International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

Livelihood Assets of the Mentawai Tribe in Siberut Island Biosphere Reserve

Fifin Nopiansyah[a*], Sambas Basuni[b], Y. Purwanto[c], Nandi Kosmaryandi[d]

[a]*Siberut National Park Office, Jln. Khatib Sulaiman No. 46, Padang – West Sumatra, Indonesia*

[b,d]*Department of Conservation of Forest Resources and Ecotourism, Faculty of Forestry, Bogor Agricultural University, Dramaga Campus, Bogor 16680, Indonesia*

[c]*Indonesian Institute of Sciences (LIPI), Cibinong Science Centre, Bogor*

[a]*Email: opinsyah@gmail.com*

[b]*Email: sambas.basuni@gmail.com*

[c]*Email: purwanto.lipi@gmail.com*

[d]*Email: nkosmaryandi@yahoo.com*

Abstract

Siberut island is one of the Mentawai Islands, located on the west coast of Sumatra island in Indonesia, a chain of islands famous for their unique biodiversity. The communities of Mentawai tribe in the Siberut islands are well known for their traditional wisdom in utilizing forest resources. For those reasons, Siberut has been officially declared as a Biosphere Reserve. On the other hand, with its rich potential in cultural and natural properties, poverty becomes the main problem faced by the tribe communities of the islands. This research is aimed to examine the assets of the Siberut commmunities utilized in their sustainable livelihood and also to describe the management of natural resources in the Siberut Island Biosphere Reserve. The study was conducted in three villages, namely Matotonan, Saibi Samukop, and Sagulubbek, in the Siberut communities of the Mentawai Islands regency. The study used a qualitative approach method for its analysis. Data were collected through a desk study on relevant literatures, interviews, and observations.

---

* Corresponding author.

The results of this study showed that the communities had five sustainable livelihood assets such as human, natural, financial, physical and social capital resources. The social capital developed on communal land system has been threatened by new external value, such as the land certification published by the local government.

Keywords: Sustainable livelihood asset; Mentawai tribe; Siberut Island Biosphere Reserve.

1. Introduction

Siberut is the largest of the four islands in the Mentawai Islands with an area of 4,030 km². The island lies off the west coast of West Sumatra Province, Indonesia. The distance to the nearest town (Padang) is about 155 km. The island is located in the Regency of Mentawai Islands, which consists of five districts, 20 villages and 146 hamlets. The native inhabitant of Siberut Island is Mentawai tribe (90%), with an addition of migrants from Minang, Batak, Java, and Nias tribes.

In 1981, the island declared as the Siberut Island Biosphere Reserve (SIBR) by UNESCO upon the proposal by the government of Indonesia. Currently, the SIBR area comprised of the Siberut island and small islands surround. Siberut island was declared as a biosphere reserve for several reasons: firstly, it has a unique ecological feature of high level of endemisity of its flora and fauna species due to isolation from the mainland (Sumatra) for around 500 thousands to one million years ago [1]. Geologically, Siberut is a young island with high level of precipitation, with clay as a dominant type of soil, having a high surface water (run off), and with more than 45% of the land categorized with I (first) grad of sensitivity level, having a slope of more than 25%, leaving it vulnerable to disaster if managed unwisely [1, 2]. Secondly, the existence of a harmonious interaction between local people and nature can give a sustainable life for the people on the Siberut Island. Thirdly, the SIBR becomes a representation of lowland tropical rain forest ecosystem in the Indonesian archipelago [3].

The poverty level category shown by the human development index for the Mentawai Islands (including Siberut) is the highest in West Sumatra province, even in Indonesia [4]. This shows that the communities of Siberut Island suffer the most from poverty in their lives. On the other hand, Siberut communities are surrounded by the abundance of natural resources crucial for sustaining their livelihood [3, 5, 6]. This dillema of livelihood of the Siberut communities already attracts a lot of attention from various agencies. In order to understand this condition, the sustainable livelihood framework is used to analyze this matter [7].

Sustainable livelihood framework has its advantages due to its reliance on assets/capitals (human resources, natural resources, financially resources, social resources, and physical resources), which are owned by the communities [7]. Sustainable livelihood is defined as: *"... a livelihood having the capabilities, assets (stores, resources, claims and access) and activities required to survive: a livelihood is sustainable if it can cope with and recover from stresses and shocks, maintaining or enhancing its capabilities and assets, and provides sustainable livelihood opportunity for the next generation; and which contributes net benefits to other livelihoods at the local and global levels, in the long and short terms"* [8]. The approach of development based on sustainable livelihoods is a contemporary development approach that attempted to correct development approach based on modernization that is less friendly to the environment. Sustainable livelihoods approach is a

tool that try to achieve the social, economic, and ecological fair and balanced manner level of fulfillment. The achievement of welfare level is approached through combinations of activities and the use of existing assets in the community [9].

This paper is an effort to describing livelihood assets of a community as stated by Departement for International Development (DFID). According to authors in [7], human capital is a representation of skills, knowledges, ability to labour and good health that by together enable people to pursue different livelihood strategies and achieve their livelihood objectives. Natural capital is the term used for the natural resource stocks from which resources flow and services useful for livelihoods are derived. Financial capital denotes the financial resources that people use to achieve their livelihood objectives, consist of available stocks and regular inflows of money. Physical capital comprises the basic infrastructure and producer goods needed by community to support their livelihoods. Social capital is taken to mean the social resources upon which people draw in pursuit of their livelihood objectives, which consists of: (1) networks and connectedness of the community, either vertical or horizontal that increase people's trust and ability to work together and expand their access to wider institutions, (2) membership of more formalised groups which often entails adherence to mutually-agreed or commonly accepted rules, norms and sanctions, and (3) relationships of trust, reciprocity and exchanges that facilitate co-operation, reduce transaction costs and may provide the basis for informal safety nets amongst the poor communities.

Linked with above matters, the writer conducted the study on livelihood assets of the Mentawai tribes in SIBR. This study is aimed at describing the situation of the community in managing the natural resources in the SIBR.

2. Methods

The study was conducted from March to May 2015 on Siberut communities in three villages: Saibi Samukop, Matotonan, and Sagulubbek, Mentawai Islands Regency, West Sumatra Province, Indonesia. The villages were selected purposively representing the three zones of the SIBR, in which the Village Saibi Samukop located in the transition area, Matotonan in the buffer zone, and Sagulubbek in the core area. This study used a qualitative approach. Data were collected through literature studies, in-depth interviews, and observation. Literature form publications and reports collected from various agencies related with the community and the characteristics of the natural resources. In-depth interviews to the 16 informants which are determined purposively based on three criterias, namely the native community, have knowledge of traditions and natural resources in Siberut. Siberut communities in this paper referred to the Mentawai tribe people who are live in the SIBR. During the study, we also have several informal meetings with the Siberut communities due to get more information. Direct observation was conducted to confirm the various issues arising from the literatures and interviews. The process of data analysis is done through a process of coding, grouping, and interpreted the data for the conclusions [10].

3. Result and Discussion

3.1. Human resources

Population in the SIBR in 2014 are 37,506 inhabitants, density of 10.74 people/km^2. The population increased

6.2% each year. The composition of the population by age class can be grouped into three: youngs (0-14 years) amounted to 39.79%, adults (15-64 years) amounted to 58.38%, and elderly (≥ 65 years) amounted to 1.84% [11]. The population composition shows that productive labor or adult age classes is dominant in SIBR.

The profession of the most of the Siberut people are fields farmers (*tinungglu* or *pumonean*), so that the their main skills are farming. Every household has a working field with size ranging from 0.25 to 1 ha. Farming is still traditionally, inheritance and has not been a lot of touches by modern technology that effect to the low quantity and quality of the crops and no skills to manage the post-harvest. The other skills are gathering forest products and only some of them can make buildings/constructions and fisherman.

In daily activity, the community may have workers from their family members so every family member has a responsibility on daily chores. The husbands or father acts as the head of the household and have the responsibility of fulfilling the daily needs of the family, including cash. They are usually work outside of their homes. The works requiring physical power usually done by the men, such as processing sago (*Metroxylon sago*), which is the staple food of Mentawaian, making a field (*tinungglu*), cultivating crops (e.g. cocoa, coconut, areca nut, nutmeg), making canoes, gathering forest products, hunting and construction worker. Meanwhile, the wifes or woman usually handle daily domestic working, such as cleaning the house, cooking meals, washing clothes, and taking care of the children. Outside of their homes, women also have duty to caring for the young crops (e.g. taro, yams, bananas), catching fish, shrimp, or scallops on the river. Nowadays, most of the children or youngsters have special role in the Siberut. The younger generations were encouraged by their parents to study at formal schools, so many of them living far away from the village. During the holiday period, the parents brought them back to the fields or forests to help collecting foods and other forest products.

Formal education level in the SIBR population are relatively low. The levels of formal education in the communities consist of preschoolers (0-6 years) amounted to 12.55%, incompleted primary school amounted to 33.33%, completed elementary school (SD) amounted to 31.65%, graduated from junior secondary school (SLTP) amounted to 14.05%, graduated from senior high school (SLTA) amounted to 7.46%, and university scholar amounted to 0.96%. Currently, many parents understood that higher education will have impact on better livelihood, so they are encouraging their children to study at school. However, when it's time for their children to reach the higher level of education, many parents face financial difficulties to pay for the education, since their children will have to settle in the district capital far away from the villages.

From the health aspect, there are two ways of treatment in the communities of SIBR. Firstly, the traditional approach by the *Sikerei*. *Sikerei* is a shaman believed to have the ability of treating diseases and can communicate with the spirits (*bajou*) or souls (*simagre*) [12]. Secondly, the modern treatment provided by the goverment medical centers for communities (*Polindes/Puskesmas*). Before the era of regional autonomy (in 1999), *Polindes*/*Puskesmas* are found in large villages only. Currently, every villages has *Polindes*/*Puskesmas*. However, they have very limited number of medical staffs (with an average of two persons per village) and very limited types and amounts of medication available. Until now, the two ways treatment above was done by the Siberut people.

3.2. Natural resources

Siberut communities are basically terrestrial-bound, so land becomes the main natural resource essential to their livehood, even though the Siberut Island is geographically surrounded by the sea. The lands of Siberut Island can be classified into two kinds of ecosystems, natural and artificial, such as the sago fields, the taro fields, the newly opened fields (*tinungglu*), old farms (*pumonean*), rivers, swamps, mangroves, coastal and small islands, forests or mountains, human settlements [13], and rice fields. The development of rice fields is encouraged again by the Regency government after fading away in the 1990s, so the rice field ecosystems are basically new on the Siberut island. The types of land ecosystem can be transformed from one ecosystem to another by the communities. From these land ecosystems flow a wide range of benefit to the Siberut people; economically, ecologically, and socially beneficial as described below:

3.2.1 Economic benefits of the natural resources

Based on the interviews, there were 110 species of biological resources often consumed by the Siberut communities everyday, usually taken from the fields (*tinungglu* or *monei*) and forests (*leleu*). If the biological resources were grouped by nutrients produced, there were six species of carbohydrate-producing plants (eg. *Metroxylon sago*, *Colocasia esculenta*, *Musa* spp.); 30 species of fruit-producing plants (eg. *Durio* spp., *Lansium* spp., *Nephelium* spp.); 16 species of vegetable-producing plants (eg *Allantodia aspera*, *Manihot* spp., *Zea mays*); and 58 species of animal as protein sources (eg primates, pigs, chickens) [14].

The result from survey on cultivation showed 28 species of crops are being cultivated by the Siberut people. The benefits and the number of cultivated plants species are presented in Table 1. The data indicate that the fields are mainly planted with plants species that are the source of subsistent foods. The fields are also planted with commercial crops that can be sold for cash. Table 2 shows that six out of seven species of commercial crops in the Siberut are being cultivated in the fields. According to authors in [15], the Mentawai people mostly fulfilled their everyday needs from farming.

Tabel 1: The benefits and the number of plant species cultivated in the fields by the communities of Siberut

Plant benefits	The number of species [a]
Source of foods	19
Source of medicines	7
Commercials	6
Firewoods	6
Supporting to the social activities	5
Source of building materials	4
Source of clothing materials	1

[a]One species can have several benefits.

Besides the fields, the communities are also gathering forest products for their subsistence needs and cash.

Plants and animals from the forests and the fields for cash presented in Table 2. According to authors in [16], forest products contributed to the rural economy in the Siberut.

Table 2: Plants and animals from the forests and the fields in the Siberut that have commercial values

Scientific name	Local name	Location[a]	Prices[b]
Plants			
Calamus manan	Bebeget[c]	L, F	[c]Size L diamater 36 mm= IDR 8,000 /stem; diamater 31 mm= IDR 3,000 /stem; size M= IDR 1,500 /stem; size S= IDR 1,000 /stem
Aquilaria malaccensis	Simoitek	F	Lower class (teri) IDR 200,000-300,000 /gram, A class IDR 3000,000 /gram
Cocos nucifera	Toitet[d]	L	IDR 4,000-5,000 /kg
Daemonorops sp.	Taset[e]	F	IDR 17,000 /kg
Pogostemon cablin	Patikoilo	L	IDR 180,000 /bottle
Theobroma cacao	Coklat	L	IDR 18,000-30,000 /kg
Arenga pinnata	Pinang	L	IDR 4,500-10,000 /kg
Syzygium aromaticum	Cengkeh[f]	L	IDR 45,000 /kg
Myristica fragrans	Palo[f]	L	Skin seeds (puli) = IDR 80,000 /kg, seeds = IDR 30,000 /kg
Animals			
Gracula religiosa	Mainong[f]	F	IDR 300,000 /individual
Copsychus malabaricus	Ratdat akek[g]	F	IDR 250,000 /individual
C. saularis pagiensis	Lut cabai[g]	F	IDR 50,000 /individual

[a]Fields (L), Forest (F); [b]Prices at the villages level; [c]Length3 m; [d]Sold in the copra form; [e]Sold in fruits; [f]Cultivated by coastal communities; [g]Sold in puppies.

Table 3: The benefits and the number of species of plants and animals from the forests closest to the villages in the Siberut

Plant benefits	The number of species[a]	Animal benefits	The number of species
Source of building materials	30	For consumed	5
Firewoods	16	For pets	2
Source of medicines	2	For sold	1
Tools for social activities	2	Has not been used	2
Source of clothing materials	1		
Has not been used	13		

[a]One spesies of plant can have several benefits.

Vegetation analysis of trees levels in the forest closest to villages were identified 56 species of trees and wildlife survey using transect method found ten species [14]. The benefits and number of plants and animals species in the forest near the villages in the Siberut are presented in Table 3. The data show that the forest closest to the villages flowing benefits to the Siberut communities continually.

3.2.2 Ecology benefits of the natural resource

Siberut communities knew that biological resources, especially forests, produced various ecological benefits. They become part of their local/traditional knowledge. Some of the plants species had been known for their distinct ecological benefits, such as *sokut* (*Ficus* spp.) that stores water, *bebeget* (*Calamus manan* Miq.) served as an indicator of soil fertility, and mangrove plant (*Avicenia* spp.) that protects the village boundaries from strong winds. According to the authors in [17], traditional knowledge on the utilization of biological resources still embedded in the communities of various biosphere reserves in Indonesia. The biological resource of the forest is also served as the source of germplasm for the communities. Plants species grown in the fields are originally came from the forests, such as rattan, aloes, durian, *langsat*, and rambutan. These findings are in accordance with the opinion of authors in [18] that the utilization of forest plants is a strategy to maximize the number of useful species cultivated in the gardens and the fields, aiming to fulfill, at least, the larger part of the livelihood needs of the communities.

3.2.3 Social benefits of the natural resources

Siberut people's lives based on customary called *Arat Sabulungan* [12]. In its implementation, various communities' social activities are involving the usage of biological resources from the environment around the settlements and also from the forests nearby. For example, one can examine the utilization of various biological resources for the ritual of *Sikerei*. *Sikerei* uses leaves and flowers from several plant species, such as *Mussaenda frondosa* (*mumunen*), *Codiaeum variegatum* (*sura' sibeugak*), *Codiaeum* sp. (*sura' siboitok*), *Graptophyllum pictum* (*aileleppet*), *Cordyline fruticosa* (*bobloh*), *Antidesma neurocarpum* (*kelak baga*), *Arenga pinnata* (*poula*), *Hibiscus rosa-sinensis* (*bekkeu*), and *Hedychium coronarium* (*simakaino*). There is also a practice of creating memorial for those who died (*kirekat*) using a trunk of *Durio* spp. (*duriat*, *toktuk*, or *kinoso*), by carving the image of the dead person on a particular tree belongs to him/her or by engraving the image on a board [12]. In addition to social activities' usage, plants species are also used for traditional tools (Table 4).

Animals also become important parts of the social life in the Siberut communities. Wildlife poaching by the Siberut people is not only a way to fulfill the needs for animal protein, but the hunting also served as a part of traditional ritual [19]. For example, hunting is important for ongoing party to establish *uma* (*punen uma*), in which the heart of a game animal used to foretell good or bad omen for the *uma*.

3.3. Financial resources

The main source of financial for the Siberut communities is crop sales, mostly grown in the fields or gathered from the forests. It is difficult to count the exact incomes and expenditures of the Siberut communities from these trades due to income fluctuation. But based on interviews with the informants, the range of revenues and

expenditures can be estimated. The range of income is between IDR 600,000 to IDR 870,000 per month. The incomes are primarily derived from the sales of farm products (e.g. cocoa, nut, patchouli, coconut, nutmeg, cloves) and forest products (e.g. rattan, aloes). The range of expenditure is between IDR 700,000 to IDR 814,000 per month. Expenditures are mainly used for buying cigarettes, sugar, coffee or tea, oil, spices and toiletries. Frequently, financial deficit is experienced by the communities. The communities usually circumvented the situation by tightening money spending, like buying cheaper cigarettes or reducing the purchase of sugar, as well as finding additional work as temporary labor. The author in [20] states that performing diverse jobs despite of low wages are some of the measures taken by the poor households in rural areas as survival strategies.

Table 4: Traditional equipments from plants source and their functions for the Siberut communities

Equipments	Plants		Functions
	Scientific name	Local name	
Tuddukat (large drum made from wood, played on the ground)	Vitex pubescens, Nephelium sp.	Kulip, Babaet	Used for relaying information about an event, such as the result of a hunting party or an occurence of death
Tetektek (tuddukat beater)	Garcinia sp.	Lakobak	
Gajeumak (long-shaped drum)	Arenga sp.	Poula	Used for accompanying the traditional dance (turuk)
Umat simagre (bird-shaped carvings)	Alstonia spp., Artocarpus integer	Gite, Peigu	Used as toys for the spirits, to make the spirits happy and not disturbing the harmony of the human souls
Lulak (Plates)	Alstonia spp., Artocarpus integer	Gite, Peigu	Used as part of offering dish
Koraibi (shield war)	Shorea sp., Vitex pubescens	Katuko, Kulip	Used for shield to fend off opponent when fighting in war
Opa (basket)	Calamus javanicus	Pelege	Used for transporting farm products and storing the goods
Jara'jak (rattan mats)	Calamus caesius	Sasa	Used as material for creating floor mat (in family gathering etc.)
Rou-rou (bow)	Arenga sp.	Poula	
Silogui (arrows)	Daemonorops propiniguus	Osi	To hunt with arrows that usually smeared poison
Leggeu (fish trap)	Arenga sp.	Poula	To traping fishs
Subba (fish catch)	Calamus spp.	-	To catching fishs

According to the informants, crops in the fields and domesticated livestock are viewed as their savings. It is the

strategy took by the Siberut communities to cope with their unstable financial conditions. In addition, the Siberut people also knew staple food preservation techniques as strategies for securing food needs. Preservation technique for sago flour that can last longer is very important. Sago flour will be loaded into woven sago leaves (*tampin*) and then soaked in a puddle of water for a period of time that can last up to three months. A piece of sago bulk can be processed into flour in about a week.

The proportion of poor people in the Siberut population [4] is disputed by some people in the Siberut. The statement of Mr. Sukirmanto Satoleuru (one of the chieftain in Matotonan) opposes the idea that Siberut people are poor, in which, according to him, "... the poors are those who do not want to try (farming), making it difficult to obtain food, while the land available for farming; if there is no *uma* land, we could borrow another *uma* land ... ". This opinion is understandable, due to the fact that Siberut communities are surrounded by the abundance of natural resources, especially for foods (e.g. sago, taro, bananas). By using preservation techniques, such as the one being used for preserving sago flour, the Siberut communities are having stronger resources available to cope with the fluctuations in food prices or other obstacles from the outside. This condition indicates that the Siberut communities do not have problems with fulfilling food needs. Currently, the local government supports the program to build rice fields in the islands to replace the program of providing rice for the poor people. But, instead of alleviate the poverty, this program could weaken the local food security of the Siberut communities. It indicates the difference in perception between the communities and the local government about the meaning of "poor" and how to address the problem.

Financial institutions, such as banks and post offices, are not available in every village in the Siberut, except in the two district capitols of Muara Siberut and Sikabaluan. It becomes an obstacle for the people especially in the situation when they have more money. If they have more money, people tend to save some cash, buying some agricultural inputs, adding fields extension, buying livestocks, repairing the house, or buying electronic goods. If they do not have enough money to fulfill the needs, they usually borrow some money from a stall or a close relative, and also selling some livestock or plants. In order to increase revenue, the communities expanding the fields and then planting some marketable commodities and also intensify the search of forest products. New valuable commodity usually causes changes in the livelihood strategies of the Siberut community. It is consistent with the authors' research in [21] suggesting that the livelihood strategies of farmer households become very dependent on the market of commodities being cultivated.

3.4. Physical resources

In the three study sites, there are some public facilities that can used to describe the condition of public facilities in other villages in the Siberut (Table 5). The table shows that public facilities are limited in the Siberut rural.

The main transportation to the rural area in the Siberut is by using motorized boat (speedboat or *pompong*). This kind of water transport is quite expensive, because it requires a lot of fuel and also due to the expensive price of boat. Roads are only available for connecting the hamlets or nearby villages. The roads are made of cement with a width of 1 to 1.5 m. Along with the availability of the road connecting the hamlets or the villages, nowadays many residents have motorcycles. Motorcycles are started to replace the function of canoe as a mode of short

distance transport, in particular to the fields. The important supporting facilities for economy such as docks, markets, mobile telecommunications, electric from the government (PLN) are only available in the Muara Siberut and Sikabaluan. In the other hand, rural areas have only several small shops, no docks and no mobile communications, as well as no electricity from the PLN. The electricity usually obtained from generators privately owned and usually are turned on at night only.

Table 5: Public facilities in Saibi Samukop, Matotonan, and Sagulubbek villages[a]

Public facilities	The number of units (in aaaa the villages center)[b]			Public facilities	The number of units (in the villages center)[b]		
	Sai	Mat	Sag		Sai	Mat	Sag
Village offices	1	1	1	Ports/Docks	0	0	0
Village Representative Board Offices	1	1	1	Village roads[d]	10	8	8
Village halls	1	1	1	Selluler telecommunications	1	0	0
Kindergartens (TK)	2	2	1	Satellite telecommunications	1[c]	1[c]	1[c]
Elementary schools (SD)	2	1	1	Markets	0	0	0
Junior high school (SLTP)	1	0	0	Small shops	7	9	6
Senior High schools (SLTA)	1	0	0	Network clean water	1[c]	1	0
Local goverment clinics (*Puskesmas/Polindes*)	2	1	1	Public toilets	5	5	0
Churchs	4	1	2	Electricity[ef]	10	9	7
Mosques/small mosques	1	2	1	Speed boats (25-40 HP)[f]	10	6	8
Fields for football, volleyball, takraw	5	3	3	Canoes with engine 3-8 HP[f]	10	15	8
Post offices	0	0	0	Motorcycles[f]	100	50	30
Banks	0	0	0				

[a]Sources: villages data in 2014; [b]Sai=Saibi, Mat=Matotonan, Sag=Sagulubbek; [c]Does not function/damaged; [d]Roads made from cement with width of 1.5 to 2 m and length in kilometers; [e]Private generator set; [f]Private property used for community transportation.

3.5. Social resources

The Siberut communities embraced patrilineal family systems which are describing the social life within the *uma*. Basic life trait inside the *uma* is togetherness, by which the works, the food, the results obtained from the

forests are divided in the *uma*. Social class is not known in the Siberut communities. Members of an *uma* have equal level in the social life (egalitarian), altough there are some figures respected by the Siberut people, namely *Sikebukat uma* (the chieftain) and *Sikerei* (the shaman). *Sikebbukat uma* does not determine a decision in the *uma*, but rather acts as a facilitator to events, especially in the implementation of customs or traditions. Similarly, the *Sikerei* acts only as a healer. Making a decision or getting a consensus is a deliberation made together by the adult males.

Uma is an economic and politic unit in Mentawai tribes, consisting of two to dozens of nuclear families (*lalep*) or 10 to 60 individuals. In addition, *uma* also refers to houses served as gathering places and for performing rituals [13]. Every *uma* has a family history or genealogy associated with the ownership of the resources, including land. In the family tree, there is contained *Sirubei teteu* and *Uma sabeu* terms which are the collections of *uma*, *uma* factions, and also different *rak-rak* (lineages), but has the same claim of the ancestral and the land. According to author in [22], it can be simply represented by the common word of 'same ancestor'. Next is the *lalep* in the production unit. The variation of *lalep* and the individuals amount in the *uma* reflects the level of solidarity, historical development, and migration of the *uma* members.

From the history of land ownership in the above, the lands on the Siberut are owned by the *uma*-s. Every *uma* knows exactly the location and the boundaries of their land. The boundaries between lands are commonly used the natural barriers, such as rivers or ridges, and are known by other *uma* adjacent to each land. The use of lands and resources belonging the *uma*-s is restricted to the members of the *uma*. Other person can utilize other *uma* land using a borrowing system. The process of borrowing the land is through an agreement, in which a witness is present. The *uma* land owner can earn money or other possession as a sign of agreement (*pulajuk monei*). According to author in [20], some of the livelihood strategies undertaken by the poor households in rural areas are by utilizing the ties of kinship and by exchanging or reciprocity of giving to create a sense of security and protection.

The utilization of resources belong to an *uma* or a person without any granted permission will produced a fine (*tulou*) by the landowner (*Sibakat laggai* or *Sibakkat polak*). Land tenure conflicts often occurs when the land or the resources are already being used by another party without any permission. Land conflict resolution requires discussion between the conflicting *uma*-s with an intermediary (*Sipasuili*) by a person from an *uma* not involved in the dispute. Land conflict resolutions are usually complicated and take a long time to be achieved and sometimes does not resolved [13].

Besides of traditional social organization, the Siberut communities are also participated and or established in some social modern organizations as part of their adaptation to the external institutions. The modern organization is formed by the community, such as the government-based village organizations, the faith-based organizations (Protestant Youth, Mudika-Catholic Youth, Wira-Islamic Youth), the age-based organizations (Karang Taruna, PKK), or the livelihood-based organizations (Chocolate Farmers, Organizational to Built Village Roads Desa (OMS)). In addition, people are involved in various activities with formal organizations, such as the Siberut National Park (SNP), Coral Reef Marine Program (COREMAP) by the Indonesian Science Institute (LIPI), the Kirekat Foundation, the Government of Saudi Arabia, the Alliance of Indigenous Peoples on

the Indonesian Archipelago (AMAN) – for Mentawai. The organizations perform activities, such as supporting agricultures, strengthening local institutions, and supporting the construction of public facilities (see Table 6). It indicates the openess of the Siberut communities to newcomers, such as person, group of people, organization, or formal institution.

Table 6: The organizations from outside of the villages that are active at Saibi Samukop, Matotonan, and Sagulubbek

Villages	Organizations	Activities
Saibi Samukop	Regency government	Building patient rooms of local government health centers, built of rice fields, construction of village roads
	Siberut National Park	Building nurseries of forest plants, conducting forest patrols, conducting biodiversity survey
	Program of Coremap II	Community of empowerment in marine fisheries
Matotonan	Regency government	Constructing primary school, constructing village roads
	Siberut National Park	Building nurseries of forest plants, conducting forest patrols, conducting biodiversity survey
	The Government of Saudi Arabia	Constructing the Matotonan mosque
	Kirekat Foundation	Conducting community empowerment in agriculture and planting some plant for the reforestation
Sagulubbek	Regency government	Maintaining village roads
	Siberut National Park	Consucting forest patrols, conducting biodiversity survey

The ties between the *uma* members on the ownership of the same resources (communal property) is strong, especially regarding the land. Currently, some of the land owners on the east coast of the Siberut Island began to sell their land to another *uma* or to newcomers (person or organization). The new landowners are starting to process the land certification (private property) that in line with the local government program. Most of the Siberut younger generation are enthusiast with the land certification, because they regard the certificate as a form of state recognition of their land ownership, avoiding conflicts of hereditary competition for land in the *uma* and can be used as economic capital (such as for collateral). On the other hand, the land certification weakens the social relation system in the Siberut communities, such as the solidarity based on the *uma* (communal) and is now going towards individualism. The unresolved land conflicts in the past will be emerge in the future which can lead to greater social conflicts. The local government needs to be cautious in encouraging various programs that are contradictory with the institution of natural resources management in the Siberut island. According to authors in [23], the land certification may improves forest management, but may also leads to the destruction of traditional institution that so far are able to manage the resources better. Furthermore, the authors in [24] state that by limiting resources owned by the local communities and neglecting customary rights by the government can lead to the marginalization of local communities.

4. Conclussion

Sustainable livelihood assets in the Siberut society are human resources, natural resources, financial resources, and physical resources. The sustainability of human resources can be seen from the increasing number of the Siberut inhabitants, the improvement of education and health services, as well as the desire of parents to improve their children's education. The natural resource sustainability is indicated by its ability to distribute the benefits, either directly or indirectly, to the Siberut communities. The sustainability of financial resources is indicated by their financial resources and the individual savings in the form of crops and livestocks. The sustainability of physical resources is shown by the increasing development of public facilities by various parties, especially by the local government. On the other hand, the sustainability of social resources in the community of the Siberut is beginning to be threatened. The influx of new values, such as the land certification, begins to destabilize the ties of society based on land or the "*uma*". The local government needs to be very careful in encouraging some programs that can marginalized the communities of Siberut, such as the development of rice fields and the land certifications.

Acknowledgements

The author extends deeply acknowledgment to the Centre for Forestry Education and Training, Ministry of Enviromental and Forestry of Republic of Indonesia for scholarship and support in budgetting and accomplishing this research.

References

[1] WWF. Penyelamatan Siberut: Sebuah Rancangan Induk Konservasi. Bogor, ID: World Wild Fund, 1980, pp. 1-134.

[2] PHPA. Rencana Pengelolaan Konservasi Alam Terpadu: Taman Nasional Siberut (1995-2020). Jakarta, ID: Perlindungan Hutan dan Pelestarian Alam Departemen Kehutanan, 1995, pp. 1-50.

[3] BTNS. Rencana Strategis Balai Taman Nasional Siberut Tahun 2010-2014. Padang, ID: Balai Taman Nasional Siberut, 2010, pp. 1-57.

[4] BPS. Indikator Kesejahteraan Rakyat Kabupaten Kepulauan Mentawai Tahun 2014. Tuapeijat, ID: Badan Pusat Statistik Kabupaten Kepulauan Mentawai, 2015, pp. 1-71.

[5] R. Munazar. "Cagar Biosfer Pulau Siberut," in Panduan Cagar Biosfer di Indonesia. H. Soedjito, Ed. Jakarta, ID: LIPI, 2004, pp. 54-76.

[6] K. Meyers, D. Pio, S. Rachmania, A Hernandez. 25 Years of Siberut Biosphere Reserve: Saving Siberut and Its Unique Culture and Natural Heritage. Jakarta, ID: UNESCO, 2006, pp. 1-20.

[7] DFID. Sustainable Livelihoods Guidance Sheets. London, GB: Departement for International Development, 1999, pp. 1-26.

[8] R. Chambers G. Conway. Sustainable Rural Livelihoods: Practical Concepts for The 21st Century. Brighton, GB: IDS, 1992, pp. 7-8:33.

[9] F. Ellis. Rural Livelihoods and Diversity in Developing Countries. Oxford, GB: Oxford University Pr, 2000.

[10] P. Irawan. Penelitian Kualitatif dan Kuantitatif untuk Ilmu-ilmu Sosial. Jakarta, ID: DIA Fisip UI Pr, 2006, pp. 1-236.

[11] BPS. Kepulauan Mentawai dalam Angka Tahun 2015. Tuapeijat, ID: Badan Pusat Statistik Kabupaten Kepulauan Mentawai, 2015, pp 1-312.

[12] R. Schefold. Mainan Bagi Roh: Kebudayaan Mentawai. Jakarta, ID: Pustaka Jaya Pr, 1991, pp. 1-181.

[13] Darmanto, A.B. Setyowati. Berebut Hutan Siberut: Orang Mentawai, Kekuasaan, dan Politik Ekologi. Jakarta, ID: Kepustakaan Populer Gramedia, 2012, pp. 1-458.

[14] F. Nopiansyah S. Basuni Y. Purwanto N. Kosmaryandi. Forest resource utilization by the Siberut community and its implications for the Siberut Island Biosphere Reserve Policy. Jurnal Manajemen Hutan Tropika, vol. 22, pp. 94-104, 2016.

[15] A. Febrianto E. Fitriani. "Orang Mentawai: Peladang tradisional dan ekonomi pasar." Humanus, vol. 11, pp. 119-133, Feb. 2012.

[16] S.K. Pattanayak E.O. Sills A.D. Mehta R.A. Kramer. "Local uses of parks: Uncovering pattern of household production from forest of Siberut, Indonesia." Conservation and Society, vol. 1 pp.209-222. 2003.

[17] H. Soedjito E. Sukara. "Mengilmiahkan pengetahuan tradisional: Sumber ilmu masa depan Indonesia," in Prosiding Piagam MAB 2005 untuk Peneliti Muda dan Praktisi Lingkungan di Indonesia, 2006, pp. 1-17.

[18] L.L. Zhang Y. Zhang L. Wang Y.H. Wang. "An ethnobotanical study of traditional edible plants used by Naxi people in Nortwest Yunnan, China." Plant and Diversity Resources, vol. 35, pp. 479-486, 2013.

[19] M. Quinten F. Stirling S. Schwarze Y. Dinata K. Hodges. "Knowledge, attitudes and practices of local people on Siberut Island (West-Sumatra, Indonesia) towards primate hunting and conservation." Journal of Threatened Taxa, vol. 6(11), pp. 6389-6398, Oct. 2014.

[20] G. Carner. Survival, Interdependence and Competition among The Philippine Rural Poor in People Centered Development. Connecticut: Kumarian Pr, 1984.

[21] R. Cramb C. Colfer W. Dressler P. Laungaramsri Q. Le E. Mulyoutami N. Peluso R. Wadley. "Swidden Transformations and Rural Livelihoods in Southeast Asia." Human Ecology, vol. 37(3), pp. 323-346, 2009.

[22] G. Reeves. "Historical Background: History and Prehistory of the Mentawai Islands." Internet: www.mentawai.org/otda.htm, 2004 [Dec. 14, 2004].

[23] B.K. Pokharel P. Branney M. Nurse Y.B. Malla. "Community forestry: conserving forests, sustaining livelihoods and strengthening democracy." Journal of Forest and Livelihood, vol. 6(2), pp. 8–18, 2007.

[24] I.N. Nurjaya. "Proses pemiskinan di sektor hutan dan sumber daya alam: Perspektif politik hukum," in Masyarakat Adat dalam Mengelola Sumber Daya Alam. Bogor, ID: ICRAFT dan JAPHAMA, 2000, pp. 54-59.