WORKING PAPER

Socio-economic considerations for land use planning

The case of Seram, Central Maluku

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CIFOR

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Cover photo by Yves Laumonier/CIRAD-CIFOR
Kali Salawai at Sawai village, North of Seram, Central Maluku District, June 2010.

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Abbreviations and acronyms

ADD	Anggaran Dana Desa, *Village Fund Allocation*
APL	Area penggunaan lain, *area for other use*
BKKBN	Badan Koordinasi Keluarga Berencana Nasional, *National Family Planning Coordination Board*
BPKH	Balai Pemantapan Kawasan Hutan, *Forest Area Gazettement Service*
BPS	Badan Pusat Statistik, *Indonesia Statistic agency*
CDP	Community Development Project, national program for people empowerment, a project managed by district governments to improve access and poverty alleviation
CITES	Convention on International Trade in Endangered Species
CoLUPSIA	Collaborative Land Use Planning and Sustainable Institutional Arrangements
FGD	Focus Group Discussions
HGU	Hak Guna Usaha, *Land cultivation rights*
HH	Household
HL	Hutan lindung, protection forest
HP	Hutan produksi, *production forest*
HPH	Hak Pengusahaan Hutan, *forest concession*
HPK	Hutan produksi konversi, *production forest for conversion*
HPT	Hutan produksi terbatas, *limited production forest*
IUCN	International Union for Conservation of Nature
LU	Land Use
MNP	Manusela National Park
NGO	Non Government Organization
NP	National park
NTFPs	Non timber forest product/s
NR	Natural resources
PERDA	Peraturan Daerah, *District Regulation*
PES	Payment for Ecosystem Services
PNPM	Program Nasional Pemberdayaan Masyarakat, *National Program Community Empowerment*
PRS	Pusat Rehabilitasi Satwa, *Wildlife Rehabilitation Center*

Acknowledgments

This paper is based on research done in 2010-2011 as part of the "Collaborative land use planning and sustainable institutional arrangements for strengthening land tenure, forest and community rights" project (CoLUPSIA). The research was funded by European Commission, the Center International for Research on Agronomy and Development (CIRAD), and the Center for International Forestry Research (CIFOR). The authors wish to acknowledge these institutions, Danan Prasetyo Hadi for providing maps and Tina Taufiqoh for helping with statistical analysis.

1. Introduction

As part of the CoLUPSIA project[1] an extensive socio-economic study was conducted on Seram Island, Central Maluku. Understanding the socio-economic conditions, the drivers for land use change and economic development, along with cultural and social characteristics is essential to ensuring land use decisions are made that optimise the benefits, resulting in positive economic, social and environmental outcomes.

The five pilot areas were chosen as areas that demonstrate different land use activities and bio-physical conditions. The socio-economic conditions and future challenges of these pilot areas have been assessed, with differences and similarities identified in this report. The five pilot areas are:

- Pilot 1: Villages in the northwest of central Seram Island (Sawai, Horale and Air Besar)
- Pilot 2: Villages in the north of Seram Island (Sariputih, Aketernate, Seti and Wailoping)
- Pilot 3: Villages in the south of Seram Island (Tehoru, Saunulu and Moso)
- Pilot 4: Villages in the southwest of central Seram Island and near the urban centre of Masohi (Sahulau, Waraka, Watludan, Amahai and Tamilouw)
- Pilot 5: Villages in the mountainous areas in the north of Seram Island (Roho, Kanikeh, Manusela and Kaloa).

Through the use of household, village, key interview surveys and focus group discussions, the CoLUPSIA socio-economic team researched the conditions facing communities and individual households across the five pilot areas. Identified from a random sampling approach, 566 households were surveyed from 19 villages,[2] or about 7.6% of the total number of households and 20% of total villages on Seram.

The socio-economic survey results aim to provide a thorough baseline understanding of the relationship between the communities on Seram and the natural resources – use and non-use, coupled with needs for economic development. The resulting challenges and opportunities are thus identified. Information will be used in the development of collaborative land use planning tools and processes, and where possible in the development of Payment for Ecosystem Service (PES) options. More detailed analysis of the survey findings for each pilot area is presented in separate pilot reports in Annexes to this report.

1 A research action project on collaborative land use planning.

2 The methodology used and copies of the survey forms are contained in the Practical guide for socio-economic livelihood, land tenure and rights surveys for use in collaborative ecosystem-based land use planning, available at http://cifor.org/online-library/browse/view-publication/publication/4030.html.

2. Introducing Seram Island

This section aims to provide an introduction to the understanding of the social and economic dynamics of Seram in relation to the use and dependency of natural resources, giving an overview at both the district and pilot level.

2.1 Demographic overview of Seram District

The Central Maluku district on Seram consists of ten sub-districts and 108 villages. In terms of population, Central Maluku has a total population of 434,113 people, with approximately 175,500 people living on Seram[3], and a population density of about 15.2 inhabitants/km^2. The population across the pilot areas is relatively young and expected to grow in forthcoming years. Ninety three percent of the population is of productive or working age (15 to 64 years[4]).

Seram is religiously divided between Moslem and Christian communities. This has been a causative factor and a justification for conflict in the past. From 1999, violent encounters across the Maluku province have resulted in thousands of deaths and the displacement of tens of thousands of people. The Malino II Accord[5] agreement has gone some way to moderating the situation bringing relative stability to Seram, however, the legacy of the conflict is present across the region in towns such as Masohi which remain informally divided into de facto Christian and Moslem sections.

While the majority of the population has access to basic education, results show that 8% of those in the study area do not hold any kind of formal education certificate. The number of higher level qualifications achieved decreases sharply with the level of education, with only 3% of the population graduating from higher education (see Figure 1). Employment is diverse in the district involving 54.4% of the total

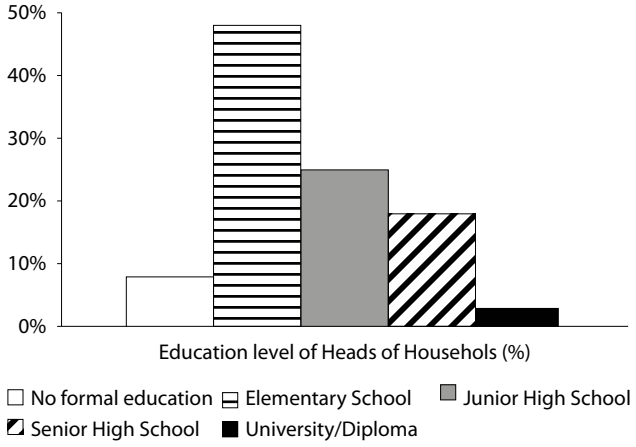


Figure 1. Levels of education of Heads of Households attained across the study area

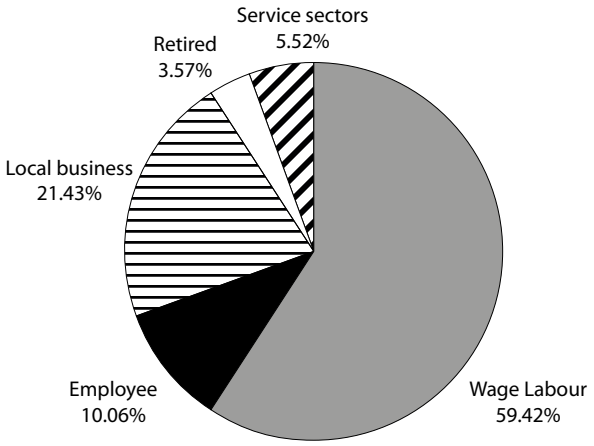


Figure 2. Household percentage representation of those in employment (308 HH) in the study area

* Note = Percentage from 308 HH (total HH=566)

population (Figure 2). Approximately 20% of wage labour is in the agricultural sector followed by trade (local business), employees and service sectors at roughly 21.43%, 10.06% and 5.52% respectively.

2.2 Environmental and land use overview of Seram District

Seram Island is the largest and main island of the Maluku province and has three administrative districts (Central Maluku, West Seram and East

3 Source BKKBN, 2010.

4 Source BPS, Anonym 2009 (http://www.scribd.com/doc/57658241/8/B-Tinjauan-Umum-Tentang-Usia-Produktif).

5 The Malino II Accord was signed on 13 February 2002 as a settlement between warring parties in the Maluku sectarian conflict that commenced in 1999 in the Maluku Islands.

Map 1. Manusela National Park on Seram Island

Seram). The island covers an area of 18,625 km^2 (Central Maluku covers 7,700 km^2) and is traversed by a central mountain range, the highest point of which, Mount Binaya, culminating at 3000 m. Seram is "one of the most tectonically complex areas on Earth" as a result of its position at the junction of several tectonic microplates.[6]

Seram Island is renowned for its rich biodiversity. There are 117 species of bird on the island, 14 of which are endemic including the Eclectus Parrot, Purple-naped Lory, Salmon-crested Cockatoo, Lazuli Kingfisher, Sacred Kingfisher, Grey-necked Friarbird and Moluccan King Parrot. The mammals found on Seram include Asian species (*Murid rodents*) as well as Australasian marsupials.[7] The mountainous areas of Seram support the greatest number of endemic mammals of any island in the region. It harbours 38 mammal species and includes nine species that are endemic or near endemic, several of which are limited to mountainous habitats. These include the Seram Bandicoot, Moluccan Flying Fox, Seram Flying Fox, Manusela Mosiac-talied Rat, Spiny Ceram Rat and the Ceram Rat, all considered threatened.[8] Saltwater crocodiles exist within some of the island's rivers, including the Salawai River.

Manusela National Park (MNP), in the centre of Seram (see Map 1), was designated by the Minister of Forestry in 1997.[9] It covers an area of 1,890 km^2 or 189,000 ha (10% of the island).[10] With the designation of MNP, commitments were made to conserve its natural resources, but the challenge is to ensure that this can be done while creating economic development that ensures poverty alleviation and supports the needs of the local population.

The dynamics between people and landscape have been long established on Seram. However, economic development has introduced changes and brought new pressures which have influenced these interactions and have far-reaching impacts for both

6 Cooper, Ian. "Seram Geology". Archived from the original on January 6, 2002.

7 BirdLife International: Saving Asia's threatened birds, 2003, retrieved 19 May 2010 (www.dephut.go.id/.../manusela_NP.htm).

8 "Seram rain forests". Terrestrial Ecoregions. World Wildlife Fund. (http://worldwildlife.org/ecoregions/aa0118. Retrieved 19 May 2010).

9 SK.No.281/Kpts-VI/97.

10 Source: www.dephut.go.id/.../manusela_NP.htm.

people and the island. These often delicate conditions and interactions have implications for the present and future viability of livelihoods (individuals, communities and the private sector) and the sustainability of natural resources.

Oil palm plantations have expanded in recent years across parts of Indonesia such as Sumatra and Kalimantan, and since 2008 are slowly being established on Seram, particularly along the north coast, with 9,000 ha of land currently under development. In addition, crude oil extraction is being developed in North Seram. The potential impact of the growth of oil palm plantations, oil extraction and agricultural commodities (e.g. subsistence, cocoa, coconuts and spices) remains unclear and could present a major challenge for the district. The need to mitigate the impacts of economic development and population growth, whilst maintaining ecosystem services including those of MNP, are challenges the district must face.

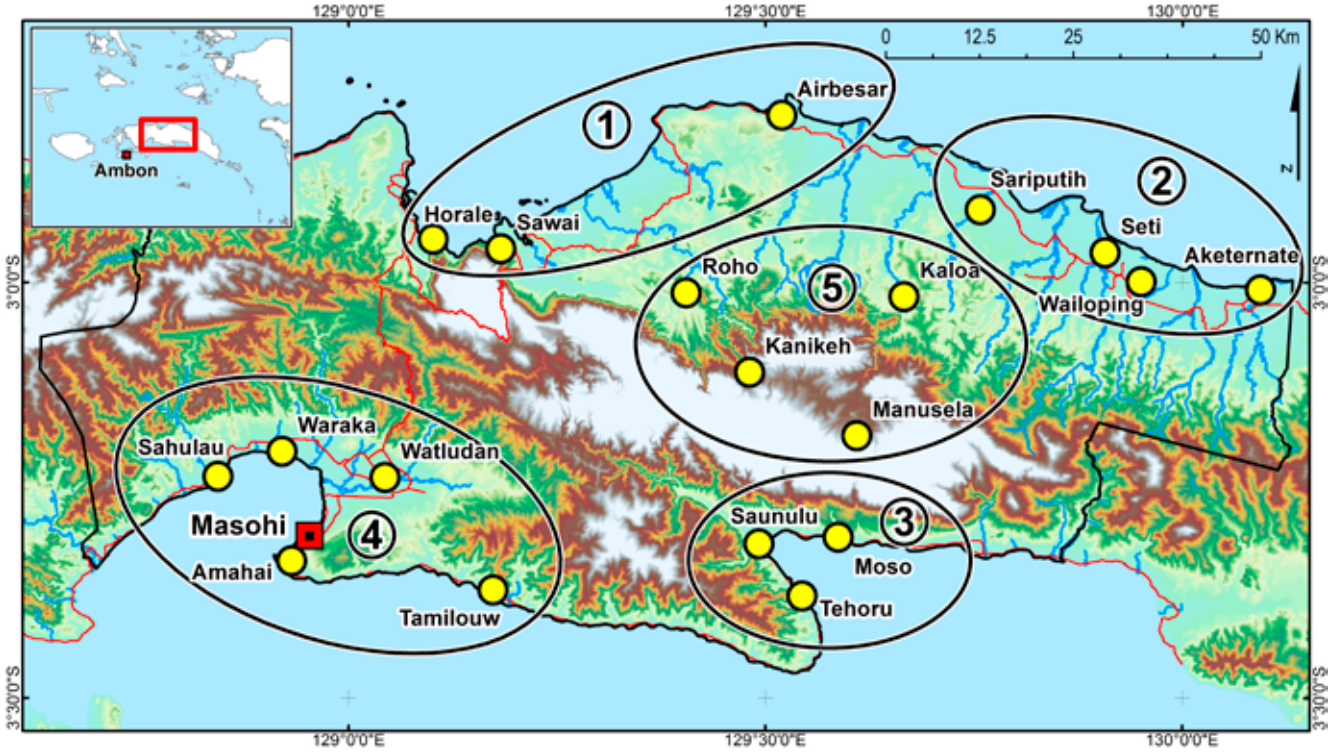
The need to address the balance of these issues is recognized through the implementation of collaborative land use planning. A collaborative approach is a mechanism that facilitates the planning and management of land use to benefit all parties, while seeking to ensure that environmental and social functions are maintained or enhanced.

3. Introducing the pilot areas

Across all five pilot areas the local communities must try to balance subsistence and resource needs with economic development through income generating activities such as the production of oil palm and cocoa. The growing population in all five pilots will continue to assert further demands on natural resources, which will increase the pressure on the limited land available for these same local communities. Land availability, or a lack of, and the issues of ownership and access are critical issues for all pilots on Seram. However, the five pilot areas do present varying bio-physical traits that are reflected in the socio-economic activities.

Pilot 1 is located in the north west of central Seram Island (Map 2). The three coastal villages sampled in this area, Horale, Sawai and Airbesar, were established before the 1800s and are traditional villages that still apply traditional rules particularly in relation to governance and institutional norms. Sanctions are given to those who ignore the rules. The main livelihoods are in agriculture. A traditional farming system is used in the utilization of land for crops. Farming activities are usually undertaken on inherited land and managed by the clan. The land in each village is divided into village land (*petuanan desa*), which all inhabitants have the right to use, and customary or clan land (*petuanan marga*), which is managed by each clan. Problems with land allocation and boundaries, as well as the embargo on the collection of forest products within MNP, have created conflicts between the Pilot 1 communities and MNP, as well as with their neighbouring villages.

In the Pilot 2 area, located in the northeast of central Seram, there were four villages sampled. Aketernate and Seti are traditional villages while Wailoping and Sariputih are transmigration villages where the majority of the population are from Java. All land in Wailoping traditionally belonged to Seti, but it was officially allocated to Wailoping in 1982 for the transmigration program. Seti has the lowest population density on Seram (0.1 inhabitants/km^2). Its inhabitants are mostly local migrants from elsewhere on Seram.



Map 2. Five pilot areas and the study villages on Seram Island, Central Maluku

Most of the land in this pilot area is used for seasonal crops (rice paddy and vegetables), perennial crops (e.g. coconut/*Cocos nucifera*, cocoa/*Theobroma cacao* and clove/*Syzygium* sp.), fruit trees, oil palm plantations (PT. Nusa Ina) and oil drilling (PT. Citic Seram Energy Ltd). The major commodities are coconuts and cocoa in Seti and Aketernate and paddy rice in Wailoping and Sariputih. Aside from agricultural crops, other sources of income include employment, timber and non-timber forest products (NTFPs). Since 2008 oil palm has begun to be established in the pilot area. Some communities are supporting the development, with the prospect of employment opportunities, while others are less receptive. This has in some cases been a source of conflict between villages over land use and access.

In the Pilot 3 area, located in the south of central Seram, three villages were chosen: Tehoru, Saunulu, and Moso. Across all the pilot areas (a total of 19 villages), Tehoru has the highest population density, 2.2 inhabitants/km^2. These three villages were established in the early 20th century and traditional rules are still applied in managing their land.

Within the villages a considerable amount of land has been officially allocated for MNP and the watershed protection (Yalanakabata). The park and protected areas overlap traditional land. This overlap has been a cause of friction. Reduced access to forest and land for agriculture has resulted in communities seeking alternative sources of income and in some cases economic hardship. The main livelihoods are agriculture and fisheries but employment and forest resources also contribute to the household income. The conflict in the Moluccas led to severe damage to Saunulu[11] in 2002. Refugees are slowly returning, but recovery is still taking place.

Pilot 4 is located in the southwest of central Seram where there are three villages: Sahulau, Waraka and Watludan, and in the south of Seram where there are two villages: Amahai and Tamilouw. The villages are relatively urban in nature due to their closer proximity the district capital, Masohi, compared with other pilot areas. The communities have been influenced by the capital in terms of livelihood options such as wage labour. However, traditional rules and knowledge are applied in all villages and many households are still dependent on the forest, but work as fishermen (with relatively little income generation) and farmers (mostly coconut and cocoa). Income is generated primarily from wage employment, fisheries, agriculture and the forest (timber and non timber forest products, NTFPs). Most of the villages (except Amahai) are highly dependent on the forest, in spite of being located close to Masohi. Among the most critical problems in this area is the issue of forest concessions for a cocoa plantation and logging activities which overlap traditional community lands. These pressures are exacerbated by an increase in population growth. Access to forest resources is currently reduced and timber harvesting is considered illegal. This has been a source of conflict in the region and currently no fair resolution for local communities exists. In addition, Watludan, the transmigration village, floods annually and so far solutions to ease the flooding have not worked.

Pilot 5 is located in the mountainous area around MNP where four villages were sampled: Roho, Kanikeh, Manusela and Kaloa. The village boundaries are in close proximity to MNP and this has resulted in constraints for the communities in terms of maintaining their traditional land management practices due to restrictions put in place when the park was established in 1997. Collecting timber and NTFPs is now forbidden and sanctions are given to those who ignore this rule. As a result local livelihoods have changed focusing more on agriculture (mainly coconut and cocoa), although their agricultural land remains limited and cannot be expanded due to the park boundaries. The forest is also a significant source of livelihoods for communities in this area, especially income and subsistence from NTFPs, hunting animals and collecting forest products, where permitted. Lack of co-ordination and information sharing about alternative livelihood options have led to villagers feeling isolated. Access to markets and poor infrastructure is another problem. However, two villages (Roho and Kanikeh) have agricultural land (inherited) located in the coastal lowlands, allowing better access to schools and markets (for the sale of coconuts). Annual natural disasters (floods and landslides), and pests and disease have created problems for the communities in Manusela village. Another crucial problem is the land dispute between Roho and Kanikeh, which has been on-going since 2011. So far, the local authority has not provided any support to resolve the situation.

11 The old conflict of 1999 broke out again in 2011 and many Saunulu households moved to the north of Seram in 2002, only returning in 2006.

4. Household income across the pilot areas

Table 1. Mean household income from poorest to richest across five pilots (Rp/year)

	Total cash income (with employment)		Total subsistence income		Total household income	
	Mean	Valid N	Mean	Valid N	Mean	Valid N
Poorest 25 %	3,920,712	140	1,882,127	141	5,734,363	142
Second 25%	9,627,582	141	3,094,009	138	12,655,761	141
Third 25%	17,608,514	141	3,682,787	140	21,265,182	141
Richest 25%	48,604,372	142	5,978,552	139	54,456,616	142
Total	**20,019,521**	**564**	**3,654,054**	**558**	**23,551,187**	**566**

Note: Cash income includes income from agriculture, forest products, fish, animal husbandry and employment. Subsistence income or value has been estimated using market prices and production/consumption levels. Costs of production have not been subtracted so these figures represent gross income values for cash and subsistence. Subsistence is focused on production of agricultural commodities and some forest resources, harvested for own consumption.

There are variations in the distribution of household income across all pilot areas (see Table 1 and Figure 3). The survey results show that there are higher frequencies of the "poorest" (lower quartile) households located in Pilot 4 and 5, whilst Pilots 1, 2 and 3 exhibit more even distributions of income across the households. The "richest" (upper quartile) households represent the highest frequencies of households in Pilot 1 and 2, with Pilot 3 also having the majority of households in the top half of income levels. Mean household income has a range of approximately a factor of 10 across the pilot areas, from approximately Rp 5.7 million[12] for the lowest "poorest" quartile to Rp 54.4 million for the upper "richest" quartile.

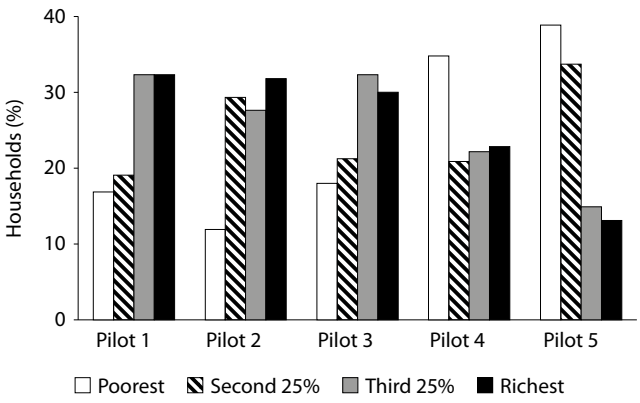


Figure 3. Percentage of poorest to richest households across five pilot areas

4.1 Sources of household income

Drawing on the findings from the pilot area analysis, this section assesses the relative importance of different economic activities in terms of the household income (cash and subsistence) and the resulting dependency on natural resources. It describes the variations in sources of income, as summarized in Table 2, in order to understand their relative importance to overall household income.

Table 2 and Figures 4 and 5 indicate that agriculture is important across all pilot areas for both subsistence and as a source of income. It is undertaken by the vast majority of households (>90%). This is also true of fishing, however, it is interesting to note that contrary to agriculture a far smaller proportion of households are engaged in this activity. For example significant cash income is generated from river fishing in Pilot 5, in excess of Rp 7.3 million, but by only one households in Roho. Other villages in Pilot 5 fish for subsistence. This is true for those villages on the coast, but not for those communities living in the land locked centre of Seram. Wage employment (from oil palm/*Elaeis* sp., cocoa, and rubber/*Hevea brasiliensis*) is important for the majority of households across the pilot areas (with the exception of Pilot 5) and represents a significant proportion of household income.

12 USD 1 = Rp 9,000

Table 2. Mean household income from different activities across five pilot areas (Rp/year)

Pilot Areas	Forest		Agriculture		Fishery		Husbandry		Employment		Total Household Income	
	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N	Mean	Valid N
Pilot 1	6,624,604	86	10,224,323	84	6,504,148	52	1,585,483	29	7,774,120	50	24,460,665	90
Pilot 2	4,508,245	115	16,019,340	112	2,355,154	26	3,321,778	63	10,426,851	67	27,347,661	120
Pilot 3	1,750,713	87	17,084,238	89	10,401,235	34	677,969	32	7,052,692	52	26,832,068	90
Pilot 4	8,259,184	136	8,658,905	134	12,703,850	30	1,178,238	40	10,810,714	98	25,141,582	150
Pilot 5	5,319,897	116	5,937,678	115	1,117,941	68	306,192	13	6,847,024	41	14,316,116	116
Total	**5,520,061**	**540**	**11,267,102**	**534**	**5,762,987**	**210**	**1,853,424**	**177**	**9,072,153**	**308**	**23,551,187**	**566**

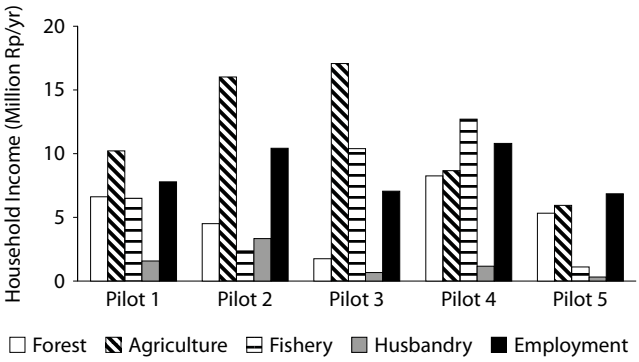


Figure 4. Mean household income from different activities across five pilot areas (Rp/year)

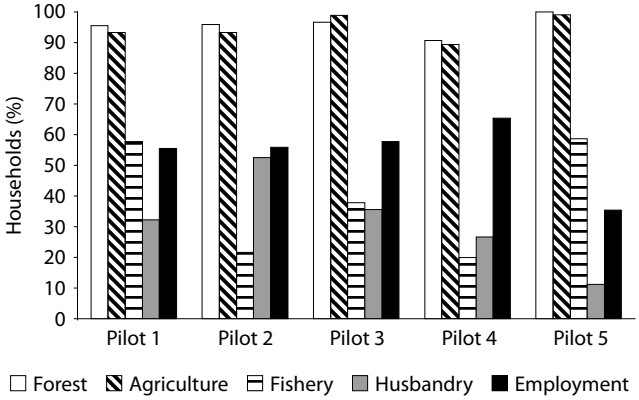


Figure 5. Percentage of households involved in different activities across five pilot areas

It is most prevalent in Pilot 4 where 65% of households earn income from wage employment; this could be attributed to greater market access and proximity to the district capital, Masohi. Total income from forests indicates perhaps the most variation across the pilot areas. Pilots 2 and 4 generate the majority of their cash income from forest activities, whilst revenue is comparatively low for the other pilot areas. Paradoxically engagement in forest activities is highest in Pilots 1, 3 and 5, but generated household income from the forest is lowest. This suggests that for these areas forest activities are essential to livelihoods in terms of resources for subsistence (e.g. building materials, firewood and NTFPs) rather than as a source of cash income (prohibited under the rules of MNP), whilst it is evident that in Pilot 4 forest activities are undertaken by relatively few households in order to provide a source of cash income and are more commercial in nature.

4.2 Agriculture and fisheries

Perennial crops such as cloves, cocoa, coconuts and nutmeg are the main commercial agricultural commodities across all pilot areas (with the exception of Pilot 2). They provide a ready source of cash income (see Figure 6) and are often grown to supplement other crops such as cassava, fruits and rice. Pilot 2 is unique in that it generates the majority of its income from the sale of staple foods, particularly rice. This area has the largest rice fields in our study area (mostly the transmigration villages).

Income from fisheries represents an important source of cash income across the pilot areas. There seems to be variation in the use of fisheries for income and the use of fisheries for subsistence. For instance Pilot 5 has low income from fisheries, but a high level of household engagement suggesting that the catch is used for subsistence purposes. Whereas Pilot 4 has a larger ratio between income and household engagement suggesting that a small number of dedicated households set to profit from the activity, perhaps aided by closer proximity to urban centers where the produce can be sold easily. Pilot 5 on the other hand generates the lowest levels of income from agriculture and fisheries which could be attributed to its remoteness and conflict with MNP over resources.

Non staple foods such as fruit trees (banana, *durian*, *cempedak/Artocarpus* sp., *langsat*, *rambutan*, etc.), vegetables (long bean, spinach, green bean, chilli, etc.) represent only a moderate source of income across all pilot areas. However, these foods are cultivated by more than 60% of households throughout the pilot areas and are perhaps the most important for subsistence (Figure 7).

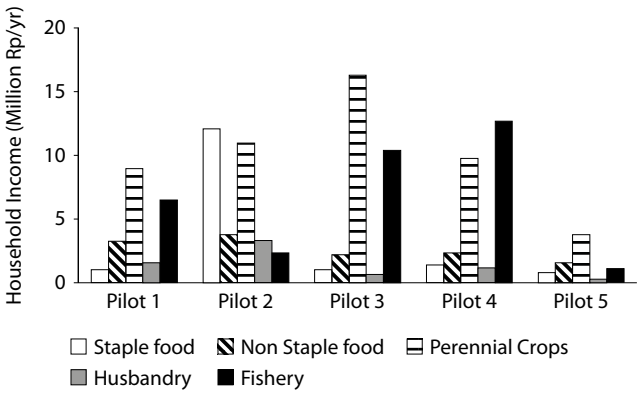


Figure 6. Mean household income from agriculture and fisheries (Rp/year)

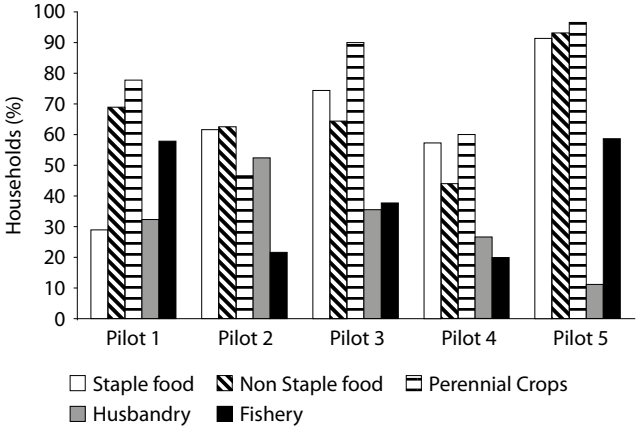


Figure 7. Percentage of households involved in agriculture and fisheries across five pilot areas

As Figure 7 indicates there is a consistently high level of engagement of all households in the various forms of agriculture indicating the central role that it plays in subsistence and livelihoods.

4.3 Oil palm, cocoa and rubber

Oil palm has been established in Pilot 2 since 2008, and to date is not yet established in the other pilot areas. As yet no direct land use compensation has been paid by PT Nusa Ina, but it has been agreed that in 2015 landowners will receive 30% of the profits, which will be in the margin of Rp 200,000/month/ha. This is set to increase to around Rp 1 million/month/ha in year 8. This figure was given by the company based on their experience in developing oil palm plantations in Central Sulawesi (2004). These involved community partnerships, for which the profit sharing was written into the agreement between the company and local communities (personal communication with a Nusa Ina member of staff).

The survey indicates that wage employment (oil palm, cocoa and rubber) is the dominant source of income in Pilots 2 and 4, which could be attributed to greater market access. The income from employment in oil palm plantations only contributes moderately to household income in the study area. For example, in Pilot 2, only 19 out of 308 households surveyed (and 6% of total income) currently derive income from wage labour on oil palm plantations. The income from oil palm is set to increase as the profit share is realized, but in the short to medium term, there is a need for communities to maintain diversified sources of income and livelihoods.

4.4 Forest resources and NTFPs

It is evident that forests are important for the local people on Seram for both income and subsistence. Figure 8 indicates the extent of income that is generated by households from forest resources, and this was seen as particularly pertinent in Pilots 1 and 4. Figure 9 shows the high levels of participation in forest activities especially for Pilots 1 and 5. However, Figure 9 elaborates on this further and indicates that all pilot areas are heavily reliant on the forests for fuelwood (>85% of households). Gathering fuelwood, although only contributing an average income of Rp 920,000 per year for households across all pilot areas, is an essential resource for subsistence (e.g. for cooking) and undertaken by the vast majority of households.

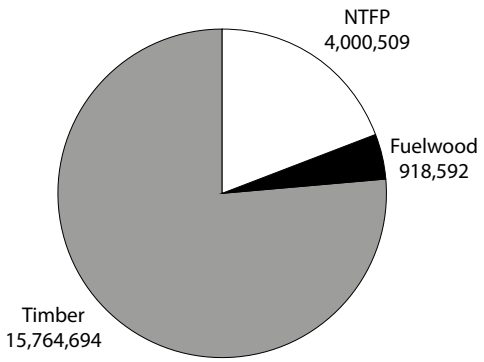


Figure 8. Relative proportion of household income generated from forest resources (Rp/year)

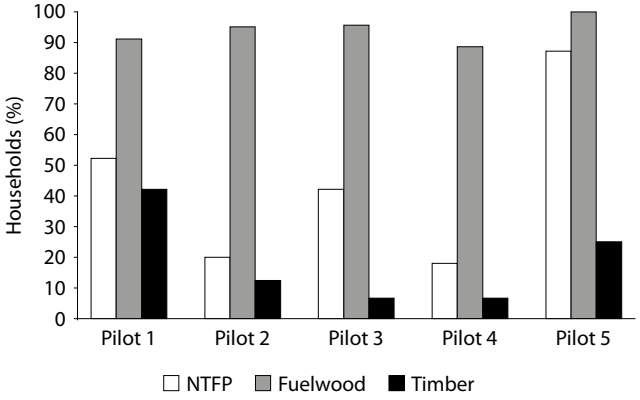


Figure 9. Percentage of households involved in forest activities

As indicated by Figures 8 and 9, NTFPs such as wild pig, rattan, clove, canary, sugar palm, honey, wild nutmeg and cuscus (possum), in terms of generating cash, have a limited economic role for the communities of Seram. However, as indicated by Figure 9 all pilot areas are engaged in NTFPs with particularly high dependence on these resources in Pilot 1 (52% of households) and Pilot 5 (87% of households) – as would be expected given their proximity to MNP and forest resources. Figure 9 clearly indicates that timber is the main forest resource for which cash income is generated, which is very important to Pilots 2 and 4 with access to markets.

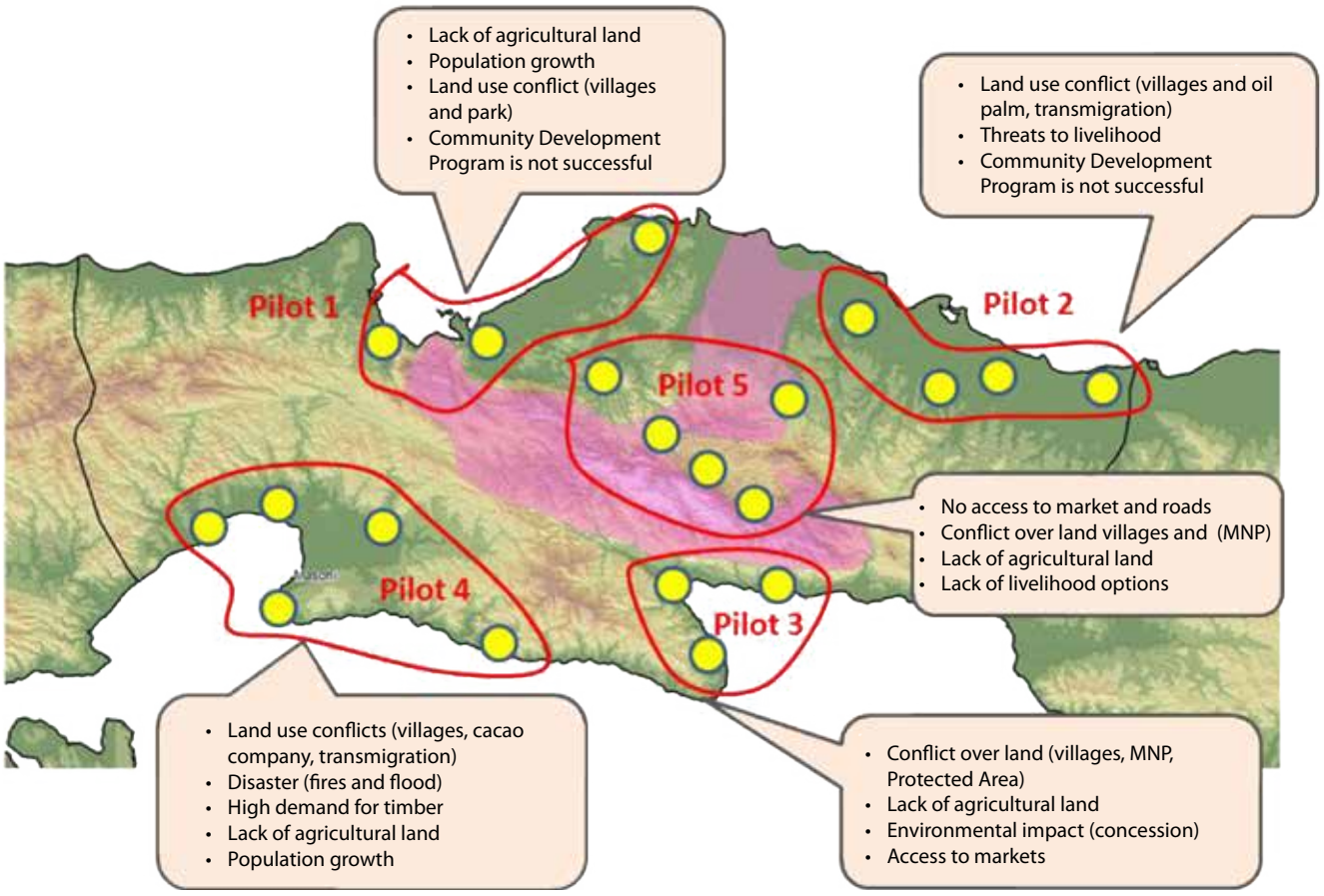
5. Critical issues impacting the Central Seram district

In all pilot areas in Central Maluku, Seram, the issues around land use, access to land and forest resources, ownership and boundaries, the need for economic development (and access to markets), and population growth are collectively putting pressure on the limited resources of Seram, and in some cases resulting in conflict between users. These critical issues are presented in Map 3 and further discussed below.

5.1 Land ownership, access and resulting conflict

In all pilot areas, issues pertaining to access to and use of, land were evident. Evidence of land conflict between villages, and between villages and MNP managers, is prevalent across all pilots. There are many cases of confusion over land ownership/tenure. For example, overlap exists in community land owned by individual clans (*petuanan*), individual villages and land owned by the State, and in some cases, land that has been allocated by the State to commercial activities such as oil palm plantations and oil drilling operations. This arises from both a lack of recognition by the State of community land and from unclear boundaries demarcating village land and State land. This is especially true of the boundary of the park which is, in many cases, unclear and potentially overlapping or in conflict with community land, as is the case of Pilots 1, 2, 3 and 5.

A lack of clarity on land ownership and boundaries has resulted in conflict. For example in the villages



Map 3. Key issues across all pilot areas

of Tehoru and Saunulu (Pilot 3), the boundaries of clan land have not been made official and this has resulted in clashes between neighbouring villages where land use conflict (or invasion) has resulted. Conflict over land ownership has occurred in some places, primarily when both parties did not have a letter of landownership or clarity of the boundary, as most of the land is based on traditional rights. Another example is in Moso, where conflict between clans occurred during the harvesting season when they collected the same commodities (such as nutmeg and clove) from the same land. Each clan insisted that the land belonged to them. Problems with land allocation and boundaries, as well as the embargo on the collection of forest products within MNP, have also created conflicts between the communities, in particular in Pilots 1 and 5, and MNP management. Historical community ownership of land has decreased, and reduced access to forest and land for agriculture has resulted in communities seeking alternative sources of income and in some cases economic hardship.

Any future development of land use plans, the allocation of land for economic development and potentially for payments for ecosystem services (PES) will need to take careful consideration of the existing issues pertaining to land ownership, access, use and boundaries.

5.2 Economic growth dependent upon access to markets and infrastructure

It is evident from the survey work that access to markets plays an important part in enabling economic growth and thus generating incomes for households. Pilot 5, situated inland and nearly surrounded by MNP has very limited infrastructure to enable villagers to access local markets. This has limited the opportunities for generating cash income from the sale of agricultural and forest resources and from gaining employment from other sectors. The households in this area are more dependent on agriculture and forest resources for subsistence than income. However, in other areas, in particular Pilot 4, proximity to markets and local towns results in increased income and economic opportunities. In other pilot areas the cost of access to markets is high, even when the infrastructure exists. In some areas, such as those in Pilot 3, access to market is predominantly by boat, as no road access exists.

The communities in Pilot 5 for example, are therefore pressing the district government to improve infrastructure and in particular the development of a road. While providing access to markets, education, health and other facilities, a road may also open up the area to economic development which could have significant negative impacts on MNP and the environmental services it provides, including flood mitigation (an existing problem for communities in Pilot 3).

5.3 Land and resource availability and population growth limits economic growth

In all pilot areas there is a high dependency on the natural resources (forest and land) for economic resources (cash and subsistence). Employment in Pilot areas 2 and 4 is significant, but this includes employment in oil palm plantations as well as government roles. As an island with a mountainous centre – a large proportion of which is designated as a national park – room for development and expansion of agricultural land, driven by population growth and the need for economic development, is severely limited. For example, in Pilot 1 available land to support a growing population and agricultural practices is limited due in part to the existence of MNP, neighbouring villages and physical limitations such as mountains and the sea.

Forest resources continue to play an important part in the provision of subsistence and in some cases for cash income. However, the need for economic development is putting pressure on the limited land available. There is increasing pressure on land-use from oil palm development and oil drilling practices in the north which needs to be carefully managed in conjunction with other land uses, needs of the population and ultimately the available land. Pilots 4 and 2 have already seen loss and degradation to the available resources, particularly in terms of forest resources. In many cases this has been due to natural disasters such as landslides (most likely due to deforestation).

There is therefore a need to consider the development of alternative economic options, including further support for high value crops (cloves and nutmeg) and potentially new commodities such as carbon credits that enable greater economic development from the limited land and resources available.

6. Concluding points and potential for PES

The dynamics between people and landscape are long established in Seram. However, economic development has introduced changes and brought new pressures which have influenced these interactions and are having far-reaching impacts on both people and place. These often delicate conditions and interactions have implications for now and the future for the viability of livelihoods (individuals, communities and the private sector) and the sustainability of natural resources.

This report explored the social and economic dynamics of Seram in relation to the use and dependency of natural resources. For Seram, a mountainous island, this presents a number of challenges when considering the options for economic development. There remains a high dependency on natural resources for both income and subsistence. Thus in order to ensure sustainable economic growth, sustainable use of the natural resources coupled with an understanding of the interdependencies is essential.

A number of critical issues have been identified including: an expanding population and the consequent pressure on the land; the potential development of oil palm plantations and other economic activities; limited infrastructure and resulting lack of access to markets. A lack of clarity on land ownership, boundaries and access remains a highly contentious issue across Seram, resulting in conflict in some cases. These critical issues represent factors that are driving change in the way that the land and natural resources are used, with the risk of potential environmental and social negative impacts to gain economic development. Critical issues should be given careful consideration in any land use planning process, ensuring that the potential socio-economic conditions and future impacts are duly considered.

Decisions to change land use to favour economic development may have the consequence of restricting the rights and access to resources of a particular social group. This is a particular risk on Seram where a lack of clarity of land ownership, access and boundaries of community and state land already exists. Collaborative land use planning is one tool that can ensure that social and economic implications of land decisions made are beneficial to all stakeholders.

6.1 Payments for ecosystem services (PES)

Where critical issues exist, there is a potential for a PES, in some exceptional circumstances, to be established. If correctly established with the appropriate benefit sharing mechanisms, PES may provide an additional source of revenue for the population of Central Seram, ensuring that the true economic value of the resources is recognized and financially realized. The need for change, recognition of the issue and willingness to pay for change, within a defined boundary, are all conditions for the establishment of a PES. The potential to establish PES will continue to be explored during the work of CoLUPSIA.

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Annex 1 – Pilot 1

Does proximity and overlapping of land use matter? The case of Sawai, Horale and Air Besar villages in the north of central Seram, Central Maluku

1 Introduction

Pilot 1 (see Figure 1) is located in the northwest (Sawai and Horale) and the north (Air Besar) of central Seram Island. This pilot area is adjacent to the Manusela National Park (MNP) with the boundary of the park running through Sawai village. Sawai and Air Besar are 4 – 5 hours by car from Masohi, the district capital of Central Maluku. To get to Horale it takes 2 hours by car from Masohi to Saka and then 30 minutes by boat to Horale. We conducted our survey of this area over a 15 day period in October 2010.

2 Objectives

In Pilot 1, the aim was to determine if MNP could provide a greater economic return to these communities, as well as other surrounding villages, than alternative land use options. We also considered the possibility of potential land use conflict with neighbouring villages and or MNP.

3 Methods

The study initially developed a wider-range survey on socio-economic factors influencing use patterns of natural resources at the district level. The project team worked with local universities and NGOs[1] to ensure socio-economic data were collected from village sites, in accordance with the objectives of the project. Based on the methods used for a socio-economic survey[2], 30 heads of households with an age range of 27 to 78 years, in 19 villages were randomly interviewed. Households were randomly selected using a systematic random sampling method. The project collected data through a household survey, FGD[3] and interviews with key informants.

The survey used two questionnaires: The first was used for key informants such as village heads and traditional leaders to obtain general information about their villages and issues related to forest management, history of conflicts and the local point of view on their natural resources. The second questionnaire was for household interviews to obtain information on demographics, economic activities and perceptions of tenure security and resource use. Household interviews included information about household wealth. Wealth is defined as the estimated cash value of capital assets of our household respondents.

Focus group discussions were conducted to discuss tenure issues among the villagers. The groups were selected based on gender, age and diverse ethnic composition. A guideline for FGD was prepared comprising topics on property rights, tenure security, forest management, conflicts/threats and community perceptions of their resources (see Liswanti et al.[2]).

Household scoring exercises were used to quantify the relative importance of the availability of forests. For this exercise the household was given one hundred counters (seeds, buttons, or matches). The project team then demonstrated three or more times how the counters could be distributed and what it implied, emphasizing quantitative relationships. The households were then asked to distribute their counters among the information cards and in proportion to their "importance" (for further information regarding this method please see Sheil *et al.* 2003[4]).

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1 NGOs = Non Government Organizations.

2 Liswanti N, Shantiko B, Fripp E, Mwangi E and Laumonier Y. 2012. *Practical Guide for Socio-economic Livelihood, Land Tenure and Rights Surveys for use in Collaborative Ecosystem-based Land Use Planning*. Bogor, Indonesia: CIFOR.

3 FGD = Focus Group Discussions.

4 Sheil D, Puri RK, Basuki I, van Heist M, Wan M, Liswanti N, Rukmiyati, Sardjono MAA, Samsoedin I, Sidiyasa K, et al. 2003. *Exploring biological diversity, environment and local people's perspectives in forest landscapes. Methods for a multidisciplinary landscape assessment*. Second edition. Bogor, Indonesia: CIFOR.

Map 1. Pilot 1 on the northwest and north of central Seram, Central Maluku

4 Results

4.1 Village description

The three traditional villages sampled for Pilot 1 apply customary law in managing and protecting their natural resources through norms and sanctions. The term norm refers to informal village rules or customary law. These villages were established before the 1800s, but Horale was situated in land before. Their main livelihoods are agriculture and fisheries. Traditional farming activities are usually undertaken on inherited land and managed by the clan. The land of each village is divided into village land (*petuanan desa*) and customary land which belongs to the clan (*petuanan marga*).

Table 1 provides a general overview of the study villages. All villagers speak the local language (Ambonese). Sawai has the highest population of the three villages and its continuing increase is putting pressure on the land. There is now little to no land available in Sawai. The village is surrounded by mountains and the settlement has expanded to houses on stilts over the water's edge. Household education varied: 7-10% of our respondents had no formal education, between 37-50% had only finished elementary school and 10% had a bachelor degree. The productive (working) age category of households in these villages ranged between 15-64 years.

Traditionally, each individual in a clan, who owns land for crops and gardens, should have a land certificate to help avoid internal conflict over land. Land ownership for crops and gardens varied between 2 - <3 ha. All villages apply traditional land use patterns with agroforestry systems and plant a mixture of crops including perennials together with three main commodities clove (*Eugenia aromatica*), coconut (*Cocos nucifera*) and cocoa (*Theobroma cacao*) (Table 1). The average size of land opened for crops (perennial and seasonal) of each household ranges from 1-2 ha.

4.2 Household assets

The household assets of these villages can be seen in Table 2. Here 'assets' includes four main items such as electric generator, electronics, transport (vehicles including boats) and tools. The highest value for

Table 1. General overview of the study villages

	Sawai	Horale	Air Besar
Village establishment	before 1800s	before 1800s	1800s
Land ownership	village, clan	village, clan	village, clan
Land areas per HH (mean)	2.52	2.6	2.02
Religion	Moslem, Christian	Christian	Christian
Total inhabitants (people)	4,517	527	828
Total HH	653	116	183
Original (HH)	568	102	160
Migrant (HH)	85	14	23
Hamlets (HH)	Olong (106), Rumaholat (100), Masihulan (81) and Oping (75).	Saka	No hamlet
Age of respondents (yrs)/mean	27-78 (48)	26-65 (46)	23-72 (42)
∑ person per HH/mean	2-13 (6)	2-9 (5)	3-10 (5)
Education level of heads of HH (%)	NE=10; ES=50; JS=23; SS=17; BSc=0	NE=7; ES=37; JS=36; SS=17; BSc=3	NE=7; ES=37; JS=26; SS=23; BSc=7
Ethnicity/origin	Arab, Ternate, Java, Sumatera, Geser, Pulau Haruku, Irian	Maluku Barat Daya, Saparua, TNS, Taniwel	Buton, Kei, Saparua, Tanimbar
Local language	Sawai	Wemale	Koa
Main commodities (Ha)	Cloves (±783), durian (*Durio zibethinus*) (±1000), coconut (±548).	Cloves (± 150), coconut (±200), cocoa (±100)	Cloves (± 35), coconut (±150), cocoa (±20)
Forest products	Rattan (*Calamus* sp.), sago (*Metroxylon sagu*), resin (*Agathis* sp.)	Rattan, timber, vegetables, game (pig/*Sus scrofa*, deer/*Cervus timorensis*, cuscus (*Phalanger maculatus*)), sago, resin (*Agathis* sp.)	Fuelwood, medicine, *mayang/sopi*[a]
Land ownership (agriculture)	Privately owned land (100%)	Privately owned land (100%)	Privately owned land (93%), land owned by others (7%)
Land certificate (house and crops)	No (83%), Yes (17%)	No (100%)	No (93%), Yes (7%)

a a local distilled drink from the fruit of Arenga pinnata

b Badan Koordinasi Keluarga Berencana Nasional (Indonesian population and family information network)

Source: direct interviews with key informants in 2010 and BKKBN[b] data in 2009/2010. Note: HH = Household, NE= No formal Education, ES=Elementary School, JS=Junior High School, SS=Senior High School, BSc=Bachelor Degree

household assets was found in Air Besar, where almost 60% of their income is used to purchase items for transportation, in Sawai 50% and Horale 40%. As these villages are accessible by road or sea, having a vehicle is very important for the community in this area. Electronics are also considered important, particularly in Horale (40%) and Air Besar (30%). In all villages the value of tools was less than electronic items although tools are important for their livelihoods.

4.3 Constraints and problems

During the field observations, some constraints and problems were found in the study villages related to land use (Table 3). The forest in Pilot 1 area was traditional land belonging to the clans, but the village leaders were not clear about the total area that belonged to them. Now, MNP overlaps part of their forest. Forest and land boundaries are unclear and contested. This has caused problems for the local communities and MNP (Table 3).

Table 2. Main household assets (Rp/year)[a]

Items	Sawai (x Rp 1000)		Horale (x Rp 1000)		Air besar (x Rp 1000)		Notes
	sum	mean	sum	mean	sum	mean	
Electricity	13,800	460	4,550	190	12,450	519	Diesel generator, solar power
Electronics	51,785	1,726	43,400	1,808	89,475	3,728	Satellite dish TV, DVD, VCD, speakers, computer, play station, radio and tape recorder, equalizer, camera, cell phone, refrigerator, water dispenser, washing machine, water pump
Transport	94,850	3,162	41,850	1,744	178,500	7,438	Motor bike, bicycle, motor boat (big engine), small boat (small engine) (*ketinting*), canoe, car/truck
Tools	18,047	602	19,180	799	25,625	1,068	Kerosene light (*petromak*), chainsaw, sewing machine, plough, hand tools, coconut grating machine, lawn mower,
Others	950	32	800	33	1,300	54	Crock (earthen ware pot - *tempayan*), jar (*guci*), rifle, plastic drum
Total	**179,432**	**5,981**	**109,780**	**4,574**	**307,350**	**12,806**	

a USD 1 = Rp 9,000

Source: Household survey in 2011

Table 3. Constraints and problems related to land use

Constraints and problems	Description	Sawai	Horale	Air Besar
Forest and land boundary	Unclear for majority	✓	✓	✓
	Clear for minority but not acceptable	✓	✓	✓
	Community land inside the park	✓	✓	✓
	Villagers do not know			✓
Land disagreements	Between villages	✓	✓	
	Within the village	✓		
Traditional activities	Land clearing for crops or gardens		✓	
Forest products	Timber extraction (outsiders)		✓	
	Bird trapping (villagers and outsiders)		✓	
Confiscation of equipment	Equipment for timber extraction	✓		
Natural disasters	Flood and landslides	✓		
Pests and diseases	Livestock disease	✓		
	Cocoa and banana pests	✓	✓	✓
	Pests from the forest		✓	

Disagreements over land between villages, except for Air Besar, are mostly to do with settlement and crop boundaries. Conflict has arisen, for example, between Horale and Saleman, Sawai and Saleman, and Sawai and Huaulu. The conflict over forest and land between Horale and Saleman has been the most critical. The conflict started when villagers from Saleman planted gold teak or *jati emas* (*Tectona grandis*) on land claimed by Horale during the national plantation program in 2006. So far the conflict has not been fully resolved.

There were also problems related to collecting forest products in Horale (Table 3). Many households

used to collect timber and NTFPs[5] for cash income from their traditional forests, but because MNP now overlaps their forest, they are no longer permitted to collect timber in these areas (now MNP). However, sometimes some villagers ignore this government regulation for financial reasons.

During the household interviews we collected information regarding household constraints and problems related to agriculture and forest (Table 4). Only 3% of households in each village believe that their land cannot be used for the next five years. The local perception of forest use is varied, but most households in Pilot 1 believe that their forest could be used for the next five years (Table 4). In the last five years, all villages faced difficult situations such as failed harvest and disasters that decreased their income. In 2008, 27% of the houses in Horale were burnt down by Saleman villagers as a result of a minor issue that escalated into a major conflict between the two villages (see Critical issues section for more information).

Due to many constraints now facing these villages, they are often forced into illegal activities for financial reasons (e.g. to buy food, pay school fees, etc).

Table 4. Summary of household perceptions of constraints and problems

Constraints and problems	Sawai	Horale	Air Besar
Land use (the next 5 years)			
- No	3%	3%	3%
- Do not know	7%	14%	7%
- Yes	90%	83%	90%
Use of forest (the next 5 years)			
- No	17%	0%	10%
- Do not know	3%	17%	10%
- Yes	80%	83%	80%
HH situation (the last 5 years)			
- Decreased income	36%	31%	37%
- Failed harvest	25%	26%	28%
- Disaster	33%	16%	25%
- House fire	3%	27%	3%
- Forest fire	3%	0	7%

5 Non Timber Forest Products.

Many households in Sawai and Horale and outsiders have collected Cockatoos (*Cacatua moluccensis*) in MNP (Table 3). This is an endemic species protected by law since 1989 (CITES[6]) and has been categorized as vulnerable under the IUCN[7] Red list. Official sanctions have been given by the park officers for illegal hunting.

4.4 Household income from different activities

Different activities such as agriculture, husbandry, fisheries, forest and employment are all sources of income for the communities in Pilot 1 (Figure 1).

Figure 1 shows that some fish (local names: *garopa*, *puri*, *gurame*, *butila*, *samandar*, *lema*, *bubara*, *sekuda*, *bolobo*) are important for the households in Pilot 1 and contribute the highest income for households: in Sawai Rp 11 million/year, Air Besar Rp 6.2 million/year and Horale Rp 2.6 million/year. But in Horale, many households are more dependent on agriculture with an income of Rp 14 million/year. In Sawai their income from agriculture amounts to Rp 9 million/year and Air Besar Rp 7 million/year.

The main agricultural products include perennial crops (clove, cocoa, coconut, sago, nutmeg (*Myristica fragans*) and canary nuts (*Canarium oleosum*)), fruit trees (durian (*Durio zibethinus*), banana (*Musa* sp.), *langsat* (*Lansium domesticum*), pineapple (*Ananas comosus*), *rambutan* (*Nephelium lappaceum*), *kuini* (*Mangifera* sp.), *salak* (*Salacca zalacca*), chinese lemon (*Citrus* sp.), *becang* (*Mangifera foetida*)),

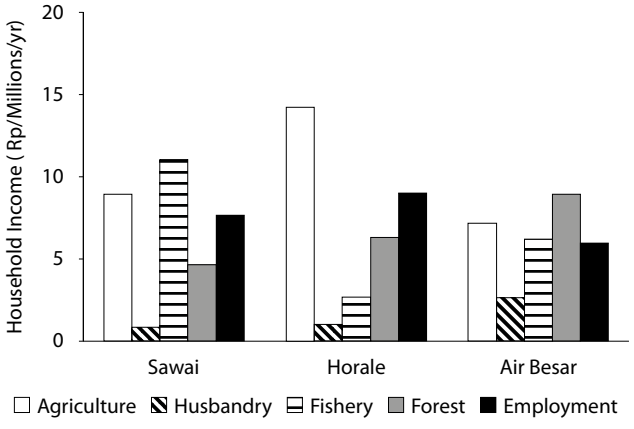


Figure 1. Average annual household income from different activities in Pilot 1 (Rp/year)

6 Convention on International Trade in Endangered Species.

7 International Union for Conservation of Nature.

*and v*egetables (spinach (*Amaranthus* sp.), long bean (*Vigna unguiculata*), mustard (*Brassica* sp.), cassava (*Manihot esculenta*) and sweet potatoes). Husbandry (cows, dogs and chickens) is considered subsistence for all villages, but sometimes it does provide an additional income such as in Air Besar (Rp 2.6 million/year). Forest products, however, contribute cash income particularly from timber (ironwood (*Intsia bijuga*), *lenggua* (*Pterocarpus indicus*), *gofasa* (*Vitex cofassus*), pulaka (*Octomeles moluccana*), *ketapang hutan* (*Terminalia gigantea*)) and NTFPs (rattan, resin, nutmeg, eaglewood (*Aquilaria moluccensis*), durian, deer, wild pig, and canary nuts). In addition, villagers in Pilot 1 collected sago for food and construction materials. For households in Air Besar this cash income can amount to Rp 9 million/year, in Horale Rp 6 million/year and Sawai Rp 4.6 million/year. Forests are also important for subsistence needs for such things as firewood. Employment can provide a monthly income for households: in Sawai Rp 7.6 million/year, Horale Rp 9 million/year, and Air Besar Rp 6 million/year. The types of employment in Pilot 1 include carpenters, sago process workers, drivers, chainsaw operators, traders, teachers, public officers, business men, pastors and security.

Gender was also considered in the different activities. Information was obtained from direct interviews with key informants. Men and women have different roles in agriculture, forest activities and paid employment. The men normally work on activities that generate cash income such as timber extraction, cash crops (land clearing) and wage employment (carpentry, etc.), while women are more involved in agricultural activities such as planting and harvesting.

Figure 2 shows that more than 90% of households in these villages are involved in agriculture and forest activities either for subsistence or livelihoods. All five activities play an important role in all households, with a minimum of 30% involved in any one activity.

In Table 5 and Figure 3, the results from the survey show that there are variations in the distribution of household income across villages. There is a higher frequency of the "poorest" (lower quartile) of households in Air Besar than Sawai, whilst there are no "poorest" households in Horale. The "richest" (upper quartile) of households represent the highest frequencies of households in Horale and Air Besar. The mean household income has a range of approximately Rp 5.3 million for the lowest

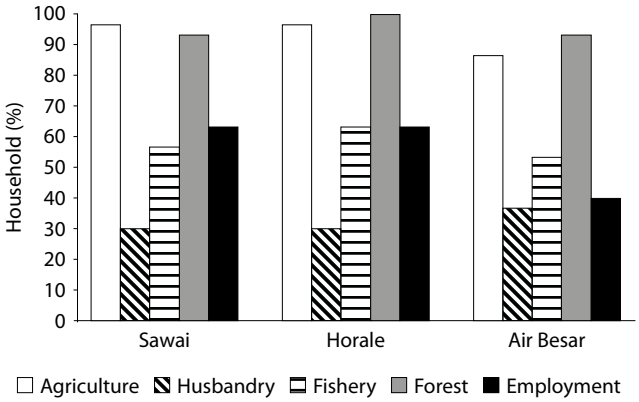


Figure 2. Percentage of households involved in different activities

Table 5. Mean household income from poorest to richest across villages (Rp/year)

Grouping of wealth	Mean household income		
	Sawai	Horale	Air Besar
Poorest	6,384,646	.	5,307,228
Second 25%	12,928,205	12,016,506	13,457,552
Third 25%	21,581,918	20,806,542	19,434,491
Richest	39,153,441	49,993,903	47,563,609

Note: Cash income includes income from agriculture, forest products, fish, husbandry, and wage labor. Subsistence income, or the value of, has been estimated using market prices and production/consumption levels. Costs of production have not been subtracted so these figures represent gross income values for cash and subsistence. Subsistence is focused on production of agricultural commodities and some forest resources, harvested for own consumption.

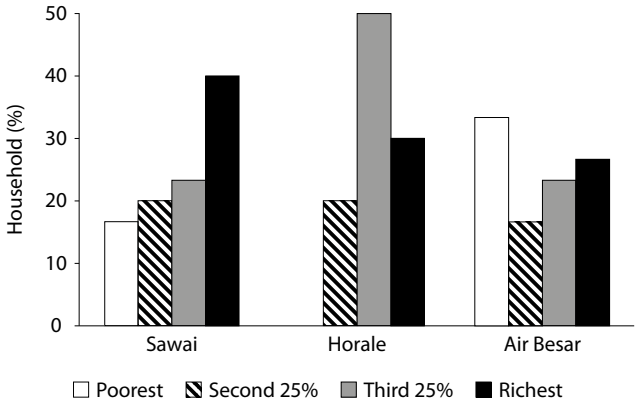


Figure 3. Percentage of poorest to richest households across villages

"poorest" quartile to Rp 50 million for the upper "richest" quartile in Horale.

Furthermore, following the source of income from agriculture and forest activities (see Figure 1), we summarized the mean household income from villages in Pilot 1 who engage in forest and agriculture activities (Table 6). More than 90% of households in all three villages collect forest products, and although Air Besar has the highest income from the forest, income from timber is higher in Horale (Rp 10 million/year) than Air Besar (Rp 9.6 million/year). The households in Air Besar also earn a higher income from NTFPs than the other two villages (Table 6).

Table 7 shows the list of forest products (timber and NTFPs) that contribute to household income in Pilot 1 where they value the forest both for cash and subsistence. At least 12-18 households have valued NTFPs as an important source of income.

In Air Besar they collect sugar palm, which is then fermented to produce *sopi*; canary nuts; sago and hunt wild pig. In Horale they hunt wild pig, cus-cus, and collect sago. In Sawai they hunt wild pig, deer and cassowary (*Casuarius* sp.) and collect agathis resin and eaglewood. Between 11 and 14 households also value timber trees such as ironwood, *gofasa*, *ketapang hutan* and *lenggua*, which contribute a higher income than other timber species (see Table 7).

Since the designation of MNP, the park management have officially banned the three communities from collecting timber and NTFPs in the park. But the park management has given certificates to 25 households in Masihulan (a hamlet of Sawai) to collect agathis resin from the park as a livelihood. However, all three villages still collect other forest products for cash to pay for education, transport, medicine and other daily needs. This is a challenge for the park; it needs to support these local communities with alternative sources of income other than from the forest.

4.5 Household scoring exercise

Using a simple scoring exercise we collected information related to the availability of forest and the perception the household has of forest over time (in the past, present and future). We asked respondents to quantify the relative importance of the availability of forest, whether the availability had increased, not changed or decreased. While for the perception of the availability of forest we asked them to score the value of forest in the past, at present and in the future.

The results from all households show that there has been a decrease in the availability of forest for Pilot 1 villages because the forest has been officially designated as a MNP. The villagers are no longer permitted to hunt or gather NTFPs except harvest produce from their gardens located inside the park (Table 8).

All respondents scored high for access to forest in the past than at present or likely to be in the future (Table 8). The forest was extensive and less utilized in the past. Most households collected forest products (NTFP) for subsistence and had only small gardens in the forest.

The present decrease in forest area is perceived as mostly due to land clearing for roads, increasing population and settlements, and the expansion of agricultural land. In the future, all villagers interviewed perceive that the forest will decrease due

Table 6. Mean household income from the forest and agriculture (Rp/year)

	Village	Sawai		Horale		Air besar	
		Mean	N	Mean	N	Mean	N
Forest	NTFPs	4,553,472	12	2,889,778	18	5,182,853	17
	Fuelwood	969,223	26	876,552	29	997,778	27
	Timber	3,872,308	13	10,159,091	11	9,664,286	14
	Total income from forest	**4,649,338**	**28**	**6,306,200**	**30**	**8,941,018**	**28**
Agriculture	Staple foods	989,332	7	745,000	4	1,160,184	15
	Non-staple foods	1,435,109	12	4,827,175	28	2,295,118	22
	Perennial crops	9,034,991	26	10,185,481	27	6,984,853	17
	Total income from agriculture	**8,932,980**	**29**	**14,246,514**	**29**	**7,178,379**	**26**

Table 7. Mean household income from timber and NTFPs (Rp/year)

Source of income	Pilot 1			Mean of HH/ year (Rp)
	Air besar Mean HH/year (Rp)	Horale Mean HH/year (Rp)	Sawai Mean HH/year (Rp)	
NTFPs				
Orchidaceae (orchid)		46,667		46,667
Arenga pinnata (sugar palm)	4,541,667			4,541,667
Arenga pinnata (*mayang/sopi*)	23,400,000			23,400,000
Wild pig	10,545,000	2,964,000	6,023,333	6,255,833
Clove	245,000			245,000
Agathis resin	80,000		1,458,571	1,286,250
Durian			666,667	666,667
Eaglewood			1,250,000	1,250,000
Cassowary (*Casuarius* sp.)			1,102,500	1,102,500
Canary nuts	3,000,000	400,000		1,050,000
Cuscus (possum)		2,566,250	60,000	2,287,778
Coconut oil		420,000		420,000
Wild nutmeg			262,500	262,500
Bambusa sp. (bamboo root)		118,667		118,667
Rattan	45,250	600,000	332,500	305,846
Deer	325,000		6,473,333	4,014,000
Sago	2,250,000	1,150,000		1,319,231
Others (medicinal & edible leaf)	2,500	72,000	240,000	193,250
Timber trees				
Calophyllum soualattri (*bintangur*)			120,000	120,000
Ironwood	11,670,000	6,638,889	2,975,000	6,843,548
Terminalia supitiana (*kayu burung*)	600,000			600,000
Gofasa	10,800,000	11,400,000		11,200,000
Kenari	375,000			375,000
Ketapang hutan		5,700,000		5,700,000
Lenggua	2,500,000	6,000,000	2,500,000	3,200,000
Pometia pinnata (*matoa*)		800,000	3,200,000	2,000,000
Pulaka	1,250,000	5,500,000	1,000,000	3,312,500
Anthocephalus macrophyllus (*samama*)	900,000		2,700,000	1,800,000
Pternandra caerulescens (*sirih*)	1,800,000			1,800,000
Palaquium njatoh (*nyatoh*)			120,000	120,000

to the increase in population, land clearing and land trading due to the unclear status of the forest.

4.6 Potential ecotourism

There are approximately 174 sites that are suitable for tourism in the Central Maluku district including

Table 8. The household perceptions of the availability and the importance of forest

		Sawai	Horale	Air Besar
The importance of forest	Past (%)	54	58	49
	Present (%)	30	29	34
	Future (%)	16	13	17
		100	**100**	**100**
The availability of forest	Increased (%)	30	18	50
	Not changed (%)	27	46	10
	Unknown (%)	3	0	3
	Decreased (%)	40	36	37
		100	**100**	**100**

Source: Household survey in 2010 and 2011

natural attractions (39), historical sites (66), marine (45), cultural tourism (19) and other ecotourism and tourism objects (8)[8]. Some of these places are located near Sawai village. Sawai has a number of potential ecotourism objects that could be developed such as marine ecotourism (snorkelling and diving), beautiful scenery, tree platforms (for bird watching), bat island, waterfalls and ocean caves. The south part of Sawai is adjacent to MNP and it has natural tourism areas with diverse flora and fauna. Various species of bird, butterfly, and orchid can be seen easily. Mangrove forests can also be found along the coast from Sawai toward Masihulan. This potential tourism is also supported by fairly good lodging facilities managed by the local people in Sawai.

In the Wildlife Rehabilitation Center (PRS[9]) area located in the Masihulan hamlet, there is a tree platform for bird watching. Wallacea (NGO), built PRS in 2004 with the aim to rehabilitate and to return birds to their habitat in MNP. The community in Masihulan has received benefits from PRS in the past, by collecting fruits and selling them to PRS for bird feeding. The income from PRS has helped to stop the community from hunting the birds. The community expected that the local government would pay more attention to PRS. Unfortunately, there has been very little response from the local government and MNP officers on this potential attraction.

8 Source: Tourism Agency of Central Maluku District in 2011.

9 Pusat Rehabilitasi Satwa.

Promotion of the bird watching tree platform has improved and the area has been successful in attracting domestic and foreign tourists and researchers. The cost of using the viewing platform ranges between Rp 1,200,000 (individual) and Rp 316,000 (per person for six people). This cost includes guide and safety monitors, six haulers, platform fee, and conservation fee. The conservation fee helps to maintain the PRS while the rest of the fee is divided among the villagers involved in this activity as guides, porters and bird feeders.

Our key informant (guesthouse owner – *losmen*) in Sawai mentioned that there were about 400 tourists (mostly from the Netherlands) per year on average that visit Sawai. Domestic tourists are more promising and more than 500 people on average visit the site annually. Between 1996 and 1999, the number of foreign tourists was more than 400 people from various countries such as Australia, New Zealand, Germany, England, United States and Netherlands. However, since the Ambon conflict in 1999 and Bali bombing in 2001, the numbers of tourists have decreased (no further information on numbers).

The park also employs villagers from Sawai and Masihulan to work as guides and porters for which they earn Rp 90,000 per day (personal communication with the park official). If MNP is damaged or reduced in size, it will have a negative impact on ecotourism.

The average travel cost per tourist is between Rp 100,000 to Rp 150,000 from Ambon City to Masohi by boat and Rp 1,000,000 to continue by car

Table 9 The cost of tour package in the Sawai area

Sea tour package	Cost (Rp/person/day)
Salawai River (sago processing)	300,000
Wai Sapalewa (beach)	500,000
Snorkeling	250,000
Bat watching	300,000
Mountain tour package	
Wai Toto (waterfall)	750,000
Api Lima Cave	200,000
Hatuputih Cave	200,000
Tree platform (bird watching)	130,000
Hatuku (hiking)	200,000
Manusela NP (trekking)	200,000

Source: direct interviews with key informants in 2010

to Sawai. The cost of the different tourism activities depends on the tourism object (Table 9). The tourism activities have considerable business potential for local tourist developers and local communities on the island.

The guides etc., for forest package tours are usually villagers from Masihulan due to their knowledge of the forest and the tourist objects. The sea tour packages are conducted by households who own boats and can act as local guides. Forest attractions tend to be more popular with visitors than those on the coast and they usually choose existing packages.

5 Critical issues

In Pilot 1 some important issues are more prevalent in Sawai and Horale than in Air Besar. Most of these issues are frequently concerned with limited land for settlement and agriculture, land ownership, population growth and conflicts over land use. In Air Besar salient issues tend to be more related to the lack of agricultural land. This is mostly due to MNP overlapping their traditional land. They also suffer from conflict over land use with Solea village (a neighbouring village). The latter are usually solved through customary regulations implemented by the two villages. In this report, we will give examples of the issues from Sawai and Horale villages that are more complex than those facing Air Besar.

Sawai village

The main problem for people in Sawai is related to access to land for settlement and agriculture. This village is located on the coast and has resorted to building houses on stilts over the water's edge. They have also built many new houses in the hamlet of Olong located on the island across from Sawai village and only accessible by boat.

The heads of two of the hamlets in Sawai (Masihulan and Rumaholat) claimed that they own most of the land in Sawai. They claim that the traditional land of the two hamlets was originally wider than Sawai, but it was not acknowledged by Sawai. Officially, Sawai was designated as a village by the local government. This has had an impact on the two hamlets because they have not received direct support from the local government. The local government's support under the village development program is given directly to Sawai. The head of the village in Sawai then distributes the government support to Sawai village and the hamlets. Priority is given to Sawai village. The hamlets of Rumaholat and Masihulan are eager to become independent villages because of this situation. Under the new village development program (*pemekaran*), Masihulan and Rumaholat forced the village head in Sawai to support their village status proposals. Unfortunately, their proposals were unsuccessful. Both hamlet leaders have talked to the local government on numerous occasions to try to push ahead their proposals. In July 2012 we (the research team) were informed that their proposals were in the district level parliament and they hoped to have the situation resolved by December 2012[10].

Problems related to land use have occurred in Sawai since MNP was established in 1996. The park overlaps traditional land belonging to the Sawai village. All communities around the park are not allowed to harvest timber nor NTFPs from inside the park or expand their gardens. This has resulted in people losing the right to conduct activities related to forest management. Officially, the village officer made a petition to MNP, and the MNP officer agreed to look into this issue, but there has not been any progress in the legal process so far (taken from direct interviews with key informants).

Sawai area is also adjacent to the shrimp farm boundary of a Japanese company (PT. Nippon Suisan Indonesia/ Nisui), which is located 6 km from Sawai village. The shrimp farm is officially owned by the PT. Djayanti Group, but in 2007 it was contracted to PT. Nisui until 2015. The shrimp ponds cover 7,000 ha which overlap the traditional land owned by the clan (*petuanan*). The concession, granted to PT Djayanti for 30 years (1995-2025), has a total area of 7000 ha: 2,000 ha in Oping village (used for shrimp processing), 5,000 ha in Arara village, 500 ha in Samalai and 50 ha in Pasahari village (used for shrimp cultivation). The conflict, with this company and the villages involved, is on going with no sign of a solution in sight.

Horale village

Horale village has major conflict issues with their neighbouring village of Saleman over an area of 10,000 ha. The entire traditional land of Horale village is 50,000 ha (according to the head of the village and the traditional leader). The conflict occurred during the local government's land rehabilitation program (2006) when Saleman claimed that the 10,000 ha belonged to their village and the local government then awarded the rehabilitation program to them to plant teak (*jati emas*). Saleman then planted the teak on this land without

10 The situation remains unsolved as at 2013.

permission from Horale. A number of witnesses supported Horale's claim to this land. Consequently, the community in Horale requested that the Saleman villagers stop planting the trees, but there was no response from Saleman. The Horale villagers then removed the trees. This problem escalated and in 2008, Saleman villagers attacked the Horale village, burning many houses causing considerable damage to the village and even fatalities.

Horale has also had land issues with MNP because MNP overlaps lands belonging to some villagers. The distance from the village to MNP is only 5 km to the east. MNP management is concerned that gardens belonging to the community inside the park threaten the park's existence. Hence, similar to Sawai village, the community is only allowed to collect NTFPs such as fruit, leaves and roots but are not permitted to cut timber or to expand their gardens located inside the park.

5.1 Local livelihoods: Primary and potential alternative incomes

In general, almost all households have gardens and plant agricultural commodities. Household income from agriculture, particularly from the top five most important commodities: clove, coconut, nutmeg, cocoa and durian, is considered the most important. Almost all households in Pilot 1 plant coconuts. However, household income from these crops is often unstable due to the uncertainty of market prices (e.g. the price of coconut is high in January to March and low in August to November) as well as harvest failure from pests and diseases, wild pig disturbance, and incorrect maintenance and management of the trees and crops. Agricultural activities not only provide a good income for most households, but also staples such as vegetables and bananas. In Horale, income from bananas is even better than durian.

While many households seldom harvest forest products, instead preferring to plant crops and gardens as their main livelihoods, the forest is still important in times of crisis. When the harvest fails or because the commodity is newly planted, the forest can provide additional income for some households.

Reduced forest dependency in these communities is higher because of MNP and access to markets. However, there are also households that even though they have a high income from agricultural land, they still collect forest products when they receive a small order from a customer for NTFPs or timber. Then there are households that do not have agricultural land and do rely on the forest to a much greater extent. These villagers have been affected the most by MNP.

In the past many households collected forest products for their livelihoods. Changing livelihood options from the forest to other alternative incomes has been encouraged by the government, predominantly after the establishment of MNP. The villagers were advised to plant perennial or seasonal crops so they could harvest the produce in a short period of time. However, planting cash crops is not easy for certain households who have previously been dependent on the forest. In this case, harvest failure of cash crops has forced a number of households to collect forest products illegally or find other alternative incomes such as wage labor.

For many households, particularly those on the coast, fish is an important source of protein. However, fishing is mostly for subsistence unless there is a specific request from a buyer who visits the village to place an order (see Figure 2).

Another potential source of income is tourism, primarily in Sawai. The potential income on Seram Island, in general and Sawai in particular, can be obtained from wage labor (guide or porter), boat rental, guesthouses or travel liaison. Many households earn income from wage labour with several households owning guesthouses, renting out their boats and acting as travel liaisons. Nevertheless, the trend in ecotourism on Seram Island is decreasing.

Our interviewees reported that there is limited support from the local government in relation to the promotion of the potential ecotourism objects and a lack of direct engagement between the tourism agency, the local tourism developer, and local people who are involved in the tourism business. If the local government supported tourism activities, it could be further developed in Sawai and Horale villages (Air Besar is less attractive for tourism; there are no tourism objects in this village). Many households would benefit from jobs such as being a porter, guide or boatmen while the women could run guesthouses or homestays.

5.2 The importance of forest and agricultural land

The forest is an important source of income for people in Pilot 1 mainly for Air Besar (Rp 8.9 million/hh/year), followed by Horale (Rp 6.3 million/hh/year) and

Sawai (Rp 4.6 million/hh/year). They collect timber (14 HH in Air Besar, 13 HH in Sawai and 11 HH in Horale) and non-timber products (18 HH in Horale, 17 HH in Air Besar and 12 HH in Sawai) (see Table 4). The most important timber species include ironwood, *bintangor*, *lenggua*, and *ketapang*, and NTFPs include orchids, bamboo shoots, rattan, dammar, *durian*, pig, deer and cuscus (see Table 5). Forest resources are also important for subsistence purposes, primarily for the provision of firewood (e.g. *samar*, *mange-mange* and *bakau*) and income from firewood is more or less similar between villages, which is around 900 thousand rupiah per year (see Table 4). Almost all households (29 HH in Horale, 27 HH in Air Besar and 26 HH in Sawai) collect fire wood for daily use.

The poorest households are more reliant on the forest than other households. The village head in Sawai explained that there are 24 households in total in Sawai, but only six of the poorest households were randomly selected as our respondents. This group will fall back on the forest if they need cash or in an emergency situation. They collect timber and sell it only in the village (small scale). Alternatively, they could also collect sago on land belonging to the village.

5.3 The proximity and unclear boundary between village and MNP

The village head in Sawai explained that MNP officially overlaps all traditional forest and land owned by the *petuanan* in Sawai, Horale and Air Besar. The area is classified by the State as Conservation watershed protection, production forest, production forest for conversion, and other use areas. In Sawai, the need for land is highly dependent upon population growth. Due to the large increase in population in Sawai, the requirement for land for crops and gardens has also increased.

The community in Sawai still collects non-timber forest products (mainly resin and rattan) from the forest in their village areas. But with the presence of MNP, harvesting both timber and non-timber is not allowed inside MNP. Timber harvesting, collecting rattan and hunting animals for sale has been considered illegal since 1997. The community is only permitted to collect forest resources from the forest outside MNP. The pressure on MNP has increased since then because villagers have, although illegal, undertaken activities inside the park, e.g. farming, NTFPs and timber extraction. This has occurred because the boundary of the park is located actually inside the village territory. Consequently, this means that villagers are not allowed to use the forest for crops or gardens or to expand their gardens, if these are located inside MNP. The latest information regarding this issue is that the zero point or the boundary of MNP has been moved by the Forest Area Gazettement Service[11] officer about 3 km from the settlement of Sawai, but this effort has yet to be approved by the Ministry of Forestry. In addition, an MNP officer has not been involved in this measurement. Hence, MNP management have informed the community that the measurement will be conducted once more. This uncertainty has made the community confused and they do not know when this problem will be resolved. At present the community continue to manage their traditional land within MNP, but only planting seasonal and perennial crops.

5.4 Conflict over land with neighbouring villages and companies

Conflicts over land have occurred between Horale and Saleman villages. After three years, the Supreme Court at the district level had to handle one prolonged conflict between these two villages. Under present circumstances, both villages are legally prohibited from using the land. Some neighbouring villages acknowledged that the land belongs to Horale, but this did not alter the decision. The community in Horale was very disappointed with the decision because they cannot use the land to expand their gardens.

Progress on conflict resolution is very slow. According to the forestry agency at the district level, efforts to reduce conflict over land between the villages has been made by mapping the traditional land boundary. Although in practice this was not properly implemented. Perhaps the local government could look for more long-term solutions to these problems that would benefit all stakeholders.

A conflict over land also occurred between Sawai village and a shrimp farm company (Nisui). According to the Nisui representative, this conflict has been resolved amicably. However, Nisui was not very clear about the implementation of the contract

11 Balai Pemantapan Kawasan Hutan (BPKH).

between PT Djayanti and the local landowners at the time. In response to this, the company has given about Rp 13.5 million, in cash, to Sawai village, which is equivalent to three drums of diesel. In addition, non-cash contributions were also given to Sawai in the form of facilities and infrastructure for the village. The head of Sawai village explained that Nisui has given many benefits to Sawai and several other villages around the company. If the shrimp farm company did not exist, the community would need to find other support to cover the cost of electricity, fuel, facilities and infrastructure that the village need.

This kind of conflict is quite common in many places in Indonesia. These conflicts can be directly solved by the community working with the company directly, without involving the local government. By discussing the conflict together with the parties involved, an amicable settlement may be achieved by all parties. If the community is not happy with the solution, it might be necessary for the local government to mediate the conflict resolution process.

5.5 Economic opportunities from MNP for the communities

The park officer has tried to reduce household reliance on the forest through the community development program. In this program, they distributed seedlings for cash crops (cocoa, coffee, nutmeg, etc.) for planting on alternative land. However, many problems occurred during the implementation on the ground such as pest and disease, low prices, lack of access to markets, etc. The main weaknesses of this program include a lack of training and field supervision for households on planting and harvesting, and also further assistance on marketing the products. Therefore, it is important that the local government address these issues. However, in relation to the need for land for agricultural purposes, the local government has given permission to open new gardens in the production forest (1 ha per household) for households who need new agriculture land for planting crops with approval from the head of the village.

However, some households also acknowledge the importance of the park. If the forest was not there, according to their perceptions, many environmental disasters could have occurred in the area such as landslides, water pollution, and increased sedimentation. Therefore they have planted their crops on their traditional land outside the park in lowland areas in order to prevent flood and other environmental disasters. These crops should require less land and thus less pressure to convert the forest/MNP area.

6 Conclusions and recommendations

Land access and ownership is very important for the villages in Pilot 1 to conduct activities related to agriculture and forestry (their main livelihoods). Currently MNP, concessions, and forest allocation for watershed protection forest overlap traditional lands belonging to the communities.

Limited land for expansion of agricultural land, in response to a growing population and restricted access to MNP, has been the basis of a number of conflicts particularly between villages. Those between MNP or concessions and villages have been less volatile and easier to resolve.

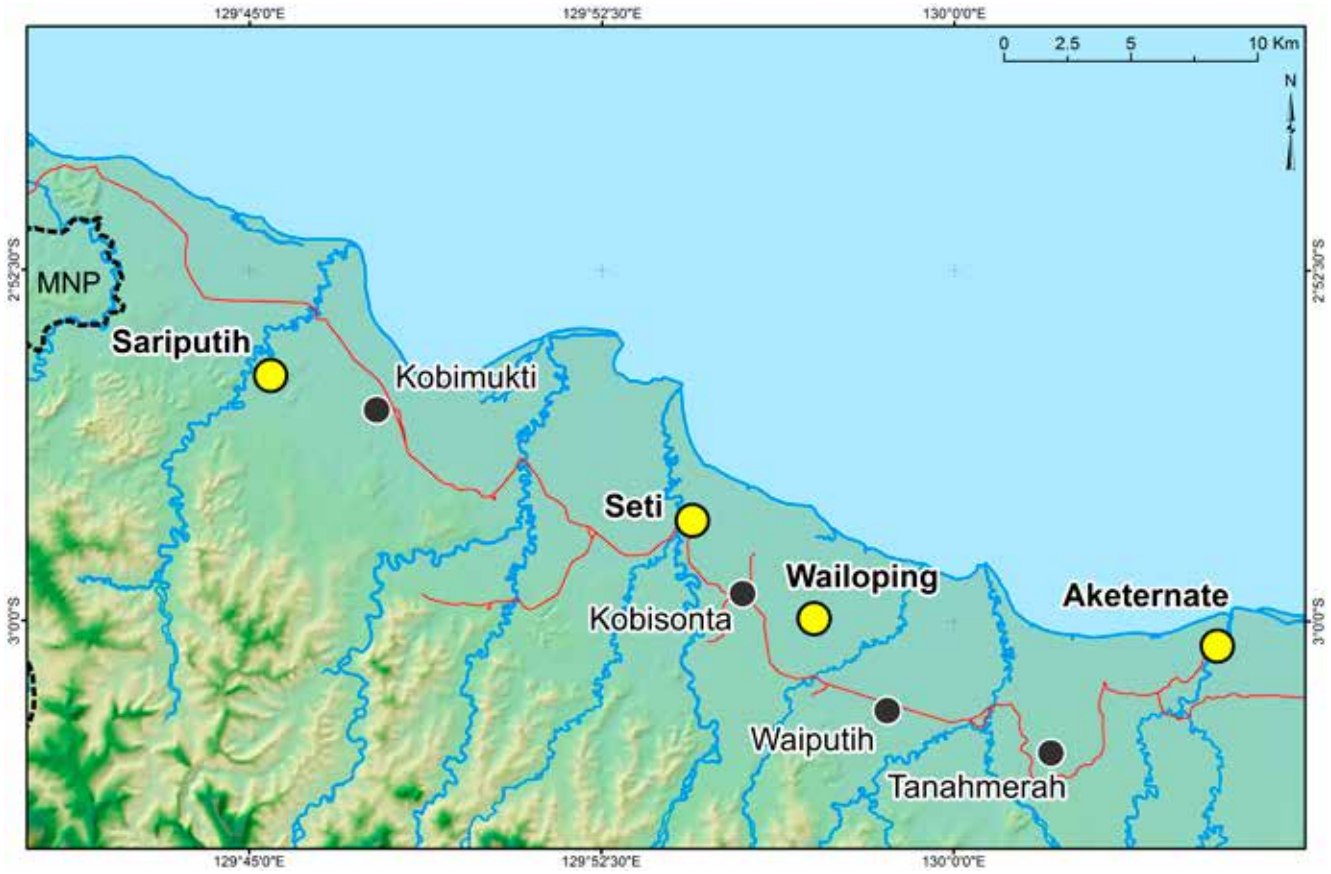
Without long-term solutions to conflicts, particularly between villages, more conflicts may well arise and stability be compromised. It is perceived that the role of MNP management in providing solutions to the conflicts could be better with more effort put into improving the local economy. The district government could also involve the local people in the land use planning process.

Some proposed recommendations associated with the land use problems and conflicts are as follows:

- Optimise plantations and agricultural land by planting certain commodities suitable for the land and of high economic value. This should be controlled by the local government;
- Local government should proactively help resolve land conflicts by learning from the settlement of conflicts in other places or through further study on conflict resolution;
- The park management or another appropriate agency, should provide the communities with continued guidance in developing commercial commodities including helping them access market information and markets; and
- Land use still requires better local government regulations, especially taking into account the needs of the community for agricultural land for subsistence and livelihoods.

Annex 2 – Pilot 2
Overlapping land use for agriculture and business: conflict and livelihood opportunities?

The case of Sariputih, Wailoping, Aketernate and Seti villages in the northeast of central Seram, Central Maluku



Map 1. Pilot 2 area in the northeast of central Seram, Central Maluku

1 Introduction

There are four villages sampled in the Pilot 2 area, located in the northeast of Central Seram. Two are traditional villages (Aketernate and Seti) and the other two are transmigration villages (Sariputih and Watludan). While Seti is a traditional village, most of the inhabitants are local migrants from other parts of Seram Island. The majority of the villagers in Sariputih and Wailoping are from Java. Land use in this area is predominantly for seasonal crops (paddy fields and vegetables), perennial crops (coconut/*Cocos Nucifera*, cocoa /*Theobroma cacao*, clove/*Eugenia aromatica*, etc.), fruit trees, oil palm plantations (PT. Nusa Ina) and oil drilling (PT. CSEL[1]). The land in Seti and Aketernate traditionally belongs to the clans (*petuanan*). In the transmigration villages the land originally belonged to traditional villages, but the district government officially allocated it to Wailoping and Sariputih in 1982 for the transmigration program. Each year many people migrate from East Java to the transmigration villages. They are usually friends or relatives of the people who have already settled in these villages. Overlapping

1 Citic Seram Energy Ltd (Oil and gas exploration company).

land use, uncertainty of the land status, and long-term official land use for business is becoming more common in this area. This could eventually lead to conflict over land use.

2 Objectives

The objective of this study is to understand whether the business activities (oil palm and oil drilling) present greater economic benefits than traditional land use such as agriculture for the local communities.

3 Methods

Thirty households within the four villages were randomly selected using a systematic random sampling method. Data was collected in October 2010 (Sawai and Air Besar) and February 2011 (Horale) through a household survey, FGD[2], and interviews with key informants. Key informants used in this study included heads of households, village leaders, community leaders and representative staff of two companies (PT. Nusa Ina and PT. CSEL).

The survey used two questionnaires: the first was used for key informants such as village heads and traditional leaders to obtain general information about their villages and issues related to forest management, history of conflicts and the local points of view on their natural resources. The second questionnaire was used for household interviews to address demographic information, economic activities and perceptions regarding tenure security and resource use. In addition, in-depth interviews with open-ended questions were conducted with the staff.

Focus group discussions were also conducted to discuss tenure issues among the villagers. The groups were selected based on gender, age, and diverse ethnic composition. A guideline for FGD comprising topics on property rights, tenure security, forest management, conflicts/threats and community perceptions of their resources can be found in the Annexes of the socio-economic toolkit available on the CIFOR[3] website.

4 Results

4.1 Village description

The total population of the four villages, at the time of the survey (2010), was 6,532 people. Seti has four hamlets (Nusa Botam, Seti Bakti, Mulumet, and Iliona), while Aketernate and Wailoping have only one hamlet each (Mahakaim and Wailoping B2). The age of the respondents ranged between 17-75 years old. The number of people per household varied, from two people to a maximum of 12. The majority of respondents had an elementary or junior high school level of education, while between three to five respondents had no education. Seven respondents from Seti and three from Sariputih were university graduates (Table 1).

According to the village leaders Seti has the largest area of traditional land (152,000 ha) including the four hamlets (see Table 1). From this total area, approximately 11,200 ha (in 1982) were allocated to the transmigration program. Wailoping, as one of the transmigration villages, was assigned 1,200 ha of this land. The Department of Forestry, at the district level, has also notified Seti village leaders that their traditional land (it is not clear how much) may be allocated for other land use (APL[4]) and production forest (HP[5]). However, in 2011 this was still at the planning stage.

In 2008, PT. Nusa Ina (an oil palm company) leased, from Seti village, approximately 200 ha in the west, 300 ha in the east and 5,000 ha intact forest in the mountains.

Each household in Wailoping and Sariputih has a set area of 2 ha for planting crops, while the average land in Seti and Aketernate is 3.7 – 3.9 ha per household with 1.2 ha for seasonal crops and 2.5 ha for planting perennial crops. Agricultural activities are commonly practiced on traditional land inherited from their parents. The major commodities are coconuts and cocoa in Seti and Aketernate and rice paddy in Wailoping and Sariputih (Table 1). Growing these commodities are the main livelihoods for most households in these villages, except for Sariputih and Wailoping, where about 20-30% of the harvested rice is used for their own consumption and the rest (70-80%) is sold in their village or in the market in Masohi (capital of Central Maluku District) or Kobisonta (sub-district) with a mean price of between Rp 2500 – 4000[6] per kilogram. In addition, most households in Pilot 2 grow vegetables and fruit on their land for subsistence.

2 Focus Group Discussions.

3 http://cifor.org/

4 Area Penggunaan Lain.

5 Hutan Produksi.

6 1USD = Rp 9,000.

Table 1. General overview of Pilot 2

Description	Seti	Aketernate	Wailoping	Sari Putih
Village establishment	1900s	1900	1983	1996
Land area (Ha)	152,528	86,000	1,200	1,389
Land ownership	clan, village and leased land (to oil palm and oil companies)	clan and village, oil palm company (official)	head of household (official as transmigrants), clan	head of household (official as transmigrants), clan
Religion	Protestant Christians	Protestant Christians	Moslem	Protestant Christians and Moslem
Population (people)	1751	1257	2187	1337
Total HH	361	294	632	367
Original (HH)	10	284	622	0
Migrant (HH)	351	10	10	367
Age of respondents (yrs)/ mean	17-71 (48)	23-75 (41)	25-67 (43)	24-78 (46)
∑ person per HH/mean	2-9 (5)	2-15 (6)	2-5 (4)	2-7 (4)
Education level of head of HH (%)	NE= 3; ES= 47; JS= 33; SS= 10; BSc= 7	NE=17; ES=30; JS=37; SS=17; BSc=0	NE =17; ES=43; JS=23; SS =17	NE=10; ES=57; JS=10; SS=20; BSc=3
Ethnicity/origin	Indonesian Chinese, West Seram (Taniwel, Pasanea, Labuan, Latea),	Indonesian Chinese, Southeast Maluku, Seram, Ambon	Java, Sulawesi/ Bugis, Buton	Java, Maluku, NTB, Kalimantan, Sumatera, Sulawesi
Local language	Seti	Akertenate	Javanese	Javanese
Main commodities (Ha)	Coconut (204), cocoa (24)	Coconut (560), cocoa (24), sago (*Metroxylon sagu*) (4)	Paddy rice (700)	Paddy rice (75), coconut (15), cocoa (30), clove (1.5)
Forest products	NTFPs: rattan (*Calamus* sp.), sago, resin (*Agathis* sp.), pig (*Sus scrofa*), cuscus/ possum (*Phalanger maculatus*), deer (*Cervus timorensis*). Timber: ironwood (*Intsia bijuga*), *bintangur* (*Calophyllum* sp.), canary wood (*Canarium oleosum*), *samar* (*Homalium foetidum*)	NTFPs: cockatoo bird (*Cacatua moluccensis*), bamboo (*Bambusa* sp.), sugar palm (*Arenga pinnata*), rattan (*Calamus* sp.), pig, cuscus. Timber: ironwood, *gofasa* (*Vitex cofassus*), *lenggua* (*Pterocarpus indicus*)	None (from HH Survey)	None (from HH Survey)

a Badan Koordinasi Keluarga Berencana Nasional (Indonesian population and family information network)

Source: Household survey conducted between 2010 and 2011 and BKKBN[a] data in 2009/2010. Note: HH=Household, NE=No formal Education, ES=Elementary School, JS=Junior High School, SS=Senior High School, BSc=Bachelor.

4.2 Household assets

Wailoping has the most household assets in Pilot 2 (Table 2) primarily transportation, tools, and electronic goods. Transportation, mainly motorbikes, is important not only for Wailoping but also for the other villages in Pilot 2 to travel to Masohi (the capital of Central Maluku), Kobisonta (sub-district), and Bola (district of East Seram). Other important tools used in Wailoping are ploughs for rice paddy and rice mills, which are used to support their livelihoods. Chainsaws are only used in Seti because some households work as carpenters so they use them

Table 2. Important household assets for villages in Pilot 2

Items	Aketernate (x Rp 1000)		Sari Putih (x Rp 1000)		Seti (x Rp 1000)		Wailoping (x Rp 1000)		Notes
	sum	mean	sum	mean	sum	Mean	sum	mean	
Electricity	6,000	240	10,900	389	9,050	323	17,750	592	Electric generator, solar power generator
Electronic	75,950	3,038	78,150	2,791	92,150	3,291	115,355	3,845	Satellite dish, television, VCD, DVD, play station, speaker, amplifier, radio tape recorder, computer, equalizer, camera, cell phone, electric fan, refrigerator, rice cooker, washing machine, water pump,
Transport	147,270	5,891	153,650	5,487	160,900	5,746	563,450	18,782	Motor bike, bicycle, outboard engine and boat (ketinting/ tempel), car/truck, fishing boat
Tools	1,220	49	8,625	308	18,547	662	253,110	8	Kerosene lamp (*petromak*), chainsaw, sewing machine, plough, coconut grating machine, lawn mower
Others	0	0	950	34	90,000	3,214	0	0	Crock (*tempayan*), jar (guci), rifle, plastic drum
Total	**230,440**	**9,218**	**252,275**	**9,009**	**370,647**	**13,237**	**949,665**	**23,227**	

Source: Household survey in 2011 (HH Respondent from Akertenate=25, Sari Putih= 28, Seti= 28, Wailoping = 30)

for felling trees. Not many households considered an electric generator as an important asset, as all villages have an electric generator for all households, where each village receives a monthly subsidy for fuel from local companies for example, PT. Nusa Ina and PT. CSEL. In recent years, the electronic items for home entertainment and communication have become more important for many households in these villages especially TV satellite dishes and cellphones.

4.3 Constraints and problems

The main constraints and problems that have occurred in Pilot 2 villages are shown in Table 3. Problems related to boundaries and land status have created conflict among the community members and also between the communities and the oil palm companies (PT. Nusa Ina and PT. Aketernate). Pests and diseases, and also disasters are responsible for the loss of crops in this area, mainly in transmigration villages (Wailoping and Sariputih).

4.4 Household income from different activities

Figure 1 shows the average household income from different activities including agriculture, forest resources, livestock, and employment. The highest income for all villages in Pilot 2 is derived from agriculture, e.g. in Wailoping (Rp 24.9 million/year), Seti (Rp 15.9 million/year), and Aketernate (Rp 13.3 million/year).

Commodities include perennial crops (clove, cocoa, coconuts, coffee (*Coffea* spp.), sago), fruit

Table 3. Constraints and problems on land use in Pilot 2

Problems	Description	Wailoping	Seti	Aketernate	Sariputih
Boundary	Unclear	v	v	v	
Land status	Unclear (including forest land)	v	v	v	
Forest product collection	Timber extraction				v
Land dispute	Between villages	v			
	Within villages	v			
Pests and diseases	Cocoa pests		v	v	
	Banana pests	v	v	v	
	Forest pests	v			v
	Livestock diseases	v			v
Disasters	Floods/landslide	v			v
	Fire (forest and crops)	v			v
	Famine	v			v
	Drought and clean water	v			v

trees (*durian* (*Durio zibethinus*), *becang* (*Mangifera foetida*), *langsat* (*Lansium domesticum*), mango (*Mangifera indica*), jackfruit (*Artocarpus heterophylla*), pineapple (*Ananas comosus*), banana (*Musa paradisiaca*), *rambutan* (*Nephelium lappaceum*)), seasonal crops (cassava (*Manihot esculenta*), taro (*Colocasia esculenta*), paddy rice (*Oriza sativa*), sweet potato (*Ipomoea batatas*)), and vegetables (chili (*Capsicum annum*), corn (*Zea mays*), long beans (*Vigna unguiculata*), peanuts (*Arachis hypogaea*), soybeans (*Glicine max*)). Except for Seti, the second most important income for all villages is from employment. Sariputih has the highest income from employment (Rp 14.8 million/year) followed by Aketernate, (Rp 12.8 million/year) and Wailoping has the smallest (Rp 4 million/year). Employment

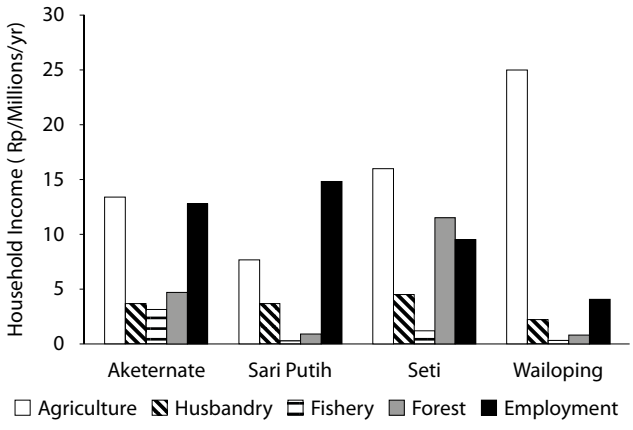


Figure 1. Average annual household income from different activities in Pilot 2 (Rp/year)

or income also includes permanent work (trade, handyman/odd jobs, labor, tractor operator, teaching, pastor/ministry, pensions, business, civil servants, making copra) and/or temporary jobs (odd jobs, carpentry, labor, trade, making copra, antique distribution and making *sopi* (alcoholic beverage distilled from palm fruit).

Forests are the most important for households in Seti (Rp 11.5 million/year) mainly from timber harvesting, e.g. *bintangur*, ironwood, *gofasa*, *lenggua*, *samar*, *kinar* (*Kleinhovia hospita*), manggustan (*Garcinia dulcis*). These products are the second most important source of income after agriculture, although income from the forest is ad hoc as it depends on receiving orders from customers. However, income from NTFPs[7] has provided livelihood opportunities for people in both villages especially Aketernate. The main NTFPs in Pilot 2 are pig, cuscus, deer, canary nuts, palm fruit (sugar palm), bamboo shoots, rattan, sago, resin, palm fruit, cockatoo, and *pombo* pigeon. Nevertheless, livestock such as cows, chickens and ducks also contributes to the income of households in Pilot 2 although the average income per year (from livestock) is less than Rp 5 million per household.

Figure 2 shows that all the different activities play an important role for all households. It shows that nearly all households sampled in Pilot 2, except those of Sariputih, have been engaged in agricultural

7 Non Timber Forest Products.

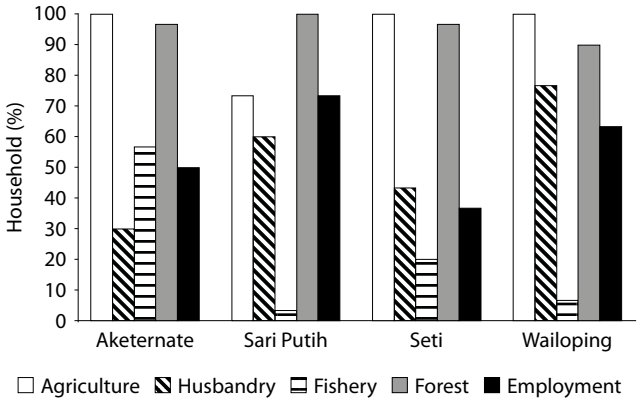


Figure 2. Percentage of household involved in different activities in Pilot 2

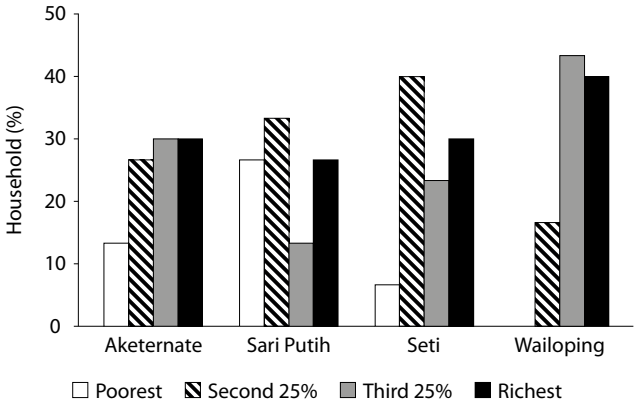


Figure 3. Percentage of the poorest and richest households across villages in Pilot 2

activities either for subsistence or their livelihoods. At least 90-100% of all households are involved in forest activities. This shows that forest is important for those households. For transmigration villages, forest is an important area as there are still a lot of trees (it does not matter that the trees are not valuable), although not primary or intact forest.

In grouping household wealth and assets it can be seen that there are variations in the distribution of household income across villages (Table 4 and Figure 3). There is a higher frequency of the "poorest" (lower quartile) of households in Sariputih, whilst there is no "poorest" of households in Wailoping. The "richest" (upper quartile) of households represent the highest frequencies of households in Seti and Aketernate. Mean annual household income ranges from approximately Rp 3.3 million for the lowest "poorest" quartile to Rp 74.8 million for the upper "richest" quartile in Seti. In general, their income from different sources is sufficient to cover their daily needs.

Following the source of income from agriculture and forest activities, we summarised the mean annual household income from villages in Pilot 2 who engage in forest and agricultural activities (Table 5). More than 90% of households collect forest products. Seti has the highest income from the forest, by collecting timber (Rp 32.6 million/year) than Aketernate (Rp 11.5 million/year). The households in Aketernate also earned a higher income from NTFPs (Rp 5.5 million/year) than Seti (Rp 1.1 million/year) (Table 5).

Forest products (timber and NTFPs) are more important in Seti and Aketernate (Table 6). In Aketernate, the mean annual household income for bamboo is Rp 10.9 million/year, *sopi* is Rp 10.5 million /year, and *lenggua* is Rp 24 million. In Seti, ironwood (*Intsia bijuga*) provides significant income for some households (Rp 37.8 million/year). In transmigration villages (Wailoping, Sariputih), forest products are not as important because their main income is from rice (see Table 5).

Table 4. Mean income by income group across villages in Pilot 2 (Rp/year)

Grouping of wealth	Mean household income in Pilot 2			
	Aketernate	Sari Putih	Seti	Wailoping
Poorest	6,736,901	3,273,941	7,645,046	.
Second 25%	12,373,926	12,232,867	12,360,164	14,263,565
Third 25%	21,601,783	20,256,051	20,800,144	22,754,188
Richest	54,843,670	44,710,154	74,792,731	44,256,304

Note: Cash income includes that from agriculture, forest, fish, husbandry, and employment. Subsistence income or value has been estimated using market prices and production/consumption levels. Costs of production have not been subtracted so these figures represent gross income values for cash and subsistence. Subsistence is the production of agricultural commodities and some forest resources harvested for personal consumption.

Table 5. Mean household income from the forest and agriculture in Pilot 2 (Rp/year)

	Village	Aketernate		Sariputih		Seti		Wailoping	
		Mean	n	Mean	n	Mean	n	Mean	n
Forest	NTFPs product	5,474,545	11	.	-	1,148,650	12	48,000	1
	Fuelwood	1,050,000	28	885,333	30	886,207	29	808,756	27
	Timber	11,550,000	4	400,000	2	32,655,556	9	.	-
	Total forest	**4,683,448**	**29**	**912,000**	**30**	**11,495,993**	**29**	**810,533**	**27**
Agriculture	Staple foods	825,000	10	6,022,500	12	4,062,493	22	24,206,127	30
	Non-staple foods	4,612,348	29	5,004,191	19	1,949,819	22	2,371,440	5
	Perennial crops	10,344,960	25	360,000	1	12,836,852	27	2,972,500	3
	Total agriculture	**13,354,403**	**30**	**7,623,165**	**22**	**15,962,195**	**30**	**24,898,617**	**30**

4.5 Scoring exercise

Scoring exercises were used to understand the importance of forestland. It was unclear whether there are trees remaining in these areas or not, particularly in Wailoping and Sariputih (see Figure 4).

All respondents gave a higher value for forest in the past than at present and in the future. In Seti and Aketernate, the forest was still abundant and available because forest is used mostly for agriculture. In Wailoping and Sariputih the forestland (with still a few trees) as a resource, is still available. Many households do not use this land because they want to keep it for paddy fields or other cash crops in the future.

All villages explained that the forest area had decreased because it has been used by households for agriculture as well as to collect forest products (Seti). It is also used for planting plantation crops (oil palm, cocoa, coconuts) and settlements (Aketernate). However, the decrease is believed to be mainly due to timber extraction for construction and fire wood (Wailoping and Sariputih).

The local perception of forest in the future is more or less the same across all villages. It is perceived that the forest will be limited (Seti). There will be no more forest because the entire forest will be rented or sold to interested parties such as a company (Aketernate), or the forest will be converted to paddy fields (Wailoping and Sariputih).

We interviewed 30 households in each village and asked their perception of changes related to the availability of forest, household consumption and household income from the forest. The results of the four villages varied (Figure 5).

Some respondents in Sariputih and Wailoping did not know whether the forest was still available or not, but our respondents in Aketernate (60%) and Seti (63%) claimed that the availability of forest had decreased due to land conversion to oil palm plantation and forest fires that often occur during the dry season because the traditional forest had been given as a concession to the oil palm company. Some households in Wailoping and Sariputih (20%) did not know the reason why the availability of forest had decreased as they were migrants and had never been to the forest. In Wailoping (40%) the availability of forest increased because they have allocated this land for future crops.

The forest still plays an important role for households in these villages even though their perceptions differed in terms of their consumption of forest products and their income from the forest (Figure 6). The households' perceptions of their consumption of forest resources over time varied. About 30-50% of households in Pilot 2 explained that their consumption of forest products had not changed in terms of firewood, food, and marketable items (Seti and Aketernate) and firewood (Wailoping and Sariputih). The increased consumption of firewood from the forest was due to an increase in population according to households in Aketernate (23%), Sariputih (13%), Seti (10%) and Wailoping (7%). A decrease in consumption of forest resources varied between 23-37% due to reduced access to the forest (oil palm plantation) and distance to the forest (Figure 6).

Table 6. Mean household income from timber and NTFPs in Pilot 2 (Rp/year)

Source of income	Aketernate Rp/year	Sariputih Rp/year	Seti Rp/year	Wailoping Rp/year	Total Rp/year
NTFPs					
Arenga catechu (palm fronds/roof)	120,000				120,000
Wild pig	1,900,000		580,000		1,240,000
Bambusa sp (bamboo shoot and stem)	10,950,000		12,000		10,962,000
Agathis resin			9,000		9,000
Cockatoo	150,000				150,000
Aleurites moluccana (candle nuts)			450,000		450,000
Cuscus	600,000		270,000		380,000
Arenga catechu (*mayang/sopi*)	10,500,000		5,000,000		9,400,000
Bird (*pombo*)	100,000				100,000
Rattan	600,000		20,400		213,600
Deer			840,000		840,000
Sago			1,433,333	48,000	1,481,333
Total	**4,632,308**		**810,812**	**48,000**	**2,388,768**
Timber trees					
Bintangur			4,800.000		800,000
Ironwood	5,550,000	250,000	37,828,571		22,115,385
Canarium oleosum (canary nuts)			300,000		300,000
Kleinhovia hospita (*kinar*)			3,000,000		3,000,000
Lenggua	24,000,000		1,000,000		12,500,000
Litsea angulata (*makila*)		300,000			300,000
Garcinia dulcis (manggustan)			15,000,000		15,000,000
Samar			5,000,000		5,000,000
Total	**9,240,000**	**266,667**	**22,607,692**		**16,233,333**

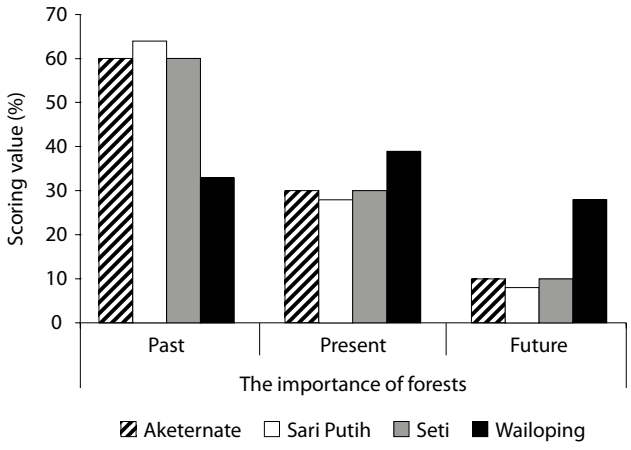


Figure 4. Scoring exercise for the importance of forest in the past, present and future in Pilot 2

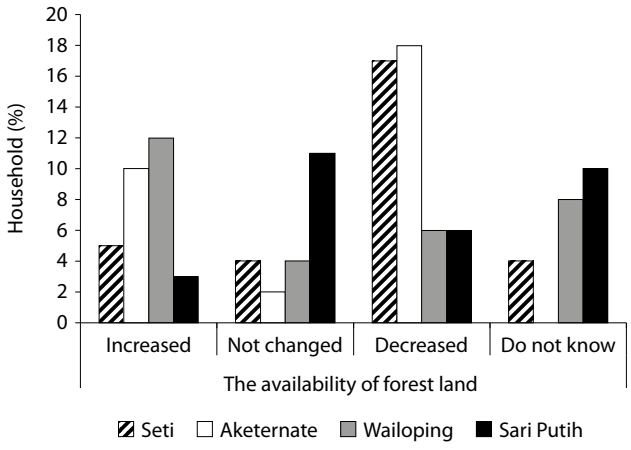


Figure 5. The household perceptions of the availability of forest in Pilot 2

Source: Household survey in 2011

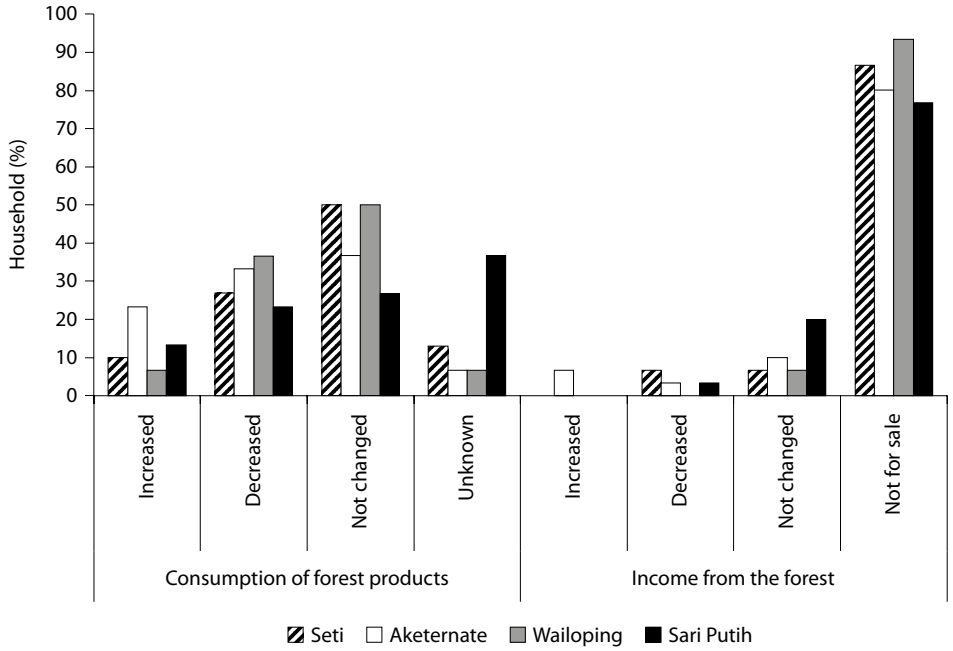


Figure 6. The household perceptions of their consumption of forest products and income from the forest in Pilot 2

In general most of the households in Pilot 2 collect forest products not for sale (77-93%), but for their own consumption (Figure 6). Only a few households (7% in Aketernate) had increased their reliance on the forest because of orders for timber species from neighbouring villages. Some household's income from the forest had not changed (7-10%) because there were no orders from outsiders for forest products. A similar reason was given by households who decreased their income from the forest (see Figure 6).

5 Critical issues

5.1 Land tenure

Problems of land tenure occurred in Sariputih and Wailoping. Many households, who left this village to find better income, sold their land to local migrants from other villages or districts. Our informants from Wailoping B2 hamlet said that the most extensive areas of land and houses belong to the local migrants in Seti and Aketernate.

In 1982, the government officially allocated land in Seti for the transmigration program. Problems occurred during the implementation of this program because some of the villagers claimed to be landowners. There was no clear resolution from the resettlement agency at the time. Many households from Seti who owned the land asked the program for compensation. They planted coconut and bananas on their land so that the land could not be utilized by the migrants and asked the villagers in Wailoping to buy the land at prices determined by the landowner in Seti. If they did not agree with the price, they would have no access to the land. Many households in Wailoping did not want to pay because the land was officially given to them by the local government. This problem has been reported to the transmigration agency and local government in the district, but there has been no clear solution as of February 2013.

There were also land tenure problems between the clans and villages in Seti due to unclear boundaries. This resulted in frequent land invasions that led to conflicts. In 2009, the Seti boundary marker was moved by a transmigration village (Namtu/D2). The dispute over this land between Seti and Namtu had yet to be resolved when we visited in 2011.

Aketernate village also had problems with land tenure. The land, traditionally belonging to the clan, was leased to an oil palm company. This has caused numerous problems amongst members of the clan. In some cases the clan leader, who has the authority to lease the land, did not inform other members of the clan or went ahead with the lease agreement against the wishes of other clan members. Unequal

distribution of fees, paid by the oil palm company, among the clan members has also caused problems.

5.2 Village development program

The settlements and infrastructure, including roads, housing, mosques, churches and meeting halls at the village level are usually much better than at the hamlet level. This occurs more frequently if the village manages the hamlet. The village leader tends to favour the village over the hamlet when distributing funding for development programs. This has impacted many households at the hamlet level, e.g. the average household residing in the village has a better level of prosperity than in the hamlets. This can encourage the hamlet to ignore some village activities, especially those related to various government policies and to seek separate village status, e.g. Wahakaim (hamlet of Aketernate village).

5.3 A change in attitude to work

In Pilot 2, the community leaders in Aketernate and Seti explained that the younger generation no longer wishes to work in traditional agriculture. The younger generation's attitude to work is changing; they are looking for instant and secure income. With more companies setting up business in the area, there are now more employment opportunities in addition to traditional agriculture. More people are working as laborers, traders, teachers or are self-employed.

In the transmigration villages (Sariputih and Wailoping), however, most households (old and young) gave up their original livelihoods to work in agriculture when they moved to Maluku in search of a better life.

5.4 Traditional knowledge

In Seti and Aketernate, the values for the importance of local knowledge were high, especially for the sustainability of natural resources such as forests and agro-forests. Traditional knowledge is still applied in daily activities under the customary of *sasi*[8]. This includes closing and opening areas for hunting and gathering, managing the harvesting of crops or forest products, traditional plant regeneration and protection of sacred places. The local government does not often request or take into consideration traditional knowledge when developing programs related to agriculture. The teak plantation program in 2008 was not fully successful because according to traditional knowledge the land was not suitable for teak.

5.5 Commercial land use

Oil palm plantation (PT. Nusa Ina)

In 2008, PT. Nusa Ina was granted a 9,000 ha concession for 30 years in the northeast of central Seram in east Seti. The plantation area overlaps 10 villages including villages in Pilot 2 except Sariputih. In 2008-2009, the company introduced the plantation project to the communities in order to obtain a letter of agreement from them (traditional landowners). This letter is a district government requirement; the company must obtain this letter before they can start their plantation on the communities' land. The company set up a partnership system with the community where the profits will be shared; 30% for the landowner and 70% for the company. The landowner will get the first share of the profits three years after planting, with a total profit of about Rp 200.000/month/ha. According to the company, after 8-10 years the community will receive up to Rp 1 million/month/ha and this should then stabilize.

In 2011, PT Nusa Ina improved the public facilities and infrastructure in ten villages around the company (including villages in Pilot 2, except Sariputih), constructing roads and building mosques. In addition free medical assistance was given to the community in July 2010.

The company has also provided employment opportunities. About 1,300 villagers work for the company as laborers, earning Rp 40.000 per day. In addition, there are opportunities for permanent work and so far 100 villagers have joined since 2008. The jobs include land clearing, cutting trees, and planting oil palm.

Oil drilling (PT. CSEL)

In 2009, PT. CSEL was granted a concession to drill in the Seti area. The company leased the land directly from the landowners for two years (2010-2011). This contract is renewable on a 2 yearly basis. In 2010, the company compensated the landowners for road construction (3.4 km long and 12 m wide) approximately Rp 25 million, and oil drilling point (2 ha) approximately Rp 75 million. In early 2011,

8 Sasi is a generic name for a family of institutions, laws and ritual practices that regulated access to resources on land, coastal reefs, and rivers (see Zerner C. 1994b. Through a green lens: the construction of customary environmental law and community in Indonesia's Maluku Islands. In : Law and Society Review. 28 (5). The Law andSociety Association).

they started to build the road and the oil drilling area. Production began in December 2011.

PT CSEL has provided many benefits to three villages located in the vicinity of the company (Seti, Tihuana, and Kobisadar). In 2011, Rp 185 million was given to these villages for renovating community buildings, Rp 15 million for educational assistance and Rp 20 million for churches and mosques. Nevertheless, conflict has arisen not only between the company and the villagers due to limited employment opportunities, but also with the clan members because of uneven distribution of the compensation.

5.6 General findings: Patterns of livelihood, forest access, and land tenure

The communities, except Wailoping and Sariputih, have had a long dependence on traditional land use farming. Agricultural activities such as cash crops (cocoa, cloves, and sago) have been grown for many generations and have become the main livelihood for the people in this region. Commodities such as chocolate and coffee were newly introduced in this region through the community development program with the aim to improve local people's livelihoods. Wailoping and Sariputih, the transmigration villages are an exception, as the main product grown there is rice paddy, either for sale or personal consumption. To meet their daily needs, people in the four villages generally plant seasonal fruit and vegetable crops.

The mean household income from agriculture (cash and subsistence) is Rp 13.3 million in Aketernate, Rp 7.6 million in Sariputih, Rp 15.9 million in Seti, and Rp 24.9 million in Wailoping. Additional revenue is also obtained from other activities such as employment, forest products, and livestock. Employment contributes significantly to their livelihoods, especially in Wailoping and Aketernate. While the forest, although widespread and abundant in resources, does not provide much income for any of the communities in this area.

Only certain households in Seti and Aketernate obtain additional income from the forest. Income from NTFPs and timber is sufficient financial support for these households. However, the revenue from the forest is not regular, as timber is only collected when they receive an order from a buyer. The important forest resources for households in Seti and Aketernate include animals (pig, cuscus, deer and birds) and plants (palm fruit, bamboo shoots, rattan, sago and resins). For timber, households prefer *bintangur*, ironwood, *gofasa*, *lenggua*, *samar* and *kinar*.

Most households in Pilot 2 are generally able to support the entire family and cover routine monthly expenses, e.g. food, transportation, school, health and clothes/shoes. Sometimes they need to cover other expenditures, e.g. home loans, equipment and family assistance. The welfare of people in these villages is good and none of the households fall into the poor category.

However, almost all households in these villages have a similar perception of the importance of forests, where they are very concerned about limited access to the forest in the future. This is not surprising as most of the land and forest in this area is currently allocated for oil palm development.

In addition, the local government is planning to allocate land in this area for production forest, conversion forest and other uses. However, the designation is currently in the process and has not yet been implemented. If the allocation of land goes ahead, the impact on these communities and villages in the area is likely to be the loss of access to land and forest.

Land tenure is a common problem in this area and has resulted in both internal and external conflicts. The driving factor of land tenure conflict is due to uncertainty of land ownership and unclear land boundaries. For internal conflicts, e.g. inter-clan or between clan members, the customary leader is the one who has the responsibility to resolve the conflict. They need to identify the source of the conflict and then help both parties to come to an agreement that must be adhered to. This type of conflict can usually be resolved quickly.

External conflict is more complicated. The government's allocation of traditionally owned land given to the transmigration program has caused serious conflicts over land tenure, such as the case between Wailoping and Seti. Officially this case had not been resolved in 2011. However, unofficially some situations have been resolved with either an agreed amount being paid for the land or the land had been abandoned. The company (Nusa Ina) resolved the external conflict between it and

the communities by offering the communities a partnership agreement.

5.7 Do business activities represent a greater economic benefit?

Currently, agriculture provides the communities with a higher income than oil palm. The income from oil palm does not come from benefit sharing but from employment. More than 1,000 villagers from the villages around the oil palm company work there as laborers and about 100 people work as permanent staff, earning more income than those working as laborers (this was confirmed in direct interviews with the company's staff). The income for labourers or permanent staff is 50% lower than from agriculture. During the study, it was not known where the distribution of employees lay, i.e. how many workers were from which village, because not many households from our respondents worked for the oil palm company when we visited them in 2011. However, the companies have provided these villages with useful assistance, such as improving infrastructure, constructing places of worship, and other village assistance. Only a few households (less than 1% of total households) have received an income from the oil drilling company.

The oil palm companies have not yet had an impact on the communities as most villagers still have sufficient agricultural land. However, the development of the oil palm plantations in this area may affect the local people in the future. These communities expect the oil palm companies to safe guard community agricultural land in the future.

Many households are also concerned about the future of their crops, particularly coconut. The presence of oil palm in this region might lower the price of coconuts and encourage fewer buyers. The local livelihood from coconut could therefore decrease. If not handled properly, it could trigger conflict between the communities and oil palm companies in the future.

To support the livelihoods of the local communities, both the oil palm company and local government need to help with the marketing of coconut products produced by the communities including determining the selling price of coconuts. This is very important so that these communities are not harmed by the presence of large-scale oil palm plantations in this region.

5.8 Are business activities perceived as a threat or an opportunity?

The oil palm and oil drilling businesses could be seen as either a threat or an opportunity. This will depend on the commitment, agreement and implementation in the future between the community and companies.

Some communities are concerned that in the future the oil palm companies will require more land and may overlap traditional agricultural land. Traditional leaders have requested clan landowners to lease only land not in use to the oil palm companies. The partnership system between oil palm companies and the communities has limited the land for crops.

In the future, however, this business might provide an opportunity for these communities. The company intends to help the communities to increase their income in the future as company partners. Based on the Nusa Ina experience in Sulawesi, the community can expect to receive a higher income after 8-10 years, with a total Rp 1 million/ha/month. As the minimum area of land owned by clans, according to the company, is 100 ha, income per month could be more than Rp 100 million per month. Although this amount will have to be distributed to all clan members, its value is still higher than their income from agriculture. However, these communities are currently concerned about the implementation as the partnership system is not transparent.

6 Conclusions and recommendations

The lands and forest in this region are important for the four villages, especially for agriculture, their main livelihood. Other important income contributions come from employment and livestock. Forests contribute additional income for some households in the traditional villages.

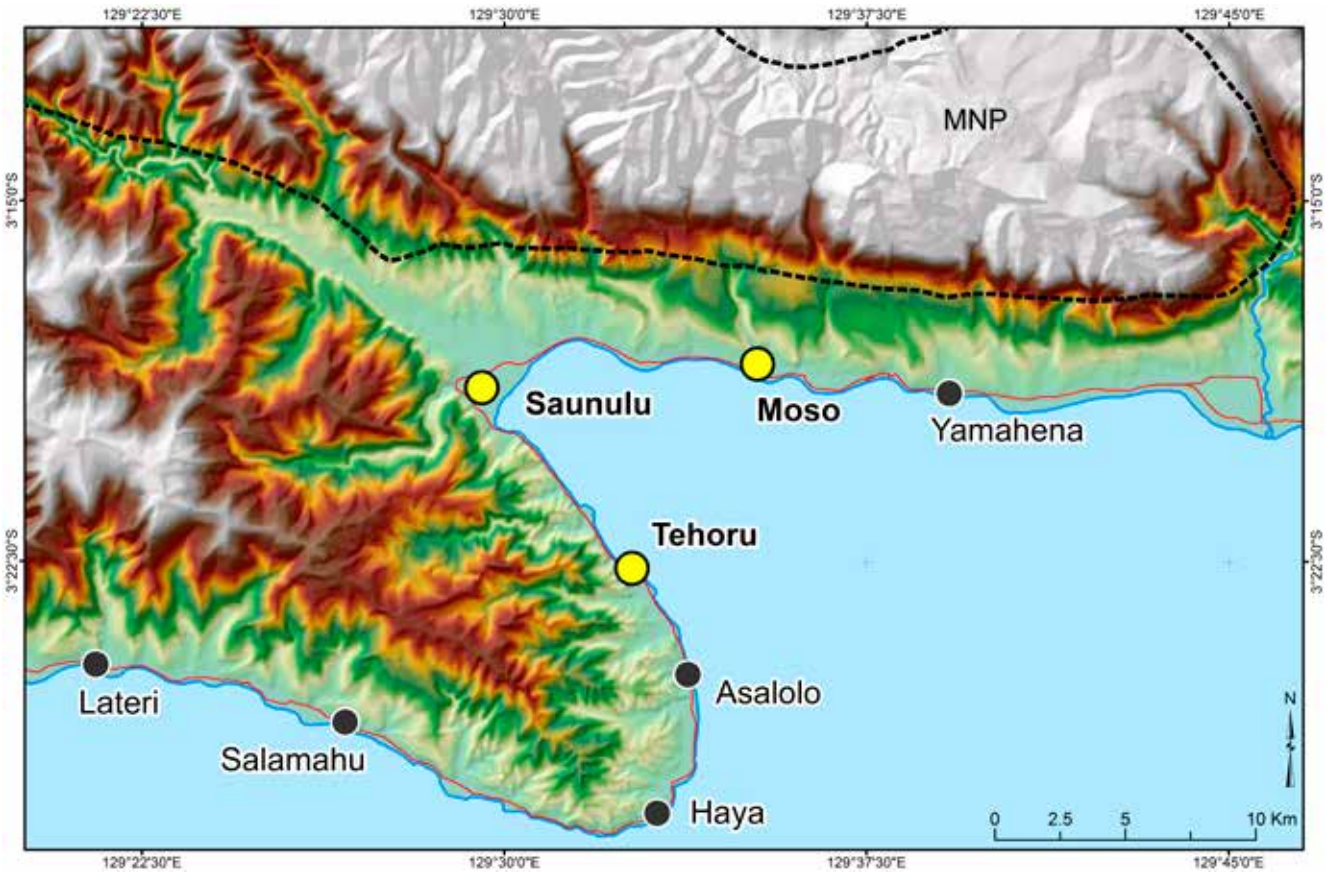
The oil palm and oil drilling companies will have an impact on these communities in terms of limiting access to land and forest in the future. A significant income from the oil palm company will only be received 8 – 10 years after the initial planting. However, if an agreement between a company and community and distribution of benefits are transparent as well as the company meeting local needs and requests, there should be many benefits for both the community and the company. On the other hand, if the business is implemented using a top-down approach ignoring the rights and needs

of the local communities, the business could have a negative impact.

In order to avoid negative impacts we would suggest that the local government support and oversee partnership schemes between companies and the local communities. The local community should be directly involved in the implementation of the partnership system. This could help safeguard community rights and reduce the likelihood of future conflict.

In addition, it is highly recommended that land for agriculture remain with the local communities. Any agricultural land belonging to local communities inadvertently granted to commercial entities should be returned. This land can then provide the villagers with an income while they wait for the oil palm profits (8 – 10 years time). This may also help ameliorate the tenure problems currently being experienced.

Annex 3 - Pilot 3
The case of three villages on the south coast of Seram, Central Maluku
(Tehoru, Saunulu, Moso)



Map 1. Pilot 3 area on the south coast of Seram, Central Maluku

1 Introduction
The Pilot 3 selected villages (Tehoru, Saunulu and Moso) are located in the South of Seram Island in Central Maluku District. These villages were established in the early 20th century (Tehoru in 1920, Saunulu in 1910, and Moso in 1914). Traditional rules governing their land are still applied. In Pilot 3, traditional community land has been officially allocated for Manusela National Park (MNP) and the watershed protection of Yalanakabata. The communities are not allowed to extract timber or wildlife from the forest, nor expand their agricultural land. Due to the reduced access to forest and land for agriculture the local communities struggle to meet their daily living costs and alternative income sources are very limited.

2 Objectives
An issue with land use in these areas relates to overlapping land use between communities and MNP and watershed protection forest (HL Yalanakabata).[1] Hence, the objectives for Pilot 3 are to learn how MNP or HL areas can provide a greater economic return to the communities of Tehoru, Saunulu and Moso as well as

1 Hutan Lindung.

Table 1. General overview of the villages in Pilot 3

Description	Tehoru	Saunulu	Moso
Village establishment	1920s	1910	1914
Land areas (ha)	274	1,200	700
Land ownership	Village, clan	Village, clan	Village, clan
Religion	Moslem, Christian, Hindu	Moslem, Christian	Moslem
Total inhabitants (people)	7,792	1,126	887
Total (HH)	1,157	234	185
Original (HH)	722	133	167
Migrant (HH)	435	101	18
Age of respondents (yrs)/mean	27-68 (44)	26-75 (43)	24-66 (47)
∑ person per HH/mean	2-12 (5)	2-8 (4)	2-8 (5)
Education of heads of HH (%)	NE=0; ES=60; =26,7; SS=10; BSc=3,3	NE=3,3; ES=53,3; JS=16,7; SS=23,3; BSc=3,3	NE=10; ES=50; JS=13,3; SS=16,7; BSc=10
Ethnicity/origin	Sulawesi	Southeast Maluku, Buton, Indonesian Chinese, Java	Southeast Maluku, Sulawesi, Haruku
Local language	Indonesian - Ambonese	Indonesian - Ambonese	Indonesian - Ambonese
Main commodities (Ha)	Cloves (200), coconut (400), Cocoa (150)	Coconut (99,4), cocoa (40), clove (37)	Clove (35), cocoa (20), nutmeg (15)
Forest products	Timber, deer	Firewood, timber, sago	Firewood, timber
Number of shops	22	8	7

a Badan Koordinasi Keluarga Berencana Nasional (Indonesian population and family information network)

Source: direct interview with key informants in February 2011 and BKKBN[a] 2009/2010. Note: HH = Household, NE=No formal Education, ES=Elementary School, JS=Junior High school, SS=Senior High school, BSc=Bachelor Degree

other villages in the surrounding area. We also want to see if there is a potential land use conflict with MNP or HL area?

3 Methods

Our sample (30 households in each village) was randomly selected using a systematic random sampling method. The data was collected in February 2011 through a household survey, FGD[2], and interviews with key informants. Key informants used in this study included the heads of households, the village leaders, and the community leaders. The survey used two questionnaires: the first was used for key informants such as village heads and traditional leaders to obtain generic information about their villages and issues related to forest management, history of conflicts and the local point of view on their natural resources. The second questionnaire was for household interviews to gain information about demographics, economic activities and perceptions regarding tenure security and resource use.

2 Focus Group Discussions.

FGD were also conducted to discuss tenure issues among the villagers. The groups were selected based on gender, age and diverse ethnic composition. A guideline of FGD has been prepared comprising topics on property rights, tenure security, forest management, conflicts, threats and community perceptions of their resources (Liswanti et al. 2012).

4 Results

4.1 Village description

The village areas vary, the smallest is Tehoru which has four hamlets (Pasalolo Waja, Supulessy, Saju and Mihu) and the biggest is Saunulu, which has 2 hamlets (Sapta Marga and Mangga Dua). Although Tehoru has the smallest area it has a higher population than Saunulu and Moso. This is mostly due to the number of migrants from Sulawesi (Table 1). Clans and villages traditionally own the land and are responsible for managing it. In contrast to Tehoru, local inhabitants or migrants in Saunulu and Moso vary in their ethnicity (Table 1). Numbers within each household varied from 2-12 people.

Their main livelihood is agriculture (28 HH in Tehoru, 30 HH in Saunulu, and 30 HH in Moso) then fishing, livestock, forest and employment. Their agriculture is predominantly perennial crops (coconut (*Cocos nucifera*), clove (*Eugenia aromatic*), cocoa (*Theobroma cacao*), nutmeg (*Myristica fragans*), coffee (*Coffea* spp.), sago (*Metroxylon sagu*)) and fruit trees (*durian* (*Durio zibethinus*), mangosteen (*Garcinia mangostana*), mango (*Mangifera indica*), *gandaria* (*Bouea* sp.), *langsat/duku* (*Lansium domesticum*), *rambutan* (*Nephelium lappaceum*), and banana (*Musa paradisiaca*)).

4.2 Household assets

The value of household assets in Saunulu is the lowest compared to Tehoru and Moso (Table 2). In 2002, Saunulu village was so severely damaged during the conflict in the Moluccas that the villagers had to move to other places as refugees. They returned to Saunulu in 2006. The village is still recovering. In Tehoru, the village provides all households with electricity; none of our respondents had a generator (Table 2). Transportation (motorbike, canoe and boat) is important for the community in Moso as it is difficult to reach other villages without and is required for daily activities as well. Other important household spending is on electronic items. Many households spend their income on home entertainment and communications technology especially in Tehoru and Saunulu (Table 2).

4.3 Constraints and problems

Nearly all of the constraints and problems listed in Table 3 have occurred in Tehoru, but problems with land (in terms of boundaries and status) and access to forest are the most problematic, according to our respondents. Limited access to land and the forest has created conflicts between villages. Disasters such as floods, landslides, pests and diseases in crops happen annually creating considerable hardship for these communities. The local government has yet to find a way to cope with these catastrophes. Local government support is usually given after the disaster.

4.4 Household income from different activities

All three villages are located in coastal areas with steep topography. The local livelihoods are mainly agriculture and fisheries while others seek employment, which contribute significant income for households (Figure 1).

Table 2. Important household assets for villages in Pilot 3 areas (Rp/year)[a]

Items	Moso		Saunulu		Tehoru		Notes
	sum (x Rp 1000)	mean (x Rp 1000)	sum (x Rp 1000)	mean (x Rp 1000)	sum (x Rp 1000)	mean (x Rp 1000)	
Electricity	20,800	743	18,300	704	0	0	Diesel generator, solar power cells
Electronic	78,300	2,796	41,470	1,595	77,825	2,684	Satellite dish TV, television, DVD, VCD, tape recorder, speakers, stabilizer, camera, cellphone, refrigerator, rice cooker, washing machine,water pump,
Transport	126,900	4,532	17,050	656	65,750	2,267	Motor bike, bicycle, outboard engine and boat (*ketinting/tempel*), canoe, car/truck, fishing boat
Tools	2,830	101	2,305	89	497	17	Kerosene lamp (petromak), sewing machine
Others	0	0	300	12	0	0	Crock (*tempayan*), jar (*guci*)
Total	**228,830**	**8,173**	**79,425**	**3,055**	**144,072**	**4,968**	

a USD 1 = Rp 9,000

Source: Household survey in February 2011 (HH respondents from Moso=28, Saunulu= 26, Tehoru = 29)

Table 3. Constraints and problems related to land use in Pilot 3

Problem	Description	Tehoru	Saunulu	Moso
Boundary	Unclear	V	V	V
Land status	Not known (forest)	V		V
Extraction of forest products	Timber and birds by villager	V	V	
Catastrophe	Flood and landslide	V	V	V
Times of crisis	Crop failure	V		
Land dispute	Within village	V		
Pest and disease	Forest pests	V		
	Livestock disease	V		
	Banana and cocoa pests		V	V

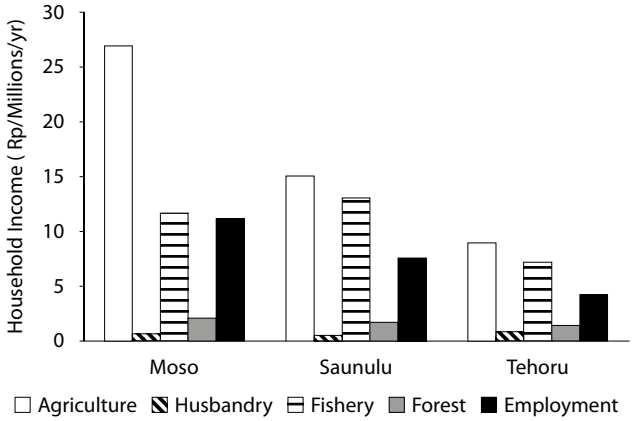


Figure 1. Average annual household income from different activities in Pilot 3 (Rp/year)

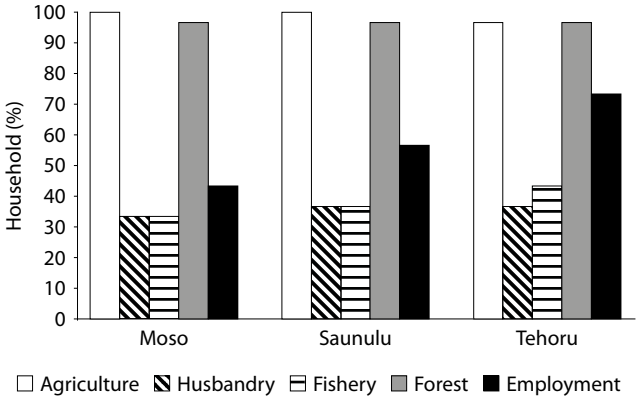


Figure 2. Percentage of household annual income in Pilot 3

The highest HH income from agriculture is in Moso followed by Saunulu and Tehoru. In Pilot 3, fisheries is used more for subsistence than cash. Income from current agricultural practices is not enough due to a lack of land for gardens. In addition, most of the land in Pilot 3 is rocky and not suitable for crops or gardens. Hence, the income from other sources (employment, fishery, forest and livestock) has helped the community to cover their monthly expenses (see Figure 1). Many households in Moso rely on employment, but they tend to look for jobs elsewhere with better pay than in Moso. Carpentry, labor and trade tend to generate the quickest income. They use their earnings to cover living costs and education.

In Pilot 3, almost 100% of households are involved in agriculture and more than 90% of households engage in forest activities, especially collecting firewood for subsistence from gardens and the forest near the village (see Figure 2). More than 30-43% of households in Pilot 3 have engaged in husbandry and fishing. Job opportunities such as labor at the port, trade, employment and canoe building, are also important for local livelihoods (43% in Moso, 57% in Saunulu and 73% in Tehoru).

Table 4 and Figure 3 show that the distribution of household income across villages, grouping household wealth or assets, varies considerably. There is a higher frequency of the "poorest" (lower quartile) of households in Tehoru and Saunulu compared to households in Moso. The "richest" (upper quartile) of households represents the highest frequency of households in Saunulu and Moso. The mean annual household income ranges from approximately Rp 6 million for the lowest "poorest" quartile to Rp 61.1 million for the upper "richest" quartile in Saunulu. None of the villages in Pilot 3 had a "poverty" category.

Table 4. Mean income by income group across villages in Pilot 3 (Rp/year)

Grouping of wealth	Mean household income in Pilot 3 (Rp/year)		
	Moso	Saunulu	Tehoru
Poorest	9,352,667	6,710,185	6,027,366
Second 25%	14,693,333	13,367,829	13,740,000
Third 25%	22,420,903	21,310,586	22,125,692
Richest	55,850,171	61,103,962	37,289,172

Note: Cash income includes income from agriculture, forest, fishing, husbandry and employment. Subsistence income or value has been estimated using market prices and production/ consumption levels. Costs of production have not been subtracted so these figures represent gross income values for cash and subsistence. Subsistence is focused on production of agricultural commodities and some forest resources, harvested for own consumption.

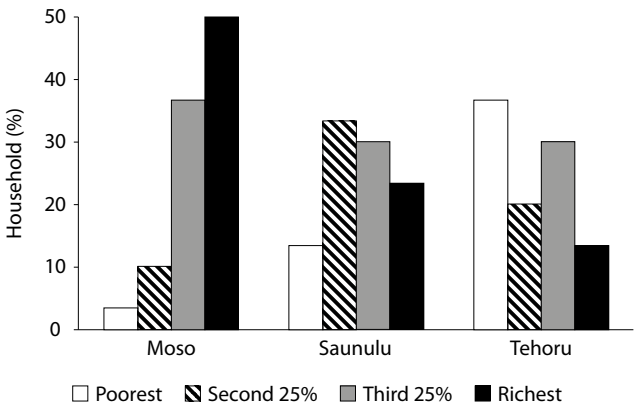


Figure 3. Percentage of the poorest and richest households across villages in Pilot 3

Table 5. Mean household income from the forest in Pilot 3 (Rp/year)

Forest Product (HH/Rp/year)		Moso		Saunulu		Tehoru	
		Mean (Rp)	N (HH)	Mean (Rp)	N (HH)	Mean (Rp)	N (HH)
NTFPs	Cash	353,929	7	980,050	8	2,790,000	3
	Subsistence	1,786,156	16	660,507	15	421,143	7
Fuelwood	Cash	0		672,000	1	0	
	Subsistence	915,714	28	995,448	29	955,517	29
Timber	Subsistence	1,125,000	4	3,000,000	1	1,800,000	1

In Table 5, we show the household income from the forest. NTFPs[3] provide cash and subsistence income for all villages. Only Saunulu obtains cash income from selling firewood. Some households (4 HH in Moso, 1 HH in Saunulu and Tehoru) collect timber for their own consumption, e.g. house construction. Our data shows that NTFPs such as sago and palm fronds do provide an income for households in the Pilot 3 villages, while rattan is collected only in Tehoru based on orders from outsiders (Table 6). Mean income from NTFPs per household per year is Rp 1.1 million in Tehoru, Rp 1 million in Moso, and Rp 770.000 in Saunulu (Table 6). While for timber species, each village collects different timber trees for their own consumption (Table 6).

All villages obtain high cash income from perennial crops (Table 7) such as clove, cocoa, coconut and nutmeg (Table 8). These products have given better cash income per year for households in Moso (Rp 24.5 million), Saunulu (Rp 12.8 million), and Tehoru (Rp 9.5 million). Staple foods (corn (*Zea mays*), cassava (*Manihot esculenta*), sago (*Metroxylon sagu*)) also contribute cash income for households in Pilot 3. The list of agricultural products collected by all households can be seen in Table 8.

4.5 Scoring exercise

All households in the three villages thought that the forest was more important in the past (50-60%), than at present (30-33%), or will be in the future (15-20%) (see Figure 4). In the past, the forest was perceived as being large, with forest products extracted for personal use rather than sale. Agricultural land was perceived as being established to provide daily needs to support a relatively low population. Forest resources were still abundant compared to the current condition. Although MNP was established in 1996, the communities still had good access to the forest at that time, because they were less aware of the existence of MNP and its boundaries.

3 Non Timber Forest Products.

Table 6. Mean income per household from timber and NTFPs in Pilot 3 (Rp/year)

Forest Product	Moso Mean HH/year (Rp)	Saunulu Mean HH/year (Rp)	Tehoru Mean HH/year (Rp)	Mean HH/year (Rp)
NTFPs				
Arenga pinnata (palm fronds)	277,571	840,615	410,000	527,000
Bambusa sp. (bamboo)	646,667			458,667
Phalanger maculatus (cuscus/ possum)		40,000		40,000
Bee (honey)	40,000			40,000
Calamus sp. (rattan)			8,000,000	8,000,000
Metroxylon sagu (sago)	2,850,000	917,500	550,000	1,840,526
Total	**1,070,897**	**771,652**	**1,131,800**	**969,710**
Timber				
Intsia bijuga (ironwood)	1,125,000			1,125,000
Pterocarpus indicus (*lenggua*)		3,000,000		3,000,000
Shorea selanica (*meranti*)			1,800,000	1,800,000
Total	**1,125,000**	**3,000,000**	**1,800,000**	**1,550,000**

Table 7. Mean household income from agriculture in Pilot 3 (Rp/year)

Agricultural products		Moso		Saunulu		Tehoru	
		Mean	HH	Mean	HH	Mean	HH
Staple foods	Cash	608,214	14	1,560,938	16	982,813	16
	Subsistence	214,795	17	315,630	24	467,956	21
	Household income	640,343	19	1,205,560	27	1,216,766	21
Non-staple foods	Cash	1,921,455	22	1,339,261	23	2,450,938	8
	Subsistence	725,724	23	661,557	25	442,670	8
	Household income	2,456,819	24	1,820,843	26	2,893,607	8
Perennial crops	Cash	24,552,967	30	12,841,379	29	9,596,250	22
	Subsistence	585,000	1	.	-	41,250	2
	Household income	24,572,467	30	12,841,379	29	9,600,000	22
Total cash agriculture		**26,245,867**	**30**	**14,272,600**	**30**	**8,801,786**	**28**
Total subsistence agriculture		**909,920**	**23**	**893,112**	**27**	**560,456**	**24**
Household income from agriculture		**26,943,472**	**30**	**15,076,401**	**30**	**8,962,101**	**29**

At present, the forest is perceived as being less important because the access to the forest has been gradually reduced (see Figure 4). An increase in population and therefore the need for more agricultural land meant forest had to be converted to agricultural land. Many households who rely on the forest have to find other alternative sources of income. Reduced access to forest has become a key issue in Pilot 3 villages. Forest is still important in providing timber and NTFPs as well as providing land for agricultural expansion.

The three villages gave different responses regarding the availability of the forest. More than 50% of households in Tehoru explained that their available forest area is widespread (see Figure 5). About 13% of households did not know the answer because they were migrants and do not have any land rights. Other respondents (17%) mentioned that the availability of forestland had decreased due to restrictions on the use of forest by MNP management. In Saunulu, 43% of households gave a similar reason for the decrease in available forest. The main reason is

Table 8. Mean income per household from agriculture in Pilot 3 (Rp/year)

Agricultural Product	Product	Moso (Rp/year)	Saunulu (Rp/year)	Tehoru (Rp/year)	Mean of HH Income (Rp/year)
Staple food	*Zea mays* (corn)		4,500,000	500,000	2,500,000
	Manihot esculenta (cassava)	349,207	952,590	1,130,097	859,173
	Colocasia esculenta (taro)	670,000	212,500	63,316	474,639
	Metroxylon sagu (sago)	200,000			200,000
Non-staple food	*Allium cepa* (red union)			119,994	119,994
	Amaranthus spp. (spinach)			48,000	48,000
	Capsicum annum (chilli)			5,073,077	5,073,077
	Durian	1,000,516	1,548,864		1,284,144
	Bouea sp. (gandaria)		150,000		150,000
	Vigna unguiculata (long string beans)			125,000	125,000
	Arachis hypogaea (peanut)		600,000		600,000
	Ipomoea sp. (water spinach)			1,344,000	1,344,000
	Duku	1,327,027	185,819		661,323
	Mangifera indica (mango)		112,500		112,500
	Garcinia mangostana (mangosteen)	120,000	129,000		127,500
	Ananas comosus (pineapple)		1,050,420		1,050,420
	Parkia sp. (*petai*)			2,250,000	2,250,000
	Banana	1,499,340	897,004	1,060,360	1,186,188
	Rambutan	80,000			80,000
	Solanum sp. (eggplant)			148,936	148,936
	Solanum lycopersicum (tomato)			3,333,333	3,333,333
Perennial crops	Clove	15,399,333	4,713,111	6,660,761	9,859,345
	Cocoa	4,048,071	4,859,280	2,747,778	4,186,419
	Coconut	3,357,292	6,968,350	2,700,000	4,851,957
	Coffee			37,500	37,500
	Nutmeg	1,935,071	1,484,167	2,094,583	1,848,931

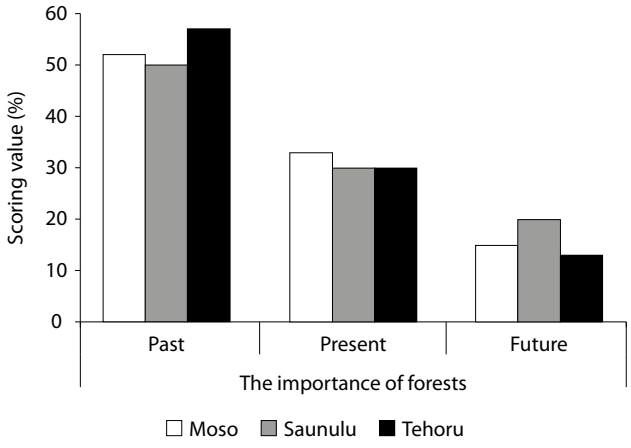


Figure 4. Scoring exercise for the importance of forests in the past, present and future in Pilot 3

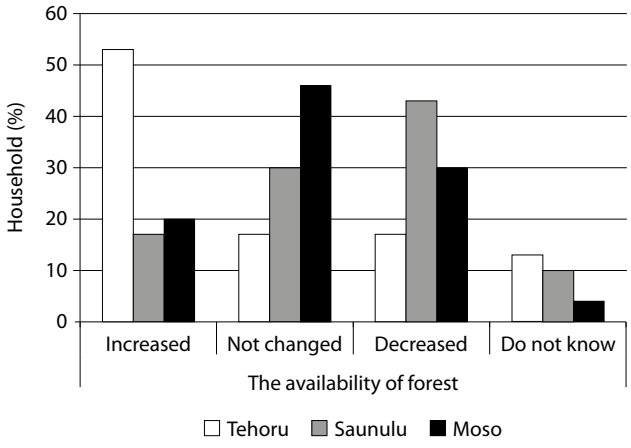


Figure 5. The household perceptions of the availability of forest in Pilot 3

Source: Household survey in 2011

because the park management does not permit the community to use the forest for gardens to avoid landslides and floods. While 30% of households explained that the availability of forest has not changed because they work in gardens inherited from their parents and do not need to clear forest for agriculture. In Moso, almost 50% of households responded that the availability of forests had not changed as they rely on their own land they have used for a long time.

5 Critical issues

5.1 Land tenure and boundaries

Land tenure is one of the most crucial problems in Pilot 3. Most traditional land (*petuanan*) does not have official land rights (land certificates) or any form of legal status according to existing regulations. Without official land rights, communities have difficulty in maintaining their traditional land. Issues over land rights have led to misunderstandings and conflict between communities and MNP or protected areas.

Land boundaries are another crucial issue for these villages. In Tehoru and Saunulu, the boundaries of the clan's land have not been officially marked and this has created land use issues, leading to conflict among the clans and between the villages. The clan's land in Tehoru is huge and adjacent to Saunulu in the north and Haya in the south.

In Saunulu, the village boundary is identified by natural landmarks such as rivers, mountains, valleys, and rocks. Due to unclear individual and clan land boundaries trespassing, both inter-village and inter-clan, have occurred and resulted in conflict. Sometimes the two communities or clans such as in Saunulu and Yaputih villages have claimed the same land. Conflict over land has occurred because neither party had a letter of land ownership, with clear boundaries, based on traditional rights. In Moso, conflict between clans has occurred during the harvesting season when they have collected commodities such as nutmeg or clove from the same land. Each clan insisting that the land belonged to them.

5.2 Access to land and forest

Access to land has become increasingly difficult in recent years within Pilot 3. The use of forest for agriculture, and collecting timber and NTFPs is restricted, because the protected area overlaps most of the community land. In Moso, the productive land for agriculture is limited and what exists is already used for crops and gardens. Some rocky areas are still available but this type of land is not suitable for agriculture, according to our respondents. Geographically, the village is located in between other villages causing problems with land use and access, resulting in difficulties for planting crops for subsistence and livelihoods.

The limited access to land will create further problems in the future as the population is increasing and demand for land will also increase. Meanwhile, a lack of agricultural land has forced many households to plant their crops on the river banks (Saunulu). For example many households (migrants from Buton, Southeast Sulawesi) use the Wai Kawa and Wai Nua River for crops and gardens, even though the land is susceptible to erosion and their crops are frequently damaged or washed away during the rainy season.

The fear is that the community will ignore MNP regulations and collect forest products so creating conflict over land and forest access. In Moso, access to forest, including forest for agriculture and resources (timber and NTFPs), has been reduced due to the presence of MNP. The need for agricultural land and forest resources has increased with the fast growing population and a need for income generation. The park and local authorities have given little support to resolving this growing problem.

Consequently, the local communities collect timber and use the forest without permission, even though there are penalties if they are apprehended. This situation will have a negative impact on the forest and forest resources if these communities are not assisted in finding other viable options.

5.3 Customary vs State regulations

Not all villagers follow the customary management of their forest and natural resources. These villagers tend to be transmigrants who do not understand the traditional management systems of their adopted village or the possible dangers of misuse of the forest. They collect forest products for daily use or for sale and use the forest for perennial crops, e.g. clove, nutmeg and cocoa. Some villagers are aware of the importance of the forest and do not collect unlimited amounts of forest products or clear the forest for agriculture as they know it is likely to cause disasters (flood and erosion), which has already occurred in recent years.

None of the villages in these areas have a clear knowledge and understanding of the State regulations relating to the management and utilization of forest resources. This is due to a lack of information and communication on the part of MNP. The largest implication of this is the exploitation of timber for trade or clearing slopes for agriculture.

5.4 The traditional knowledge, rules/norms and institutional structure

Traditional knowledge such as *sasi*[4] is used in Tehoru, Saunulu and Moso to manage and to use the forest resources and other natural resources. Other traditional knowledge also includes regeneration of plants, implementing traditional agroforestry (*dusung*), which is the combination of tree species and agriculture in their land use system. Sacred places are protected; collecting forest products and other natural resources in these protected places is not allowed.

In Tehoru, there are traditional institutional structures that are often combined with religious affairs. *Luasi*, meaning the two eyes of the house (clan), is one type of traditional institution, where the eye of the house serves as the village leader or King and the other serves as a religious leader (in this case Muslem). *Kasisi* is another type of traditional institution that functions only to manage religious matters in the village. The integration between customary government and religion is important in establishing and developing the village.

In Saunulu and Moso, traditional values still exist including traditional regulations which are governed by the customary leader (King or *Orang Kaya*) and customary institution (*Saniri*, Clan Leader/*Soa*, *Tuan Tanah*, etc.), including the giving of sanctions for customary violations. In Moso, traditional systems have been implemented for a long time. In Saunulu, the traditional system was re-arranged by the customary leader when the traditional or *adat* village (*Negeri adat*) was acknowledged in a district regulation (PERDA[5]). The regulation of the village government has been uniformed in all parts of Indonesia since Suharto was president.

4 Sasi is a generic name for a family of institutions, laws and ritual practices that regulated access to resources on land, coastal reefs, and rivers (see Zerner C. 1994b. Through a green lens: The construction of customary environmental law and community in Indonesia's Maluku Islands. *Law and Society Review* 28(5).

5 Peraturan Daerah.

5.5 Economic opportunities from the local government and MNP/protected area for the communities

To reduce household reliance on the forest, the local government has introduced various programs. These include the National Program for Community Empowerment (PNPM's[6]) through the provision of micro credit to support community development proposals developed by the communities (2011), village fund allocation (ADD[7]) which is an annual fund allocated by the Regency Government given directly to the village for the village development. Thirty percent of ADD is used for the operating expenses of the village level government and 70% is used for community empowerment. In 2005-2006, Mercy Corps (a global aid agency engaged in transitional environments that have experienced some sort of shock: natural disaster, economic collapse, or conflict) gave tools for drying cocoa as well as training on how to maintain a cocoa plantation to increase the community income from cocoa.

The CBCM agency (Community Based Case Management) in 2008-2009, provided the Pilot 3 villages with micro credit (which was given to a group of women in Pilot 3, where one group consisted of three to five people and each group received, between Rp 3 to 5 million) for trading (fish, agriculture, kerosene). CBCM also distributed pontoons (*rumpon*) to the villages in Pilot 3. In 2010, the Department of Forestry (at the dictrict level) provided the villages in Pilot 3 with a plantation program for a fast growing teak variety (Jati Mas). This support has helped the villagers look at alternative livelihood options.

However, some problems occurred during the implementation of the programs on the ground. The teak plantation for example was not successful according to our informants because the community did not know how to grow teak and this was not what they wanted to do. They wanted to grow commodities such as clove, nutmeg, cocoa or orange, trees they already know how to grow.

The main weaknesses with the community development program or other aid programs (similar problems have been experienced in the other Pilot sites) are the lack of training and field supervision for households in using the financial aid,

6 Program Nasional Pemberdayaan Masyarakat.

7 Anggaran Dana Desa.

maintaining resources, and also further assistance on marketing the products. A lack of monitoring the implementation has caused problems for the community. It is important that the local government address these issues before providing further programs. Considering that villages in Pilot 3 depend heavily on agriculture and fishery, support in these activities is urgently needed.

All villages understand that the park and protected areas are important for the future. If the park or protected area were not there, many environmental disasters such as landslides or flood could occur in the area. However, according to informants, if the local government does not consider what is important for the local communities in terms of alternative sources of livelihood, the communities will fall back on the forest when the population increases in the future. As the population grows competition for employment, lack of agricultural land and over harvesting of fish will increase. The cost of these impacts could be immeasurable.

6 Conclusions and recommendations

In Pilot 3 the land is very important for agriculture and forestry. Currently MNP and watershed protection overlap traditional lands belonging to the communities. Limited land for expansion of agricultural land, in response to a growing population, and restricted access to MNP has made the communities insecure in terms of land tenure and livelihood options, which may continue into the future escalating with time if the problems are not addressed.

Long-term solutions to current problems need to be considered. It is perceived that the role of the national park and protected areas in providing solutions to the problems could be better with more effort put into improving the local economy. It was recommended that the local government include local community participation in the planning process, implementation and monitoring of any community development program and land use planning in these areas. Other recommendations are similar to those of Pilot 1, including to optimise plantations and agricultural land by planting certain commodities suitable for the land and of high economic value. This should be controlled by the local government, the national park or the Department of Forestry. They should provide the community with better guidance in developing alternative sources of livelihood including helping them access market information and markets. Land use still requires better local government regulations, especially taking into account the needs of the local community for agricultural land.

Annex 4 - Pilot 4
The case of villages in the southwest of central Seram, Central Maluku

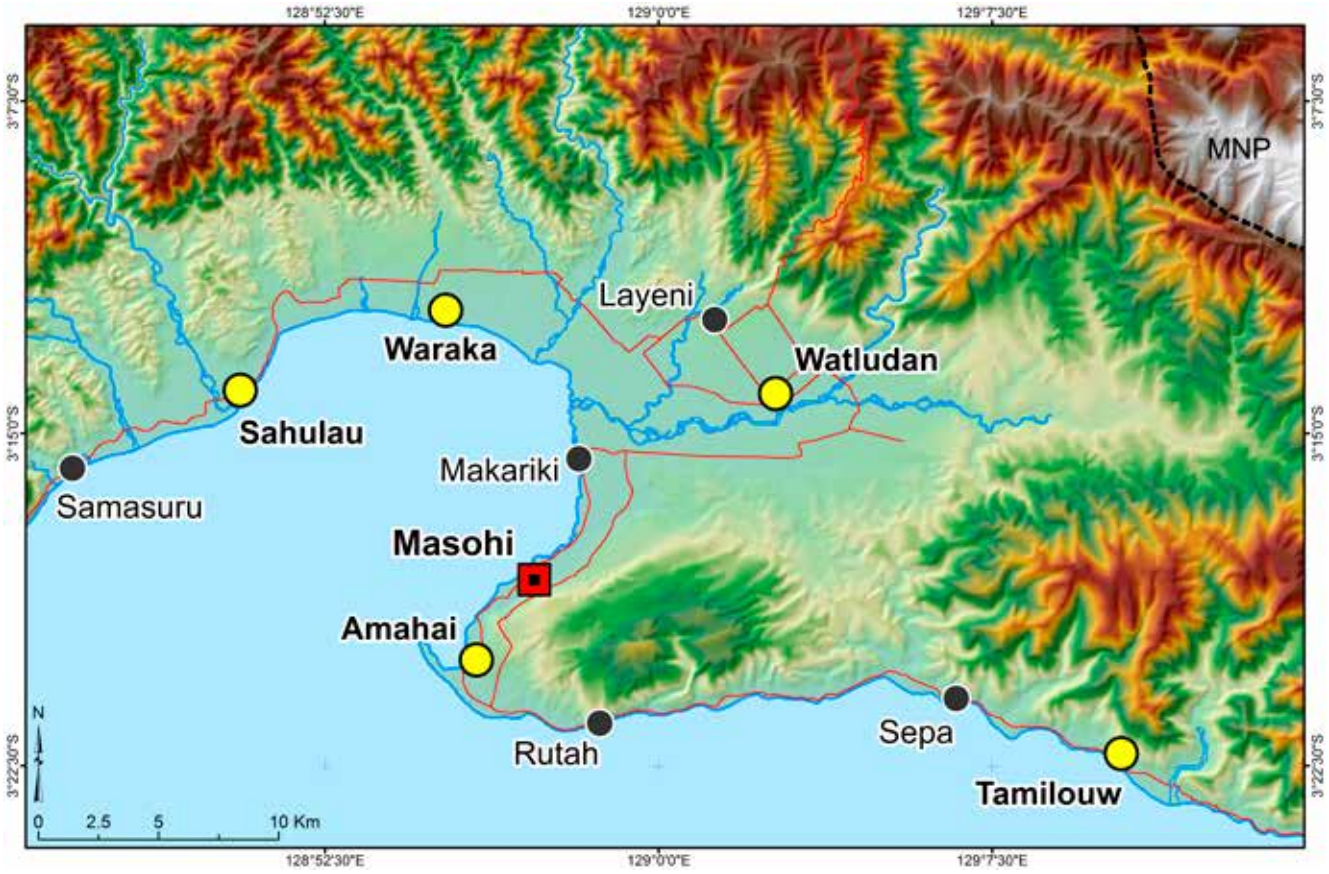
(Sahulau, Waraka, Watludan, Amahai, Tamilouw)

1 Introduction

The Pilot 4 area is located in the southwest of central Seram (Sahulau, Waraka, Watludan) and in south of central Seram (Amahai and Tamilouw), Central Maluku District (Map 1). Watludan is the only transmigration village in the area whereas most households in the other four villages are from Seram Island. All five villages are more integrated or have better access to urban areas due to their closer proximity to the district capital than do the villages in the other pilot areas. These communities have been greatly influenced by the district in term of livelihood options such as wage labor. Traditional rules and traditional knowledge are still applied in all villages and many households are still dependent on the forest. However, problems have occurred in these areas especially in relation to land and forest use. Among the most critical is the allocation of concessions for cocoa (*Theobroma cacao*) plantations and logging activities. These concessions overlap traditional community lands used for agriculture and plantations. In some areas communities feel that they have insufficient land for their daily needs. Population growth in the area is placing further pressure on the need for land. Access to forest resources is currently reduced and timber harvesting is considered illegal. This has been a source of conflict in the region and there is currently no solution for the local communities.

2 Objectives

The objective of this study is to understand whether the concessions such as cocoa and logging present greater economic benefits than traditional land use or farming practices for the local communities.



Map 1. Pilot 4 area in the southwest of central Seram, Central Maluku

3 Methods

The survey selected five villages of which 30 households per village were randomly selected using a systematic random sampling method. The data was collected in December 2010 from the households surveyed using FGD[1], and interviews with key informants. Key informants used in this study included the heads of households, village leaders and community leaders.

The survey used two questionnaires. The first was used for key stakeholders such as village heads and traditional leaders to obtain general information about their villages and issues related to forest management, history of conflicts and the local point of view on their natural resources. The second questionnaire was for household interviews and was used to assess demographic information, economic activities and perceptions regarding tenure security and resource use. In addition, in-depth interviews with open-ended questions were used during interviews with the staff of PTP Nusantara XIV[2].

Focus Group Discussions were also conducted to discuss tenure issues among the villagers. The groups were selected based on gender, age, and ethnic composition. A guideline for FGDs has been prepared comprising topics on property rights, tenure security, forest management, conflicts/threats and community perceptions of their resources (see Liswanti et. al 2012).

4 Results

4.1 Village descriptions

Amahai is the oldest and largest village, in terms of area, and has an immigrant population three times that of the original households. Tamilouw has the largest population (Table 1). Overall the total number of people per household varies between 2-12 people. Many households work as fishermen and farmers (mostly coconut (*Cocos nucifera*) and cocoa) (Table 1). Land traditionally belonged to the village or clan where they were also responsible for land use management.

4.2 Household assets

Table 2 shows the household assets in Pilot 4 villages where Amahai has the greatest assets for transportation, e.g. motorbikes, trucks and cars. Amahai is the sub-district city, the location of the port and very close to Masohi, the district capital. Hence transportation is very important for many households in this village for selling their agricultural products and business (general transportation and car rental).

In general all villages in Pilot 4 use their income to buy home entertainment items and vehicles for transport (Table 2). In Watludan and Amahai some households own generators. The electricity for the remaining households are provided by the village, such as happened in the other three villages (Sahulau, Waraka, Tamilouw).

4.3 Constraints and problems

Three villages in Pilot 4 have problems regarding the forest boundaries which are unclear and the forest, as defined, is still unaccepted by the villagers. The forest in the areas around Sahulau and Tamilouw is officially used by the logging companies and around Amahai by the local government for development activities. The local communities believe that because the forests belong to them traditionally they should be informed if their land is to be used by other parties.

In Tamilouw, part of the traditional forest is also located inside the watershed protection area and this has caused problems related to collecting timber and bird hunting inside the protected area (Table 3). These problems do not occur in Waraka and Watludan as the forest boundary is clear and accepted by the villagers. Their traditional forest is extensive and the village leader still allows other stakeholders (state-owned company and local transmigration) to use their land.

In Watludan, as this is a transmigration village, they do not have a problem with the forest boundary because the government has allocated 2 ha of land to each household with a clear boundary. Wadludan is the only village in Pilot 4 that has no problems and constraints related to land use (Table 3).

All villages, except in Watludan, collect timber causing problems in their villages and with outsiders. Disasters such as floods and landslides have occurred in all villages every year (except Amahai) damaging crops and making access to these villages difficult. Unfortunately, the village flood prevention failed in 1998. There is still a need for greater assistance from the local authority with regards to flood and fire prevention.

1 Focus Group Discussions.

2 State-Owned Enterprises. PT. Perkebunan Nusantara XIV.

Table 1. General overview of the villages in Pilot 4

Description	Sahulau	Waraka	Watludan	Amahai	Tamilouw
Village establishment	1918	1899	1978	1300s	1360
Land ownership	Village, clan	Village, clan	Family	Village, clan	Village, clan
Religion	Christian, Moslem	Christian, Moslem	Christian, Moslem	Christian,	Christian, Moslem, Hindu
Total inhabitants (people)	1083	1721	1008	3491	9103
Total HH	272	362	228	673	1233
Original (HH)	195	348	207	171	1117
Migrant (HH)	77	14	21	502	116
Age of respondents (yrs)/mean	24-71 (44)	28-75 (51)	32-80 (49)	27-73 (45)	27-72 (44)
∑ person per HH/mean	3-10 (6)	1-10 (4)	2-10 (6)	2-9 (5)	2-12 (6)
Education of heads of HH (%)	NE=0; ES=36,7; JS=23,3; SS=36,7; BSc=3,3	NE=3,3; ES=70; JS=23,3; SS=33,3; BSc=0	NE=0; ES=50; JS=13,3; SS=33,3; BSc=10	NE=0; ES=13,3; JS=33,3; SS=53,3; BSc=0	NE=3,3; ES=63,3; JS=26,7; SS=6,7; BSc=0
Ethnicity/origin	Southeast Maluku, Buton, Java, Flores	Java, Kalimantan, Sulawesi, Indonesian Chinese, South West Maluku	Sanana, Saunulu, Lease, Indonesian Chinese, Bugis	Ambon, Minahasa, Flores, Papua, Buton, Indonesian Chinese	Java, Bugis, Makasar, Flores, Buton, Muna, Indonesian Chinese/Wanci
Local language	Na	Wemale	Indonesian - Ambonese	Amahai	Na
Main commodities (Ha)	Coconut (23), cocoa (15), rubber (*Hevea brasiliensis*) (10)	Coconut (45), cocoa (12), banana (*Musa* sp.) (12)	Coconut (30), banana (10), cocoa (7)	Coconut (350), clove (*Eugenia aromatic*) (210), cocoa (30)	Coconut (152), clove (324), cocoa (176), paddy rice (315)
Forest product	Firewood, deer (*Cervus timorensis*), timber	Firewood, timber, sago (*Metroxylon sago*)	Firewood, timber	none	Firewood, timber, rattan (*Calamus* sp.), sago, honey, deer, pig (*Sus scrofa*), *patola* (snake), cuscus (*Phalanger maculatus*)
Number of shop	10	5	4	7	15

a Badan Koordinasi Keluarga Berencana Natiional (National Family Planning Coordination Agency)

Source: direct interview with key informant (December 2010) and BKKBN[a] 2009/2010. Note: HH = Household, NE=No formal Education, ES=Elementary School, JS=Junior High School, SS=Senior High School, BSc=Bachelor

The land in Waraka and Amahai are prone to fires during the dry seasons (Table 3). The village rules related to maintenance or management of forest has been enforced to reduce this problem. The rules stipulate that the villagers must limit their use of fire during the long dry season.

4.4 Household income from different activities

The average annual household income differs between villages in Pilot 4 (Figure 1). Except Watludan, fishing is an important source of income for all

Table 2. Main household assets per year in Pilot 4

Items		Amahai (x Rp 1000)	Sahulau (x Rp 1000)	Tamilouw (x Rp 1000)	Waraka (x Rp 1000)	Watludan (x Rp 1000)	Notes
Electricity	sum	2,100	-	-	-	7,250	Electric generator, solar power generator
	mean	72	-	-		330	
Electronic	sum	85,025	91,375	54,005	63,775	65,960	Satellite dish, TV, VCD, DVD, radio, tape, recorder, computer, camera, cellphone, stabilizer, speaker, amplifier, refrigerator, fan, water dispenser, water pump
	mean	2,932	3,973	2,455	2,899	2,998	
Transportation	sum	309,660	122,675	64,650	41,100	100,630	Bicycle, motor bike, outboard engine and boat (*ketinting/tempel*), canoe, truck, fishing boat
	mean	10,678	5,334	2,939	1,868	4,574	
Tools	sum	15,270	23,200	10,231	2,281	1,450	Kerosene lamp (*petromak*), chainsaw, sewing machine, small motorize hand plough
	mean	527	1,009	465	104	66	
Others	sum	-	-	775	450	850	
	mean	-		35	20	39	
Total	**sum**	**412,055**	**237,250**	**129,661**	**107,606**	**176,140**	
	mean	**14,209**	**10,315**	**5,894**	**4,891**	**8,006**	

Source: Household survey in 2010 (HH Respondent from Amahai=29, Sahulau= 23, Tamilouw=22, Waraka = 22, Watludan = 22)

Table 3. Constraints and problems related to land use in Pilot 4

Problems	Sahulau	Waraka	Watludan	Amahai	Tamilouw
Forest boundary:					
Unknown/Unclear	V			V	V
Defined but unaccepted by villagers	V			V	V
Land status - inside protected area					V
Timber extraction - By villagers & outsiders	V	V		V	V
Bird hunting					V
Confiscated tools or goods by forest agency				V	
Disaster: flood & landslide	V	V	V		V
Pest and disease:					
Forest				V	V
Livestock	V			V	V
Cocoa		V			
Fires (forest and garden) – around the village		V			V
Land dispute – between and within village					V
Loss of livestock – stolen by outsiders	V			V	V

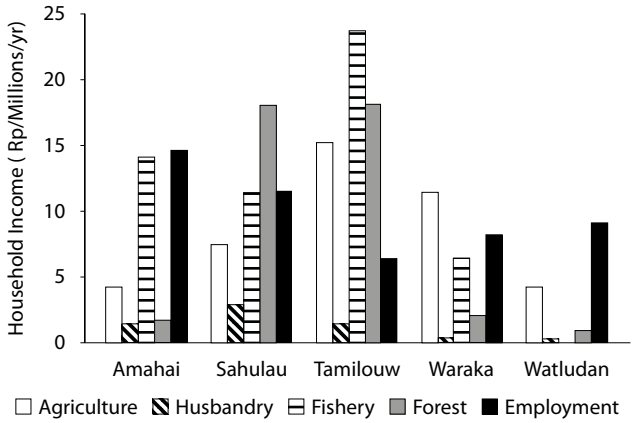


Figure 1. Average annual household income from different activities in Pilot 4 (Rp/year)

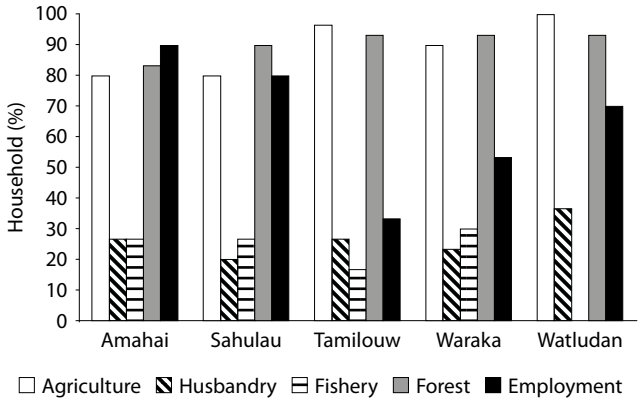


Figure 2. Percentage of household annual income in Pilot 4

villages both for subsistence and cash especially in Tamilouw followed by Amahai, Sahulau and Waraka. The majority of households in Tamilouw and Waraka obtain higher income from planting crops than the other three villages. The main agricultural commodities in Pilot 4 are from perennial crops such as coconut, clove, cocoa, coffee (*Coffea* sp*p*.), nutmeg, sago and sugar palm (*Arenga pinnata*). Timber and NTFPs are important for households in Sahulau and Tamilouw where they get an income of about Rp 18 million/year[3] (Figure 1). However, the collection of forest products is now restricted as their forest is located inside the watershed protection area. Many households in all villages are employed. In Pilot 4, only a few households generate income from animal husbandry (Figure 1).

In Pilot 4, at least 80-100% of households engage in agriculture and forestry (timber and NTFPs) (Figure 2). Interestingly, only 20-30% of households in these villages fish although the income from fishing is higher than agriculture on average (see Figure 1 and Figure 2). Between 50-90% of households, except for Tamilouw (31%), obtain income from employment (Figure 2). Employment is varied with the majority being categorized as carpenters, estate employees, loggers, traders, laborers, businessmen. Some households still receive a pension. Forests are important for all households in Pilot 4, although not all households receive a cash income from NTFPs or sell timber, but they all benefit from collecting firewood used for subsistence.

In Watludan, a transmigration village, some households still earn an income from cattle (8 HH) and NTFPs (3 HH). The main agricultural commodities are from perennial crops (coconut, clove, cocoa and nutmeg) and fruit trees (banana, *durian* (*Durio zibethinus*), duku/langsat (*Lansium domesticum*), and orange (*Citrus* sp.)). From agriculture, the average annual household income is below Rp 5 million. The contribution of forests to the local income in this village is small, but most households (26 HH) collect firewood for subsistence. In terms of wage labor, many households work as church officers, laborers, carpenters, craftsmen, traders, village officers or are retired.

Table 4 and Figure 3 show the variations in livelihood activities and the distribution of household income across villages using grouping of household assets. Using the mean income group, the frequencies of the "poorest" (lower quartile) of households and the "richest" (upper quartile) of households represent the highest frequencies of households in Tamilouw.

Mean household income has a range of approximately Rp 3.6 million for the lowest "poorest" quartile in Tamilouw to Rp 108 million for the upper "richest" quartile in Tamilouw. But if we look at the "poorest" and "richest" groups based on numbers of households, Watludan is the "poorest" and Amahai is the "richest" (Figure 3).

The importance of forest for households in Pilot 4 can be seen in Table 5. At least 1-7 households in each village except Amahai, collect forest products with an annual cash income per household that varies from the smallest Rp 1.5 million/household (3 HH) (the smallest) in Watludan and the highest Rp 107 million/household (only 4 HH) in Tamilouw.

3 USD 1 = Rp 9,000.

Table 4. Mean income by income group across villages in Pilot 4 (Rp/year)

Grouping of wealth	Mean household income by group (Rp/year)				
	Amahai	Sahulau	Tamilouw	Waraka	Watludan
Poorest	5,986,857	5,937,244	3,606,999	5,075,732	5,150,439
Second 25%	13,085,011	10,609,000	12,171,688	12,778,028	12,504,252
Third 25%	21,706,788	21,223,437	20,910,852	19,099,002	22,393,333
Richest	42,599,374	89,122,457	108,206,196	52,547,382	33,660,000

Note: Cash income includes income from agriculture, forest, fish, husbandry, and employment. Subsistence income or value has been estimated using market prices and production/consumption levels. Costs of production have not been subtracted so these figures represent gross income values for cash and subsistence. Subsistence is focused on production of agricultural commodities and some forest resources, harvested for own consumption.

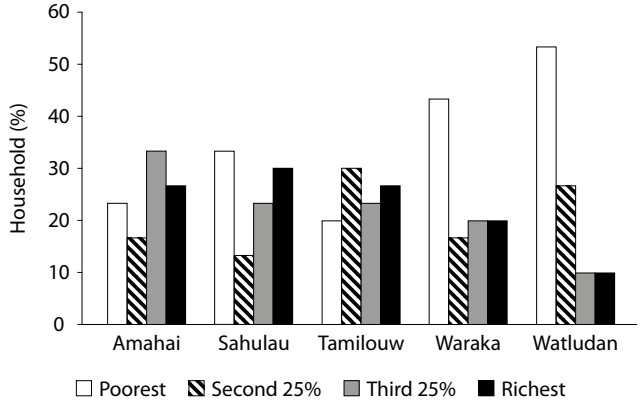


Figure 3. Percentage of the poorest and richest households across villages in Pilot 4

NTFPs are important for subsistence in all villages except Sahulau and involve about 2-6 HH in each village. Almost all households collect fuelwood for subsistence, not for cash (Table 5). Timber trees have given significant annual cash income for 3 HH in Sahulau (Rp 150.6 million) and 1 HH in Tamilouw (Rp 360.4 million). In summary, the households in Tamilouw have obtained the highest cash from NTFPs (4 HH/Rp 107 million) and the highest subsistence value (28 HH/Rp 2.8 million).

Here we provide a list of forest products (timber and NTFPs) that are collected by households in Pilot 4. Sugar palm/*Arenga pinnata* (Waraka), sago/*Metroxylon sagu* (Amahai), and deer/*Cervus timorensis* (Tamilouw) contribute a high income for some households in this Pilot (see Table 6). Other important NTFPs are bamboo (*Bambusa* sp.), rattan (*Calamus* sp.), honey and pig (*Sus scrofa*). While important timber species that contribute to cash income for households in Sahulau and Tamilouw (Table 5 & 6) include *gejawas hutan* (*Syzygium* sp.), *gofasa* (*Vitex cofassus*) and *lenggua* (*Pterocarpus indicus*).

In Pilot 4, agricultural products are important for cash income especially perennial crops such as rubber, clove, coconut, cocoa and nutmeg (Table 7 and 8). Income from rubber is higher than other cash crops and only collected by households in Sahulau. Some crops were used as staple food such as corn (*Zea mays*), cassava (*Manihot esculenta*), yam (*Dioscorea* sp.), taro (*Colocasia esculenta*) and sago (Table 8), but some households sell these products as a livelihood (Table 7).

4.5 Scoring exercise

The scoring value indicates that the perception of the role of forests in the past is higher than at present or the future. According to household perceptions in five villages, the importance of forests in the past was greater because they still held abundant resources (Figure 4).

In the past, access to forests was still good and the use of forest resources was less because of a low population and they used the forest only for gardens, for subsistence. At present, the population has increased and all villages use forests to expand their gardens for their livelihoods and subsistence. They use forest resources to build their settlements (Tamilow, Sahulau). The forest is also used by investors for developing rubber and cocoa plantations (Waraka). In addition, the high cost of living has caused an increase in the use of forest resources (Amahai). Access to the forests has decreased as the distance to the forest has increased; hence, the value as perceived by the communities has become less important than the past (Figure 4).

Table 5. Mean household income from the forest in Pilot 4 (Rp/year)

Forest Product			Mean household income (Rp/year)				
			Amahai	Sahulau	Tamilouw	Waraka	Watludan
NTFPs	Cash	Mean	.	2,136,000	16,900,000	5,975,000	1,546,667
		N	-	5	4	4	3
	Subsistence	Mean	3,441,600	.	7,653,333	1,400,000	437,000
		N	5	-	6	2	3
	Cash and Subsisten	Mean	3,441,600	2,136,000	16,217,143	5,340,000	1,190,200
		N	5	5	7	5	5
Fuelwood	Subsistence	Mean	1,022,500	922,222	1,053,214	1,000,000	810,000
		N	24	27	28	28	26
Timber	Cash	Mean	.	150,600,000	360,404,000	.	.
		N	-	3	1	-	-
	Subsistence	Mean	1,500,000	.	1,024,000	1,700,000	.
		N	1	-	4	2	-
	Cash and Subsisten	Mean	1,500,000	150,600,000	91,125,000	1,700,000	.
		N	1	3	4	2	-
Total income from the forest	**Cash**	**Mean**	**.**	**66,068,571**	**107,001,000**	**5,975,000**	**1,546,667**
		N	**-**	**7**	**4**	**4**	**3**
	Subsistence	**Mean**	**1,729,920**	**922,222**	**2,839,500**	**1,221,429**	**828,556**
		N	**25**	**27**	**28**	**28**	**27**
	Cash and Subsisten	**Mean**	**1,729,920**	**18,051,111**	**18,125,357**	**2,075,000**	**964,679**
		N	**25**	**27**	**28**	**28**	**28**

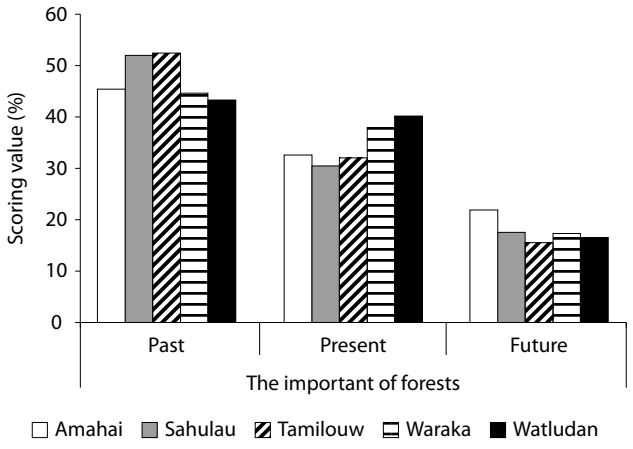


Figure 4. Scoring exercise for the importance of forest in the past, present and future in Pilot 4

The perceived future value of the forest is that it will decrease due to the loss of forest resources as a result of increased logging activities, gardens or by other interested parties (Sahulau, Waraka). Population growth will mean an increased use of forest for gardens (Watludan, Amahai). In Tamilouw, the forest resources are now limited as the community use the forest for settlements, gardens and logging activities.

According to all respondents, the availability of forest in general has not changed because the forest is still extensive (Figure 5). The problem is that the watershed protection areas (in Sahulau and Tamilouw), state-owned enterprises (in Waraka), and transmigration areas (in Amahai) all overlap their traditional forest land. This has limited their access and use of the forest and forest resources. In Wadludan, the availability of forest has decreased because the forest has been claimed by the Naulu ethnic group, the original ethnic group in Watludan. However, not all households know about the availability of forests as they only use their gardens and seldom use the forest (Figure 5).

Table 6. Mean income per household from timber and NTFPs in Pilot 4 (Rp/year)

Forest products	Mean households income per year (Rp/year)					
	Amahai	Sahulau	Tamilouw	Waraka	Watludan	Total
NTFPs						
Arenga pinnata (palm fronds & fruit)		3,360,000		18,300,000	4,200,000	15,030,000
Bambusa sp. (bamboo)	939,500	4,800,000	1,990,000	1,560,000	5,000	1,323,357
Apoidea/bee (honey)			1,200,000		10,000	605,000
Calamus sp. (rattan)			2,920,000		700,000	1,440,000
Nutmeg				400,000		400,000
Edible leaf	1,000		240,000			120,500
Wild pig			10,000	1,000,000		505,000
Sago	15,330,000			5,200,000		20,530,000
Metroxylon sagu (sago leaf - midrib/*gaba-gaba*)			7,300,000			7,300,000
Butterfly		1,260,000				1,260,000
Cuscus				240,000		240,000
Deer			33,240,000		336,000	25,014,000
Total	**2,868,000**	**2,136,000**	**9,460,000**	**3,337,500**	**991,833**	**4,704,297**
Timber						
Gejawas hutan (*Duabanga molluccana*)		129,600,000	350,000,000			239,800,000
Melia ecelsa (bawang)				300,000		300,000
Casuarina sumatrana (cemara)	1,500,000					1,500,000
Gofasa		68,400,000				68,400,000
Macaranga hispida (*hanua*)			600,000			600,000
Terminalia gigantea (*ketapang hutan*)				1,200,000		1,200,000
Lenggua		90,000,000				90,000,000
Litsea angulata (*makila*)			150,000			150,000
Shorea selanica (*meranti*)			1,500,000			1,500,000
Octomeles moluccana (*pulaka*)			6,125,000	1,000,000		4,416,667
Anthocephalus macrophyllus (*samama*)		5,400,000		900,000		3,150,000
Total	**1,500,000**	**75,300,000**	**60,750,000**	**850,000**		**48,305,882**

Table 7. Mean household income from agriculture in Pilot 4 (Rp/year)

Forest Product			Mean household income (Rp/year)				
			Amahai	Sahulau	Tamilouw	Waraka	Watludan
Staple foods	Cash	Mean	1,800,200	2,442,000	877,000	1,615,833	1,849,600
		N	6	5	10	6	10
	Subsistence	Mean	226,028	664,227	1,740,407	437,509	932,014
		N	14	13	16	15	18
	Cash and Subsisten	Mean	997,542	1,389,663	1,927,185	855,665	1,856,434
		N	14	15	19	19	19
Non-staple foods	Cash	Mean	1,132,778	3,405,000	1,825,938	2,106,035	1,881,071
		N	9	10	8	17	14
	Subsistence	Mean	744,465	237,394	446,638	717,886	484,386
		N	9	10	10	20	15
	Cash and Subsisten	Mean	1,877,243	3,311,267	1,907,388	2,508,016	2,100,050
		N	9	11	10	20	16
Perennial crops	Cash	Mean	5,557,833	8,725,586	13,745,607	12,719,421	4,219,786
		N	12	14	28	19	14
	Subsistence	Mean	736,667	60,007	201,749	295,000	120,000
		N	6	3	4	4	1
	Cash and Subsisten	Mean	5,079,571	8,155,881	13,774,428	12,781,526	4,228,357
		N	14	15	28	19	14
Total income from agriculture	**Cash**	**Mean**	**4,175,724**	**8,420,910**	**14,077,741**	**13,053,027**	**3,996,462**
		N	**21**	**20**	**29**	**22**	**26**
	Subsistence	**Mean**	**793,587**	**532,805**	**1,577,137**	**920,848**	**894,890**
		N	**18**	**21**	**21**	**24**	**27**
	Cash and Subsisten	**Mean**	**4,248,949**	**7,483,630**	**15,219,806**	**11,454,332**	**4,269,001**
		N	**24**	**24**	**29**	**27**	**30**

5 Critical issues

5.1 Conflict over land use

Traditionally, most of the land in this area belonged and was used by the local communities, as was the case in other areas of Seram. However, in 1982 the state-owned company PTP Nusantara XIV was granted a thirty year concession for a cocoa plantation despite the fact that the concession overlapped the traditional land (*petuanan*) of several villages in Teluk Elpaputih District, including two of our study villages (Sahulau and Waraka). In practice, the company has applied the Right to Use the land for 30 years (HGU[4]). To date these communities have not obtained compensation for the loss of their land.

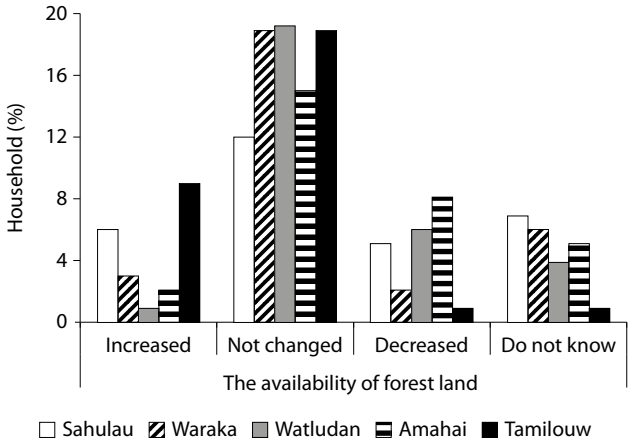


Figure 5. The household perceptions of the availability of forest in Pilot 4

4 Hak Guna Usaha.

Table 8. Mean income per household from agriculture products in Pilot 4 (Rp/year)

Agricultural Products	Product	Amahai	Sahulau	Tamilouw	Waraka	Watludan	Mean of HH Income
Staple food	Corn		530,000				530,000
	Cassava	829,503	1,047,496	904,156	362,163	1,456,014	933,812
	Taro	390,814	468,750	154,583	541,037	500,000	401,138
	Yam	147,506	90,000		1,940,000	2,004,000	1,172,190
	Sago		2,625,000	4,668,000	360,000		3,618,750
Non-staple food	Vegetables (spinach (*Amaranthus* sp*p*.), string beans (*Vigna unguculata*), water spinach (*Ipomoea* sp.), mustard greens (*Brassica* sp.), eggplant (*Solanum* sp.), chili (*Capsicum annum*))	4,784,540	8,000,000	375,000	5,125,000	690,000	7,178,175
	Fruit (*duku*, *durian*, orange, lemon, cucumber (*Cucumis sativum*), banana, *rambutan* (*Nephelium lappaceum*))	2,584,697	2,256,359	3,537,307	5,786,423	9,473,816	9,661,390
	Beans (green beans (*Vigna radiata*), long beans, peanuts (*Arachis* sp.), soybeans (*Glicyne max*))	551,245	5,860,355	250,000	8,700,000	750,000	10,990,711
Perennial crops	Clove	1,000,000	5,716,667	8,704,476	5,000,000	1,000,000	7,664,593
	Cocoa	2,200,000	1,798,200	4,284,750	2,826,333	1,012,857	3,015,420
	Rubber		30,000,000				30,000,000
	Coconut	3,969,625	3,016,435	4,133,333	8,867,333	3,197,133	5,083,318
	Nutmeg			4,705,588	924,000	1,575,000	3,185,690

According to the concession agreement the company promised to provide assistance for village development, particularly for the villages where the land was used by the concession. This has created difficulties between the company and the community and has resulted in the community (in particular the King and traditional leader) not wanting to extend the HGU. This condition will have a negative impact on the future of the company in the area, particularly for the local people who work for the company. There is also a risk of losing jobs which has been a source of income for so long.

Conflict over land use has also been caused by unclear land boundary. In Pilot 4 land boundaries are yet to be marked, either the boundaries between villages or between the clans in each village. This has caused land disputes and is a potential source of friction between communities (e.g. conflict between Watludan and Naulu ethnic groups).

5.2 Access to forest and forest use

Most of all, Pilot 4 villages (except Amahai) are dependent on the forest, in spite of their villages being located close to Masohi, the capital city of the district. In Amahai, many households have a number of livelihood options mainly derived from employment such as government employee, private employee, port laborers, carpentry services (carpenters, masons), traders, drivers and businessperson/businessmen while other households are farmers and fishermen.

Access to forest and land is currently decreasing due to an increasing population over time. The forest and land resources are generally used by villages in Pilot 4 for cash and subsistence. This will have an impact on the utilization of forest resources such as timber exploitation for sale. To address local logging activities on a large scale by local people, each village have tried to manage timber harvesting in a sustainable way and conserve the forest for future generations.

In 2012 PT. Albasi Priangan Lestari/APL was granted a timber concession from the government both at central and district level for the utilization of timber forest products from natural resources (IUPHHK-HA[5]). A problem ensued because the community in Waraka did not know about this decision as there was no consultation. The village has refused to accept this decision because their access to forest resources would be restricted and uncompensated. Until recently the company had not started working in the Waraka area.

A similar problem occurred a few years ago in Tamilouw when a forest concession (PT. Hasil Bumi Indonesia/ HBI) conducted logging activities in the village area. Responsibility and obligations of the company to undertake a forest rehabilitation and village development program were not implemented properly and have caused damage to the forest. Environmental impacts of logging activities have recently caused river turbidity, landslides, and a decrease in timber trees. Most of the traditional communities in Pilot 4 have objected to logging activities in their area.

In contrast many households in Sahulau extract timber for sale and use the income for daily needs and livelihoods. The villages have also exploited their clan land (petuanan), which the government has allocated for production and watershed protection areas. Their activities are officially considered illegal, but households argue that they collect timber from their inherited land and therefore do not need official permits from the local government. Our respondents complained that it is unfair if their traditional forest is exploited by other parties who do have a permit from the authorities.

Many communities outside the Pilot 4 area use forest resources, mainly because the forest is a large area and lacks control from the village officer of each village area. In addition, the forest boundaries between the villages are unclear. In Waraka for instance, the Kewang (traditional village forest guard), controls the forest and land, but the implementation is not optimal.

5.3 The customary rule and traditional knowledge

All villages in Pilot 4 are consistent in applying customary rules in their village although the villages are located in the urban area, with government systems, ceremonies and customary rules relating to the management of forest resources, for example, Lailosa clan in Waraka is the only clan that has the right to become king of the land according to customary rules for Waraka. Also in Amahai, the king or head of the village always comes from the Hallatu clan. This kind of system is implemented in all traditional villages on this island.

5 IUPHHK-HA = Ijin Usaha Pemanfaatan Hasil Hutan Kayu dalam Hutan Alam.

Traditional knowledge such as sasi[6] is still used in all villages mainly in the management and utilization of forests and natural resources. Some places are also considered sacred or taboo and activities are prohibited.

5.4 Do business activities represent a greater economic benefit?

In Pilot 4, business activities do not provide greater economic benefit compared to the other activities such as agriculture or fisheries (Figure 1). In general, the household income from employment is lower than from agriculture or fisheries, except in Watludan. Most income from employment, for villages in Pilot 4, is varied with the majority being categorized as carpenters, estate employees, loggers, traders, laborers, businessmen. In addition, only 50% of our respondents in each village were employed, with a few households were employed by PTP Nusantara XIV in Waraka and only a few households were State employees. Employment opportunities are limited as certain skills are usually required and they are frequently skills the local community do not have.

Currently, PTP Nusantara XIV in Pilot 4 provides less income to the communities than agriculture and fisheries. The income from this company does not come from benefit sharing but from employment. Only 11 out of 150 households in Pilot 4 (Sahulau and Waraka) work there as staff and laborers, earning an income ranging from Rp 3.6 million to Rp 13 million per year. In agriculture, their income range is from Rp 2 million to Rp 23 million per year. In addition, this company has not yet provided useful assistance to these villages. These villages have asked for compensation for improving infrastructure, constructing places of worship and other village assistance. At the time of our visit in 2012 the company accepted their requests and acted at the end of 2012.

5.5 Are business activities perceived as being positive or negative?

The PTP Nusantara XIV could be seen as either positive or negative. This will depend on the commitment and agreement in the future between the community and company and the implementation of any agreed activity. In this case, the King in Waraka represents the other villages located around PTP Nusantara XIV, in explaining to the company the villages' needs and expectations. In general, all villages expect the company to provide more job opportunities as an alternative livelihood as well as to provide training and counselling on planting, maintaining and harvesting cocoa. The farmers' cocoa crop often fails due to pests, disease, or because the farmers do not have the skills to maintain the cocoa trees.

At present, these villages are currently concerned about the implementation of the partnership system having extended the HGU (2012 – 2042). They are concerned that the company may not be willing to accommodate their needs and interests, particularly those that will help them to increase their income in the future as company partners.

6 Conclusions and recommendations

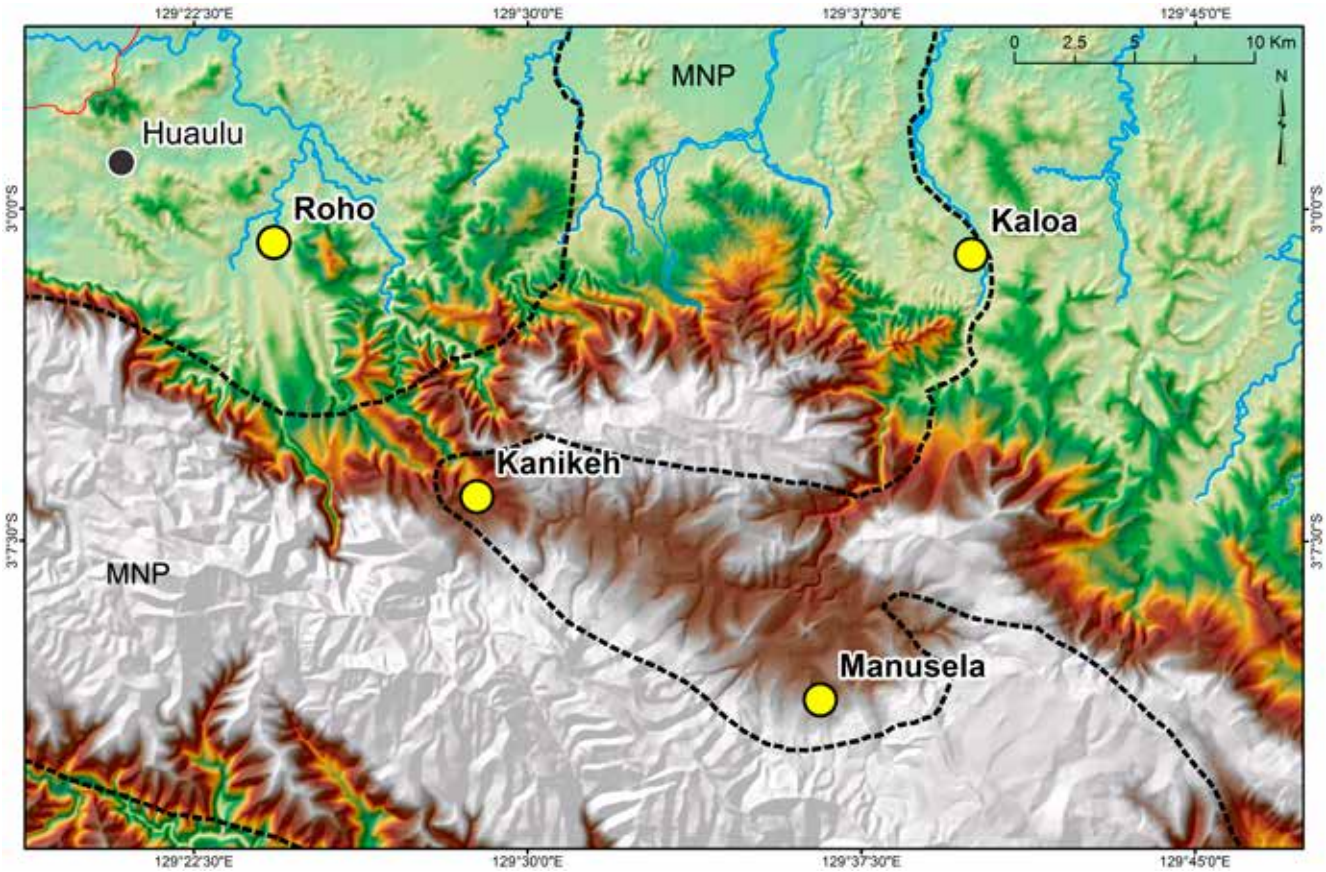
The land and forest are important for villages in Pilot 4 especially for agriculture, which is the main source of livelihood after fishery and employment. Forest products also play an important role in contributing to the household income in Pilot 4. In order to reduce household dependency on the forest, support from the local government or other parties is urgently needed, especially in finding alternative livelihood options. Villages in Pilot 4 are close to Masohi, the capital city of the Central Maluku district, so providing more employment opportunities could be one solution.

All villages in Pilot 4, except Wadludan, have problems related to land use, which has caused conflict between villages, and between villages and the companies. These issues need further support and action either from the local government or other parties.

We recommend that the cooperation between the local communities and PTP Nusantara XIV have an agreement that outlines clearly all distribution of benefits. The company is expected to be transparent and to meet local needs and requests; there should be many benefits for both the community and the company. If the business is implemented using a top-down approach ignoring the rights and needs of the local communities, the business could have a negative impact. We suggest the local government support and oversee all partnership schemes between companies operating in the area and the local communities involved to avoid negative impacts.

6 Sasi is a generic name for a family of institutions, laws and ritual practices that regulated access to resources on land, coastal reefs, and rivers (see Zerner C. 1994b. Through a green lens: The construction of customary environmental law andcommunity in Indonesia's Maluku Islands. *Law and Society Review* 28(5).

Annex 5 - Pilot 5
The case of mountain villages in the north of central Seram, Central Maluku
(Roho, Kanikeh, Manusela, Kaloa)



Map 1. Pilot 5 on the mountainous area of central Seram, Central Maluku

1 Introduction

All four villages (Roho, Kanikeh, Manusela, Kaloa) in the Pilot 5 area are located in the mountains around the Manusela National Park (MNP); the park boundary overlaps all four villages. This has made it difficult for the communities to manage their land. Problems with land use started when the park was established in 1997 and access to forest and forest products was restricted. Collecting timber and (NTFP[1]) is now forbidden and sanctions are given to those who ignore this rule. Since 1997, local livelihoods have changed to agriculture, mainly coconut and cocoa, although their agricultural land is limited and cannot be expanded due to the park. To date, the villagers believe that the park officer has not provided enough co-ordination and information with regards to the existence of MNP and alternative livelihood options. A lack of roads and access to markets are additional problems the communities face in this mountainous area. In Pilot 5, problems of land, resources and livelihood options have arisen and could create potential conflict in the next few years unless solutions are found.

1 Non Timber Forest Products.

2 Objectives

The objectives of Pilot 5 are to learn how MNP could provide a greater economic return to the local community than alternative land use options. We also considered the possibility of potential land use conflict with neighbouring areas and or MNP.

3 Methods

Thirty households per village, from four different villages were randomly selected using a systematic random sampling method. Unfortunately though, many households were not in the village during the survey in June 2011 as they had gone to their settlement on the coast. The total number of heads of households who stayed in the village was less than 30 HH[2]. We interviewed all available households, 24 HH in Kanikeh and 21 HH in Kaloa. In Roho and Manusela, we interviewed 30 HH randomly. The data was collected through a household survey, FGD[3], and interviews with key informants. Key informants used in this study included the heads of households the village leader, and the community leader.

The survey used two questionnaires: the first was used for key informants such as village heads and traditional leaders to obtain global information about their villages and issues related to forest management, history of conflicts and the local point of view on their natural resources. The second questionnaire was for household interviews to address demographic information, economic activities and perceptions of tenure security and resource use.

Focus group discussions were also conducted to discuss tenure issues among the villagers. The groups were selected based on gender, age, and diverse ethnic composition. The guideline for livelihood and survey, which includes FGD[4] topics on property rights, tenure security, forest management, conflicts/threats and community perceptions of their resources, was used for the FGD.

4 Results

4.1 Village description

Roho has a much larger area of land than the other villages (Table 1), while Kaloa has the smallest area and also has two hamlets (Hatuolo and Elemata). Some villagers from Pilot 5 have moved to the coast (Roho and Kanikeh), but have maintained a link with their original village. The village head explained that the area of Roho is spread between the mountains and coastal area. The villages on the coast and those in the mountains are linked in terms of sharing their land and natural resources, as is the case in Kanikeh village. Both villages live in the mountains, but most of their agricultural land (inherited) is located in the lowland area, allowing better access to schools and markets (for the sale of coconuts). The findings are related to economic activities in both coastal and mountain areas.

The education of heads of households in Roho and Kanikeh is better than Manusela and Kaloa (Table 1). Members of each household varied between 2-12 people. The main income in all villages is derived from agriculture and forestry (hunting and collecting forest products). All communities collect forest products both timber and NTFP[5] (Table 1), but extraction of forest products are now much reduced due to MNP regulations. In the past, the community in this area had a better income from the forest. The clan and village who own the land traditionally are responsible for maintaining the land.

4.2 Household assets

Household assets are of a much higher value in Roho than other villages (Table 2). Transportation is important for households in Roho and Kanikeh in coastal areas, while items such as electronics and electricity are quite important for households in Kaloa. Household spending in Manusela is the smallest, because access to this village is the most difficult. Electronics and transportation are the items on which the most is spent (Table 2). Other important household spending, in these villages, is on tools for hunting. Many households in Roho and Kaloa spend their income on home entertainment and communication (Table 2).

4.3 Constraints and problems

According to responses from the households interviewed, there have been problems related to land status, land boundaries (with the exception of Manusela), and extraction of forest products, as well as a lack of attention from the park management (Table 3). From the communities' perspective, the park overlaps their village land, but the park management explained that land allocation for settlement is in an enclave area, where the

2 Households.

3 Focus Group Discussions.

4 Liswanti N, Shantiko B, Fripp E, Mwangi E and Laumonier Y. 2012. *Practical Guide for Socio-economic Livelihood, Land Tenure and Rights Surveys for use in Collaborative Ecosystem-based Land Use Planning*. Bogor, Indonesia: CIFOR.

5 Non Timber Forest Products.

Table 1. General overview of the study villages

Description	Roho	Kanikeh	Manusela	Kaloa
Village establishment	1910	1953	1800s	1920
Land ownership	Village, clan	Village, clan	Village, clan	Village, clan
Religion	Christian	Christian	Christian	Christian
Land area(Ha)	37,000	8,750	3,685	29,070
∑ Inhabitant (people)	368	232	1868	499
Total HH	85	61	372	124
Original (HH)	78	61	342	122
Migrant (HH)	7	0	30	2
Age of respondents (yrs)/ mean	21-57 (36)	20-56 (37)	21-70 (35)	19-70 (39)
∑ person per HH/mean	2-10 (5)	2-8 (4)	2-9 (4)	2-12 (5)
Education level of heads of HH (%)	NE=23,3; ES=30; JS=30; SS=13,3; BSc=3,3	NE=8,3; ES=62,5; JS=20,8; SS=8,3; BSc=0	NE=9,8; ES=73,2; JS=12,2; SS=4,9; BSc=0	NE=14,3; ES=85,7; JS=0; SS=0; BSc=0
Ethnicity/origin	Kei, Flores, Saparua	Kanikeh	Southeast Maluku, Ambon, Seram, Java	Southeast Maluku
Local language	Koa	Kawa	Indonesian - Ambonese	Bahasa Kaloa (Koa)
Main commodities (Ha)	Coconut (40), cocoa (50)	Coconut (20), cocoa (12)	Cocoa (150), coconut (85), banana (*Musa* sp.) (90)	Cocoa (65), banana (35), sweet potato (25)
Forest products	NTFPs: rattan (*Calamus* sp.), sago (*Metroxylon sagu*), resin (*Agathis* sp.), pig (*Sus scrofa*), cuscus (*Phalanger maculatus*), deer (*Cervus timorensis*) Timber: ironwood (*Intsia bijuga*), *gofasa* (*Vitex coffasus*), *canary* (*Canarium oleosum*), *samar* (*Homalium foetidum*)	NTFPs: bird (cockatoo, nuri), bamboo (*Bambosa* sp.), sugar palm (*Arenga pinnata*), rattan, pig, cuscus, deer, fuelwood, palm fronds/roof, vegetables Timber: ironwood, *gofasa*, *lenggua*	NTFPs: sago, bird, deer, honey, resin Timber: ironwood, *lenggua*, *gofasa*, *binuang* (*Octomeles sumatrana*).	NTFPs: sago, bird, deer, resin Timber: ironwood, *lenggua*, *gofasa*, *binuang*
Number of shops	2	2	2	1

a Badan Koordinasi Keluarga Berencana Nasional (Indonesian population and family information network)

Source: direct interview with key informants in June 2011 and BKKBN[a] 2009/2010. Note: NE=No formal Education; ES=Elementary School; JS=Junior High school; SS=Senior High school; BSc=Bachelor degree

Table 2. Main household assets (Rp/year)[a]

Items		Roho (x Rp 1000)	Kanikeh (x Rp 1000)	Manusela (x Rp 1000)	Kaloa (x Rp 1000)	Notes
Electricity	sum	9,450,000	3,600,000	-	11,250,000	Diesel generator, solar power
	mean	726,923	600,000	-	1,607,143	
Electronic	sum	30,850,000	700,000	900,000	12,325,000	Satelite dish, TV, DVD, speakers, VCD, radio and tape recorder, cellphone, computer, refrigerator, washing machine, water pump
	mean	2,373,077	116,667	75,000	1,760,714	
Transport	sum	50,400,000	18,000,000	-	-	Car, truck, fishing boat
	mean	3,876,923	3,000,000	-	-	
Tools	sum	-	150,000	400,000	120,000	Kerosene lamp (*petromak*)
	mean		25,000	33,333	17,143	
Others	sum	3,150,000	500,000	2,175,000	1,250,000	Rifle
	mean	242,308	83,333	181,250	178,571	
Total	**sum**	**93,850,000**	**22,950,000**	**3,475,000**	**24,945,000**	
	mean	**7,219,231**	**3,825,000**	**289,583**	**3,563,571**	

a USD 1 = Rp 9,000

Source: Household survey in June 2011 (HH Respondents from Roho=30, Kanikeh = 24, Manusela=41, Kaloa = 21)

Table 3. Constraints and problems related to land use

Constraints and problems		Roho	Kanikeh	Manusela	Kaloa
Land status	Villagers do not know the status	V	V	V	V
	Community land is inside MNP	V	V	V	V
Land boundary	Clear but not acceptable	V	V		V
Land dispute	Between villages	V	V		
Forest products	Timber extraction:				
	By other villagers	V	V		
	By villagers	V	V	V	V
	Bird hunting	V	V	V	V
Confiscation of equipment	Equipment for catching birds			V	
Natural disaster	Flood & landslide			V	

village still has enough room for existing crops. However, according to the communities a part of their land is located inside the park because their traditional territory (petuanan) land is extensive. A lack of information sharing and counselling by the park management has led to confusion and misunderstanding of the park regulations and land boundaries. Some key informants said that the existence of the park has resulted in reduced access to the forest. Forest products are used as the main source of livelihoods for most communities and were sourced from the mountainous area before the establishment of the park. Since the establishment of the park, many forest products are protected by park regulations especially timber and birds of high economic value. Limited access to land and forest has created conflict between villages and the park. Annual disasters (floods and landslides), and crop pests and diseases have also created problems for the communities. Another crucial problem is the land dispute between Roho and Kanikeh, which was still ongoing in 2011. Both villages believe that the land belongs to them, but so far the local authorities have not provided any support in handling this problem.

4.4 Household income from different activities

Different activities such as agriculture, husbandry, fisheries, forest and employment are all sources of income (cash and subsistence) for the communities in Pilot 5 (Figure 1). Of the households living in coastal areas in Pilot 5, who obtain an income from fisheries[6], the highest annual income is in Kanikeh (Rp 3.2 million) and the lowest is in Manusela (Rp 230.000,-).

Forest resources also contribute significantly to community livelihoods in Pilot 5, earning from Rp 3.6 million (Manusela) up to Rp 10 million (Kanikeh). Only Roho and Kaloa earn an income from logging timber while Manusela and Kanikeh can only earn an income from NTFPs because of MNP regulations and a lack of access to markets. However, timber extraction is allowed if they want to build a house or for other personal use, but villagers are not allowed to sell the timber.

Many households in Pilot 5 obtain a good income from employment such as wage labor and as porters (for households in the mountainous area) or as government employees, traders, and workers at the sawmill (for households on the coast). The average household income per year from employment ranges from Rp 2 million to Rp 13 million. This is the main reason why many households from Roho move to their village on the coast and only visit their village in the mountains occasionally. Employment includes working for the cocoa and oil palm companies on the coast, or working as public employees, village officers, traders, carpenters, laborers and chainsaw operators.

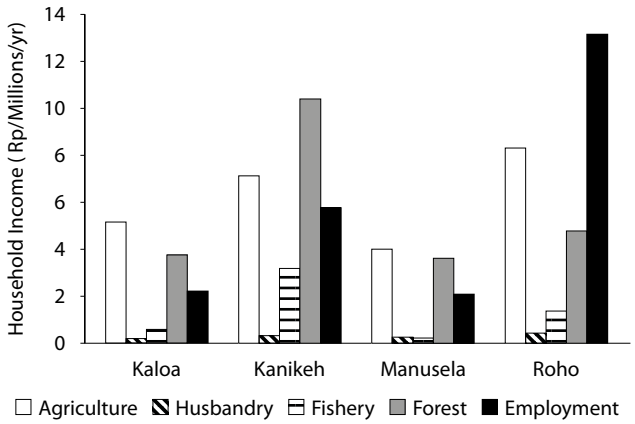


Figure 1. Average annual household income from different activities in Pilot 5 (Rp/year)

The main commodities from agriculture in Pilot 5 are perennial crops (coconut (*Cocos nucifera*), clove (*Eugenia aromatic*), cocoa (*Theobroma cacao*), nutmeg (*Myristica fragans*), and sago (*Metroxylon sagu*)) and fruit trees (*durian* (*Durio zibethinus*), banana (*Musa* sp.), langsat (*Lansium domesticum*) and mangosteen (*Garcinia mangostana*)). In Manusela, income from agriculture is low because transportation to market is limited and the products need to be carried to the market. For NTFPs, many households in Manusela collect birds, deer (*Cervus timorensis*), honey, resin (*Agathis* sp.), and sago (*Metroxylon sagu*). Although birds and deer are restricted (park regulations), the villagers ignore these regulations, as there is no alternative livelihood options or immediate source of such foods for subsistence. Timber extraction in this village is limited due to the park regulations. The main jobs are as laborers, porters and employees at the cocoa company. In Kaloa, forest has provided better income for households (17 HH) from collecting NTFPs that includes birds, sago and resin. The preferred timber trees are ironwood (*Intsia bijuga*), *lenggua* (*Pterocarpus indicus*), *gofasa* (*Vitex cofassus*), and *binuang* (*Octomeles sumatrana*). Only seven households in Pilot 5 have the opportunity to work as laborers or employees for the oil palm company (PT. Nusa Ina). All households in Pilot 5 collected firewood for subsistence and timber for housing.

Figure 2 shows that almost 100% of households in Pilot 5 are involved in agricultural and forest activities either for subsistence or livelihoods. In Pilot 5, less than 20% of households are engage in husbandry, 20% to 50% are employed, and 50% to 80% of households fish both for subsistence and cash.

In Table 4 and Figure 3, we can see there are variations in the distribution of household income across villages in Pilot 5. The highest frequency of the "poorest" (lowest quartile) of households is found in Manusela (Rp 5.9 million) and Kaloa (Rp 6.2 million), whilst the "richest" (upper quartile) of households represent the highest frequency of households is also found in Kanikeh (Rp 37.2 million).

Here we summarize the mean household income from agriculture for villages in Pilot 5 (see Table 5).

6 In Pilot 5, all communities both in coastal and mountain areas fish in the rivers. In general they fish 2-3 times a week (maximum). Due to the high water level in the wet season, they can only fish seven months of the year.

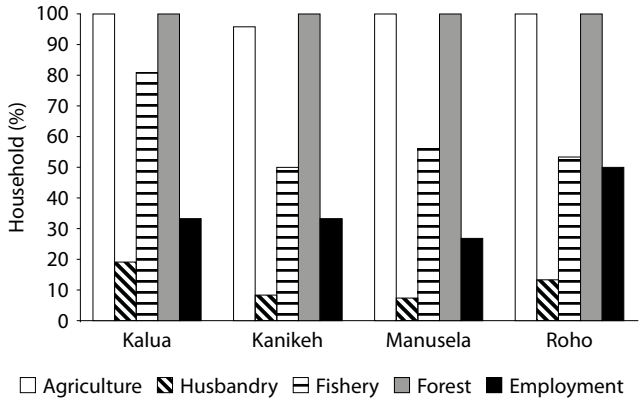


Figure 2. Percentage of household involved in Pilot 4

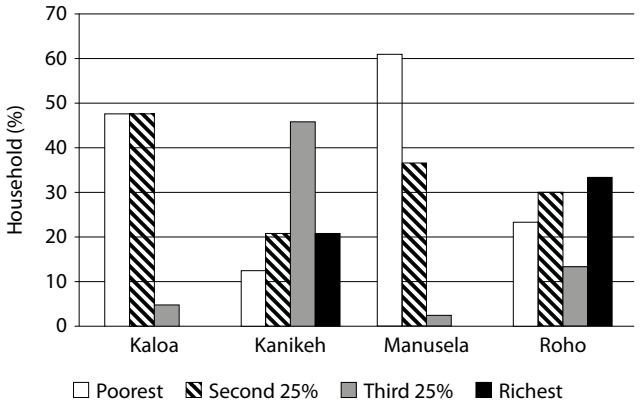


Figure 3. Percentage of the poorest to richest households across villages in Pilot 5

Table 4. Mean household income from poorest to richest across villages (Rp/year)

Grouping of wealth	Mean household income in Pilot 5 (Rp/year)			
	Kaloa	Kanikeh	Manusela	Roho
Poorest	6,269,752	7,514,333	5,888,325	7,799,682
Second 25%	12,928,324	12,927,400	11,318,272	13,480,379
Third 25%	21,476,000	20,287,569	22,344,500	21,002,458
Richest	.	37,189,800	.	35,166,277

Note: Cash income includes income from agriculture, forest products, fish, husbandry, and wage labor. Subsistence income or the value of has been estimated using market prices and production/consumption levels. Costs of production have not been subtracted so these figures represent gross income values for cash and subsistence. Subsistence is focused on production of agricultural commodities and some forest resources, harvested for own consumption.

The source of income for both cash and subsistence can come from staple food, non-staple food and perennial crops. In total, the village with the highest income per year is Roho (Rp 8.3 million) and the lowest is Manusela (Rp 4 million), which is mainly obtained from perennial crops such as clove, cocoa, coffee, nutmeg and coconut (see Table 6). The table also provides a list of agricultural products that have been used by households in Pilot 5 for their livelihoods.

Table 7 shows the mean household income from the forest per year where all households value the forest both for subsistence and cash. NTFPs contributed the highest income for 23 households in Kanikeh (Rp 9.3 million/year). The highest income from timber was obtained by only one household in Roho (Rp 6.3 million) and one household in Kaloa (Rp 1.2 million/year), but there are 15 households in Roho which obtained Rp 2.7 million per year from timber extraction for cash and subsistence. Fuelwood was important for all households in Pilot 5 mainly for subsistence except for Roho, one household obtained an income from fuelwood (Rp 1.4 million). A list of important forest products are given in Table 8, which also shows the mean household income from each product per year for villages in Pilot 5.

4.5 Household scoring exercise

In general, all villages in Pilot 5 have similar perceptions in response to the question on the importantce of forest, believing that the forest was more important in the past (44% on average) than at present (32%) or in the future (20%) (Figure 4).

In the past, these communities had good access to forest because MNP had not been established and the forest covered a large area with abundant resources. Collecting forest products and making small gardens was only for subsistence purposes. In addition, the population was low so the use of forest and demand for land for agriculture was much less.

At present, the forest is still important for the villages, but with limited access to the forest, and a decrease in forest resources, due to an increase in population.

Table 5. Mean household income from agriculture (Rp/year)

Agricultural product			Mean household income (Rp/year)			
			Kaloa	Kanikeh	Manusela	Roho
Staple foods	Cash	Mean	638,750	526,250	1,188,750	815,000
		N	4	12	16	10
	Subsistence	Mean	932,684	349,549	456,302	310,830
		N	19	20	40	24
	Cash and Subsistence	Mean	1,067,158	633,618	931,802	600,382
		N	19	21	40	26
Non-staple foods	Cash	Mean	492,278	1,167,706	461,154	2,051,154
		N	18	17	13	13
	Subsistence	Mean	1,641,124	708,271	614,390	1,525,978
		N	19	22	41	24
	Cash and Subsistence	Mean	2,002,118	1,540,564	760,610	2,637,020
		N	20	23	41	24
Perennial crops	Cash	Mean	2,276,667	5,200,568	2,302,537	6,032,982
		N	21	22	41	28
	Subsistence	Mean	100,000	.	70,074	115,000
		N	2	-	3	4
	Cash and Subsistence	Mean	2,286,190	5,200,568	2,307,664	6,049,411
		N	21	22	41	28
Total Agriculture Income	Cash	Mean	2,820,286	6,112,109	2,912,659	6,791,283
		N	21	23	41	30
	Subsistence	Mean	2,338,208	1,026,043	1,064,690	1,649,755
		N	21	22	41	27
	Cash and Subsistence	Mean	5,158,493	7,093,542	3,977,349	8,276,063
		N	21	23	41	30

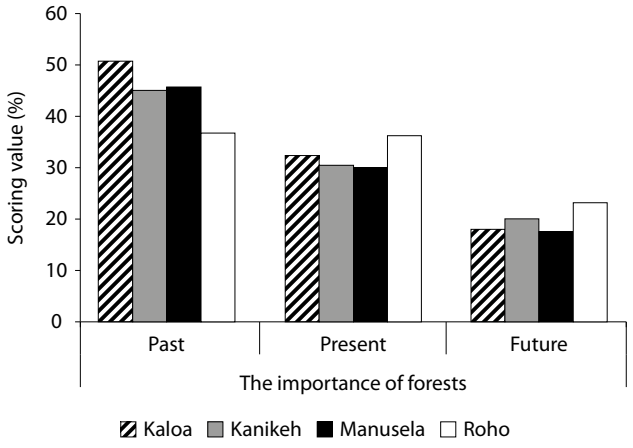


Figure 4. Scoring exercises for the importance of forest in the past, present and future in Pilot 5

The forest is used for subsistence (food, firewood and timber for houses) and for generating income (timber and NTFPs). It provides land for planting crops and valuable products (cocoa and coconut).

All villages explained that in the future, due to the population growth, government development programs and commercial activities, they believe the access to forest will become very limited. At present this is not yet happening, the community still have access to forest but mostly for their own consumption rather than for sale because there is no road access for public transport from the villages in the mountains to the lowland area (market place). If the local government take into account the local

Table 6. Mean household income from agriculture (Rp/year)

Agricultural	Products	Kaloa	Kanikeh	Manusela	Roho	Mean of HH Income
				(Rp/year)		
Staple foods	*Zea mays* (corn)				340,000	340,000
	Manihot esculenta (cassava)	17,571	234,718	31,363	350,218	138,793
	Colocasia esculenta (taro)	355,000	316,313	243,266	439,457	303,752
	Dioscorea sp. (yam)	80,000	195,000	102,000	295,714	190,435
	Sago	926,250	1,225,000	1,910,714	1,200,000	1,370,303
Non-staple foods	*Allium cepa* (shallots)			150,000		150,000
	Amaranthus spp. (spinach)		180,000	20,000		100,000
	Capsicum annum (chili)				900,000	900,000
	Artocarpus integer (*cempedak*)	381,000	5,000	81,818	125,758	206,938
	Durio zibethinus (*durian*)	769,563	355,000	92,667	600,000	436,750
	Psidium sp. (guava)				90,000	90,000
	Vigna unguiculata (long beans)		120,000			120,000
	Arachis hypogaea (peanut)		2,250,000	400,000	2,513,611	2,038,167
	Solanum sp. (potato)			216,667		216,667
	Cucurbita sp. (*labu siam*)		180,000	6,667		50,000
	Lansium domesticum (*langsat*)	140,000		92,000	50,000	116,250
	Mangifera indica (mango)	900,090		75,000	250,000	368,773
	Garcinia mangostana (mangosteen)	139,817		51,667	30,000	81,752
	Artocarpus heterophyllus (jackfruit)	417,500		14,545		122,000
	Ananas comosus (pineapple)				450,000	450,000
	Banana	1,185,000	1,330,259	638,780	2,119,839	1,217,520
	Nephelium lappaceum (*rambutan*)		400,000		500,000	480,000
	Brassica sp. (mustard)	10,000	162,000			86,000
Perennial crops	*Eugenia aromatic* (clove)			200,000	10,000,000	3,466,667
	Cocoa	1,912,857	5,091,477	2,249,550	3,576,321	3,083,797
	Coconut	1,306,667	2,400,000	165,000	4,315,115	3,030,295
	Coffea spp. (coffee)			302,222		30,222
	Myristica fragans (nutmeg)			3,600,000	3,150,000	3,375,000

Table 7. Mean household income from the forest (Rp/year)

Forest Products			Mean household income (Rp/year)			
			Kaloa	Kanikeh	Manusela	Roho
NTFPs	Cash	Mean	2,600,824	6,774,400	2,399,933	2,043,000
		N	17	22	30	27
	Subsistence	Mean	535,673	4,105,063	1,550,533	867,231
		N	11	16	27	13
	Cash and Subsistence	Mean	2,783,689	9,335,557	3,450,376	2,460,556
		N	18	23	33	27
Fuelwood	Cash	Mean	.	.	.	1,436,400
		N	-	-	-	1
	Subsistence	Mean	579,048	962,500	600,488	1,150,667
		N	21	24	41	30
	Cash and Subsistence	Mean	579,048	962,500	600,488	1,198,547
		N	21	24	41	30
Timber	Cash	Mean	1,200,000	.	.	6,336,000
		N	1	-	-	1
	Subsistence	Mean	5,066,667	1,300,000	4,400,000	2,280,933
		N	3	8	2	15
	Cash and Subsistence	Mean	4,100,000	1,300,000	4,400,000	2,703,333
		N	4	8	2	15
Total income from the forest	Cash	Mean	2,671,412	6,774,400	2,399,933	2,330,867
		N	17	22	30	27
	Subsistence	Mean	1,583,448	4,132,542	1,836,205	2,666,933
		N	21	24	41	30
	Cash and Subsistence	Mean	3,746,019	10,342,408	3,592,254	4,764,713
		N	21	24	41	30

people's desire for access to roads, access to forest in the future will need to be considered.

We asked respondents to quantify the relative importance of the availability of forest, whether the availability had increased, not changed or decreased. Based on interviews with households in Pilot 5, the availability of forest varied across villages (Figure 5).

About six to ten households in Pilot 5 mentioned that the availability of forest has increased because the forest is widespread and the use of forest (mainly timber) is very little. Collecting forest products is more about NTFPs and firewood (mostly for personal consumption), such as in Roho, Kanikeh and Manusela (see Figure 5). The availability of forest

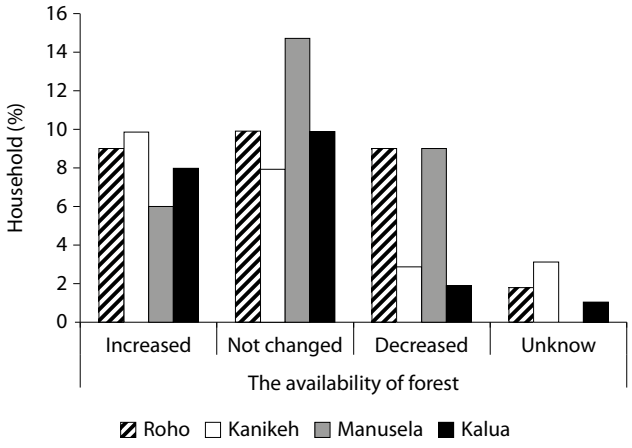


Figure 5. The household perceptions of the availability of forest in Pilot 5

Table 8. Mean household income from NTFPs and timber (Rp/year)

NTFPs	Kaloa	Kanikeh	Manusela	Roho	Mean of HH Income
Palm fronds				24,000	24,000
Wild pig	1,620,000	4,130,000	1,770,769	222,000	1,812,692
Bamboo		45,000	1,545,000		645,000
Wild animals (any)		4,200,000		2,000,000	3,466,667
Bird	650,000	2,400,000	3,600,000		1,433,333
Clove		3,600,000		1,403,200	1,769,333
Agathis resin	36,000		18,000		27,000
Aquilaria moluccensis (eaglewood)	2,990,909	900,000			2,542,857
Fern				82,500	82,500
Cockatoo			250,000		250,000
Cuscus	300,000		920,000		672,000
Honey	645,000	727,500	556,429	500,000	602,800
Black caped lory	1,200,000	2,670,000	1,364,286		1,785,833
Red nuri		900,000			900,000
Nutmeg		4,046,667		1,020,000	1,992,857
Bird (*Perkici Merah*)			490,000		490,000
Bird (*Pombo*)			600,000		600,000
Bamboo root				222,000	222,000
Rattan	400	3,400	8,133		5,267
Deer	220,000	9,557,167	1,832,500	5,822,500	4,060,854
Sago	500,000	3,840,000	2,491,667		2,800,909
Fern				126,000	126,000
Total	**1,284,779**	**4,294,356**	**1,388,566**	**1,384,063**	**2,032,519**

continued on next page

Table 8. Continued

Timber	Kaloa	Kanikeh	Manusela	Roho	Mean of HH Income
Calophyllum soualattri (*bintangur*)		900,000			900,000
Ironwood		1,666,667		2.637.500	2,443,333
Terminalia supitiana (*kayu burung*)	1,200,000				1,200,000
Gofasa	7,200,000			3,600,000	5,400,000
Canary				600,000	600,000
Terminalia gigantea (*ketapang hutan*)				600,000	600,000
Lenggua	4,000,000			2,000,000	3,333,333
Litsea angulata (*makila*)		750,000			750,000
Pometia pinnata (matoa)			4,400,000		4,400,000
Eugenia spp. (*kayu merah*)				60,.000	600,000
Palaquium obovatum (*kayu siki*)		1,000,000		900,000	975,000
Total	**4,100,000**	**1,155,556**	**4,400,000**	**2,134,211**	**2,239,706**

has not changed in general because the villagers only use the forest for their gardens (Roho and Manusela) and collecting forest products when needed (Kanikeh and Kaloa). They use their gardens only for subsistence.

Some households reported that access to forest has decreased due to MNP regulations (Roho, Kanikeh, Manusela). Some households said they did not know as they work only in their gardens and seldom go to the forest (Kanikeh, Manusela, Kaloa).

5 Critical issues

5.1 Access to forest

According to our key informants in Pilot 5, access to forest is now very restricted. The villages in the mountainous regions were previously located inside MNP, but since the demarcation and zonation of the park, all villages in Pilot 5 have been re-allocated to the enclave area (see Map 1). Nevertheless, the park still overlaps part of their traditional land. Thus their access to forest resources has become increasingly limited. They still collect food crops from their gardens located inside the park and gather and/or maintain some NTFPs such as sago, *cempedak* (*Artocarpus integer*), and resin. Maintaining these products leads to better harvesting.

Expanding agricultural land inside the park as well as cutting timber is prohibited. This regulation has worried the villagers in Pilot 5. They fear that if there is any illegal timber extraction the park officer may blame them because their villages are the closest to the park. All villages still cut timber for their own consumption (see Table 3) such as for building houses, but other villages also extract timber for commercial purposes in Pilot 5 (Table 3). They have asked for an alternative solution, another area that is not traditional land (which MNP overlaps) where they might legally extract timber.

Population growth is set to increase the need for agricultural land for food crops in the future, which will increase the pressure on available land. If access to forest and land is limited, this will create conflict between the community and MNP. A solution from the local authority and park management is urgently needed.

5.2 Access to roads

Indigenous communities living in the remote mountainous region in central Seram are far from

any development. There is no road access or public transportation from the mountain villages to the lowlands where public transport is available to Masohi (the district capital). The villagers must walk for two to three days to reach the lowlands. This situation has caused the communities to be more dependent on forest resources. However, gathering forest products for sale, e.g. honey and birds, is dependent on if they can carry the products to the closest market in Wahai. Other products such as resin, sago, *durian* and cocoa have a high earning potential, but a lack of transportation makes it less financially viable to collect these products.

5.3 Work motivation

In some villages, the motivation to develop income opportunities is relatively low, for example in Manusela and Kaloa. A lack of access to transportation and markets prohibits the sale of agricultural and NTFPs, this acts as a disincentive for the local communities to develop these potential sources of income. However, in Roho and Kanikeh villages, their coconut gardens are located on the coast, close to the market and road.

5.4 Forest boundaries

The park boundary was officially drawn by the Forest Area Gazettement Service[7] in Ambon. The villagers were not happy when they discovered that the demarcated park boundary overlapped their traditional land. Villagers in Hatuolo hamlet (Kaloa village) pulled the marker posts out when they found them in their gardens (May 2011) as they had no idea what they were or who put them there. When they discovered the meaning and origin of the markers they demanded their traditional community ownership rights to the land. They wanted the local government and other parties to recognize their rights. Perhaps, if there had been more coordination and information sharing with MNP, village heads and local communities when the boundary marker posts were put in place, conflict and misunderstanding might have been avoided.

5.5 Conflict over land use

Conflicts over land use have occurred in this area due to unclear boundaries. The dramatically reduced area officially owned by the villages and clans, following the designation of the park, has resulted in conflict between villages and within villagers (between clans). In the past, having an expansive forest area at their disposal meant there was no need for precise boundaries. Now living in closer proximity to each other clear boundaries are urgently needed. Conflict arose between Kanikeh and Roho villages with each village claiming to have land rights to the same forest area. A solution to this conflict is still being sort at the sub-district level.

5.6 Traditional knowledge, customary law and state regulations

In managing and using the forest resources and other natural resources, the communities in the mountain region use different types of traditional knowledge, e.g. *sasi*[8]. For instance, *sasi* "hunting ground" in Manusela and Kaloa is used for communities to hunt animals in certain areas. The local term for *sasi* is "*Seli Kaitahu*" or "*Ana Poha*".

Local knowledge is also used to maintain sacred places, where any activity in this area is forbidden, e.g. in a sacred place of a certain clan in Manusela, only that clan is allowed to visit and should perform a traditional ceremony (called *sirih-pinang*) before entering the sacred place. Some sacred places in Manusela are called "*Amalia*", "*Tomosiae*", and "*Sikanala*".

All traditional villages in the mountain region have applied traditional rules to maintain their land and resources. In addition, they also obey the park regulations that are applied in their areas, e.g. the regulation of MNP to maintain wildlife inside the park and the ban on cutting down trees. Hunting wildlife is only carried out outside the park areas.

5.7 Economic opportunities from MNP for the communities

The indigenous communities in the mountainous region of Manusela feel that the local government is discriminating against them in the community development program. This program is apparently applied only to the villages with better access to roads; hence, it did not reach the remote villages in the mountainous areas. These issues were discussed

7 BPKH (Balai Pemantapan Kawasan Hutan).

8 Sasi is a generic name for a family of institutions, laws and ritual practices that regulated access to resources on land, coastal reefs, and rivers (see Zerner C. 1994b. Through a green lens: the construction of customary environmental law andcommunity in Indonesia's Maluku Islands. *Law and Society Review* 28(5).

during the stakeholder workshop in Ambon (2011). In theory, the village development program is given to all villages in Central Maluku. However, it is sometimes difficult to implement in the mountain area due to a lack of road access to the villages. Villages in Pilot 5 in the lowland area do not have a problem with the program.

In addition, the local communities in Pilot 5 feel that the local government pays little attention to their rights in terms of their access to forest, which is now MNP. The presence of MNP has reduced the communities' access to forest and land, which is important for their daily life and livelihoods. The local communities have low levels of trust in the government and even believe that the government is lying to them. In response to this matter, MNP has been paying attention to these issues. In 2011, the park proposed a zonation system, including establishing a cultural zone to be used by the local communities. In this zone, the community will still be able to collect forest products. However, this proposal was still being processed in central government and had not been approved at the time of our visit to MNP in November 2012.

In addition, the park agency has tried to support the local communities living around the park in terms of identifying alternative sources of income. In 2012, the park supported 13 forest dependent coastal villages around the park with training and marketing handicrafts, providing *rumpon*[9] and collecting seedlings of endemic species (clove, nutmeg) and resin (only certain villages). The park needs to proceed carefully and slowly in their efforts following counseling and direct consultation with the communities. This is important when the local people find it difficult to accept the park particularly when they are to lose their access to their traditional lands inside the park. In addition, it is equally important for the park to also consider alternative sources of income for the communities in the mountains. Promoting the village area as a future tourist destination has potential.

6 Conclusions and recommendations

In Pilot 5 the need for land to conduct agricultural activities is very important as agriculture is the main source of income. Forest products are also an important source of income. Other sources of income from employment and possibly tourism provide additional necessary income for some villages in Pilot 5. Support for such initiatives could help develop enterprises that provide the maximum benefits and longevity and could help reduce the local people's dependency on the forest.

The park currently overlaps traditional lands belonging to the communities. In addition, MNP and a growing population have reduced the amount of land available for the expansion of agricultural land. This has been the basis of a number of conflicts particularly between villages. Conflict between MNP and villages has been less volatile and easier to resolve, but conflict over land between villages has been much more complicated and more difficult to resolve. Without long-term solutions to conflicts, particularly between villages, more conflicts may well arise and stability compromised.

Some proposed recommendations associated with the land use problems and conflicts include optimising plantations and agricultural land by planting certain commodities suitable for the land that are of high economic value. The local government should control this. It is highly recommended that the local government use lessons learnt in conflict resolution from the settlement of conflicts in other places or through further study on conflict resolution. The park needs to continue to guide the local communities in developing better alternative livelihood option through training and direct assistance on the ground; including helping them access market information and markets. Last but not least, the community's desire for road access needs to be considered in future land use planning, but minimalizing environmental and forest degradation.

9 Pontoons (*rumpon*) were traditionally constructed with locally harvested wood, bamboo and fibres, and were placed in fairly shallow, inshore coastal waters (<50 m deep). Since the mid-1980s, pontoons have been constructed with polypropylene and polyethylene mooring lines, cement and other types of anchors and with other industrial materials of Indonesia. See http://archimer.ifremer.fr/doc/00042/15320/12658.pdf and Monintja, D.R. 1993. Study on the development of *rumpon* as fish aggregating devices. Martek: Bulletin T.J.K. 3(3): 1-137.

***CIFOR Working Papers* contain preliminary or advance research results on tropical forest issues that need to be published in a timely manner to inform and promote discussion. This content has been internally reviewed but has not undergone external peer review.**

Understanding the socio-economic conditions, the drivers for land use change and economic development, along with cultural and social characteristics, is essential to ensure that land use decisions are made that ensure positive economic and social outcomes are optimised.

The CoLUPSIA socio-economic team researched the conditions facing communities and individual households across five pilot areas, each area representing different socio-economic and environmental/ bio-physical conditions. Household, village, key interview surveys and focus group discussions, were completed for 566 households, 19 villages, equivalent to approximately 7.6% of the total number of households and 20% of villages on Seram Island, Central Maluku.

The results highlight the challenges that face the communities and how these vary across the pilot sites. For example in Pilot 1 on the north coast of Seram communities have growing populations, a lack of agricultural land with limited options to expand as they border the national park and in Pilot 2 alternative land uses for commodities and oil are posing challenges to the traditional way of life. On the south of the island in Pilots 3 and 4, the challenges of managing population and urban growth with access to land suitable for agricultural production, while maintaining use and access to natural forest (in part the national park) are increasing.

The results of the socio-economic survey aim to provide a baseline that provides an understanding of the relationship between the communities on Seram and the natural resources – use and non-use, coupled with the needs for economic development. The resulting challenges and opportunities are identified and can be used in the development of land use planning processes and where possibly in the development of Payment for Ecosystem Service (PES) schemes.

This research was carried out as part of the European Union funded Collaborative Land Use Planning and Sustainable Institutional Arrangement project (CoLUPSIA). Run by CIRAD in partnership with CIFOR, TELAPAK and several local NGOs and Universities, the project aims to contribute to avoided environmental degradation and to strengthen land tenure and community right by collaboratively integrating all stakeholders' views in land use planning processes. The outputs revolve around the relationship between land use planning, land allocation and the provision and potential payment of ecosystem services. The project focuses on two regencies (*kabupaten*), Kapuas Hulu and Central Maluku in Indonesia.