FACTORS INFLUENCING SUSTAINABILITY IN CUSTOMARY FOREST

by **Christine Wulandari**

Forestry Department, Faculty of Agriculture, Lampung University. Indonesia.
chs_wulandari@unila.ac.id and chs.wulandari@gmail.com

Abstract

Degradation a forest area in Lampung is increasing and recently around 72% of forest area has already damage (*Dinas Kehutanan* Lampung, 2013). One reason the damaging of Lampung forest is squatters. One alternative for solving this problem is encouraging community surround forest to intensify their homegarden and their customary forest. Study on this matter conducted in 3 (three) customary forest in West Lampung District, namely Bakhu, Bedudu and Sukarame. This study used data on 354 respondents. Those data obtained by field study together with bio-physical observation. The socio-economic data gathered using an interview schedule and the variables that affect measured by Analytic Hierarchy Process (AHP) and logit models. The independent variables that used are Social Acceptability Index (SAI), Farming Index (FI), bio-physical and socio-economic factors. Specific objectives of this study are: (1) to predict the level of sustainability of the agroforestry in customary forest; and (2) to determine and rank the priority of variables that affect the sustainability of agroforestry in the customary forest. The soil fertility condition in study area is in the scale of Fair-Good and the level of community's SAI in the 3 (three) research sites is high with the score 74.92 and the level of the Farming Index (FI) is moderate with the score 65.61. While the biggest income of 72.33% respondents is in above of 3,600,000 IDR. Based on analysis results, overall, the three significant variables in the 3 (three) village by rank are Labor adequacy, Soil Nitrogen, Social Acceptability Index (SAI) and Soil Texture.

Key words: forest degradation, squatters, customary forest, forest sustainability

1. Introduction

Lampung Province is the first destination of transmigration in Indonesia, so it is understandable that the current population is composed of many tribes and quite dense. The rates of population growth in Lampung 1.36% per year (BPS Lampung, 2010) resulting in excessive pressure on the utilization of natural resources or forest resources and consequently a lot of encroachment on all functions of the forest, protected forest, production forest, as well as conservation areas.

It is currently known that there are about 72% of the forests in Lampung Province have damaged and need immediate rescue efforts both in technical and non-technical terms which includes social, cultural and economic (*Dinas Kehutanan* Lampung, 2010). One effort is to intensify the management of the yard and clan forest or indigenous forest, because it is known that 62.88% of land area in Lampung Province is private land, both residential and owned forest (*Dinas Kehutanan* Lampung, 2010).

Based on many studies, it is note that the community forest in Lampung has high potential in meeting the needs of the surrounding community, both in the form of timber and Non Timber Forest Products or NTFPs (Wulandari, 2010). Even currently the growth of community forests in Java Island is very high and become the majority of the existing conditions in the field related to the percentage of land cover. In Lampung Province, there are a lot of indigenous forests, which are located outside of the State Forest and owned by the indigenous people. Further in this paper referred as the *Hutan Marga* or customary forest. The mention of the *Hutan Marga* was aimed so that does not violate the provisions of existing laws or regulations as in the Act number 41 of year 1999 on Forestry, the referred of indigenous forest is the forest in the State Forest. Moreover, *Hutan Marga* are not managed directly by a ministry even though it condition is forest. So it requires continuation monitoring and guidance by all relevant parties so that the indigenous peoples still tough in carrying out their customary rules and the sustainability of *Hutan Marga* stay preserved.

Recent developments show that, more than ever, the *hutan marga* now needs to be studied more comprehensively due to its potentials to provide better management approaches toward more sustainable agricultural and natural resource development especially in West Lampung District, Lampung Province. Moreover, most of the private forest areas near protected forests or conservation forests thus to fulfilled for their daily needs, the farmers still to rely on the forest instead of their *Hutan Marga* and private forests. The general objective of this study was to determine and compare the sustainability of agroforestry in the 3 (three) *hutan marga* that practiced by farmers. Specific objectives of this study are: (1) to predict the level of sustainability of the agroforestry in customary forest; and (2) to determine and rank the priority of variables that affect the sustainability of agroforestry in the customary forest.

2. Related Literatures
2.1. Community Based Forest Management: Customary Forest and Village Forest

The private forests is a complex system which has socio-cultural, ecological, and economic dimensions (Asdi, 1996). All dimensions are clearly related to one another in affecting the sustainability of farming practices in the private forest included customary forest or *Hutan Marga*.

In certain circumstances, private forest as one of suitable location for Community Based Forest Management (CBFM) program have proved to be an efficient strategy for capital-poor farmers wishing to intensify land use as land-holding size decreases. As a land-use system, the private forest system has evolved from centuries of trial and error by households that have adapted the practice to the environmental, social, cultural and economic realities of village life. Aside from filling the household's subsistence needs, the private forest provides a variety of economic, biophysical and sociocultural functions for the owner while contributing directly and indirectly to the sustainability of the other forests such as state forest. Unfortunately, the private forest such as customary forest or *Hutan Marga* that located outside of state forest and has high potential for sustainbale CBFM program has not been fully and consciously taken into account in the formulation of Indonesia's forest management strategies.

From some CBFM schemes in Indonesia recognized the existence of indigenous forest and village forest which is the legal option of communities to manage forests in the state forest area. These two schemes of CBFM forests in the definition of community are very relevant to the issue of ownership or in the Law number 41 year 99 also known as right forests. The *hutan adat* or customary forest is devoted to be given to indigenous people in law. While the *Hutan Desa* or Village Forest is a state forest that has not have a license or rights, which is managed by the village through the *Lembaga Masyarakat Desa* or LMD or Rural Community Organization and utilized for the welfare of the village. Until now technical or implementing regulations that governing the indigenous forest and village forest is still in the stages of discussion. Act number 41/1999 promising opportunities for community participation in the forest management and establish the basis of more various forest utilization and forest resources for empowering community. According to the legal framework in force in Act number 41/99, customary forest and village forest is the state forest that encumbered management rights granted by the state on indigenous or rural communities. In terms of community, indigenous forest is a forest located in the indigenous areas, and village forest is located in the village areas, regardless of whether these forests are in the state forest areas or not. If it is associated with Act number 41/99, whether the forest under indigenous areas or rural areas outside the forest area cannot name to be customary forest or village forest? Is the customary forest only for forest in the forest areas according to the official establishment of the government?

The newest development of village forest is a signatory of the Minister of Forestry in the Ministry of Forestry decree No. 154 and 155/MoF-II/2013 on March 8th 2013 as the validity of the first community right to manage in the Riau Province in Segamai Village,

Teluk Meranti Sub district and Serapung Village Kuala Kampar Sub district, Pelalawan District, on the area of 4,000 hectares. These two villages are located in *Kesatuan Pengelolaan Hutan* Produksi or KPHP (Production Forest Management Unit) Model of Tasik Besar Serkap in Riau Province which established by the Minister of Forestry Decree No. 509/MoF-II/2010 on 21 September 21st 2010. This KPH area includes Pelalawan and Siak District with total area of ± 513,276 hectares. Those extents include the Limited Production Forest (*Hutan Produksi Terbatas* or HPT) of ± 2.880 hectares, Production Forest *(Hutan Produksi* or HP) of ± 491,768 hectares and Convertible Production Forest (*Hutan Produksi dapat Dikonversi* or HPK) area of 18,848 hectares. One of the companies inside is RAPP either more than ten companies and one cooperation. With the factual conditions in the field where big companies exist in the same management area within the KPHP, of course is not difficult for both the village forests in Segamai and Serapung villages to develop the sustainable village forest management based on MoF Regulation P.49/2008 on *Hutan Desa* juncto P 53/2011 so that it will do beneficial for rural communities. And, further to be observed is when later *Lembaga Masyarakat Desa* or LMD in two village forests have village regulation or *Peraturan Desa* (Perdes) and *Badan Usaha Milik Desa* or BUMDes (A company belong to village). Is BUMDes in this two village forests will also could be developed as a sustainable business unit and its advantages could be enjoyed by the whole village?

Then when talking about customary forests, some Indigenous people and customary forest Law experts have tried to describe the indigenous people. Soerjono Soekanto (1990) provide a description of the indigenous peoples as follows: indigenous peoples like the village in Java, the clan in the South of Sumatra such as Lampung, Jambi, South Sumatra, are social entities that have some completeness to be able to stand alone, which has a unity environment based on collective rights to land (communal land) and water for all members. The form of family law (patrilineal, matrilineal or bilateral) affecting the government system, mainly based on agriculture, livestock, fisheries, and forest product harvesting and water yield, coupled with a bit of hunting wild animals, mining and crafts, all members are equal in rights and obligations. Their life featured communal life, where there is mutual cooperation, mutual assistance, equality and all have a big role.

Based on the opinion of the experts of indigenous and customary law above, so it is concluded the indigenous people criteria as follows: there is an orderly society; occupies a certain place, some institutional, own common wealth, social order based on the correlation of a hereditary or based within the region, and live in communal and mutual cooperation. Based on this understanding, then the customary forest outside the State Forest could be referred to as customary forest. Especially for Lampung Province, so as not to violate the force law in Indonesia, then the existing customary forests are called as the *Hutan Marga*. The community in the research site does not take the option to seek legal protection in the form of village forest scheme because they still have the principles that their forests are customary forests owned by communal and not as a village forest. Designation granting of indigenous forests as *Hutan Marga* in Lampung was done because the Act Number 41/ 1999 on Forestry Article 67 paragraph (1), stated as follows: Indigenous people, as long as in fact it exists, and acknowledged its

existence, and in fact meet the elements, such as: the society still in the form of association (*rechtsgemeenschap*); there are institution in the form of customary authorities; a clear customary jurisdiction; existing institutions and legal instruments, in particular customary justice, which is still adhered to, and still held a forest harvesting in the surrounding forest areas for meeting their need every day. While in Paragraph (2) reads as follows: Inauguration of existence and abolishment of indigenous peoples, as referred to paragraph (1), determined by the Regional Regulation. It means that it will take time and money, and not a small amount of ability to be able to get the legality as the Customary Forest that located within a State Forest area. In addition there must be a high political will of the government on this initiative.

One example that is quite interesting and worth emulated by other districts or provinces in Indonesia related to this issue is the District Regulation or *Peraturan Daerah* or Perda No. 24 /2012 on The Lay Out of Kerinci District Year 2013 to 2032 where in it stated that in one district in Jambi Province will be designed 10 Kerinci customary forest within the duration from 2013 to 2032.

For Riau Province, according to Gusliana (2011) required the Forest Protection Pattern of Communal Land of Malay Riau Indigenous People for customary forests within the state forest in order to stem that no longer bloodshed happens among indigenous people who have customary rights, as well as the entrepreneur as manager of customary rights of indigenous peoples. The first protection pattern is Conversion of Private Indigenous Rights, Second, Strengthening the Role of Government as Supervisor, Third, Re-definition of Nationalism, Fourth, Mapping communal land and Fifth, involvement of Indigenous people in the process of communal land use. Next, the Sixth, as mentioned by the Act 41/1999 that there are Regional Regulation or district Regulation or *Peraturan Daerah* or Perda on Protection of Indigenous Peoples and its implementing regulations include patterns of participatory empowerment.

2.2. Customary Forest and KPH

Customary forest schemes is also possible to be exist in KPH and do not need to be made as a separate category as KPHA or *Kesatuan Pengelolaan Hutan Adat*, because according to BPKH (2013), customary forests are part of the state forest that able to have the principal function of conservation, protection and production so that management unit that will be held in the customary forest will follow the existing core functions of forests. It is important to be explicit here because KPH was one of the mainstreaming forestry developments in Indonesia and all of the existing forest functions will be divided out its management mechanisms in KPH. It means, in the future it needs to be immediately initiated on the development of collaboration implementation policy among the CBFM schemes in the KPH, e.g. collaboration of village forests or customary forest with the KPH, other companies and partners that exist in the KPH. On the other hand, many customary forests which are located outside the State forest such as Hutan Marga, which cannot be incorporated into the village forest scheme should also be immediately established its legal protection, e.g. through Perdes (Village Regulation) or PerDa (Regional or District Regulation). This effort is

urgent to be realized in order to preserve the customary forests. Based on the evidence in the field, it is known that the majority of private forest management, be it a yard or homegardens, customary forests and community forests in Indonesian is the *agroforestry* technique which is known to have social, cultural and economic functions.

2.3. Agroforestry

Agroforestry is a land-use system that involves socially and ecologically acceptable integration of trees with agricultural crops and or animals, simultaneously or sequentially, so as to get increased total productivity of plants and animals in a sustainable manner from a unit of farmland, especially under conditions of low level of technological inputs and marginal lands (Nair, 1993). Agroforestry has also been defined as a sustainable land-management system that increases the overall yield of the land, combines the production of crops (including tree crops) and forest plants and or animals simultaneously or sequentially, on the same unit of land, and applies management practices that are compatible with the cultural practices of the local population (King and Chandler, 1978).

According to Andayani (2005) *agroforestry* can be interpreted also as a form of Collective name from *sincerelye* piece of the community value system associated with models of sustainable forest use. Therefore, *agroforestry* in the form of implementation can be shaped as follows: *Agrisilviculture*, that is land use consciously and with careful consideration to produce agricultural products from the forest at one time, *Sylvopastural*, that is the system of forest management where the forest is managed to produce timber and also raising livestock, *Agrosylvo-pastoral*, that is the system in which land is managed for the production of agricultural and forestry product concurrently and simultaneously raising livestock, and Multipurpose forest tree production system, that is a system where different types of timber are planted and managed, not only timber products but also leaves and fruits which can be used as human food or fed to livestock. Even in some areas combine it by maintaining honey bee (Wulandari,2007).

The benefit of *agroforestry* according to Hairiah, *et al* (2003) are: Productivity because the total product of mix systems in *agroforestry* is much higher than monoculture systems, Diversity as it is the combining of two or more components in *agroforestry* systems resulting in a high diversity, either in relation to products or services, rehabilitation of critical areas because by implementing AF which have stratified canopy it can protect water resources, and also protection of land owned by the clan which is due to economic considerations, it is more favorable if managed collectively by planting various types of plants rather than just for seasonal crops. De Foresta *et al* (2000) and Risdiyanto (2001) suggested that *agroforestry* is the result of ideas, investments and long-term planning of the farmers. In some locations in Lampung and also other provinces in Indonesia, it can be found an *Agroforestry* which is in its application rely on the customary law systems and knowledge that has evolved from the tradition of ancient forests. This technology is implemented by a simple techniques and integrated practices, and controlled by social systems and traditional land ownership that includes

rights and obligations. Positive interaction between biological, practical knowledge, techniques, and institutions systems and appropriate policies will encourage *agroforestry* towards success.

Contribution of farming practices on private forest such *Hutan Marga l*and in Indonesia ranges from less than 5% to more than 50% of total household income. In West Sumatra, agroforestry products account for 26 to 30%. About 57% of the agricultural income of this household group was from private forest land in Java (Suryana and Simatupang, 1992) and around 53% in Lampung (Wulandari, 1999). These differences were due to the size of private forest land, choice of plants, degree of commercialization and farming intensity.

3.Methodology
3.1.Time and Location
This study conducted on July – December 2011 (wet season) in West Lampung Sub District particularly in Bakhu, Bedudu and Sukarame villages.

3.2. Sample
In West Lampung there are living 3,067 people as residence of 3 villages namely Sukarame, Bedudu and Bakhu.

Based on the data and formula of Slovin (Wulandari, 1999), the number of samples (minimum) was calculated using this formula 1 :

$$ n \; = \frac{N}{1 \; + \; Ne^2} = \frac{3{,}067}{1 + \; 3{,}067 \, (0.05)^2} = \; 353.856 \; \; 354 \text{ respondents} \qquad (1) $$

Where :
n = sample size
N = population size
e = desired margin of error (5% margin of error)

3.3. Analytical Procedure

Statistical method used in the analysis of the data as the following steps:
1. Determination of the sample number (total of 354 samples).
2. Identification relevant variables that influence to sustainability of the *Hutan Marga* based on previous studies, namely: FI, SAI, bio-physical and socioeconomic indicators.
3. Using the split-half correlation with the Spearman-Brown formula to test the Reliability of the instrument (questionnaire).
4. Collecting of data of 354 samples from the Bakhu, Bedudu, and Sukarame villages.
5. Determination of the level of FI and SAI based on previous studies.
6. The *Hutan Marga* sustainability was determined using the cumulative scores and categorized into three levels namely low, moderate and high. Based on studies of

ABedudu-Ella *et al.,* 1981; Agustin, 1991; Alicante, 1991; Asdi, 1996 and Wulandari 1999, FI and SAI were determined based on the following scores:

Level	Score	Code
Low	0 - 33	0
Moderate	34 - 66	1
High	67 - 100	2

7.In AHP, the variables have weight/value (0 to 1.00) based on their rank and inconsistency ratio (Saaty, 1995). The inconsistency ratio of AHP process must be less than or equal to 0.1. In Multinomial Logit Model, Y variable (sustainability level) is low, moderate, and high and determined based on the following scoring system :

Level	Score	Code
Low	0.00 - 0.33	0
Moderate	0.34 - 0. 66	1
High	0. 67 - 1.00	2

8.Computation of all data by multinomial Logit model to determine the significant variables and to know the probability of prediction of sustainability levels by models. It is a multinomial logit model if   the dependent variable (PS) is coded as 0, 1, and 2 (as shown in formula 2 and formula 3).

The logit model for PS would thus take the general form:

$$Pr\ (PS = j\ ) = \frac{1}{[\ 1 + exp\ (\ -A_j\ -\ X_i\ B)]} \tag{2}$$

or

$$Ln\ \frac{Pr\ (\ PS = j\ )}{[\ 1 - Pr\ (\ PS = j\ )]}\ =\ A_j\ +\ X_i\ B_{ij} \tag{3}$$

where: j = 0 or 1   (binomial model)
           = 0, 1, or 2   (multinomial model)
       Pr (PS = j) = probability of the jth *Hutan Marga* sustainability
           Aj = intercept parameters
           Xi = column vector of independent variables
                (biophysical and socioeconomic factors)
           Bij = row vector of coefficients

The dependent variables (PS) were low, moderate and high levels of sustainability of *Hutan Marga* in   multinomial   logit   model. **The independent variables** were: socioeconomic indicator, SAI, FI and bio-physical   indicators.

Sustainability, meaning sustainable use of land and natural resources in general, can be defined as follows: production + conservation = sustainability (Erskine, 1997). It means, farming index (indices of all kind of harvests), socioeconomic factors and bio-physical factors were considered. This study using Farming Index (FI) based on research methodology of Asdi (1996) with adding variables i.e. planted vegetables, benefit trees, chicken, goats, cattle, and fish.

From a social strategic perspective, sustainability is related to participation because it is increasingly clear that change without participation of those most affected by the change is not likely to be viewed as development, and not likely to be sustainable (Dixon *et al.*, 1997). Changed should be accompanied by the development of the right attitudes and values associated with the operation of the project at certain point in time (Asdi, 1996). Social Acceptability Index (SAI) this study refers to some psychological factors such as participation, attitudes and value towards some aspects and issues related to sustainability of *Hutan Marga*.

3.4. Social Acceptability Index (SAI)

The SAI formula that used in this study is based on the research methodologies of Agustin (1991), Alicante (1991), Asdi (1996) and Wulandari (1999).

$$SAI = (TSP+TSA+TSV) / \text{The highest} (TSP+TSA+TSV) \times 100 \qquad (4)$$
where :
  TSP = Total Score Participation
  TSA = Total Score Attitudes
  TSV = Total Score Value

3.5. Farming Index (FI)

The Farming Index (FI) that used in this study is based on research of Asdi (1996) with adding variables i.e. planted vegetables, benefit trees, chicken, goats, cattle, and fish. *Hutan Marga* sustainability should increase farmers' productivity expressed in terms of income generated from various combinations of commodity in their *Hutan Marga*.

$$FI = (TV / TAA + TC/ HTC + TG/ HTG + TCt/ HTCt + TT/HTT + TF/HTF) \times 100 \qquad (5)$$

where :
  TV = Total Effective Area Planted to Vegetables
  TAA = Total Area Available
  TC = Total Number of Existing Chickens
  HTC = The Highest Total Number of Existing Chickens by a respondent
  TG = Total Number of Existing Goats
  HTG = The Highest Total Number of Existing Goats by a respondent
  TCt = Total Number of Existing Cattle
  HTCt = The Highest Total Number of Existing Cattle by a respondent

TT   = Total Number of Existing Beneficial Trees
HTT = The Highest Total Number of Existing Beneficial Trees by a respondent
TF   = Total Number of Existing Fish
HTF = The Highest Total Number of Existing Fish by a respondent

4.Results and Discussion

4.1.Respondents' Profile

Ethnic Group. The Lampung ethnic is major community' respondents in the three villages of the research area. Around of 97% people in Bakhu is Lampung ethnic, Bedudu 96% and Sukarame 99%. There are also very small percentage of community of Javanese and Batak ethnic (see Table 1.).

Age. The ages of the respondents ranged from 21-30 years is around 20-30% in Bedudu and Sukarame, and in Bakhu there are 14.28%.

Civil status. Majority of the respondents at Bakhu, Bedudu and Sukarame were married.

Educational attainment. Highest educational attainment in Bakhu is elementary school i.e. 63.31% and Sukarame 54.88%. Otherwise the highest educational attainment in Bedudu is Senior High School i.e. 43.86%.

Household size. Majority of the respondents i.e 77.55% in Bakhu, 96.99% in Bedudu and 84.15% in Sukarame. In 3 (three) villages have family sizes of 1 to 4 members.

Social Acceptability Index (SAI). The respondents in 3 villages are high in their participation, attitude, and value toward the operations in the *Hutan Marga*. That SAI in those three village is almost the same; in the village of Bakhu is 76.34, in Bedudu is 75.89 and in the Sukarame is 72.54, in other word, the average SAI score of respondents in 3 villages were high i.e. 74.92 (Figure 1.). Based on field survey, 3(three) villages had an indigenous rules to manage *hutan marga*, therefore it is reasonable that the community has a high level of SAI. As shown on the field evidence, the existence of indigenous rules in the 3(three) villages is likely thinking ahead, because not all villages have similar rules.

Table 1. Respondents Profiles

Characteristics	Bakhu	Bedudu	Sukarame
Respondents	%	%	%
Ethnic			
Lampung	97	96	99
Batak	0	1	0
Java	3	3	1
Age (years)			
20 and below	0	0	0
21 - 30	14.28	21.95	25.61

31 - 40	32.65	24.39	48.78
41 - 50	22.46	26.83	15.84
above 50	30.61	26.83	9.77
Civil status			
Married	25	30.32	43.62
Single/widowed	1.06	0	0
Gender			
Male	53.012	41.96	52.79
Female	46.99	58.04	47.21
Household number	26.06	30.32	43.62
Household size			
1 – 4	77.55	96.49	84.15
5 – 7	22.45	3.51	15.85
8 – 10	0	0	0
Above 10	0	0	0
Educational attain			
Non formal education	2.04	1.75	2.44
Elementary school	65.31	31.58	54.88
Junior high school	12.24	21.05	9.76
Senior high school	18.37	43.86	32.93
University/College	2.04	1.75	0.00

Source: Wulandari *et al*., 2012

4.2. Economic Characteristics

Occupation. About 93 to 100% of respondents has occupation as farmer.

Farming Index (FI). As shown in Figure 1., the average Farming Index (FI) score of three *Hutan Marga* respondents as a whole is moderate (65.61), its meaning the communities surounding the *hutan marga* will be maintained the sustainability of productions of forest. Actually FI in Bakhu is 29.59 and the lowest than 2 (two) others due to close to the highway therefore easy to logged illegally by the people who are not the residents of Bakhu. The FI in Sukarame (73.79) and Bedudu (93.46). The 72.33% of communities obtained a high level of income (more than 3,600,000 IDR per year per household) as an influencing of moderate level of FI.
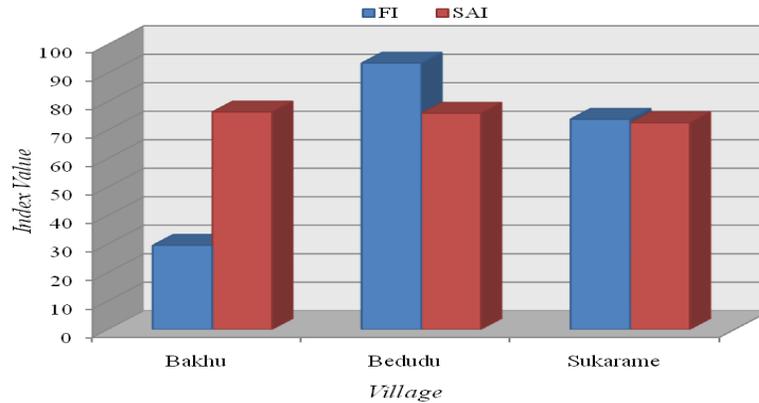
Figure 1. FI and SAI of Research Sites
Source: Wulandari *et al.* (2012)

Family income. Based on the research analysis, table 2 shown income out of 41.07% respondent from 72.33% is Rp 3,601,000 above per year (Figure 2.). In fact, community has not gathering a lot of forest products for daily needs fulfillment therefore income from the forest products is not to significant variable to the *Hutan Marga* management in those 3 (three) villages. The customary regulation mentioned that community allowed to took wood/trees from *Hutan Marga*, every household has a right to harvest the timber to be used to build their house for maximum 5 m^3.

Number of agroforestry activities in the *hutan marga*. Majority of respondents in 3 (three) *hutan marga* have 3 (three) activities averagely in *hutan marga* i.e. planting of trees and vegetable, fishery or husbandry.
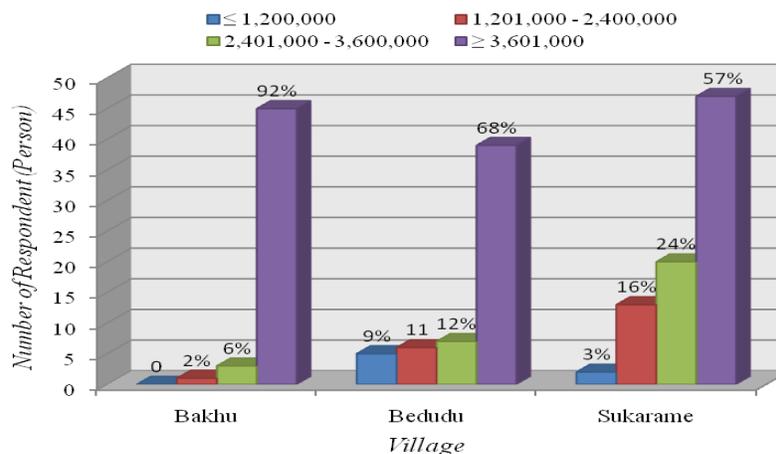

Figure 2. Family Income (annual) in Rupiah
Source: Wulandari *et al.* (2012)

Source and adequacy of labor. The main source of labor is family member and 80.19% of respondents indicated has sufficient for all activities in the *Hutan Marga*. According to 76.71% respondent the wives were mostly involved in all activities, husbands and children gave support only when needed.

Table 2. Respondent Socio Economic Characteristics

Characteristics	Bakhu		Bedudu		Sukarame	
	Total	%	Total	%	Total	%
Occupation						
Farming	92	100.0	103	92.8	141	93.4
Others	0	0.0	8	7.2	10	6.6
Family Income (annual) in Rupiah						
1,200,000 and below	0	0.0	9	8.8	4	2.4
1,201,000 - 2,400,000	2	2.2	12	10.5	24	15.9
2,401,000 - 3,600,000	6	6.5	14	12.3	37	24.4
3,601,000 and above	84	91.3	76	68.4	86	57.3
Size of land tillage (in sq.m)						
100 and below	2	2.0	6	5.3	11	7.3
101 – 300	0	0.0	6	5.3	7	4.9
301 – 500	9	10.2	37	33.3	11	7.3
501 and above	81	87.8	62	56.1	122	80.5

Source: Wulandari et al., 2012

4.3. Bio-physical characteristics

Soil properties. As soil analysis result, level of soil fertility of 3 (three) *Hutan Marga* is in the range of Fair to Good.

4.4.The *Hutan Marga* Sustainability Models
4.4.1.Bakhu Village

The signs of all significant variables came out as expected. One significant variable is labor adequacy (LA). Based on to the logit analysis, shown at Table 3 that amounted 30 unit samples have low level in sustainable, 57 unit samples have moderate sustainable, and 5 unit samples have high level on sustainable agroforestry in *hutan marga*.

Table 3. Logit Analysis Result of Bakhu Village

Dependent Variable : HMS coded as   0 = low level
                                      1 = moderate level
                                      2 = high level

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Hsize	0.802228	0.802934	0.999121	0.3177
Oc	10.40075	98.85575	0.105211	0.9162
LA*	-11.91421	5.249838	-2.269443	0.0232
Act	3.802017	5.011960	0.758589	0.4481
SAI	-1.954692	1.071991	-1.823422	0.0682
FI	0.328069	0.326287	1.005462	0.3147
pH	-2.533574	2.548220	-0.994252	0.3201
OMC	13.52074	8.948366	1.510973	0.1308
BD	-33.19893	26.93260	-1.232667	0.2177
N	23.58619	26.50715	0.889805	0.3736
P	0.269110	1.908855	0.140980	0.8879
K	1.530052	0.807497	1.894809	0.0581

Notes: Hsize=household, Oc=Occupation, LA=Labor adequacy, Act=number of agroforestry activities,SAI=Social Acceptability Index,FI=Farming Index, pH=soil pH, OMC=Organic Matter Contents, BD=Bulk Density, N=Soil Nitrogen, P=Soil Phoshor, K= Soil Kalium, and HMS=*Hutan Marga* Sustainability

		Predicted			
		0	1	2	TOTAL
	0	26	2	0	28
Actual	1	3	54	1	58
	2	1	1	4	6
	TOTAL	30	57	5	92

4.4.2.Bedudu Village

During field validation and interview, it has proven that majority of samples have correctly classified on high, moderate either low sustainable level. Based on the multinomial logit analysis results (Table 4.), 10 unit samples are in Bedudu village has the category of high level sustainable, 30 unit samples of agroforestry has low category, and 71 samples have moderate sustainable level. There were 3 (three) significant variables affecting the moderate level of *Hutan Marga* sustainability in Bedudu village namely SAI, bulk density (BD), and soil texture (Tx).

Table 4. Logit Analysis Result of Bedudu Village

Dependent Variable : HMS coded as   0 = low level
1 = moderate level
2 = high level

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Hsize	1.633641	1.583020	1.031977	0.3021
Oc	3.293371	2.584904	1.274078	0.2026
LA	44.67108	928.1620	0.048129	0.9616
Act	-11.65388	6.471867	-1.800699	0.0718
SAI*	114.2533	58.51154	1.952663	0.0409

FI	-570.3093	345.6743	-1.649846	0.0990
pH	-229.3295	212.2303	-1.080569	0.2799
OMC	5.377701	6.967229	0.771857	0.4402
BD*	-220.2704	119.6246	-1.841346	0.0456
N	1246.101	690.9903	1.803356	0.0713
P	292.5363	161.7594	1.808465	0.0705
K	74.55592	41.22591	1.808472	0.0705
Tx*	27.58409	15.19354	1.815514	0.0494

Notes: Hsize=household, Oc=Occupation, LA=Labor adequacy, Act=number of agroforestry activities,SAI=Social Acceptability Index,FI=Farming Index, pH=soil pH, OMC=Organic Matter Contents, BD=Bulk Density, N=Soil Nitrogen, P=Soil Phoshor, K= Soil Kalium, Tx=Soil Texture and HMS= *Hutan Marga* Sustainability

		Predicted			
		0	1	2	TOTAL
	0	26	3	0	29
Actual	1	4	67	1	72
	2	0	1	9	10
	TOTAL	30	71	10	111

4.4.3.Sukarame village.

The signs of all significant variables were as expected. Three significant variables namely labor adequacy (LA), Soil Nitrogen (N) and soil pH (pH) influenced *Hutan Marga* sustainability (Table 5.). There are 19 unit samples in the low sustainable, 125 unit samples are in the moderate level, and 8 unit samples are in the high level sustainability in agroforestry on the *hutan marga* of Sukarame village. Out of 152 units of fields, based on logit analysis, there were 125 units sample in moderate level and 7 units sample in high level were predicted correctly, while 20 units sample in low level sustainability were predicted correctly. It has concluded that the equation above is effective because the overachieved was 5.26% in the low level, 0% in moderate level, and underachieved 12.50% in high level.

Table 5. Logit Analysis Result of Sukarame Village

Dependent Variable : HMS coded as 0 = low level
1 = moderate level
2 = high level

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Hsize	0.594423	0.461534	1.287928	0.1978
LA*	-239.5661	114.4940	-2.092391	0.0364
Act	-1.891219	1.270724	-1.488300	0.1367
SAI	-0.005504	0.214409	-0.025671	0.9795
FI	0.138920	0.146950	0.945354	0.3445
pH*	3.404752	1.372598	2.480516	0.0131
OMC	-0.978675	0.997325	-0.981300	0.3264

BD	2.510488	1.677661	1.496421	0.1345
N*	0.111214	1.342502	0.055920	0.0474
P	-0.037804	0.154311	-0.244984	0.8065
K	0.025149	0.046322	0.542919	0.5872
Ag	-0.114328	0.089562	-1.276521	0.2018

Notes: Hsize=household, LA=Labor adequacy, Act=number of agroforestry activities,SAI=Social Acceptability Index,FI=Farming Index, pH=soil pH, OMC=Organic Matter Contents, BD=Bulk Density, N=Soil Nitrogen, P=Soil Phoshor, K= Soil Kalium, Ag=Soil aggregate and HMS=*Hutan Marga* Sustainability

		Predicted			
		0	1	2	TOTAL
	0	19	0	0	19
Actual	1	1	124	0	125
	2	0	1	7	8
TOTAL		20	125	7	152

5.The Ranking of Significant Variables

As results of multinomial logit calculations that there is only one significant variable in Bakhu is Labor adequacy (LA). For the Bedudu, the significant variables are Bulk Density (BD), SAI and Soil Texture (Tx). While in Sukarame are Labor Adequacy (LA), Soil Nitrogen (N) and Soil pH. When analyzed using AHP, it is found that the ranking of significant variable in Bedudu is SAI, BD and Tx, while in Sukarame as follows LA, N and pH. In accordance with the results of the AHP analysis mentioned in the table 6 then the ranking of significant variables in general 3 (three) Hutan Marga are as follows: SAI, Labor Adequacy (LA), Soil Nitrogen (N) and Soil Texture (Tx).

Table 6. The ranking of significant variables in multinomial logit

No	Village	Ranking of Significant Factors				
		1	2	3	4	5
1	Bakhu	LA				
2	Bedudu	SAI	BD	Tx		
3	Sukarame	LA	N	pH		
4	In general	SAI	LA	N	Tx	

All significant variables would be superfluous if the social acceptability index of farmers is not high. In general, The *Hutan Marga* that is managed by the 3 (three) villages area of research influenced by SAI. This factor is the first rank that influence to *Hutan Marga* sustainability. Gregersen (1988) stated that ingredients are common in successful social forestry programs like those using in customary forest as private forest, namely:
(1.) widespread local participation backed by high level of political support and
(2.) sustainable productivity-increasing technologies that are adaptable to local circumstances and acceptable to local populations. Therefore local participation is the first element to consider in programs related to increasing agricultural productivity. This involves recognizing local knowledge (value) and understanding, and commitment (attitude) of local resources to organize production and to distribute fairly any increased production.

Moreover if the community has high level SAI as in 3 (three) villages will be positive to the forest resources, especially to the sustainability of agroforestry in *hutan marga* at those 3 (three) villages. Clough *et al.* (2011) said that the mature agroforest will influence for reducing the risk of deforestation.

The SAI is becoming the first significant variables as a whole in Bakhu, Bedudu and Sukarame village that might be supported by an important capital to conserve the sustainability of agroforestry in *hutan marga* such as indigenous rule. Because customary rules is still have not recognized in the Hierarchy of Law, according to *Undang Undang* or UU (Laws) No. 10Year 2004 then this rule should be developed into a Village Regulation (*Peraturan Desa*) or Region or District Regulation (*Peraturan Daerah*).

The custom order in that three village areas including the rules to manage forest resources, including regulations on logging in the *Hutan Marga*. These two rules are already at 3 (three) villages as follows: (1.) Regulations of logging license in the *hutan marga*. Issuance of logging license in the *hutan marga* is held by *peratin* (village head) and the chairman *of* customs of each indigenous group that includes various provisions that must be followed by every people involved in every community in every logging activity in the *hutan marga*. (2.) Logging in the *hutan marga* have some rules, namely a.) Timber, only for the development in the Sub District of Belalau and Batu Ketulis, not for sale, and b.) The right to prohibited to cut the timber in the *hutan marga* is not just for members of   indigenous groups but also for the migrants who stay and living in those two sub districts. Several others Customary Rules in research areas are:
- Regulation in Bedudu Pekon (village),No. 03 year 2005, on Forestry, Plantations, and Fruits harvesting.
- Decision of Peratin Pekon Sukarame (village), No. P/004/KPTS/IX/2002, mentioned that Preserve Forest Product Owned by and Fishery and Security managed by Customary Institution of Pekon Sukarame (village).
- Regulation in Pekon Bakhu (village) No. 141/003/KPTS/BKH/H/Year 2006, On *Hutan Rakyat* (community forest) and *Hutan Marga* Management in Pekon Bakhu (village).

Development of written rules is the next important step is communicating and demonstration the functional role of agroforestry into the *Hutan Marga* sustainability. The community will comply with these written regulations because there is tangible evidence of the agroforestry benefits in the *hutan marga.* This condition should be followed by appropriate trainings method that topics relevant to the needs of the community in responding the challenges of agroforestry management in *Hutan Marga* in the 3 (three) villages. Amounted by 76% of respondents expressed the need for the training of agroforestry and other skills that is well organized. Respondents said it will be able to update the development of their agroforestry production and technology including the market information for the products.

The second rank factor is Labor Adequacy (LA). It is reasonable that labor adequacy (LA) became significant variable and as second rank factor that influenced to Hutan Marga sustainability in general, because according to Clough *et al.* (2011), farm yield was positively correlated with labor. Labor reflects time spent on plot maintenance and care of *Hutan Marga*, such as weeding, pruning etc. This finding is similar to the research results of Soemarwoto (1988) in Java island, Indonesia, Agroforestry research in Peru by Padoch and de Jong (1991), and the research on the agroforestry in homegardens sustainability in Lampung by Wulandari (1999). Their research variable were tightly associated with labor availability variable.

The availability of labor here is not only in terms of the numbers but also including the skills, because the condition of the *Hutan Marga* is very specific and also preserved by the custom rules. This is reasonable because according to Asdi (1996) and Wulandari (2005), labor sufficiency is the major problems identified by the respondents in the Food and Nutrition Diversification Project in West Sumatra and Lampung Provinces. With labor adequacy as the first rank, it is known that absolutely necessary the availability of sufficient labor for managing the *Hutan Marga*.

In each 3 (three) village and in all sites as a whole, some soil properties were found to be significant variables. Soil properties that were found to affect *Hutan Marga* sustainability are different in each area depending on their soil mineral particles, particularly soil texture, soil pH and bulk density. Bulk Density is become a significant variable in Bedudu. According to Rachman (1997), bulk density is a soil property used for assessment of capacity to exchange gaseous materials with the above-ground atmosphere for plant growth and development.

Nitrogen (N) is essential for plant growth (Mississippi State University Extension Services, 2010) therefore was reasonable as the third rank factor that influence to *Hutan Marga* sustainability. The N is mobile within the plant, when N is limiting, crop growth became slow and yields of *Hutan Marga* are reduced. Further its institution stated that Nitrogen behavior is complex, but must be understood so growers may manage N for maximum profitability and for minimum environmental impact.

In general, soil texture (Tx) is the fourth rank factor that influenced to sustainability of 3 (three) *Hutan Marga.* This was reasonable because soil texture is a soil property

related to nutrient accessibility for root development and soil erodibility (Glaesner *et al.*, 2011). Soil texture was also found as one of significant variable in multinomial logit in Bededu. In relation to soil condition and function, soil texture is used as a preferred measure to know the retention and transport of water and chemicals. In addition,

6.Development of *Hutan Marga* in Lampung Province in the Future

The use of *Hutan Marga* terminology as the term of customary forests outside the State forests in Lampung Province is in order to not violate the existing rules. The absence of significant follow-up from the central government for customary forests outside the state forests should be addressed wisely by local governments. One alternative that can be done is to develop *PerDes or Peraturan Desa* (Village Regulations) or PerDa or *Peraturan Daerah* (Regional or District Regulations) for the basis of its management. Although the location of *Hutan Marga* is outside the state forests area, the developed PerDes or PerDa can be set that *Hutan Marga* will be managed as the customary forest or village forest.

If the customary forests considered more absurd or difficult to implement due to there is no specific policy set yet, then the management as village forest can be chosen. Selection of *Hutan Marga* management with the village forest schemes is also done by many initiators or Non Government Organization (NGOs) who assistants of customary forests which are located in the state forest area. One sample in the field is village forest of Segamai and Serapung villages in Riau which recently inaugurated by the Ministry of Forestry. This is often to be done because by the scheme of village forest, the rural government will contribute actively in the management of the village forest and everything must be regulated by the PerDes made by the Rural Community Institution or *Lembaga Masyarakat Desa* (LMD). According to Gusliana (2011) this is also one way to guarantee the protection of customary forest communities including preservation of the forest function.

In addition, based on the regulations on the Village Forest that set in the Ministry of Forestry Regulation or *Peraturan Menteri Kehutanan* (Permenhut) Number P.49/2008 Chapter III Section 9 stated that village forest communities will receive facilitation to improve the capacity of rural institutions on forest management. It is also stated that the type of facilitation which can be provided including: a. education and training; b. institutional development; c. guidance of village forest working plan; d. guidance of technology, e. information provision of markets and capital, and f. business development. All of those types of facilitation was also much needed by the community of *Hutan Marga* at the research sites. In the setting of PerDa for *Hutan Marga* should also mention that those facilitation must be done by the national government, the provincial government, or district/ city governments in accordance with their authority. Then in the implementation may be mentioned that the facilitation may be assisted by other parties, such as: universities/ research institutions and community service; non government organizations; financial institutions; cooperatives, or state/ local/ private enterprises. If using the village forest scheme as set out in that the Permenhut, then the Rights of village forest management is not as the right of ownership over the forest

areas, and is prohibited from transferring or mortgaging, and change the status and functions of the forest area. Besides, the rights of village forest management are prohibited to be used for other purposes beyond the forest management plan and should be managed based on the principles of sustainable forest management. All of those rules actually had been done by the community of *Hutan Marga* in the 3 (three) villages where *Hutan Marga* does not belong to an individual but owned by communal and its use should only be managed and done by the local indigenous people.

Related to forest management through *Kesatuan Pengelolaan Hutan* or KPH which is mainstreaming the forestry development in Indonesia, then what can be done for *Hutan Marga* which are located outside the state forest is treated the *Hutan Marga* as buffer zone for the Protection Forest in the surrounding areas or buffer zone for Kesatuan Pengelolaan Hutan Lindung (KPHL) which will be established around the *Hutan Marga*. Furthermore it is required more rules in terms of partnership between the *Hutan Marga* management and the KPHL management. Partnership arrangements between KPH and community and other partners is still weak until today, and the draft of Permenhut on the Partnership mandated by Act number 41/1999 on Forestry has not been approved to date. This weakness is begun to be felt in the KPH management in Indonesia including KPHs in Lampung Province or the largest KPHP *(Kesatuan Pengelolaan Hutan Produksi)* i.e. KPHP Tasik Besar Serkap in Riau Province which established by the Minister of Forestry Decree No. 509/MoF-II/2010 on 21 September 21st 2010. This KPH area includes Pelalawan and Siak District with total area of ± 513,276 hectares.

Related to development of umbrella policy for *Hutan Marga* in research site, thus there should be an early step undertaken by West Lampung or local governments when drafting PerDa for *Hutan Marga* that is drafting the management partnership rules should be mentioned collaboration or partnership between *Hutan Marga* and KPHL and other partners. Alternatively, if in the future the local government of West Lampung District or Region intent to also organize the customary forests in the forest area, then the steps of Kerinci District or local government could be the role models. Kerinci local government in 2012 has been approved the Regional Regulation No. 24 Year 2012 which states that there would be the establishment of 10 (ten) Kerinci customary forests in the duration of 2013 to 2032. That is, the West Lampung District could draft the PerDa that will regulate the customary forests, which are located inside and outside the forest area. Role models provided by the Kerinci District local government actually also can be replicated by Pelalawan and Siak District in Riau Province for anticipation of the possibility of a conflict or problems related Village Forest management, or village forest inside the KPHP.

7. Conclusions

The research carried out at 3 villages in West Lampung in July – December 2011. The general objective of this study was to determine and compare the sustainability of agroforestry in the 3 (three) *hutan marga* that practiced by farmers. Specific objectives of this study are: (1) to predict the level of sustainability of the agroforestry in customary

forest; and (2) to determine and rank the priority of variables that affect the sustainability of agroforestry in the customary forest. Data analysis using logit-factor to determine the significant factors and AHP to determine the ranking of priorities of those significant factors.

Out of 354 respondents stated that their income does not significantly influence to the *Hutan Marga* sustainability even though income of the majority of the people in the study area is high i.e. Rp 3,601,000 above per year. Fulfillment of their food and housing are not buy from market due to can be provided by *Hutan Marga.* This condition is reasonable because their customary regulation mentioned that community can harvest Non Timber Forest Products (NTFPs) and each household have the right to take wood for 5m^3 to build a house. Based on laboratory analysis of soil that belong to the government, it has known that soil fertility in 3 (three) *Hutan Marga* are fair to good so it is not surprising if the FI was 65.61. In fact in field and through research analysis found that community or most respondents have applied a sustainable forest management in their *Hutan Marga*.

As known the average score of SAI was 74.92 and in general this factor is the first ranking factors that influence to the sustainability of *Hutan Marga*. Based on the results of the AHP analysis, the three factors that influence to *Hutan Marga* sustainability is Labor Adequacy then soil Nitrogen and Soil Texture. The SAI is the first factor that influence to the sustainability of *Hutan Marga* is reasonable because community in 3 (three) villages already have customary regulations therefore their social capital level is very adequate. The *Hutan Marga* sustainability will be guaranteed if existence of customary regulations in favor for sustainable *Hutan Marga* followed up or developed into a village regulations (*Peraturan Desa or Perdes*) or local (region or district) regulation (*Peraturan Daerah or Perda*).

Acknowledgements

Literatures Cited

Abd-Ella, M.M. Holzberg, E.O. and Warren, R.D. 1981. Adoption Behavior in Family Farm System. An Iowa Study Journal Paper No. 1. 9644. Iowa Agriculture and Home Economics Experimental Station, Ames, Iowa, U.S.A.

Agustin, E.T. 1990. Sustainability of AEOP-Assisted Outreach Project : the Case of Aklan Agricultural College. Unpublished Ph.D. Dissertation. UPLB, Philippines.

Alicante, E.L. 1991. Social and Economic Sustainability of Communal Irrigation System in Ilo-ilo Province. Unpublished Ph.D. Dissertation. UPLB, Philippines.

Andayani, Wahyu. 2005. *Ekonomi Agroforestry.* Debut Press. Yogyakarta. INdonesia

Asdi, Agustar. 1996. Sustainability of Food and Nutrition Diversification Projects in West Sumatra, Indonesia. Unpublished Ph.D. Dissertation. UPLB, Philippines.

BPS Lampung. 2010. *Lampung dalam Angka*. Statistics Office of Lampung Province, Bandar Lampung.

BPKH. 2010*. Pembentukan Wilayah Pengelolaan Hutan Tingkat Unit Pengelola (KPH).* Downloaded from http://bpkh1.com/pembentukan-wilayah-pengelolaan-hutan-tingkat-unit-pengelolaan-kph on March 10, 2013.

Clough, Y., Barkmann, J., Juhrbandt, J., Kessler M., Wanger T.C., Anshary A., Buchori D., Cicuzza D., Drras K., Putra DD., Erasmi S., Pitopang R., Schmidt C., Schulze CH., Seidel D., Steffean- Dewenter I., Stenchly K., Vidal S., Weist M., Wiegloss AC., and Tscharntke T. 2011. Combining High Biodiversity with High Yields in Tropical Agroforests. Edited by Gretchen C. Daily, Stanford University. Proceeding of the National Academy of Sciences of the United States of America (PNAS) May 17, 2011 vol.108 no. 20 p. 8311-8316

De Foresta, H., A. Kusworo, G. Michon and W.A. Djatmiko. 2000. Ketika Kebun berupa Hutan-Agroforestry Kehutanan Indonesia-Sebuah Sumber Masyarakat. ICRAF. Bogor.

Dinas Kehutanan Lampung. 2010. Statistik Kehutanan. Bandarlampung.

Dixon, J.M., Varughese, G., and Sharma, P.N. 1997. Conceptualizing Sustainability. In: Proceedings of an International Conference on People and Participation in Sustainable Development. Nepal.

Erskine, J.M. 1997. Sustainability Measures for Natural Resources. In: of an International Conference on People and Participation in Sustainable Development. Nepal.

Glæsner N., Charlotte Kjaergaard, Gitte H. Rubæk, Jakob Magid. 2011. Interactions between Soil Texture and Placement of Dairy Slurry Application: I. Flow Characteristics and Leaching of Nonreactive Components. *Journal of Environment Quality*, 2011; 40

Gregersen, H. M. 1988. People, Trees, and Rural Development: The Role of Social Forestry. Journal of Forestry. Vol. 86 No. 10. USA.

Gusliana HB. 2011. *Pola Perlindungan Hutan Tanah Hutan Ulayat Masyarakat Hukum Adat Melayu Riau di Provinsi Riau.* Jurnal Ilmu Hukum ISBN 2087-8591. Downloaded from http://ejournal.unri.ac.id/index.php/JIH/article/view/486 on March 2013

Hairiah, K. M. Mustofa Agung Sardjono, dan Sambas Sabarnurdin. 2003. *Pengantar Agroforestri*. ICRAF. Bogor.

Ministry of Forestry. 1999. Laws No.41/1999 on Forestry. Jakarta

Ministry of Forestry. 2001. Ministry of Forestry regulation No. 49/MoF-II/2008

Ministry of Forestry. 2010. Ministry of Forestry regulation No. 509/MoF-II/2010

Ministry of Forestry. 2013. Ministry of Forestry regulation No. 154/MoF-II/2013

Ministry of Forestry. 2013. Ministry of Forestry regulation No. 155/MoF-II/2013

King, K.F.S and Chandler, M.T. 1978. The Wasted Lands. ICRAF. Nairobi

Missisipi State University. 2010. Nitrogen Fertility. Downloaded from http://msucares.com/crops/soils/nitrogen.html on March 21, 2013.

Nair PKR. 1993. An Introduction to Agroforestry. Kluwer Academic Publisher. The Netherland.

Rachman, L.M. 1997. Long-term Effect of Alley Cropping System in Soil Productivity and Soil Quality: Evaluation of Its Sustainability on Soil Resource. Unpublished Ph.D. Dissertation. UPLB, Philippines.

Risdiyanto, 2001. *Pengetahuan Ekologi Masyarakat Lokal Mengenai praktek-praktek teknik konservasi tanah dan air pada sistem Agroforestry*. Universitas Lampung. Bandar Lampung.

Saaty, T.L. 1995. Decision Making for Leaders. Vol. II. AHP Series. RWS Publications, Pittsburgh.

Soemarwoto, O. 1988. Survey on the USP Farmer Beneficiaries Awareness and Participation: Preliminary Study on the Issues, Concepts and Strategies of Project's Sustainability. Palawan, Philippines. March - May.

Soerjono Soekanto. 1990. Sosiologi: suatu pengantar. Rajawali Pers. Jakarta, Indonesia.

Suryana, A. and Pantjar Simatupang. 1992. Socio-economic Aspects of Hutan Marga Land in Java: A Literature Review. IARD Journal, Vol. 14, No. 1.

Wulandari, C. 1999. Prediction of Homegarden Sustainability in Lampung Province. Dissertation. University of the Philippines Los Banos. Unpublished.

——————— . 2005. Ranking Priority Variables that Influenced Sustainability of Agroforestry-Hutan Marga in South Lampung. Socio-economica Journal edition June 2005. Lampung University

——————— . 2007. Local Ecological Knowledge on Forest Conservation: Importance Factor to Consider of Forest Regulation Development. Journal "Rimba Kalimantan". Faculty of Forestry, Mulawarman University, Samarinda, East Kalimantan

Wulandari, C., Budiono P., Qurniati R., and Hidayat W. 2012. Prediction of Agroforestry Sustainability on *Hutan Marga* (Customary Forest) in Lampung Province. Research Report. SEAMEO-SEARCA. Philippines