>)	546	22.2	475	26.9
3.	Mengkudu (<i>Morinda citrifolia</i>)	120	4.9	27	1.5
4.	Asam (<i>Tamarindus indica</i>)	73	3.0	168	9.5
5.	Kedawung (<i>Parkia timoriana</i>)	384	15.6	474	26.8
6.	Pinang (<i>Pinanga odorata</i>)	21	0.9	9	0.5
7.	Duwet (<i>Eugenia sp.</i>)	83	3.4	12	0.7
8.	Jambu mete (<i>Anacardium occidentale</i>)	11	0.4	11	0.6
9.	Guava water (<i>Eugenia cuminii</i>)	19	0.8	3	0.2
10.	Rambutan (<i>Nephelium sp.</i>)	7	0.3	-	-
11.	Mango (<i>Mangifera indica</i>)	61	2.5	75	4.2
12.	Candle nut (<i>Aleurites moluccana</i>)	43	1.7	31	1.8
13.	Kluwih (<i>Artocarpus communis</i>)	38	1.5	-	-
14.	Sirsak (<i>Annona muricata</i>)	7	0.3	5	0.3
15.	Melinjo (<i>Gnetum gnemon</i>)	2	0.1	12	0.7
16.	Durio (<i>Durio zibethinus</i>)	4	0.2	-	-
17.	Kepuh (<i>Sterculia foetida</i>)	6	0.2	23	1.3
18.	Trembesi (<i>Samanea saman</i>)	2	0.1	-	-
19.	Sukun (<i>Artocarpus altilis</i>)	3	0.1	5	0.3
20.	Jengkol (<i>Pithecellobium jiringa</i>)	2	0.1	11	0.6
21.	Bendo (<i>Grewia acuminata</i>)	19	0.8	-	-
22.	Knitu (<i>Chrysophyllum cainito</i>)	3	0.1	-	-
23.	Avocado (<i>Persea gratissima</i>)	1	-	4	0.2
24.	Pakem (<i>Pangium edule</i>)	-	-	52	2.9
25.	Joho Lawe (<i>Vitex quinata</i>)	-	-	15	0.8
26.	Aren (<i>Arenga pinata</i>)	-	-	8	0.5
27.	Kemuning (<i>Murraya paniculata</i>)	-	-	1	0.1
28.	Sintok (<i>Bridelia minutiflora</i>)	-	-	1	0.1
Total		2,463	100.0	1,769	100.0

Sumber : Purwaningsih (2006).

Within the program, farmers have the obligation to plant wood species that endemic to MBNP area combined with medicinal plants, or encourage to apply agroforestry systems. Seedling of this woody species were provided by MBNP and it is possible if farmers wanted to provide seedlings by themselves. Farmers have to maintain the security of the park and they have the responsibility to maintain the main trees as those trees belong to MBNP and are not allowed to be cut down. However, farmers are still allowed to harvest fruits of the main trees. Several fruit species planted as the main trees are durian (*Durio zibethinus*), candlenut (*Aleuriteus moluccana*), kedawung (*Parkia timoriana*), jackfruit (*Artocarpus integra*), petai (*Parkia speciosa*), nephelium (*Nephelium lappaceum*), and sukun (*Artocarpus altilis*). Moreover, farmers are allowed to plant crops under woody species such as rice, corn, and peanuts. Several species which require direct sun shine or clean ground surface (eg. coffee, chocolate and tobacco) are not allowed to plant as these species susceptible to main trees' mutilation.



Figure 5. (A) Rehabilitation land at MBNP which had been grown timber plants at *Curahnongko* Village (left hand side); (B) Rice yield from a rehabilitation land.

4.1.2. Impact

In general, the rehabilitation program has contributed to reforest bare areas in the park. In general the impact of this scheme are as follow: (i) to some extent restore function of land as a buffer and protected area for the core zone, (ii) involve of local people in conservation activities in rehabilitation zone, (iii) enhance self motivation to protect the park for some farmers, and (iv) increase income for forest communities amounting to about 16.8 per cent (Subaktini, 2006).

4.1.3. Factors Influencing the Success and Failure of the Scheme

The success and failure of this program has been evaluated widely (cf., Amzu, 2007; Subaktini, 2003, Puspita, 2006). Some factors influencing the success are as follows: (i) limited land ownership and access to land, hence this program is seen as an option to have legal access to utilize land within MBNP, to (ii) limited employment opportunity in the surrounding area, and (iii) limited access to have a better job due to low skill and formal education level. Most of the communities (60.1%) is educated only in primary school, only less than one per cen (0.9%) graduated from University (Subaktini, 2006).

The success of communities based conservation with secure land tenure had been found elsewhere, for example **parak** in West Sumatera, **pelak** in Kerinci, Jambi, **tembawang** in West Kalimantan, **talun** in West Java, and **repong** in Pesisir Krui, Lampung. Each with their uniqueness and characteristics as described by Foresta, Kusworo, Michon dan Djatmiko, (2000). Therefore, evaluation to make **tetelan** become a starting point for communities based conservation need to be undertaken. This evaluation includes: (i) undertake tree cutting for kedawung, with minimal plant between tree of 30 m, otherwise it will lead to failure of ex situ conservation (Amzu, 2010), (ii) undertake domestication and cultivation of other medicinal plant that has economic potential such as candle nut (*Aleurites moluccana*), pakem (*Pangium edule*), kemukus (*Piper cubeba*), joho lawe (*Terminalia balerica*), joho keling (*Vitex quinata*), kapulaga (*Amomum cardonomum*), cabe jawa (*Piper retrofractum*), serawu (*Piper canimum*), bendoh (*Entada phaseoloides*), kulit batang pule (*Alstonia scholaris*), arjasa (*Agenandra javanica*), suren (*Toona sureni*), kayu selasih, aren (*Arenga pinnata*) dan pinang (*Areca catechu*), serta berbagai jenis bambu dan lain-lain, (iii) undertake

domestication and cultivation some species associated with kedawung in their natural habitat, (iv) undertake domestication and cultivation of housing material, *furniture*, boat material, aromatic species, etc. Commercial plant that often illegally taken from the MBNP, include kayu garu (*Chicoheton divergen*), kayu kembang rekisi (*Michelia velutina*), kayu selasih (*Cinnamomum porrectum*), kayu pacar gunung (*Cassine glauca*), kayu bindung (*Tetrameles nudiflora*), kayu suren (*Toona sureni*), kayu sapen (*Pometia tomentosa*), kayu kepuh (*Sterculia foetida*), kayu bendo (*Artocarpus elasticus*), kayu takir (*Duabanga moluccana*), kayu putat (*Plachonella elasticus*) dan kayu bungur (*Lagerstroemia speciosa*).

While some factors had unexpected result such as unproductive tree although it has reached a mature age, unmarketed fruit product such as breadfruit and jackfruit during high season. These factors to some extent discourage community to maintain their rehabilitation land.

Therefore improve added value of product from *tetelan* are needed including: (i) development of household based agro-industry. By doing this, production of fruit during peak season from main tree can be managed through developing home industry for post harvesting product, processing and packaging product, marketing and promotion. Commodity that was abundant during peak season, and need to be managed for home based agro-industry include corn, variety of banana, petai, variety of jackfruit, honey, picung (kluwek) fruit, kedawung seed, mengkudu fruit, etc. (ii) established fair marketing partnership from *tetelan*. Based on research undertaken by Purwandari (2001), every year kedawung seed was sold out for herbal drink through broker. Kedawung seed is used by 10 herbal industri in Java to produce 51 variety of traditional medicine or herbal drink which would be exported worldwide. The two most herbal factories that used a lot of kedawung seed was Jamu Jago and Air Mancur.

How to build partnership between communities and industry is therefore needed to be facilitated. Public and private partnership should play role in building this linkage. By doing this, not only sustainable industry and employment opportunity, but also conservation of national park through *tetelan kedawung* undertaken by communities would be contribute to global enhancement of carbon stock.

Another issue in the implementation of rehabilitation program is the some clauses stated of the agreement which are considered by farmers to be unfair. It is written on the agreement that after 5 years MBNP will evaluate the project and based on the evaluation MBNP has the decision whether to extend the agreement or not. On the contrary, it is not explained if MBNP break the agreement. Moreover, MBNP has the authority to cancel agreement in two conditions (i) if the agreement holder death, (ii) if the MBNP needs the area back or whatever purpose. However, the agreement holders must return the land plots the national park without claiming any compensation (Nawir *et al.*,2007).

Currently, all the agreements had expired since 2008; though in reality ex-agreement holders are still cultivating the land plots. The national park seems to let the agreement status in unclear condition. It is unsurprisingly the fact some agreement holders have transferred their land plots and local community extend their lands beyond the allowed zone; made the national park hesitates and be cautious in updating the agreement. Therefore, land tenurial agreement through the issuance of a revised agreement would be significant and urgently needed.

4.2. Scheme of Family's Medicinal Plant (*Tanaman Obat Keluarga - TOGA*)

4.2.1. Design

Traditional medicines, locally known as "jamu," usually refers to traditionally processed dried whole plant or plant organ that are used for medicinal or health care purposes. Some plant species grow naturally, in home gardens, surrounding orchards, or in nearby forests. Most of the traditional medicinal plants utilised by different ethnic groups throughout Indonesia were formerly collected from the forest. As technology and markets developed, medicinal plants made increasing contributions to the economies of indigenous and other communities.

Jamu has been used for generations by forest communities throughout Indonesia, not only in Java. Such traditional use of medicinal plants is part of the cultural heritage of ethnic groups on other islands such as Sumatra, Kalimantan, Sulawesi, Maluku and Irian Jaya. Now a day, even in a modern area, some families prefer to use only traditional medication, as an alternative medicine, while others use it as a supplement to modern medication. Therefore, there is a trend of increasing trends

in using traditional medicines because of their price competitiveness and lower risks of side-effects.

Medicinal plant potential in MBNP is relatively high, about 200 species of medicinal plant from 77 family had been identified and described. Most of that plant is in form of tree, liana, epiphyte, parasite and shrub. This medicinal plant has long been used by communities for their family medicine. These plants include kemukus (*Piper cubeba*), cabe jawa (*Piper retrofractum*), kedawung (*Parkia roxburghii*), joho lawe (*Terminalia balerica*) and pakem (*Pangium edule*). Some of this medicinal plant are categorised as endanger such as pulepandak (*Rauwolfia serpentina* Benth.), joho (*Terminalia balerica* Roxb.), widoro upas (*Merremia mommosa*), jati belanda (*Guazuma tomentosa* Kunth.), gadung (*Dioscorea hispida* Denn.), pulasari (*Alyxia reinwardtii* Bl.), kemukus (*Piper cubeba* L.F.) dan patmosari (*Rafflesia zollingeriana* Kds.) (Jamil, Atmojo, and Firnandus, 2006).

Most of medicine used by communities surrounding the MBNP is still harvested from the forest without effort for cultivation and arrangement for their sustainability. Therefore, in 1992, Faculty of Forestry and Indonesian Tropical Institute (LATIN), facilitated the establishment of a consortium for sustainability used of tropical medicinal plant Indonesia. One of the activity is to create a Pilot Project for sustainability and used of medicinal plant in MBNP. Actually, TOGA activity is an initiative to develop activity of community rehabilitation program related to collection or inventory of efficacious medicinal plants.

The activity and type of assistance for medicinal plant sustainability can be seen in Table 6.

Table 6. Assistance for Medicinal Plant Development in Jember District

No	Year	Sub-District	Village	Types of Assistance
1.	2005	Tempurejo	Working group Toga Sari Hutani, Curahnongko	Three Herbal Permit Production
2.	2006	Tempurejo	Andongrejo and Curahnongko	Herbal Right

Source: MoF, DGFPNC, 2010

There are three Family's Medicinal groups which are based in three villages: Sumber Waras at Andongrejo village, Sari Hutani at Curahnongko village, and Enggal Waras at Sanenrejo village.

The major roles of family's medicinal plant can be summarised as follows:

- (i) to take the pressure off existing forest resources and improve distribution of labour;
- (ii) to increase income opportunity, and meet their expectation for family healing;
- (iii) to rehabilitate and enhance *tetelan*;
- (iv) to implement greenhouse gas (GHG) abatement activities;
- (v) to increase sustainability and improve soil fertility.

4.2.2. Impact

The impact of family's medicinal plant group is perceived by local communities involved as beneficial due to the availability of alternative medicine close to them and very competitive price. Since most of communities involved are women, many of them directly apply their medicinal herb to their children or relatives. Before the implementation of TOGA, some women assisted their husband to cultivate *tetelan*. But since some products of medicinal herb are marketable, they are not going into their husband land plots anymore as they feel more comfortable making medicinal herbs than working in *tetelan* land plots.

While some TOGA's members have the ability making herbal medicine from training and comparative studies to other herbal producers; some members have the ability making herbal medicine as traditional knowledge from their ancestors. The continuity of herbal medicine production means the pass down the knowledge from generation to generation. The establishment of permitted family medicinal herbal, however, is expensive in terms of labour and capital inputs, which may discourage their widespread adoption.

4.2.3. Factors Influencing Success and Failure

Factors influencing the success and failure of this scheme stemmed from production and marketing aspects. The productivity of medicinal plant includes

Some of the major features of the family's medicinal plant that could be adapted for park management are: (i) voluntary participation by all stakeholders in the management of the park, (ii) establishment of ground rules to set behavioral norms during discussion by group consensus, (iii) early determination of common goals by group consensus and staying focused on these goals, (iv) all decisions must be made by consensus, (v) emphasise needs rather than positions during discussions, (vi) develop management objectives and action which move towards the agreed goals, (vii) create a team to develop empowering trust and respect, (viii) monitor and measure progress about the resource and the process.

Perhaps one major advantage of family's medicinal plants that lends its application to parks management is that it promotes an atmosphere of open communication and listening than do strategies that seek to enforce decisions using legal and political means. This hopefully would reduce/eliminate unnecessary conflicts between park management and the local communities around the park.

4.3. Collaborative Forest Management System (*Pengelolaan Hutan Bersama Masyarakat - PHBM*)

4.3.1. Design

Collaborative Forest Management System (PHBM) is a forest management system which elaborate a State Own Forestry Enterprise (*Perhutani*) and communities around forest areas or stakeholders that having interest in order to reach sustainable roles and benefits of forests (CIRAD *et al.*, 2007). Moreover, the system aims to improve forest management to be flexible, participative, and accomodate communities' needs. In implementing PHBM, three aspects of sustainability i.e. economy, ecology and social; are considered proportionally and professionally. It is hoped that through the system, *Perhutani* able to play its role in improving forest communities' livelihoods as communities are allowed to cultivate selected *Perhutani's* forest areas. From ecology perspective, the program aims to replant the land after timber harvesting (if PHBM is carried out in production forest) and to rehabilitate and reclaim forest condition (if PHBM is carried out in protected forest) (KPH Jember, 2007). In terms of social aspects, PHBM is planned based on participatory process that involved stakeholders

around forest areas. Communities around forest who have being grouped into Forest Village community Forum (*Lembaga Masyarakat Desa Hutan* or LMDH) are allowed to participate within the system. The system can be implemented in and outside forest areas. Though, the system does not change forest status, role of forests and land status.

Collaborative Forest Management System enable farmers to cultivate crops under wood trees in *Perhutani* areas for the first two years after those being planted. The permit can be extended for another two years to plant crops (KPH Jember, 2007). While planting crops, farmers have the obligation to take care main wood trees. If PHBM is carried out in production forest, it is possible for farmers to receive benefit sharing from thinning and parts of forest products at the end of cutting cycle. However, if PHBM is carried out in protected forests, trees planted will never be harvested. Different with wood trees, farmers have to share some of their crops with *Perhutani* during harvesting time both if they cultivate land in production forest and protected forest. The percentage of benefit sharing of crop production is different on what inputs of planting activities provided by *Perhutani*.

There have been 49 LMDH in Jember District, located in 49 villages and 16 sub districts since the implementation of PHBM in 2002. The two locations of PHBM which located next to MBNP area are sub regency offices (*Resort Pemangkuan Hutan* or RPH) Babansilosanen and RPH Curahtakir. Two protected forest areas in the two RPH that had logged illegally especially during the reform era in 1998, are rehabilitate through PHBM system. PHBM activity within those locations are carried out through two LMDH: LMDH Mandiri Jaya and LMDH Mulyorejo Lestari (KPH Jember, 2009). Community leaders including religious leaders and traditional leaders were involved in the forming process of LMDH. The agreement between two LMDHs and *Perhutani* were made in 2006 and 2007 (KPH Jember, 2009).

Perhutani provides seedlings of multi purpose tree species (MPTS) such as *Durio zibethinus*, mango, and avocado. Selection of MPTs as the main trees aims to provide communities additional benefit from joining the system while they also binding up soil profil. Farmers in Curahtakir and Babansilosanen are planting coffee under main trees. Benefit sharing within PHBM would be different in the other parts of the forest area. Current agreement between

Perhutani with LMDHs around MBBP on benefit sharing arrangement of timber product allocates 75 percent for *Perhutani* and 25 percent for farmers if the system implemented in *Perhutani*'s areas classified as production forests. Farmers have the rights to benefit 100 percent from their cash crops; however they benefit 70 percent of the fruit products while 30 percent remaining going to *Perhutani*. On the contrary, there is no timber products produced if the program implemented in protected forests it aims to rehabilitate and conserve the existence of forest (pers.communication with Soegiharto Aris staff at KPH Jember).

4.3.2. Impact

Several bare land within *Perhutani* forest areas, especially protected forests at MBBP margin, have been rehabilitate through PHBM. From community perspective, they benefited from the system that landless farmers are now able to cultivate plots of land even though they do not have their own land. Misundersanding occured that in farmer perception they do not need to share coffeed planted under main trees with *Perhutani* if they implement PHBM in protected forests. In order to lengthen planting crop period some farmers try to fail the wood tree growth by grub up young plants. Moreover, in some plots of PHBM at Curahtakir, some farmers also try to fail the wood tree growth by grub up young plants and pick leaves of wood trees so that the sun is still able to shine coffee plantation below the wood trees. Actually, if farmers communicate their needs of more open space for coffee plantation, tree spacing of the main trees can be arrange wider to enable more sun shine. This unfavourable behaviour brings negative benefits to *Perhutani* that its forest areas which should be regrown are still in bare condition.

The benefit of PHBM perceived by local communities involved is income improvement as they attain additional income from crops planted under wood trees. Several crops planted are coffee, corn, rice, porang or known as konjac (*Amorphophallus oncophyllus*), *Jatropha curcas*, and tobacco (KPH Jember, 2007). However, marketing is still become one of problems during harvesting time as yield are produced in abundant as the prices going down. Although, there is a possibility to broad marketing scope as for porang there is still demand from Japan that has not being fulfilled.

The role of PHBM carried out around MBNP is important as two *Perhutani* areas of PHBM i.e. RPH Babansilosanen and RPH Curahtakir are border area of MBNP. Therefore, PHBM in two locations is a buffer for communities before they going into the National Park area.

4.3.3. Factors influencing the success and failure

Perhutani involves community leaders in the forming of *LMDH (Lembaga Masyarakat Desa Hutan)*— an institution under the structured of village, so that it is more easier to empower people as some villagers in this site is characterized as follower of their leader. Some weakness of the program can be explain as follows:

1. Lack of clear statement in the beginning of process to explain farmers that the program is not to legalize cultivating *Perhutani*'s forest land. Not only areas allocated for PHBM, farmers also cultivate protected forest that is still in good condition by opening the forest first.
2. Currently, there are some farmers who sell their contract of PHBM agreement to other people. Buyers of those contracts do not know that forest areas for *PHBM* cannot be converted their status into personal proprietary. This condition provoke land conflict as “buyer of the PHBM plots” demand their plots of land to be certified as “owned land”.
3. Communities still have not fully enjoy income from fruits they harvested as during harvesting time often they could not sell the fruits in normal price that the supply abundant. Because they do not have other options than sell their products in cheap prices as they do not have technology to process into products which can be stored for a longer time for example canning system of process the fruits into crackers.
4. There is a need of marketing strategy as in an extreme condition there is no demand for the products, for example farmers have planted *Jatropha curcas* but during the plants harvested no one want to buy the fruits.

4.4. Livestock Assistance Program

4.4.1. Design

Livestock assistance program was carried out in 1998-2000, initiated by MBNP Office. Three types of livestock given to local communities are chicken, goat and cow. Scrolling system is implemented in the program where a pair of livestock is given to a household to be raised. After the cattles produce children, the recipient households have to transfer the parents to other households to be raised and this happen several times.

The handover livestocks from MBNP Office to local was carried out in the village hall and was witnessed by the village leader. Every household who received the livestocks were agreed to transfer the livestocks after producing children; but, no written agreement.

4.4.2. Impact

In its implementation in the field, the program was not run as planned. Some parent cattles were reported dead, lost and some were sold by the holders. This occurred because the lack of monitoring activities and MBNP staff could not do anything further as there was no written agreement on what should be do if communities failed in raising livestock or if *force majeure* occured (e.g. lost). Also, there was lack of data recapitulation at MBNP Office as they do not have complete record on this activity.

4.4.3. Factors Influencing the Success and Failure

Some factors including involvement of village leader in handed over the livestock, and scrolling design would become a positive strategy were the scheme was monitored and documented well since the beginning. Again, clearly stated role and obligation, as well as violation again the scheme is compulsory for dealing with communities. This agreement need also to be well documented, if necessary by involving community and villages institutions.

4.5. Lessons Learned From the Schemes

It can be seen from Table 7, the difference of the schemes that has been implemented in the surrounding area of MBNP. There are three effort that contribute to the sustainability of the system, regardless of the productivity and distributional equity, i.e., reward from schemes, absence of threat for losing rights, and guardianship.

Reward from schemes. The perceived benefited from schemes by communities is highly regarded as main motivator for actively involved in the schemes. Incentives and disincentives systems hence need to be established clearly to mitigate violation again the agreement. These rewards need to be given to communities or group of household rather than individual household, it is therefore agreement among households need to be established or institutionalised.

Absence of threat for losing right. The threat for losing “property” need to be minimized, ownership of the “property” need to be clearly defined.

Guardianship. Avoiding negative effects through guardianship is crucial, followed by self documented and monitoring action. Local government role and private sectors need also to be clearly set.

Table 7. Summary Characteristics of the Schemes

No.	Items	Rehabilitation	Family's Medicinal Plant	PHBM	Livestocks
1.	Land Ownership	State land (MBNP)	State land and Home garden	State land (<i>Perhutani</i>)	Not applicable
2.	Participants	Household	Women	Communities Institutions	Household
3.	Facilitators	MBNP CSO	University and CSO	<i>Perhutani</i>	MBNP
4.	Benefit Sharing	Not applied	Not applied	Applied	Applied
5.	Contractual Agreement	Applied	Not applied	Applied	Unwritten
6.	Sustainability	Yes	Yes	Yes	No

V. CONCLUSION AND RECOMENDATION

- It is concluded that MBNP Official cannot work independently to empower its surrounding communities in order to improve their livelihood and economically independent. Since around the borders of MBNP there are plantation and *Perhutani* areas, thus, success of economic improvement activities in both types of areas would affect the sustainability of the national park.
- Regardless of the productivity and distributional equity of the schemes, the sustainability of the choosing scheme would likely depend on reward from schemes, absence of threat for losing rights, and guardianship.
- Designing good schemes requires clear understanding of land ownership, planting systems, and commodity involved accompanied by promoting community self regulation, self documentation, and self monitoring.
- Generate and disseminate of simple information for self educating in conservation, agroforestry system and processing agricultural products.

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