World Agroforestry Centre

TRANSFORMING LIVES AND LANDSCAPES

REPORT 4

BASELINE COMMUNITY SURVEY IN SOUTHEAST SULAWESI

(FOCUS GROUP DISCUSSION AND PROFITABILITY ANALYSIS)

This report was prepared by:

Elok Mulyoutami, Suyanto, Janudianto, Endri Martini, Arif Rahmanullah, M Sofiyudin, James M Roshetko

AgFor SULAWESI

Agroforestry and Forestry

Table of Contents

List of Figures

List of Table

Executive Summary

As part of Livelihood Baseline Study, this report were formed as data compilation from community and land use level data collection. Data were gathered through some series of structured discussion (mini workshop) with some groups of people who represented each community, and also semi structured interview with key informants in community level and other stakeholder. Disaggregated data between men and women were designed with expectation to identify whether gender gap can be identified.

Four villages typologies were defined in prior the data collection that were based on physical condition which lead to different main land use activities and farming practices on each area. They were:

A. Local villages, dominated by local people (Tolaki)
B. Local and long establishment migrant, local people with many migrants from the South Sulawesi
C. Long establishment migrant/transmigrant, village that were formed long time ago consist of some spontaneous migrants from the South Sulawesi and nearby transmigration villages
D. Recent migrant/ transmigrant villages

This executive summary gives a summary on some related finding by considering the village typologies as above, with four main aspects as described below.

Major findings

Livelihood options and land use. Differences in terms of livelihoods option, tree-crops and farm management which farmers practice in the villages influenced by historical differences of land management, market access, and the considerable influence of migrants in the villages. In local village (Group A: Ambondiaa, Lamunde, Simbune, and Taosu), main livelihoods sources of the people were cacao, paddy, patchouli and sago. Sago (sago) were typically important within this villages since local people (Tolaki ethnic) were consume sago as their staple food. Cacao based systems become an important livelihood source for people in some migrant villages that were grouped in Group B (Anggawo, Lawonua, and Wonua Hoa). Interestingly, there were significant different on how farmers cultivate cacao based system between local and migrants. Migrants were practicing intensive cacao systems while locals were more unintensive. Migrants have tendencies to cultivate cacao in monoculture while locals were still manage their cacao based system integrated with other trees. Comparing with Group A, local people in Group B were already got some influences from the migrants, it shows in how they managed their cacao that more intensive.

Long-established transmigrant village (that was represented by Tasahea village – Group B) has many diversification of livelihoods option which depend on the major farming system/crops outcome such as cacao, pepper, and also livestocks. The opposites conditions where showed in the recent transmigrant (UPT Asinua Jaya/Lasao) which most of people's livelihood was rely on forests as a major source of incomes (charcoal and timber) and less on plantation crops. Almost all the people of the recent transmigrant village were extracted charcoal and timber from forests as the main income, at the moment their plantation the crops were not productive yet.

Out-migration within this area were mainly driven by the needs to improve their economic condition due several reasons. Low agriculture and plantation productivity were become the main driving factors for people to move or work spontaneously to other areas. People who don't have ability to cultivate the land, don't have link to other areas, and don't have enough capital would prefer to work in nonfarm activity. High in-migration rate in Southeast Sulawesi as shown in secondary data, were supported by the data in villages level. There were some villages were having relatively high rate in migration. This is shown that this area become the destination of people migration due to cacao expansion. Acceleration of land use change within this area can be as a consequences of massive in migration by people from the South starting in early 1990.

Profitability. There are several main land uses identified in the study area ranging from Monoculture system (cocoa, patchouli, sago, and pepper), simple mixed garden (cocoa-patchouli, cocoa-coconut), timber garden. The most profitable land use system based on annual equity measure is patchouli monoculture, followed by, timber garden (teak), and pepper monoculture. Timber garden (teak) generate the highest return to labour (66 $/psday) among other land use in South Sulawesi; while the cocoa monoculture system shows the lowest (8 $/psday).

Gender and natural resource management. The result of baseline gender study showed that no clear difference on women and men's role in each villages typologies. Most of the typologies perform the same condition that women were more responsible in domestic and maintain the land that close to the settlement area, while men have more responsibility as income earner and in public domain. Men were fully responsible in maintaining the land far from the housing complex and related with heavy load of work. In term of land issues, the main problem face by the women is that they remain under acknowledge land holders. Land certificate were preferable under men's name. Giving more condition that is conducive for women to become land owner that were legalized in land certificate will increase the equity of men and women.

The data in each village's typology showed that women have more knowledge on land use value regarding the environment issues related with biodiversity while men were more on conservation or protecting use of environment. Biodiversity issues is closely relate with medicinal plants, many women taking advantage on that. Therefore, to pointing this out, women involvement on land use management must be acknowledged.

In term of market access, women play an important role in marketing product such cacao, clove and coffee. Seller may come to the villagers or even women may go to the market to sell the products. However, producer or villager were in the end of market chain and usually they become the actor that always been pressing by the other actors in market. Therefore, in avoiding women to become the pressing victim, women position in the marketing aspect should be strengthen with knowledge on farm products quality and price information.

In higher level, issues on inequality between women and men were reflected through Gender Development Index and Gender Empowerment Measure that were still below national level and the large gap between those index compare to Human Development Index. Therefore there must be an integrated program to promote women involvement in community level (considering women as income earner) and also in meso level that women should be more involve in parliament and decision making process.

Agricultural extension. Issues on agricultural extension covering the priority species, mode and media use for extension services. Species prioritization were determined based on socio-economic and biophysical variation. Generally, in Southeast Sulawesi, cacao has become the most prioritized species that contribute to the local livelihood, except in newly established areas like the new transmigrant areas that depend their livelihood to short-term crops and NTFP (Non Timber Forest Products). Durian was the most demanded species by farmers in South East Sulawesi.

The main problems face by the farmers is how to improve land productivity; they need more access to information on innovative technology. They were very thirsty to knowledge and technology, mainly on vegetative propagation and also pest and disease handling. Not only about vegetation, but community were also interested to learn more about livestock management. Both women and men were performing almost similar needs on training and in class extension services. In term of media, radio and handphone were the two most effective media for agriculture information. However, frequency of agricultural extension programs in radio were relatively rare. Handphone become effective communication media to updating price of agricultural commodity.

Most of the community tended to unsatisfy with the current extension services they received so far. Thus, through AgFor the community were expecting improvement in the agricultural extension services through a) introduction of innovative knowledge or technology that can improve their garden productivity; and b) regular facilitation for broader community.

Introduction

The Agroforestry and Forestry in Sulawesi: Linking Knowledge with Action project or known as 'AgFor Sulawesi project' was developed to be implemented in three provinces on the island of Sulawesi, Indonesia (South Sulawesi, Southeast Sulawesi and Gorontalo) from 2011 until 2016. The ultimate outcome of the project is enhanced agroforestry and forestry livelihoods systems of rural communities in Sulawesi. In order to support the project, a series of baseline survey were conducted. One of the main objectives of the survey is to study general characteristics of types of livelihoods in the community, local farming systems and the existing land use systems in the area based on community perspectives. Currently, livelihood baseline survey was conducted in two first sites, South Sulawesi and Southeast Sulawesi. This report will cover all the result from livelihood baseline study in Southeast Sulawesi.

This livelihood baseline study used two unit analysis, i.e.a) household level; and b) community level, and information that was compiled in this report were only results from study at the community level. Community level baseline study consisted of four main topics that were conducted using different kind of methods to gather all related data and also on analyzing data. Those topics were:

1. Land use systems and its dynamic; and some farm activities on each land use systems
2. Profitability analysis from each land use and farming practices
3. Gender issues on natural resource management
4. Extension services and communication information

Information at community level were very useful to be used as basic data in designing development program in the community, and as basic to develop criteria and indicator for monitoring the implementation of AgFor program. In this study, livelihood is not only about people and their source of livelihood but alsothe relation of people with the environment. Study on land use systems and all related practices was useful to portray the previous and current condition on each land use and to predict the condition in the future. Profitability analysis gave good understanding on cost and benefit that people receives from their land and from related products from other source of livelihood. Gender issues is become the cross cutting issues between components that covered in AgFor project (i.e. Livelihood component, Environmental component and Governance component), therefore baseline analysis was employed gender as one of important issues that need to be study in this baseline survey. AgFor project intervention is focusing on enhancing local people livelihood through improved access to knowledge and skills, thus extension services were crucial to support program implementation, in particular at preliminary stage to make sure that the extension support is really relevant with people needs and priority. By having those information on landuse trajectory, profitability and extension systems, as baseline information the program implementation is expected to fit in with the real people condition and position.

The organization of this report was following the main part of related livelihood issues as presented above. General information of study area will be illustrated briefly in this introduction including general methodology that used in data collection. More detail on methodology, rationale and concepts will be explained in more detail on each chapter.

Southeast Sulawesi – site characteristics and typologies

Southeast Sulawesi province lay in southeastern peninsula of Sulawesi, with numbers of small islands as Buton, Muna, and some islets as Wowoni, Kabaena, etc. Mainland of southeast Sulawesi were about 38,140 km2 and small island area were estimated about 114,876 km 2. Konawe, Kolaka, Bombana were the main areas in mainland and also Kendari as capital city. AgFor projects were focusing in Konawe and Kolaka districts in mainland.

In 2007, agriculture sector contributing 38% for economic growth through cassava and corn, and some commodity as cocoa, coffee, coconut, cloves, cashew nut, pepper and oil palm. Data from the same year were showing that from nearly 15000 ha area for cassava, producing cassava for almost 240000 ton, and from 40975 ha area of Maize, producing for about 97,037 ton. On cassava production, Konawe contributing nearly 5%, while Kolaka contributing 3.3%. Buton performing the highest production of cassava for about 76709 ton from 4795 ha areas. The first maize producer in southeast Sulawesi were Buton District (13990 ton), followed by Kolaka (6454 ton), Buton Utara (5863 ton), Kendari (3569 ton) and Konawe (3297 ton). http://regionalinvestment.bkpm.go.id/newsipid/id/area.php?ia=74

Oilpalm production in Southeast Sulawesi was concentrated in Kolaka district with area covering about 21033 ha, and the production for about 7220 ton. Cacao productivity in Southeast Sulawesi were about 137833 in 2010, with the largest area of cacao production in Kolaka (91,259 ha) and Kolaka Utara (82,206). The other district were also producing cacao but only with areas less than 10,000 ha. The highest production wasin Kolaka Utara 63101 ton in 2009 and Kolaka producing 29297 in 2009. In 2010, pepper production in Southeast Sulawesi were 5,371 ton, with total area 11,775 ha, produced by smallholder for about 99%. Konawe were contributing 1,317 (24.5%) ton from 3,661 ha areas, and Konawe contributing nearly 40% from total production in Southeast Sulawesi.

Livelihood aspects of Southeast Sulawesi people were closely related to population dynamics history and migration. People with different ethnic background, native people and immigrant were having different livelihood source and strategies. Defining community typology in this province were considering migration issues as illustrate on Table 1 as below.

Table 1 Village typologies and detail information of focus group discussion in Southeast Sulawesi

Villages type	Local villages	Local and long establishment migrant/ transmigrant	Long establishment migrant/transmigrant	Recent migrant/ transmigrant villages	Total
Districts	Konawe, Kolaka	Konawe	Kolaka	Konawe	
Group	A	B	C	D	
Mini workshop/ group discussion and number of discussions	Ambondiaa, Lamunde, Simbune, Taosu (4)	Anggawo, Wonua Hoa (local villagers), Wonua Hoa (migrant), Lawonua (4)	Tasahea (1)	UPT Asinua Jaya (1)	10 discussion in 9 villages

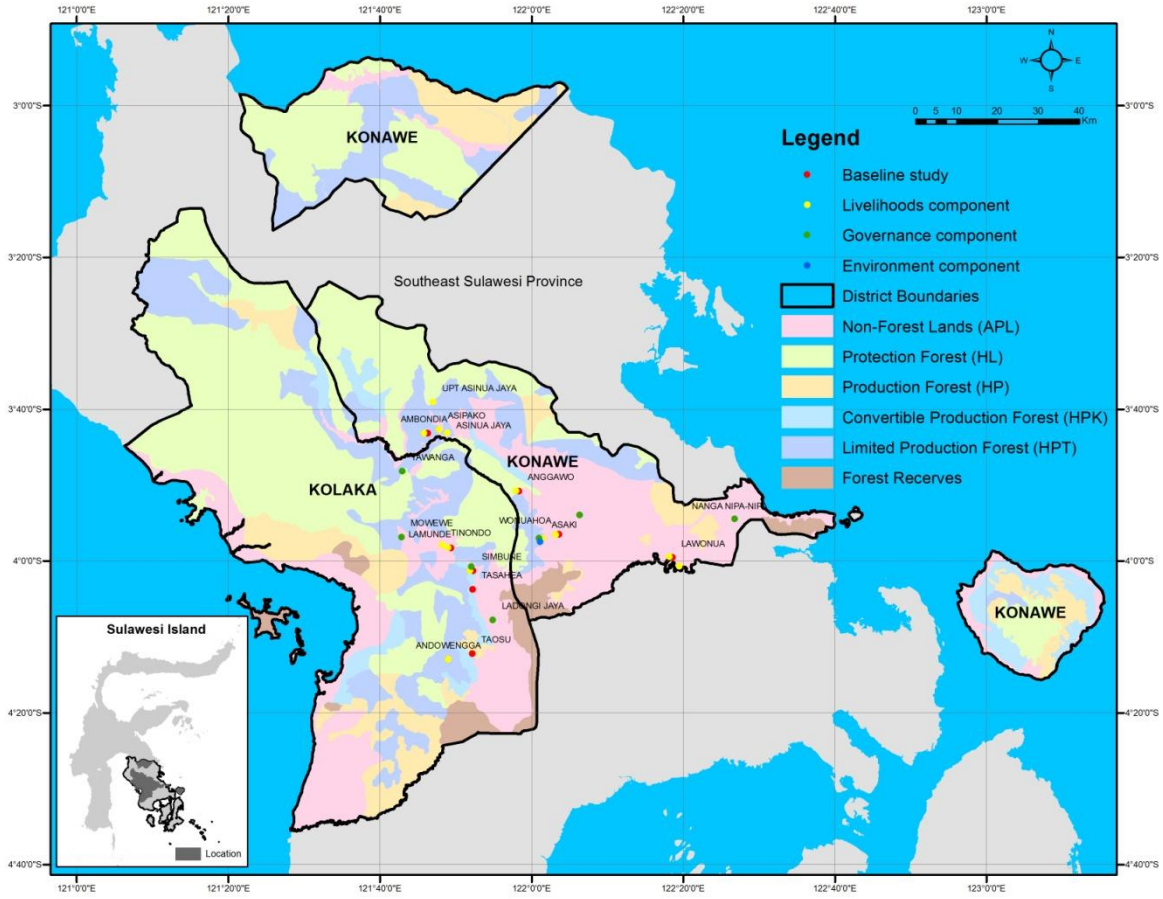


Figure 1 Location of baseline study

General Methodology

Data collection methods for baseline study on community level were using group discussions; individual interview with some key informants from farmer level to higher level; and desktop review through some literatures, existing reports, and secondary data.

There were two different type of group discussions were set for the study. One is full day mini workshop that were employed to get the information for topic 1, topic 3 and topic 4 (land use and its dynamics, gender and extension issues), and the second is group based interview with 2 – 4 key informants representing each land use which they maintain for their livelihood source. This second discussion mainly to get information on profitability analysis for each particular land use in the whole landscape of Konawe and Kolaka.

Full day mini workshop was held in each selected villages with some invited villagers and key persons that were indicated by village head in prior the discussions. This workshop were to get basic information on land use and sources of livelihood history, demography and migration pattern, land management practices, poverty, some basic information related to training and extension and village organization, marketing practices, sources and how farmers get access to planting material, communication, and gender roles in natural resource management. Mini workshop or group based interviews usually start around 9 a.m. and end in 4 p.m o clock. In each village, the participants were divided on three different groups which consist of more less 4

- 8 farmers in average. First group consist of mostly male participants discussed about land use and source of livelihood history, land management practices, demography and migration. Second group consist of only male participants and discuss more on gender roles in land management issues; communication, village institution; gender perception on land use values and poverty; also some basic information on their needs of extension. The third discussions were using the same set of question as in second group which consist of only female participants. Therefore, the total amount of participants is in average 24 farmers. Some discussion were held in village office, and some others were in local leaders house. There were 10 full day mini workshops for 9 villages, 5 in Konawe and 4 in Kolaka.

Group based interview and key informants consultation for profitability analysis were conducted using adapted rapid rural appraisal. All the information related with farm budget data for each land use, including prices, production, labour and input on current situation (2012) were collectedfrom some resource persons and/or key informants interviewed such as farmers, traders and government officers. Group discussion at farmers level were implemented to collect comprehensive information of a single land use in a village.

Part One: Livelihoods, land use, farming system and migration

Janudianto, Heru T Maulana, Elok Mulyoutami, Syamsidar, Rahma R Talui, Jusupta Tarigan, Suyanto, James Roshetko

Background

Assessment on land use and farming system, livelihood strategies, and migration pattern within those two districts in South Sulawesi Provinces would be important as basis of program designing on intervention. This issue also important to get overview on what is the strategies preferred and appropriate with local condition. This section will discuss about the village history, land use, livelihoods strategies and migration pattern change over period of time.

History of the villages and main land use system

Table 2 presenting main land use systems in each village typologies as described in Introduction chapter. Cacao based system become the main land use systems in most of villages in each typologies. Forest were also remaining in majority villages in each group except in Lawonua village. Sago as the important food security system in most of local village were not identified as main land use system because they only cultivate one or two sago in some places, in riverbank for example.

Table 2 Land use systems in Bantaeng and Bulukumba district in each villages

	Landuse Systems															
	Agroforestry Systems								Agriculture			Forests/Openland				
	Cacao	Pepper	Sago	Cashewnut	Teak	Clove	Mixed	Oil palm	Maize	Rice	Fish ponds	Production Forests	Community Forests	Shrubs	Openland/ swamp	Settlements
Local villages																
Ambondiaa	21			10	11				7			27		12		12
Lamunde	13									33	3	6		8	29	8
Simbune	21	9										32		20	9	9
Taosu	58	1			6			1					10	2		22
Local and long establishment migrant/transmigrant villages																
Anggawo	63				5							25			5	2
Lawonua	38		4					17	9					24		8
Wonua Hoa (local)	12	6	14	4	5	3			10	14		12		12		8
Wonua Hoa (migrants)	31				1	9	1	3				35		16		4

	Landuse Systems															
	Agroforestry Systems								Agriculture			Forests/Openland				
	Cacao	Pepper	Sago	Cashewnut	Teak	Clove	Mixed	Oil palm	Maize	Rice	Fish ponds	Pro Forests	Com Forests	Shrubs	Openland/ swampy area	Settlements
Long establishement migant/transmigrant villages																
Tasahea	55	16										5			5	19
Recent migrant/transmigration villages																
UPT Asinoa Jaya (Lasao)	3						15*						50	30		2

Note: * home garden

Local villages typology

This village typology was dominated by local community which was Tolaki ethnic as the indigenous people. In four villages within this typology, there was small number of in-migration from outsides village occurred.

Ambondiaa

Ambondiaa was established in 1900s with Tolaki ethnic as the indigeous people. Sago and swidden paddy were the main livelihood and food stafle to the community. During 1950s until 1960s there was a separatism movement which forced local people to move to the down town in Unahaa.

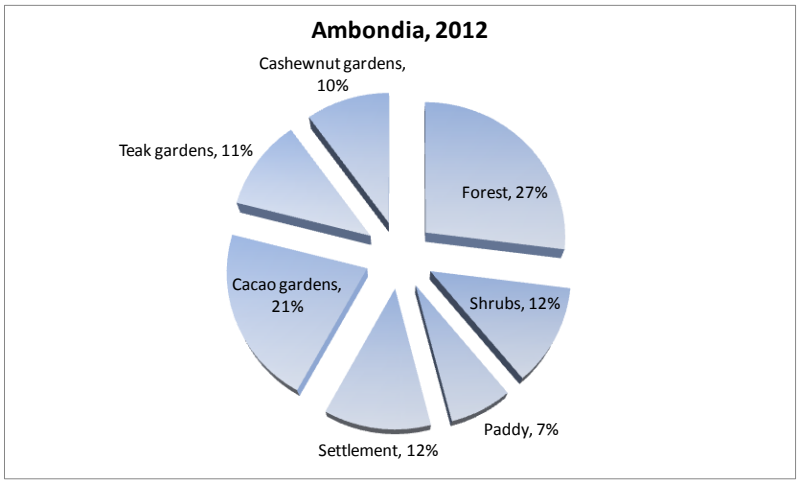


Figure 2 Existing land use in Ambondiaa village based on community perspectives

In 1980s, farmer started to plant cacao, they find the seedling from North Kolaka. Since that, number of cacao gardens was increase. Government through Plantation Agency also gave support of 1,000 of cacao seedlings per household in 2000s. Then 1997 Ambondia became a preparation village as part of division process of Asinua Jaya village. At that moment farmers rely

on cacao, processing sago, and pepper as the main livelihood. Now, forest and smallholder cacao plantation were dominated the village area.

Lamunde

Lamunde was established before 1940s, the ancestors, Tolaki ethnic, were relied on swidden paddy as main livelihood. In 1970s and 1980s, few numbers of migrants' people from South and Tana Toraja came to this village. The migrant were cultivated cacao and clove. Tolaki people began to learn how use cattle in cultivating the paddy fields. Local farmers stopped on shifting cultivation, and began to cultivate paddy fields and planting cacao.

In 1990 livelihoods of community was more varied by the increasing number of sources of incomes such as paddy, pepper, cloves, rattan and honey. In this year the price of cloves reached IDR 7,000/kg. Recent land use showed that the village area was dominated by paddy area, swamp, and cacao agroforest (as the major cash crop in Lamunde)

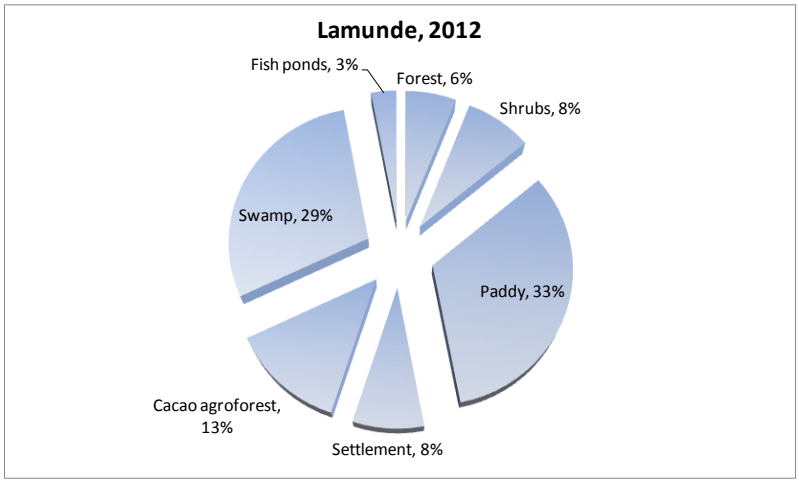


Figure 3 Existing land use in Lamunde village based on community perspectives

Simbune

Simbune was established in 1930s, Tolaki ethnic as the indiginoeus people this village were relied on swidden paddy until end of 1950s. In 1970s, people started to plant coffee and clove; then in 1993 there was a support program from OECF and PT. Haspram to provide F1 seedlings of cacao. The program was also providing the extention services and production support to farmers.

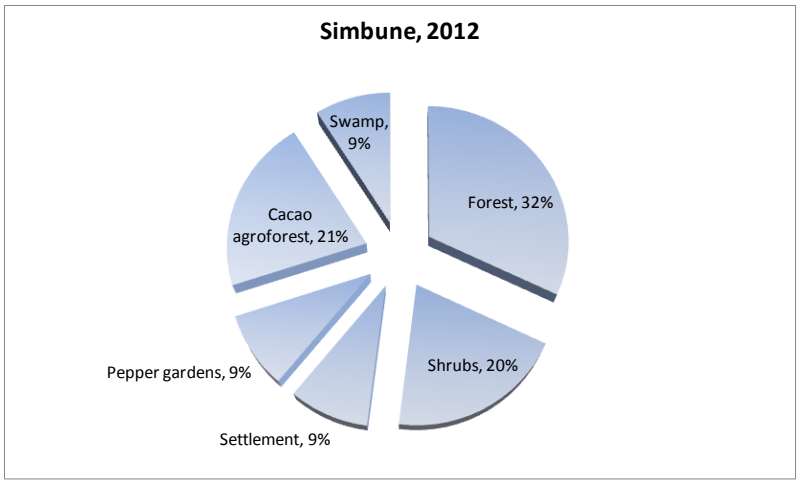


Figure 4 Existing land use in Simbune village based on community perspectives

The next support came from *Gerakan Nasional Kakao* (GERNAS) in 2009 which focussed in cacao rejuvenation, fertilizer and grafting technique. All households were actively participated in GERNAS: 30 ha cacao rejuvenation area, 19 ha of fertilizer application and 25 ha of grafting activities. This program was still continuing until now. Recently, forest was still dominated the land use in this village and cacao agroforest became the major plantation crops.

Taosu

Taosu was established in 1990s when Tolaki ethnic people from Aiure and Rate-rate came and lived in the area. The main livelihoods of the people were swidden paddy, maize, coffee and coconut. In 1985 the many farmers began to plant cacao and at the same time, PT. Ladongi and PT. Haspram established 250 ha of nurseries in Poli Polia village. Swidden paddy was stopped in 1995 when many people changed into cacao and pepper.

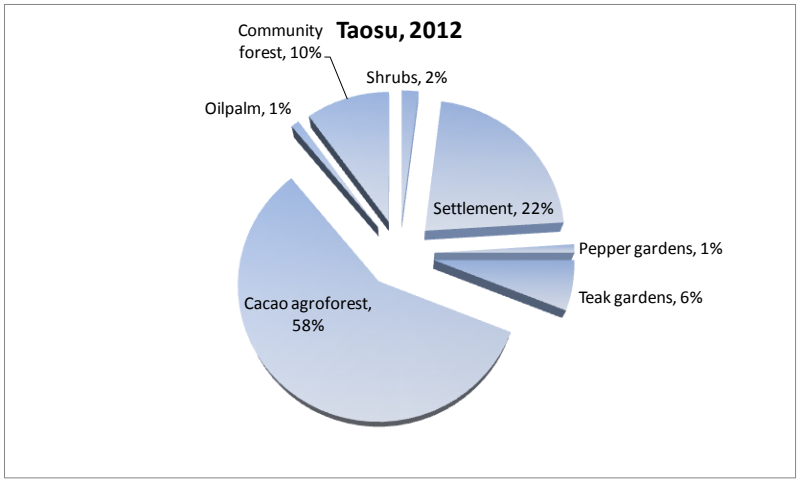


Figure 5 Existing land use in Taosu village based on community perspectives

Then in 1999, people were involved in measuring the boundary of Hutan Kemasyarakatan (community forest) followed by nursery establishment of teak and sengon. In 2000s, people were participated in timber planting inside 1,000 ha of community forest in 4 villages. Recently, patchouly to be integrated in cacao agroforest and teak gardens and it was populer in the area. The survey also showed that cacao agrofrest was the main landuse in Taosu.

Local and long establishment migrant/transmigrant villages typology

This village typology was consist of local (Tolaki ethnic as the indigeous people) and migrant people which came mostly from Bugis ethnic and some number Javanese. In Wonoa Hoa, there was specific dusun (sub village/hamlet) which was fully migrant people that established a long ago, more than ten years.

Anggawo

Anggawo was established since Dutch era (before 1945). Tolaki people as the indigenous people were still performed shifting cultivation, also paddy coconut, maize and sago. Since 1955, the villagers were also familiar with teak cultivation. In the 1990s community were much interested in planting cacao and started independently seeking the cacao seedlings from Kolaka.

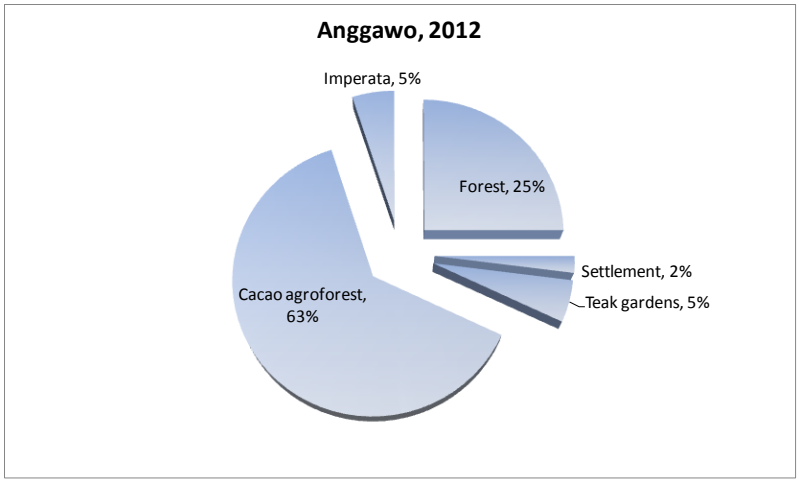


Figure 6 Existing land use in Anggawo village based on community perspectives

Furthermore, in 2000s the Government provided cacao seedlings support through projects. Local people who has half hectare of land were obtained fertilizer; herbicides ('Tamaris'), and 1,000 of cacao seeds or 450 of cacao seedlings. In the same year, an extension support was carried out for cacao planting by spacing of 3 x 3m. Then, in 2000s there were a lot of numbers of Javanese and Bugis migrants came from Java Island and South Sulawesi to live and plant cacao in this village. Currently, cacao agroforest and forest were the dominant land use in the village. Cacao were integrated with pepper, citrus, durian, pineapple, grass ('rumput gajah' or *Pennisetum purpureum*) and maize.

Lawonua

This village was established around 1930s, at the time the people were still living on the riparian area of Konawe-Eha river and planting maize and crops to fulfill their daily needs. The first households who inhabited the Lawonua village was Tolaki ethnic from Amosilu village, and Bugis people from the Southern (Bone) who married natives. The community were clearing forests gradually to plant swidden paddy, local coffee, sago, coconut and maize.

In 1959 there was a big flood in the Konawe-Eha river which affected the majority of people who live surround the river. Thus, in 1978 the Government implemented a BKBA program through the Ministry of Social which giving a disaster assistance for people affected by big flooding in 1959. The supports includes a house of 4 x 6 m size in flood-free areas and the cost of living needs and equipment for 1 year duration.

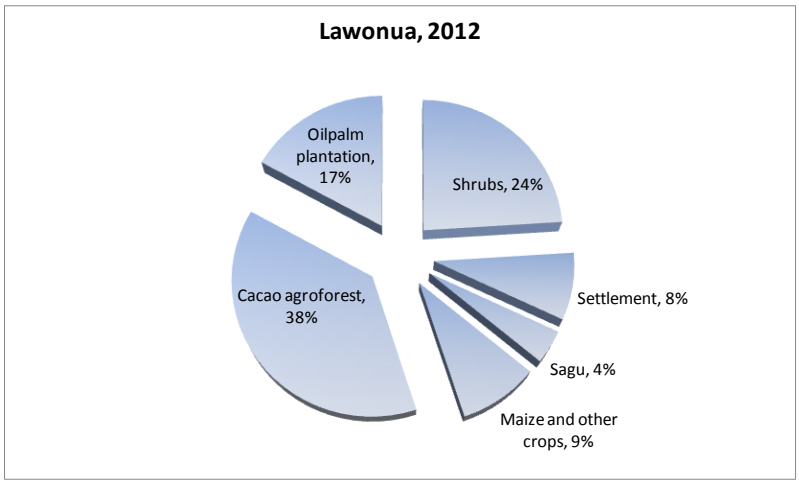


Figure 7 Existing land use in Anggawo village based on community perspectives

In the 1980s people were new to cacao, and in 1987 they started to plant cacao in the presence of Government support of cacao seedlings from South Sumatra. Since 1990s, many migrants from Sinjai, Sopeng, Bulukumba, as well as people from other villages around Lawonua came and settled in this village. Another group of migrants from South (Wajo, sopeng and Sinjai) came to settled and planted cacao in 1997. In the periods of 1999-2000, there was cacao seedlings support to people as much as 1,200 stems/ha, rambutan and durian seedlings, fertilizers, agricultural equipment and agricultural medicines through SRADP program. Plantation Agency was also support the farmer field school in 2004, the main topics were the pests management and how to increase production. There were 30 people who participated in the programs for 6 months, 2 times a week.

In 2009, again around 100 households (50 stems each) got support of teak seedlings, breadfruit, durian, rambutan, citrus, cloves. Currently, the majority of people were planting cacao, pepper, rambutan, durian, and teak. A palm oil company, PT. Agrindo Utama Mas, began to establish 1,000 ha of oil palm in the villages.

Wonua Hoa (Local dan Migrants)

Tolaki communities who lived in this village before the independence in 1945 were rely on shifting cultivation, vegetables, coffee and sago as the main livelihood. In 1968, started to build the paddy fields, but only few have cultivated. Since the 1980s people began planting teak from seedlings were purchased from the Forest Agency. Some villagers have tried to plant cacao and cashew nuts. Number of swidden paddy field was decrease and converted into rainfed paddy.

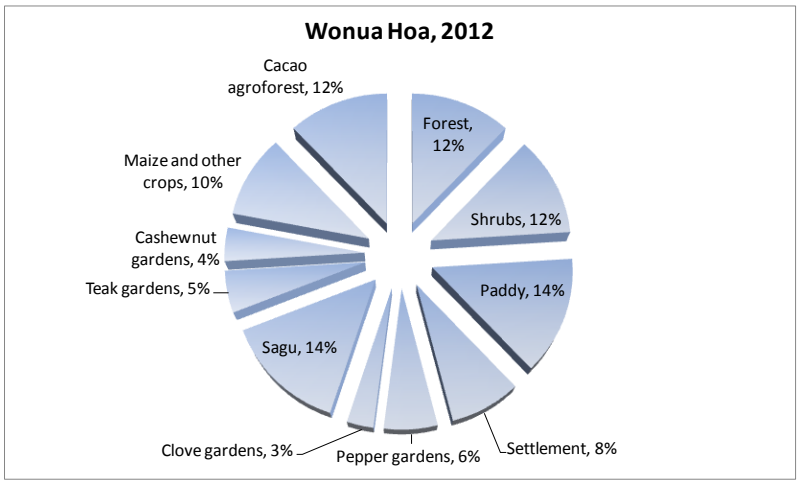


Figure 8 Existing land use in Wonua Hoa village based on locals community perspectives

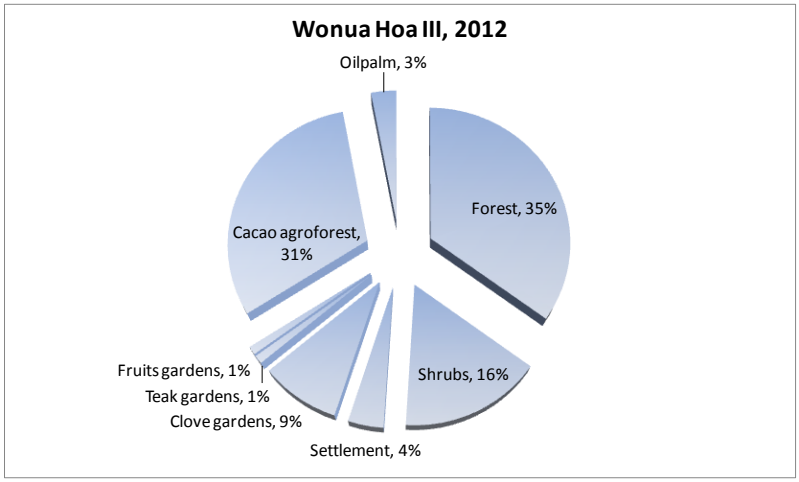


Figure 9 Existing land use in Hamlet III of Wonua Hoa village based on migrants community perspectives

Wonua Hoa village was consisting of three hamlets. Since the 1990s many migrants from South Sulawesi began arriving, originally joined the local communities living in the hamlet of I and II. Until the 2000s a growing number of migrants from the South Sulawesi amounted to 34 families, then they live permanently in Hamlet III (the majority are migrants) to gardening cacao and pepper. While, the majority of local people in the village I and II were planting paddy, cacao, pepper, and patchouli which were in mixed systems. In 2010 the Agriculture Agency of

Southeast Sulawesi provided training on side grafting. Then, the Gerhan program also provided 45,000 of teak seedlings and 10,000 of sengon seedlings.

In 1998 the hamlet III remains a forest, since 2004 the land acquisition was carried out for smallholder farmers. Currently, the landuse of hamlet III was dominated by forests, cacao agroforest, shrubs and clove gardens; while the whole land use of Wonua Hoa was dominated by paddy, sago and cacao agroforests.

Long establishment migrant/transmigrant villages typology

This village typology was consist of (trans) migrant people which came mostly from Bali and Java islands. They came during the transmigrant booming periods in 1970s with self-inititive transmigrant programmes.

Tasahea

In 1940, the people who already live around Tasahea were rely on shifting cultivation as the main livelihood. Until the 1960s, there were still very rare population in the area. Around 1970s, the transmigrant people from Bali and Java began to occupy the transmigrant location in Ladongi I and Ladongi II. Some of them were settled around Tasahea stopped, running the shifting cultivation to meet their needs and seek 'wikoro' or wild sweetpotato for food.

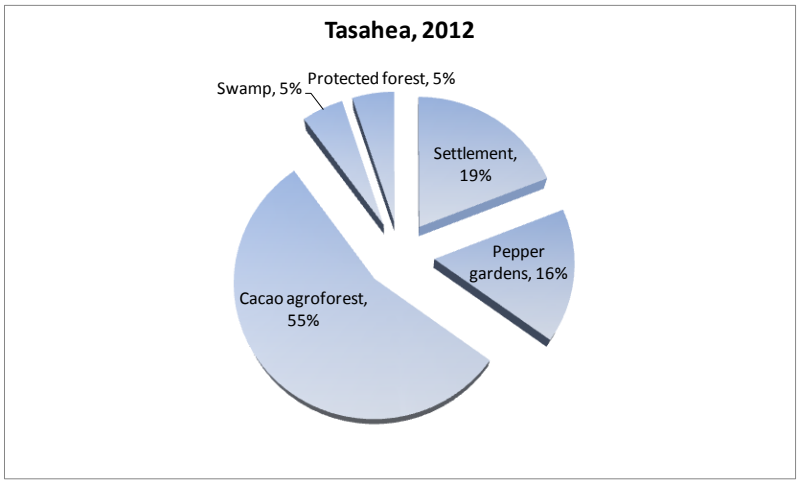


Figure 10 Existing land use in Tasahea village based on community perspectives

In the 1970 -1975 period, the people who live along the main road started to plant cloves. At that time, Tasahea, Tababu, Benggi, and Megaloma still a sub-village consisting of 20 households. They still cultivated sago and swidden paddy for livelihoods. In 1986, there was a support programme from the Government on cacao, each household got 200 of cacao seedlings. Then until 2000s, many people started to plant cacao and brought the seedlings from North Kolaka.

It was continue in 2007-2008 when people also interested in pepper, but unfortunately, many of these pepper were dead because of their root was infected by fungal disease. At the same time,

many of smallholder cacao were attacked by cacao pod borer. Currently, the cacao agroforest was dominated the land use in the village, followed by pepper gardens.

Recent migrant/transmigrant villages typology

This village typology was consisting of transmigrant people which came from Nusa Tenggara Timur, Java, and also Tolaki ethnic people from Asinua Jaya village. This village was recently established as requested by Asinua Jaya village for accelerating the development process and part of assimilation strategy into this areas.

UPT Asinua Jaya (Lasao)

Lasao village was originally the area of grasslands at the time it proposed to be transmigration area in 1982. The new proposal was realized in 2007 when the housing for transmigrant was built. In 2008, there was a placement of the 200 first families, who 50% came from Nusa Tenggara Timur and Java, and the rest 50% came from local people of Asinua Jaya village.

During the first year, the transmigrants were supported by a package of rice, kerosene, salt and agriculture tools while they started to open their farmland. Unfortunately, a lot of tree-crops that they plant were died due to long drought at the moment. All the wells in village were dry, and people need to take water from the river.

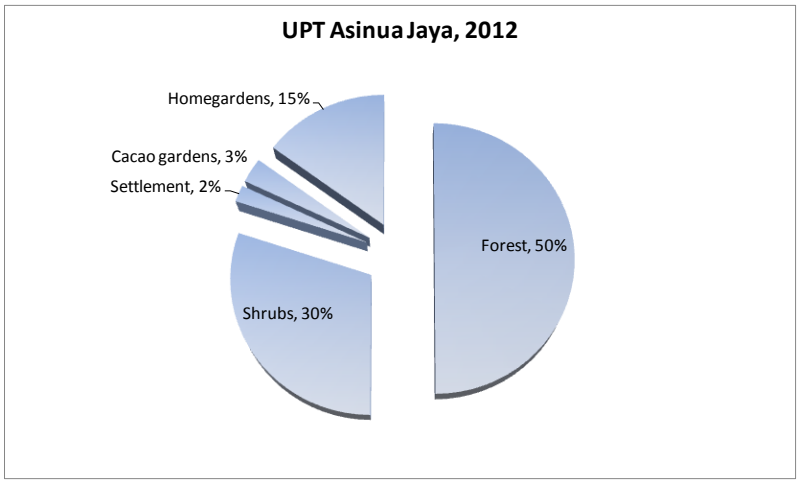


Figure 11 Existing land use in UPT Asinua Jaya (Lasao) village based on community perspectives

In 2009, the government helped these 202 housholds for water piping to fetch water at Amate spring. The other proposed of Hydroelectric power was also rolled out in 2010, but has not been realized. Then, many people went out the village to look another source of income in gold mining at Bombana or oil palm plantations labours in the Asera region. Recently, the major livelihood for the communities were logging, charcoal, pepper, sago and looking for honey. Nowadays, half the village area was still forested and the shrub area was widely spread.

Livelihood options

Local villages

Cacao, paddy, patchouli and sago were the dominant livelihoods in Ambondiaa, Simbune, Lamunde and Taosu. The traditional systems in maintains these tree-based commodities was lead to low productivity of the systems in this area.

Cacao

Cacao was one of the dominant livelihoods in Ambondiaa, Simbune, Lamunde and Taosu. Cacao garden was considered more profitable for locals, so then people tend to convert the shrubs, forests and swidden for cacao gardens. The traditional land clearing was done using slash and burn technique. Planting cacao was started at the beginning of the rainy season, and farmers planted crops, vegetables, maize, watermelons and generally short-term crops before planting the cacao. Cacao spacing used 3 x 3 m with a 15 x 15x 15 cm of planting hole. Cacao seedlings were generally generated from exisiting cacao gardens surround farmers plots which has healthy trees and have good productivity.

Cacao maintenance activities were included weeding, fertilizer application, pruning, pest and disease control. Weeding was done 2 times a year while fertilizer application was done at 2 or 3 times for a season, even not at all, depending on farmer management. Fertilizers which used was Urea, TSP, KCL, Phonska, NPK that using various doses, such as 2-10 sacks per applications. Pruning of cacao stems was made 2 times a year, while the pest and disease control was done by spraying pesticide, and stimulant which applied 2 times a month throughout the year, depending on crop conditions.

Cacao gardens in Taosu had an average age of 15-20 years and could produces an average of 1 ton/ha/year. Generally, farmers sell the results to a middleman in the village with the price of IDR 15,000/kg (after 3 days drying).

Several obstacles and barriers that are generally found in the cacao planting are:

- Pests and diseases, such as cacao pod borer, stem cancer, rotten fruit and mushroom stems.
- Price fluctuations, likely played by middlemen.

Lack of apropriate technology on post harvest phase

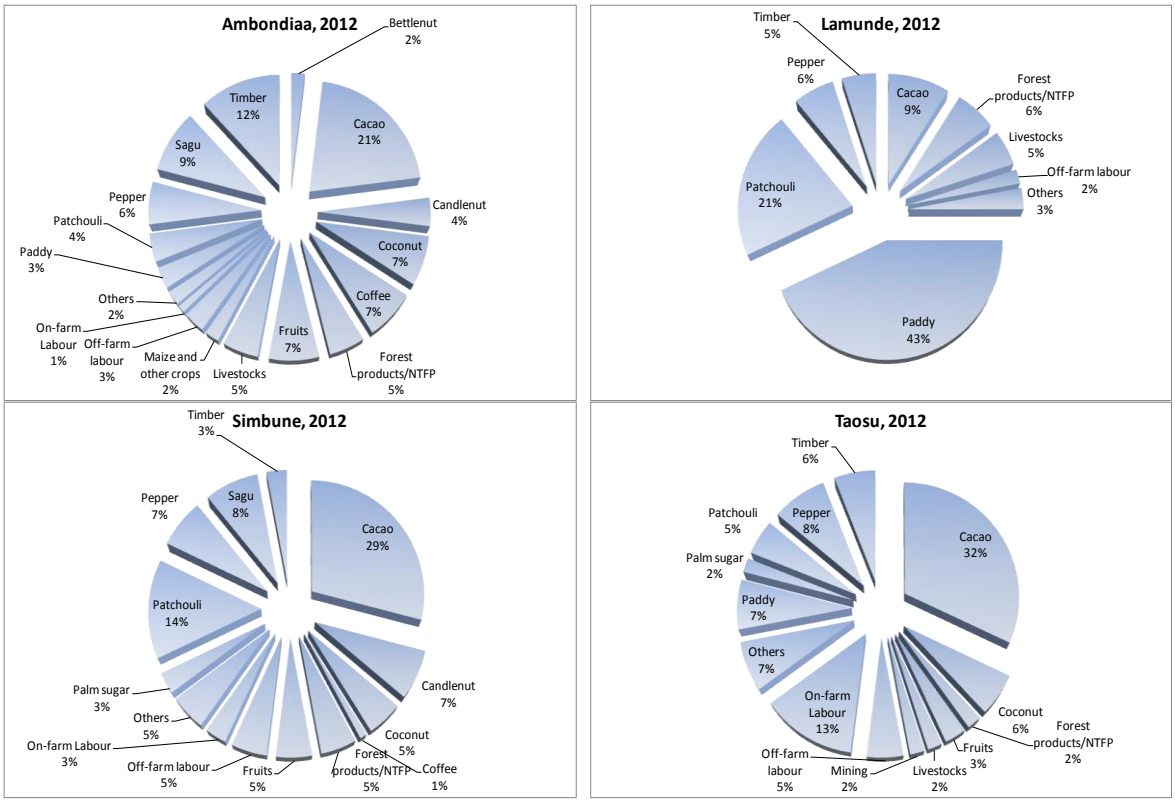


Figure 12 Recent livelihoods option in Ambondiaa, Lamunde, Taosu, and Simbune based on community perspectives

Paddy

Wetland paddy was the largest livelihoods option of Lamunde. The area of wetland paddy in this village were 300 ha with an average of land ownership of of paddy area was ½ ha per household. Local and hybrid rice varieties which widely grown were Elis, Mekongga, Luparin, Padi 66, Padi Kuda, Lampari, Konawe, Ciliwung, and IR 36. The land preparation was done by using a tractor especially on quite hard soil, and using spraying system in the swamp area. Initial planting season was in May, planting usually done in two ways, using scattering system and 'Tabela' or direct-seeded planting.

The maintenance stages of wetland paddy which commonly done in Lamunde were

- Weeding is done 1-3 times during a season, manually pulling the weed by hand or sprayed with herbicide in the first weeks after planting;
- The paddy replanting was maintained during 10 to 30 days age of saplings using the same age of paddy seedlings;
- Fertilizer application is done two times in a season, when paddy was 1 month and 2 months old. Fertilizer used were Urea, TSP, NPK, SP36 and Za with 1:2 composition of of urea and TSP, 3 sacks of the mixture for a one-time application, or depending on the level of soil fertility.
- Pest control was done three times in a season, to avoid the attacks of walang sangit, rat and golden snails.

The harvesting was done at the age of 120 days. The paddy production was approximately 40-70 sacks of fresh paddy (1 sack equivalent to 100kg) and the harvesting was often done by share-labour (Pasangki). Most farmers use paddy for self consumption, small number was for market. Currently, the price of a sack of rice (50 Kg) was approximately IDR 350,000 or IDR 7,000/kg of rice. The main obstacles which experienced by farmers were wter shortage, pests attacks such as rodent, golden snails, wereng and walang sangit.

Patchouli

Patchouli was quite potential and popular in the community, especially in Lamunde village. Patchouli seedlings were obtained from inside the village, the Ambopai village of Tinondo sub-district, even North Kolaka. Farmers planted and mixed patchouli with cacao or timber trees, which cacao use 3 x 3 m spacing and patchouli use 50 x 50 cm.

The plumb shoots of patchouli was planting directly in the field, starting in the morning up to evening, and can complete up to 500 trees a day. The fertilizer application was done by giving a liquid fertilizer to accelerate budding.

Nilam harvesting could be done up to 3 times:

- the first harvesting at age 6 months
- the second harvesting at age 4 months
- the third harvesting depend on crop conditions.

The first harvesting of 400 trees of patchouli could produce 125 kg of fresh patchouli at a price of IDR 3,000/kg. The yields were marketed in the village after all dried leaves and stems were chopped and sun-drying for 2 days. Main constraints in the patchouli cultivation were low prices, more difficult treatment compared to the results obtained, and also the marketing constraints.

Sago

Sago was commonly found in the Ambondiaa village which mostly of sago were the legacy and family owned. Sago harvesting was carried out after 7 years age by by cutting down the trees, cut into small pieces and using grater to extract the sago starch. The harvesting process were conducted in groups, consisting of 3-4 people who able to harvest one tree per day. Harvesting was not conducted during the rainy season due to turbid water conditions which can lead to black sago.

A sago tree could produce about 25 bags which were sold at a price of IDR 40,000 per sack (1 sack equivalent to 20 kg). Sago tree can be sold directly to buyers with a price of IDR 75,000/stem. The sago starch was use for self consumption; some were sold to markets in Unaaha.

Currently, sago population was remain decrease, due to exploitation. The public has just harvested and not many were doing sago propagation. Sago propagation was use saplings which hanging little bit, mature enough and lots of roots to ease to grow.

Local and long establishment migrant/transmigrant villages

Cacao, paddy, and fruits were the dominant livelihoods in this typology. In this villages, the traditional systems met some innovation practice during the assimilation with Bugis ethnic and some number Javanese in these villages. It was lead to more improve productivity of the systems in this area.

Cacao

The slash-and-burn technique was used by farmers in land clearing phase for cacao gardens. These steps on pioneering, cutting down, clearing and burning were normally carried out in September-December . Planting was conducted at the beginning of rainy season, in January-February. Commonly, farmers planting cacao directly once the land was ready, but some farmers also cultivate vegetables before the cacao. This cacao planting was use 3.5 x 3.5 m, 3 x 3 m, 3m x 4m, or 2m x 4m of planting spacing. Farmers found the best local cacao seedlings, which came from healthy mother trees, no diseases and had good productivity. Some of these trees were derivatives of F2 seedlings taken from SRADP project.

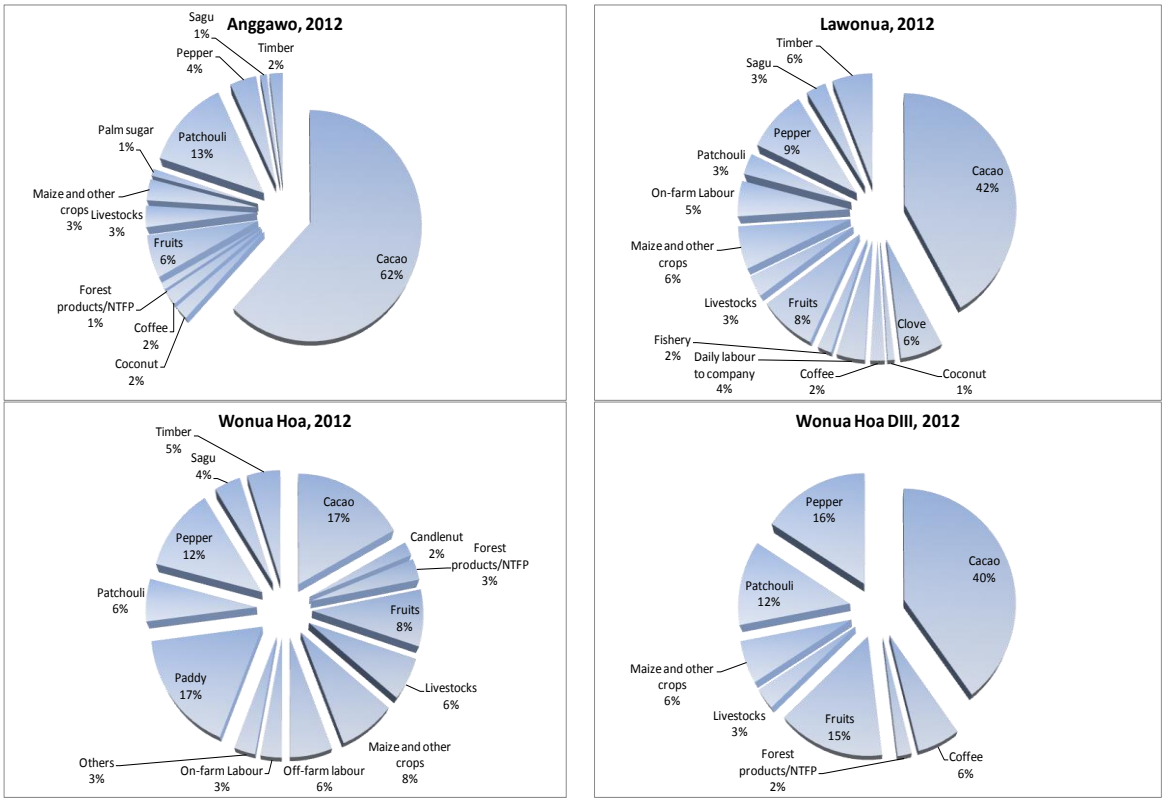


Figure 13 Recent livelihoods option in Anggawo, Lawonua, and Wonua Hoa based on community perspectives

The maintenance process conducted were varies in intensity, depending on the capabilities and management of farmers. Maintenance of migrants farmers in Wonua Hoa was relatively intensive as described below

- Pests control using pesticides and leaves fertilizers; as much as 2-3 times in one month in the first months or the first year, and then the next was depending on the existing crop pests.
- Weeding by spraying herbicides: 'Rambo' 1x a month and a contact poison twice in a month
- Discard the water shoots which was conducted 1 x in 1 the month
- Fertilizer application was performed at least twice a year, using TSP, KCl and Urea.

The main obstacles which was encountered today at farm management are:

- Pest: wild boar and monkeys, cacao pod borer and fruit rot
- PSD (Off Shoot)
- High price of fertilizer and agricultural supplies
- The price continues to drop and the quality of cacao below market

Paddy

Wonua Hoa community was still planting paddy as one of their main livelihood today. Paddy seedlings that commonly planted by farmers include Ciliwung, Padi 36, and Konawe. Paddy planting was performed 2 times in a year, starting July and December.

Maintenance performed during a season were

- Spraying for 2-4 time in a season
- Fertilization was conducted 2 times per season with Urea, TSP, Organic, Phonska
- Weeding for 2-3 times in a season

The productivity of paddy was obtained 4 tons/ha of unhusked rice. Farmers usually use it for their own family, and some are sold. The main obstacle that encountered today: 1) pests such as rodent, wild boar and cows; 2) requires a large capital, and 3) Less of extension support

Fruits

Banana and rambutan were quick resulting fruits which quite productive in the villages. Banana gardens could produce up to 8 bunches in a month that was sold to at a price of IDR 25,000/bunches to the market. While the Rambutan (23-30 trees) could generated money up to IDR 1 million per season. Rambutan selling price was around IDR 30,000/sack (a 50 kg sacks of rice).

Long establishment migrant/transmigrant villages

Cacao, and pepper were the dominant livelihoods in this typology besides other commodities. In this villages, the farming systems was quite intensive compared to other villages.

Cacao

The developing of cacao gardens in Tasahea was still used slash and burn techniques. Cacao planting was applied a spacing of 3 x 3 m, with 40 cm X 40 cm X 40 cm of the planting hole. I initially, cacao seedlings using F1 and subsequently extracted from this seed of F1 derivatives or side-grafting.

The cacao maintenance activities undertaken were:

- Fertilizer application was done two times in a year (every 6 months) at the beginning of flowering and after harvesting. Fertilizers used were TSP, KCl, urea, depends on the age of cacao and farmers management. Cacao in many gardens in Tasahea were up to 12 years old, then farmers believed that using fertilization was able to increase the yield up to 2-3 quintals.
- Sanitation cleaning was performed 2 times a year, once a within two year the weeding, pruning branches and weed spraying should performed.
- Insecticide spraying, from flowering to harvesting 3-4 months
- Prunning 2 times a year
- Drainage maintenance once in a year.

The cacao productivity in the village was quite high compared to other villages. 1.5 tons/ha/year, at the age of 7 years old cacao trees which fertilized once in a year. Even at the 10 years old of cacao, the tree was still produce 800 kg/ha/year. Most cacao in the village was sold to collectors at a price IDR 15,000/kg at 7% levels.

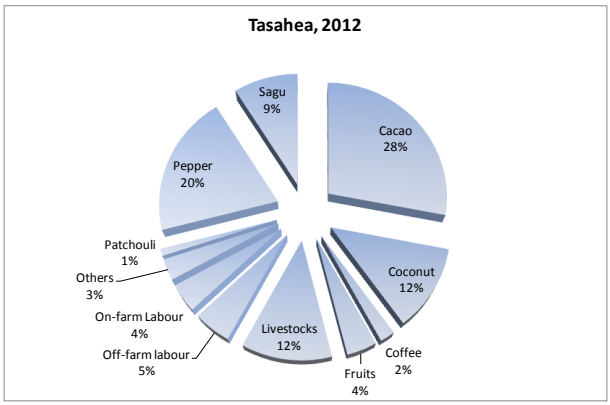


Figure 14 Recent livelihoods option in Tasahe based on community perspectives

Pepper

Many pepper grown in Tasahea was mixed with cacao using a spacing of 3m x 3m; or if its in monoculture uses 2m x 3m spacing. Several farmers integrate peppers into home garden which had mixed coconut 10 x 10m or 8 X 8m. Pepper maintenance include:

- Pruning 1 times in 1 year for the propagation pole
- Fertilizing 1 time within 1 year or a according to the ability of farmers
- Weeding 2-4 times in a year
- Pest and disease control using spraying 3 times within 1 year (spray mixed with fertilizer)

Based on the farmers experience, in an area of 0.5 ha of pepper (6 years age) could produce more than 750 kg per harvest. If the price of pepper was IDR 65,000 at 17 levels, then farmers could earn up to IDR 50 millions.

Recent migrant/transmigrant villages

Charcoal, timber and other extracting livelihood source were still dominated this typology. In term of framing system, only small number of fruits which already contributed toi livelihoods of people in this village. Many of other tree-based commodity such as cacao was still in immature periods.

Charcoal

Charcoal was the main livelihood for transmigrant that inhabits the UPT Asinua Jaya. This transmigrant settlement built 4 years ago so that many crops planted were remains immature. the 10 cm of diameter of ironwood (kayu nona) was the best timber for making charcoal, it slash and cut along 2 m and collected in the burning site. Burning process carried out by making the 1 x 1.5 m wide of burning site, the left-right- rear and the above was closed while the front door which was made to burn. The timber were arranged by lengthwise, then all incorporated and burned. The front should be closed and maintain with no leaks in order to avoid the burning charcoal became ashes.

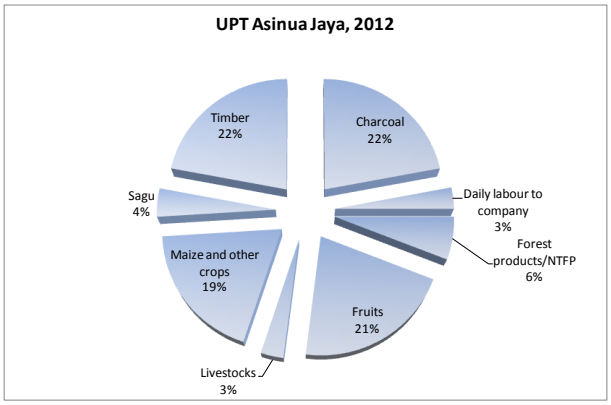


Figure 15 Recent livelihoods option in UPT Asianua Jaya based on community perspectives

The burning started in the morning, at 08:00 to 09:00 and carried out for 1 week or 5-7 nights. The results of 1 m3 of timber burning will produces 10 sacks of charcoal that sold for IDR 20,000-23,000/sacks to the middlemen from Kolaka, Unaaha and Kendari who came to the village. In one full month, the charcoal maker can produce 70-100 sacks of charcoal. The main operational cost was cost of a chainsaw to cut timber, a pieces of timber will charged IDR 2,000 while there were 50 pieces of wood in 1m3 of timber.

At the moment, the charcoal process approximately 1-2 Km far from the village. This leas to the estimation that in the next 2 years there will be no more people in charcoal business because of its costly and really heavy work.

Timber

Villagers in UPT Asinua Jaya was kept logging as one of the main livelihood. Commonly, high demanded timber were kolapi, ponto, kayu merah, and kayu biti. This timber processing basicly by order which came from outside the village such as Unaaha. Kayu biti was the demanding

timber on the size 7 x 15 cm and 4 m length. In general, 1 m3 of timber price of IDR 1.5 million such as kayu poto.

At the moment, the logging sites were quite far to the village, about 10 km and even more. Looking at the cost of production per 1 M3: Petrol 6-7 liters per liter to Rp. 8000, gross oil 1.5 liter Rp. 2600, Oil pure Rp. 25.000/1l, transport costs Rp. 400,000/m3, oprator Salary Rp. 250.000/m3, Work 1 Day; the net profit per 1 m3 is IDR 150,000. It would be advantageous when logging process as many as 5-10 cubic timber per order.

Fruits

Bananas are the only fruit that rapidly produce in the village. The farmers plant bananas in the homegardens or not to far from home. Buyers generally come to the village, when buying charcoal they also carrying bananas. Farmer experienced showed that the biggest obstacle was still the marketing, road conditions and limited mode of transport which cause bananas less profitable today.

Migration Pattern

Population dynamics are characterized by movement from one region to another is called migration. Population movement is difficult to measure (McFalls 2007) due to take place over and over, sporadic, often covering the same area, and is often associated with social and environmental issues that each hook. Migration is defined by experts as the movement of population movement is limited by specific geographic boundaries (space) and a certain time limit.

Issue of migration will be very relevant to investigate more in relation with other sensitive issues as livelihood source, poverty and well being, social, economic, and environmental change and also land use change. Therefore, study on migration and the reason behind the migration will portray on how people deal with their livelihood and environment condition that lead to the decision to move to other areas. Moreover, livelihood and environment condition in the destination areas were also can change with more dense population and other social pressure. In baseline study, issue about migration will enrich the information on people livelihood, environment and social pressure may happen in the area, and also predicting the change may happen in projects area.

Drivers of both in migration or out-migration have been identified and can be use to predict future migration that might be happened. People move in and move out from an area to another for different reasons. Migration were seen as adaptive strategy to adverse environmental condition (McLeman and Smith 2006, Raleigh et al, 2001), to find better economic or agricultural option, and it can also relate with the cultural value for certain ethnic (Weber 2007). Those differences affect the overall migration process that also affected on people population within the areas. Discussion with villagers shows some factors influencing in migration and out migration.

This study discuss about migration pattern in South Sulawesi and Southeast Sulawesi. Interestingly, those two areas have very close relation in term of migration, since people from South Sulawesi migrate to Southeast Sulawesi. The discussion will be divided become the population and migration pattern in South Sulawesi, followed by the situation in Southeast Sulawesi.

Migration pattern in provincial level

Based on population census in 2012, population in Southeast Sulawesi Province were around 2,232,586, with people who reside in urban areas as many as 611 373 people (27.38 percent) and in rural areas as many as 1,621,213 people (72.62 percent). Population distribution percentage in each district were varies from the lowest in Konawe Utara (2.31%) and the highest in Kolaka (14.12%). Sex ratio were 101, with male population for about 1,121,826 people and women as much as 1.11076 million inhabitants. Sex ratio is 101, meaning there are 101 males for every 100 women.

Results SP2010 recorded 121,090 residents or 6.2 percent of the population in this province were categorized as recent incoming migrant. Recent migrants in urban areas 2.6 times greater than in rural areas, respectively by 11.1 and 4.3 per cent. Number of male migrant workers more than female, 63,524 versus 57,566 people. Those two data sets shows that men are more actively migrant and city or urban area were still more preferred destination for migrating.

Migration pattern in study area

In Southeast Sulawesi, migration pattern were more dynamics in particular in long established migrant village and transmigration villages. However, Figure 16 shows that though the villages in Group A were categorized as local villages, but they were also consist of people coming from miscellaneous areas. Some of them were also experienced in having migrants from people out of the province, but not in recent periods. The out migration rate within those four villages in Group A were also not performing high. Out migration only happen in few cases in Lamunde in the recent periods of time.

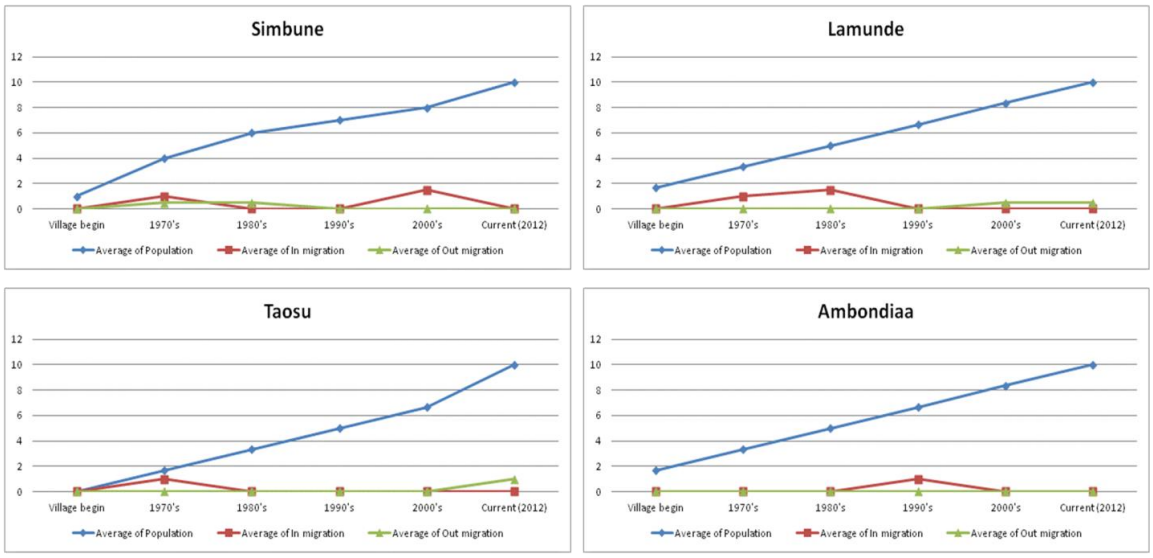


Figure 16 Population, in migration and out migration pattern of villages on Group A in Southeast Sulawesi

Long established migrants villages in Group B, as seen in Figure 17, were having high migrant from South Sulawesi since around 1970 in Lawanoa villages, 1980 in Wanoahoa villages, and in 1990 in Anggawo villages. South Sulawesi people were coming from Maros, Bone, Sinjai, Sopeng, Bulukumba and Tana Toraja (Mamarasa, Rantepao), but majority were from Sinjai and Bulukumba. This is relevant with the information in South Sulawesi (see report for South Sulawesi), that some people from Borong Rapoa and Balang Pesoang villages (Bulukumba district) were migrating to Konawe and Kolaka district in Southeast Sulawesi.

Most of migrants were move due to cacao plantation expansion that were started since 1970s. Cocoa production in Southeast Sulawesi were getting increase in around 1987 to 1996, in line with the increasing of cacao area that were for about 4.13% per year in around 1990 to 2002 (Estate Plantation Statistic, 1990 – 2006). Moreover, Southern Sulawesi were become the second highest of cacao producer in Sulawesi after Central Sulawesi. During those periods, Southeast Sulawesi and also Central Sulawesi were become the main target area for people to cultivate cacao as promising commodity, and most of the people were from the South and some existing migrants in their location. Hence this is become the pull factors of Southeast Sulawesi, in particular some villages in Kolaka, Kolaka Utara and Konawe Selatan as the main target of people from the south to migrate.

Some moving reasons that rose in the discussion were due to the cacao prices and the land availability. Some farmers mention that cacao prices in the Southeast were better than the South. Moreover, the land availability in the south is also decreasing due to more dense population.

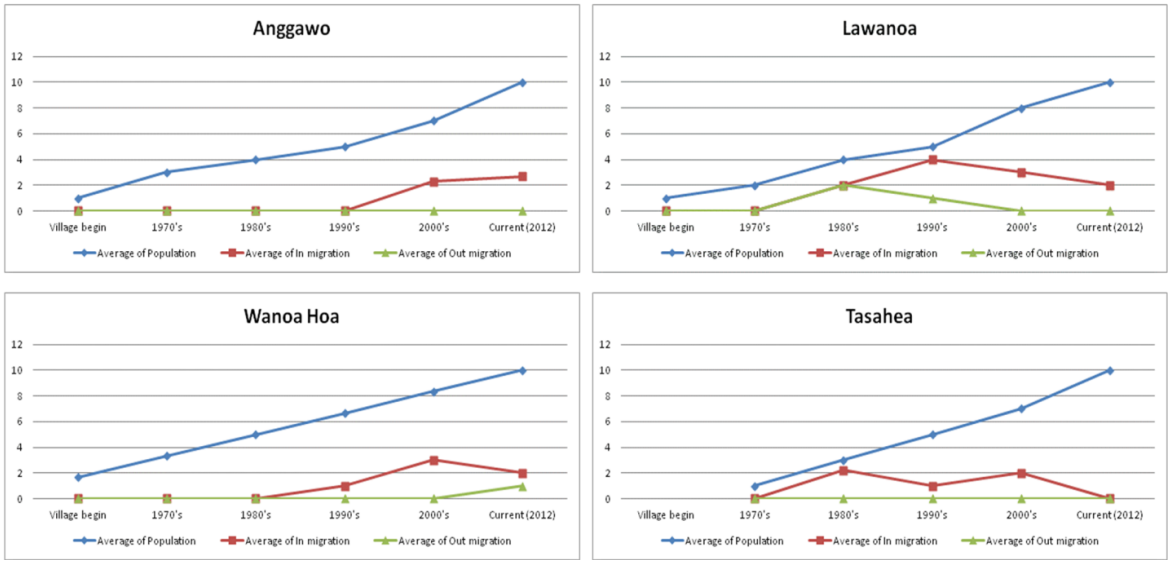


Figure 17 Population, in migration and out migration pattern of villages in Group B (long establishment migrants villages, represented by Anggawo, Lawanoa, and Wanoa Hoa village) and Group C (Transmigration villages, represented by Tasahea village) in Southeast Sulawesi

Illustrating in migration in Southeast Sulawesi can be defined by three condition. First condition, were represented by the village in Group A, people were coming to the villages but due to some reason within the villages, those villages were not become interesting target for cacao cultivation for people from out of Southeast Sulawesi. The second condition were represented by Lawanoa villages, migration also start in around 1970's where people from the South were coming spontaneously to find the land for cocoa cultivation. This is in line with the beginning of cacao production in Southeast Sulawesi. Comer on Lawonua villages were increasing in around 1990s and now become decreasing, but this is still show us that Lawonua still become an attracting areas for the cacao cultivator may come to the village. While in Wanuahoa village, migration start in around 1980s and increasing in 2000s. In Anggawo villages, the migration start in 1990s till now. This is indicating that people always try to find another areas that might be interesting for people from the South to move and cultivate cacao. Situation in Wanuahoa and Anggawao villages illustrating condition number three where this area start to become new famous destination area. However, there also some villages which close for the comer as Simbune. Simbune village head mention that hereditary, village head has banned people to come to this village if only in purpose of land expansion. The village is close for the comer from outside the area except due to marital reason.

Table 3 List of in migration in Southeast Sulawesi

Origin	Ethnic	Destination	Estimated year	Livelihood source	Reason of migration
Java	Jawa	Ambondia	1990	Cacao cultivation	Land expansion
South Sulawesi	Bugis	Anggawo	2000	Cacao cultivation	Land expansion
Java	Jawa	Anggawo	2000	Cacao cultivation	Land expansion
South Sulawesi **(Maros, Bone, Sinjai, Bulukumba**	Bugis Makasar	Lamunde	1971	Cacao cultivation Paddy cultivation	Economic, Land expansion
Tana toraja **(Mamasa Rantepao)**	Tator	Lamunde	1981	Cacao cultivation Paddy cultivation	Economic, Land expansion
Konawe Selatan (Moramu)	Java	Lawonua	1982	Crops farming	Economic, Land expansion
Surrounding villages	Tolaki	Lawonua	1994	Crops and/or cashew cultivation	Economic, Land expansion
South Sulawesi **(Sinjai, Sopeng, Bulukumba)**	Bugis	Lawonua	1997s (simultaneous)	Cacao cultivation Fruit trees, clove (rambutan, durian)	Economic, Land expansion
Sulsel	Bugis	Simbune	1970s	Paddy farming and horticulture	Economic
Transmigration sites in surrounding areas	Bali	Simbune	2000s	Cacao and pepper cultivation	Economic
Surrounding villages	Tator, Makassar, Bugis	Simbune	2000s	Cacao and pepper cultivation	Economic
Surrounding villages	Bugis, Makassar, Java and Bali	Tasahea	1978s (simultaneous)	Paddy cultivation Horticulture Coconut	Land expansion
South Sulawesi	Bugis	Tasahea	2002	Cacao cultivation	Land expansion
Surrounding villages (Pangi-pangi)	Bugis	Tasahea	2002 – 2004	Cacao cultivation	Land expansion
South Sulawesi (Bone, Jeneponto, Pinrang, Sopeng, Polmas)	Bugis	Wanoahoa	2000s 2004s	Cacao and paddy cultivation	Land expansion
Java	Javanese	Wanoahoa	2000	Cacao and paddy cultivation	Economic, Land expansion
Bali	Bali	Wanoahoa	2000	Cacao and paddy cultivation	Economic, Land expansion
Tana Toraja	Tator	Wanoahoa	2000	Cacao and paddy cultivation	Economic, Land expansion
Pinrang, sopeng, bone, tator, polmas	Bugis, Tator	Wanoahoa (migrant)	2004	Cacao and paddy cultivation	Economic, Land expansion

Table 4 List of out migration in Southeast Sulawesi

Origin	Destination	Ethnic	Year	New livelihood source	Reason of moving
Lamunde	Kalimantan	Bugis	2009	Oil palm work (as labour)	Economic
Lamunde	Lambuya	Tator, Tolaki	2010	Paddy cultivation	Economic
Lawonua	Java - Back to origin areas	Java	1980	No information	No information
Lawonua	Surrounding villages	Java	1980	Labour	No information
Lawonua	Surrounding villages	Tolaki	-	Cacao cultivation	Land expansion
Lawonua	Surrounding villages	Bugis	-	Cacao cultivation	Land expansion
Simbune	No information	Bugis	1973 - 1974	No information	Low income, limited market access
Taosu	Surrounding villages	Bugis	2012	Farming	No information
Taosu	South Sulawesi	Java	-	Farming	No information
Taosu	Malaysia	Bugis, Tolaki	2009, 2012	Oil palm company	Economic
Wanuahoa	Kolaka	Bugis	2010	Cocoa cultivation	Low income (other reasons?)
Wanuahoa	Konawe Selatan	Bugis	2009	Non farming	Low income or Low production
Wanuahoa	Sopeng	Bugis	2005	Trading	Low production
Wanuahoa	Bombana		2008	Gold mining	Economic

Table 5 Individual out migration in Southeast Sulawesi

Origin	Destination	Women or men? Old?	Type of livelihood source	Remittances
Ambondia	Saudi Arabia	Women 20 - 30 years old	Domestic support	No information
Lamunde	Saudi Arabia	Women 20 - 30 years old	Domestic support	IDR 10 million per years
Lamunde	Singapura	Women 30 – 40 years old	Domestic support	No information
Lawanoa	Malaysia	Women, more than 20 years	Oil palm worker	IDR 15 million per 2 years
Lawanoa	Bombana	Women, teenager and adult	Gold mining	Due to low production, miner migrant were decreasing
Lawanoa	Ambon	Men, teenager	Gold mining	IDR 10 million per year

Lawanoa	Malaysia	Men, teenager and adult	Oil palm worker	IDR 2 million per year
Lawanoa	Bombana	Men, teenager and adult	Gold mining	Due to low production, miner migrant were decreasing
Simbune	Malaysia	Men - Teenagers (5 – 6 people)	Oil palm worker	IDR 1 million per year
Taosu	Arapsaudi	Women 30-40	Oil palm worker	No information
Taosu	Malaysia	Women 20-30	Domestic support	IDR 2 million per months
Taosu	Malaysia	Men, 20-40	Oil palm	IDR 10 million per months
Tasahea	Kolaka Kendari	Women, Teenagers dan Adult (15 people)	Domestic support	No information
Tasahea	Kolaka Kendari	Men, teenagers and adult (40 people)	Infrastructure labour (seasonal)	No information
Wanuahoa	Malaysia	Women, 25-30 years	Domestic support	IDR 5 Million/year

Discussion and recommendation

Main land use system and livelihoods options

Based on the focus group discussion, among the four village typologies showed several adequate differences in terms of livelihoods option, tree-crops and farm management which farmers practice in the villages. These differences could be influenced by historical differences of land management, management of farmers, market access, and the considerable influence of migrants in the villages.

In the first village typology, these villages (Ambondiaa, Lamunde, Simbune, and Taosu) were considered as local village in term of dominant population and influence of migrants in the villages; there were not many migrants from outside who came to village. The main livelihoods of the people were cacao, paddy, patchouli and sago. The presence of sago was fairly unique difference with other village typology, considering sago was the staple food for indigenous Tolaki people in this area. Tolaki people were extracted natural sago since the sago cultivation by farmer was not optimal yet. Cacao agroforest and paddy were main farming system exsist in the area. The cacao system who carried by locals in this village typology was not intense compared to cacao systems managed by migrants from South Sulawesi in the second typology. Then, the farming intensity of managing cacao and other crops will be considered as the main differentiating factor for the first and second village typology.

The second village typology which was consist of Anggawo, Lawonua, and Wonua Hoa village showed the strong influences of migrants in current farming system. Many migrants came from South Sulawesi and developed cacao gardens in these villages. They use quite intensive farming

system which also has strong impact to the local farmers. It was clearly showed in Wonua Hoa village, within Hamlet I and II compared to hamlet III. Intensive management of cacao in the hamlets III was strongly influences the local cacao farmer's management, also the village farming systems pattern. Another case showed when the migrants introduce to locals how to managed animals (buffalos) in paddy field plowing. These two stories were showed how significant the impact of local-migrant relations which was happend in the area.

While in the third and fourth village typology was using time period of village establishment (long and short) in order to distinguish the two transmigrant villages in terms of livelihoods options. These survey were showed clearly that long-established transmigrant village (Tasahea) has many diversification of livelihoods option which depend on the major farming system/crops outcome such as cacao, pepper, and also livestocks. The opposites conditions where showed in the recent transmigrant (UPT Asinua Jaya/Lasao) which most of people's livelihood was rely on forests as a major source of incomes (charcoal and timber) and less on plantation crops. Almost all the people of the recent transmigrant village were extracted charcoal and timber from forests as the main income, at the moment their plantation the crops wer not productive yet.

Thus, the results of this survey showed that there are several suggestions and feedback for the improvement of people's livelihoods, as follows:

- Conducting comprehensive agricultural extension, ranging from farming techniques to pests and diseases management;
- Increasing the access and knowledge against the improved/good seedlings for all potential crops;
- Establishing micro-economic institution to boost the local economy and reduce the dependancy on the village collectors in marketing agricultural products.
- Diversification of existing plantation, such as rubber as a promising one.
- Conducting the transfer of appropriate technology for post-harvesting such as drying technology for cacao, also improving the capability of cacao farmers.
- Conducting farmers visits farmers (farmers cross visits) to other farmers/farmers groups which has advanced experienced.
- Establishing demo trial at plots level of cacao and various plantation crops.

Migration issues

Out-migration within this area were mainly driven by the needs to improve their economic condition due several reasons. Harvest failure due to climatic condition become one of important reason why people work abroad as well as try to find available land for farming or cultivate some high economic value commodity. Most of out-migration in this areas were spontaneous and insulted by the market power. People who don't have ability to cultivate the land, don't have link to other areas, and don't have enough capital would prefer to work in nonfarm activity. However, this premise might need some additional data to be more valid.

High in-migration rate in Southeast Sulawesi as shown in secondary data, were supported by the data in villages level. There were some villages were having relatively high rate in migration. This is shown that this area become the destination of people migration due to cacao expansion. Acceleration of land use change within this area can be as a consequences of massive in

migration by people from the South. Study about migration in Southeast Sulawesi is clearly linked to the condition in South Sulawesi. More detail analysis to see the link between those and the reason behind people decision to move from the South to Southeast is important to avoid further implication from people migration and the possibility conflict happen.

Part Two: Profitability of land use systems

Arif Rahmanullah, Muhammad Sofiyuddin

Background

This study analyze profitability of existing land uses to provide better understanding both on the farming system efficiency and labour engagement. Understanding the farming system efficiency is helping farmers in resource allocation. They can invest in which the highest financial return that lead to improve their livelihood quality. Labour engagement in a farming system is linked with the demographic condition of an area. By understanding the figure of labour engagement of existing systems, we can analyze the demographic impacts possible to happen.

This study was conducted in South Sulawesi and Southeast Sulawesi, as part of CIDA project. South Sulawesi has unique characteristics in term of land use systems. The mountainous area from Bantaeng to Bulukumba district shows mosaic pattern of various farming systems. There were annual crops system, tree based system and mixed garden found in the area. Understanding this mosaic land use system could help the intervention of reducing environmental risks as well as to improving its people livelihood.

This study aims (1) to estimate profitability of existing land use and (2) provide figure of labour engagement in the farming systems.

Materials and methods

Net present value

Net present value (NPV) is the most common indicator used for comparing profit of different types of investment (in this case, different types of land use). The NPV of an investment is defined as the sum of the present values of the annual cash flows minus the initial investment. The annual cash flows are the net benefits (revenue minus costs) generated from the investment during its lifetime. These cash flows are discounted or adjusted by incorporating the uncertainty and time value of money (Gittinger 1982).

NPV is one of the most robust financial evaluation tools to estimate the value of an investment. The formula to calculate the NPV is below.

$$NPV = \sum_{t=0}^{t=n} \frac{B_t - C_t}{(1+i)^t}$$

where Bt is benefit at year t, Ct cost at year t, t is time denoting year and i is discount rate.

NPV is calculated at private prices. NPV at private price shows private profitability, as a measure of profitability as a production incentive. The investment for one specific land use is labeled

profitable if the NPV is higher than zero. The higher the NPV means the higher the profitability of that investment. NPV is also called 'return to land'. An indicator of profitability is return to labour.

Equivalent Annuity

Since each land use system has different cycle, we use equivalent annuity to make the comparison between land use systems possible. The formula is described as follow:

$$C = \frac{r(NPV)}{1-(1+r)^{-n}}$$

$C = Equivalent\ Annuity\ Cash\ Flow$
$NPV = Net\ Present\ Value$
$r = rate\ per\ period$
$n = number\ of\ periods$

Basically equivalent annuity expresses the NPV as an annualized cash flow by dividing it by the present value of the annuity factor.

Return to labour

Return to labour is defined as the wage rate at NPV equal to zero. Return to labour is calculated by adjusting the wage rate until NPV reaches zero. The value of return to labour indicates the attractiveness of the system; if return to labour is higher than average wage rate, then it would be attractive for people to work in the system. In contrary, if the value is lower than the daily work return (wage rate) then people tend to choose other opportunities than the system.

Macroeconomic assumptions

Both return to land (NPV) and return to labour was estimated using data collected from in the field. Profitability assessment needs a detailed farm budget calculation. It is necessary to clarify the macroeconomic assumptions and the proper prices for calculating the cost and return used in this assessment. In this study, some macroeconomic parameters were used (Table 6). The wage rate for agricultural work was IDR 30 000 – 50 000 per day and the exchange rate was IDR 9085 = USD 1. Real interest rates (that is interest rate net of inflation) were the discount factors used to value future cash flows in current terms. We argue that a private discount rate of 8% is a lower boundary for the actual cost of capital for a smallholder owing to imperfections in capital markets in the area under study. Owing to the time constraint and lack of reliable time-series data, the study used single year price data, that is, 2012 prices.

Table 6 Macroeconomic parameters used in the study

Parameters	
Exchange rate	IDR 9085 =USD 1
Wage rate in	
South Sulawesi	3.3 USD / day
Southeast Sulawesi	5.5 USD / day
Private interest rate	8% per year

Data collection

The first step in the study was to select the land uses for the profitability analysis. Primary data was collected using Rapid Rural Appraisal (RRA). It was used to gather farm budget data for each land use, including prices, production, labour and input, for 2012. As already mention in Introduction chapter, the resource persons and/or key informants interviewed for the purpose of the study were farmers, traders and government officers. Focused Groups Discussions (FGDs) were conducted to collect comprehensive information of a single land use in a village. Data collected in FGD were verified with the resources person interviewed. This study also collected data from secondary sources; such publications both from government and private companies.

Selected main land-use systems

There are seven major land uses system at Konawe and Kolaka District, Southeast Sulawesi Province were selected for profitability analysis. Teak garden for timber plantation category. Patchouli, pepper, sago, and cocoa which is cultivated in monoculture. For simple agroforestry there was cacao-coconut agroforestry and cacao-patchouli agroforestry. All land uses system was managed by smallholder with an area range from 0.25-1 ha. The seven major land uses as shown in Table 7.

In Southeast Sulawesi Province, almost the entire area is dominated by cacao plantation. Cacao cultivation has been started in the '70s. Planting activity carried out through various government programs in order to improve export commodities. In the last 20 years, the area of cacao cultivation in Southeast Sulawesi Province increased from 55,000 ha in 1990 to 230,000 ha in 2010 (Dirjenbun, 1990-2010), with an average productivity of 966.01 kg / ha (KPPU, 2009).

In fact, the productivity of cocoa varies, depending on the pattern of cultivation. Current productivity of cacao tendency to decline, due to some constraints in the cultivation of cocoa, includes: the quality of the seeds, disease and pests, and the age of plant that has to be rejuvenated. Decreasing productivity and pest attacks causing farmers started looking for other easily cultivated and more profitable crops.

Table 7 Land cover of Southeast Sulawesi and the selected main land-use systems

Category	Land use type	Products	Scale of operation	Location (village)
Smallscale				
Timber	Teak garden	Teak	0.5-1 ha	Anggawo
Monoculture	Patchouli	Patchouli	0.25-1 ha	Anggawo, Lamunde, Tinondo
	Pepper	Pepper	0.5-1 ha	Lawonua
	Sago	Sago	0.5-1 ha	Simbune
	Cacao	Cacao	1 ha	Asipako, Tasahea, Taosu
Simple agroforestry	Cacao-coconut agroforestry	Cacao, coconut	1 ha	Taosu
	Cacao-patchouli agroforestry	Cacao, patchouli	1 ha	Anggawo, Tinondo

In some areas, people had already cultivates coconuts as a livelihood. The entry of cocoa, making farmers applies the mix system of coconuts and cocoa. On other hand in order to utilize the land and increase profits, farmers began to plant patchouli on the sidelines of cocoa plantations.

Patchouli cultivation began less than a year, they cultivated because of seeing the success story of farmers in other districts, such as in Northern Kolaka district. Farmers choose patchouli is affected by the ease of cultivation; patchouli can be harvested six months after planting, and can be harvesting every four months later.

Other commodities are also in demand by the people of Southeast Sulawesi is the pepper. This plant has been growing since 1990. Based on 2010 data from the total area of 12,193 hectares, more than 60% of planting area located in Konawe and Kolaka (BPS, 2011). The pattern cultivation of pepper in Southeast Sulawesi still be traditional, using the pole climbing of gamal tree. Productivity of these crops cannot be maximal because of the constraints of stem rot disease and other diseases.

Sago palm is widely grown in Southeast Sulawesi Province, with a vast spread in several districts, and has long been used as a staple food. Sago palm plantation area has reached about 5,282 hectares (BPS, 2011). People said, the history of sago in Southeast Sulawesi is brought by the migrant from Maluku Island long time ago, then planted and developed on its territory, until eventually spread throughout the province. However, the current state of sago plantation area is declining due to excessive harvesting, lack of planting, and also settlements development.

In Konawe District, several villages in Lambuya and Uepai sub district are directly adjacent to the forest. Land use with timber base system can be found in the area or the villages adjacent to forests. Planting teak in Southeast Sulawesi began around the year 2003-2005, in order of reforestation program. The local government distributed free seedlings to be planted on private lands.

Profitability

The results of the profitability for Southeast Sulawesi Province show that all land uses are positive, indicating that those land uses are profitable. Estimates of NPV using the annual equity are presented in Table 8.

For all land uses system, patchouli is the most profitable. Undeniably, patchouli is an easy crop to be cultivated. Production requires very little input but can produce a large output. With a spacing of only 50 x 50 cm, the number of plants per hectare reached 2000 trees. Of this amount can be harvested more than 10 tons of leaves and stems. The number of collectors and a distillery, allowing farmers to sell their crops. Although prices fluctuate, only within 6 months farmers have been able to get the result, and the next harvest every 3-4 months. Not surprisingly for one year cultivation, net profit in one year could reach 2930 USD / ha.

Table 8 Profitability of land-uses system in Southeast Sulawesi

No	Type of land use	Main Product	1 cycle period (year)	Return to land (USD/ha)	
				at 1 cycle period	equal per year
1	Teak garden	Teak	20	25201	2485
2	Patchouli	Patchouli	1	2930	2930
3	Pepper	Pepper	20	22935	2261
5	Cacao	Cacao	20	3732	368
4	Sago	Sago	15	4208	472
6	Mix garden Cacao-coconut	Cacao, coconut	20	5588	551
7	Mix garden Cacao-patchouli	Cacao, patchouli	20	4488	443

Other land use systems that have high profitability are teak garden and pepper. As we know, to fulfill the raw material of the domestic wood industry in Indonesia, people began to turn into private forest. Increasing domestic demand for wood, causing the price of teak continues to rise. Although return to land reaches 2490 USD, the farmers have to wait for 15-20 years to be able to harvest the timber from the teak garden.

Similarly, pepper prices continue to rise during the last 4 years of 40 thousand rupiah in 2008, to 65 thousand in the year 2011. With productivity of 670 kg/ha, return to land of pepper reaches 2261USD. The low productivity of pepper because of farmers' doesn't perform in accordance with the recommended management, lack of capital into one of the obstacles. However with the current price, the pepper plant has been quite profitable.

As described previously, cocoa plantation is the dominant crop in the Southeast Sulawesi. However, profitability is the lowest from other land uses system, is only 368 USD for a 20-year cultivation period. Current condition, the productivity of cocoa cultivation is already declining due to old age. To increase the profits there's need to rejuvenate and improvements the pattern of cultivation. The low profit causes farmers began looking for alternative crops or other plants to be plant along with the cocoa. The profitability of agroforestry system between cacao and coconut increase to 551 USD. Boom in patchouli plants also affect the farmers to plant patchouli among cocoa trees. Scenario created for profitability of agroforestry system between cocoa with patchouli, which patchouli newly planted when 20-year-old cacao. This is in accordance with what is happening on the field. The profitability for this system only increase to 443 USD. There will likely be different when the patchouli plant is planted in conjunction with cacao. Need to do further research on the impact that would occur, whether patchouli plant will affect the productivity of the cocoa crop.

Return to land of sago monoculture reaches 472 USD, slightly higher than cocoa. Sago palm can only be harvested at an average age of 10 years, and the productivity of sago palm was not optimal because people have not done intensive cultivation. Although, the profitability has a low value, sago palm has the role of social and culturally important in Southeast Sulawesi.

Labor engagement

As describers above, return to labour is another indicator of profitability for labour, the higher of return to labour of a land use means the higher level of attractiveness to farmer for engage. Table 9 show the labour engagement in Southeast Sulawesi.

Table 9 Labour engagement in Southeast Sulawesi

	Type of land use	Return to Labor (USD/psday)	Labor Req (psday/ha/yr)
1	Teak garden	66	29
2	Patchouli	27	148
3	Pepper	16	227
4	Cacao	8	83
5	Sago	12	117
6	Mix garden Cacao-coconut	11	105
7	Mix garden Cacao-patchouli	11	89

The result of return to labor for all land use system shows a larger value of the wage rates in Southeast Sulawesi on average 5.5 USD/ps -day. This suggests all land use in attractive and profitable for farmer. Teak monoculture has the highest return to labor. In fact, planted teak does not require a large amount of labor, maintenance activities are performed only once a year. Large workforce is required only in the early years of planting.

Conclusion

- There are several main land uses identified in the study area ranging from Monoculture system (cocoa, patchouli, sago, and pepper), simple mixed garden (cocoa- patchouli, cocoa-coconut), timber garden
- The most profitable land use system based on annual equity measure is patchouli monoculture, followed by, timber garden (teak), and pepper monoculture.
- Timber garden (teak) generate the highest return to labour (66 $/psday) among other land use in South Sulawesi; while the cocoa monoculture system shows the lowest (8 $/psday).

Part Three: Gender and Natural Resource Management in Southeast Sulawesi

Elok Mulyoutami, Endri Martini, Syamsidar, Rahma R Talui, Janudianto, Heru T Maulana, Suyanto

Background

Interrelation of men and women, and how cultural and social aspects influence that relation were always hotly discussed. Concepts such equity, equality, marginalize, subordination, and others always embed on the discussion as most of the discussion relate to social inclusion. Those concepts raise along with the problems found within community where one of gender role were invisible or not being valued though it has important value on natural resource management. World Bank, FAO and IFAD mentioned in Gender in Agriculture report mention that women has 50% contribution on family income, but their value as income earner is not recognized and under acknowledge (2009). Also, their contribution on how to build a good nutrition for kids, family food security, were not valued as productive but mainly only as women obligation in family.

Gender become cross cutting issues within AgFor Sulawesi Project, therefore study on gender baseline is urgently required not only to understand the overall gender issues in Sulawesi, but also to develop criteria and indicator for project implementation. Defining quantitative indicator for the project is not so difficult; however defining qualitative indicator would be more complex since it should be based on local consultation with community with considering cultural and social structure that must be site specific.

Methodology

Primary data collection methods employed in this topic study were mainly from full day mini workshop with some villagers representative (describe in Introduction). There were separate discussion between women's and men's group discussion using the same set of question to compare the situation from women's and men's point o f view. Some individual interview were undertaken to get general view of the villages and community condition. Data from Statistic Biro and some usefull report about HDI, GDI and GEI were used to illustrate how gender issues in district and provincial level were situated.

Ethnic and cultural identity

Sulawesi, was formerly known as Celebes, has hundreds ethnic group. Those are indicated in ethnologue that it has about 114 local ethnic with different dialect. Southeast Sulawesi is inhabited by four main ethnic groups: Tolaki, Buton, Muna, Moronene and Bugis. Tolaki tribe is

estimated about 16 percent from the whole Southeastern Sulawesi (including sub-ethnic Mekongga) and Moronene tribes are the two indigenous tribes who live mainly on the mainland. These tribes are scattered in Kolaka, Kolaka Utara, Kendari, Konawe, Konawe Selatan, North Konawe, and Bombana. Muna and Buton are the indigenous tribe of the islands. They inhabit the region Muna, Buton, North Buton, Bau-Bau, Wakatobi, and the surrounding small islands. Bugis are dominant migrants from South Sulawesi, and many others ethnic Javanese, Sundanese and Bali from the transmigration program. Though Moronene is known as the oldest tribe in this region, Tolaki and Buton are the most prominent ethnic because they have history as the great empire ever existing. Ethnic groups distribution information were extracted from Lewis (2009). Area that were focusing in this study were dominated by Tolaki tribe.

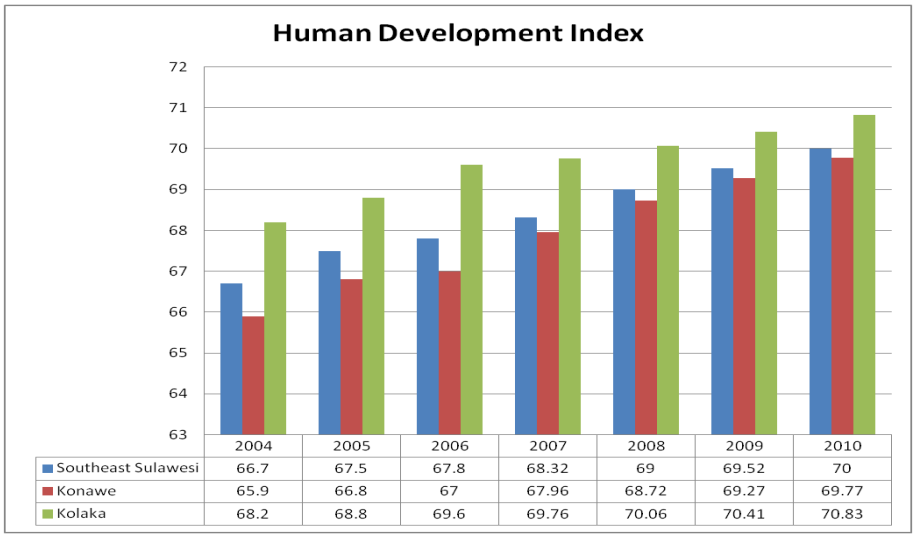
Migrants were mainly come from Java, Bali, and South Sulawesi. People from Java and Bali initially coming from the transmigration program, followed by some spontaneous migration. Within Southeast Sulawesi, they also migrated to other area outside the transmigration areas after they cultivated their area. Migrants from South Sulawesi were coming spontaneously to get the land for cocoa cultivation. They mainly come to Kolaka and Konawe district.

Gender and human development index

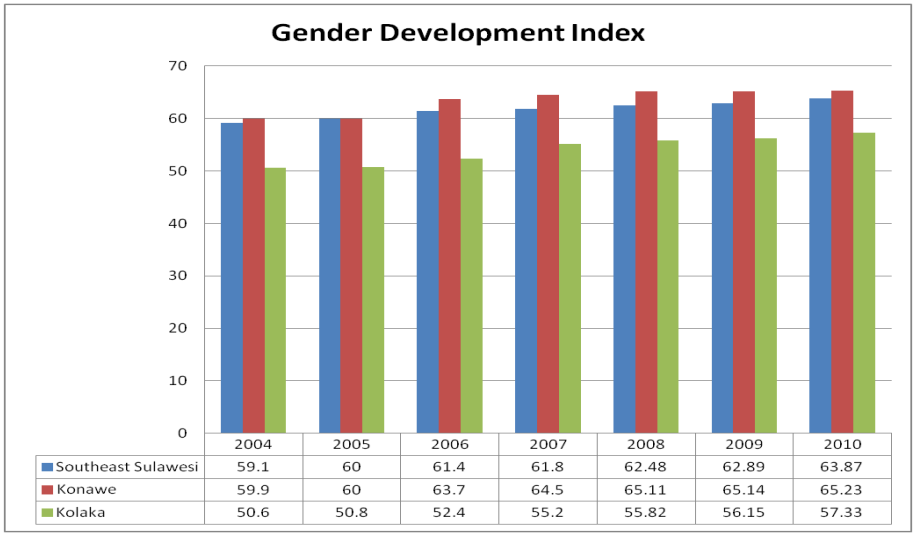
Human Development Index (HDI) is a simple or composite measurement which describing level of human development. HDI shows the progress of development in three basic human capabilities, life expectancy, education enrollment, and standard of living. Gender Development Index (GDI) describing development progress for women and for men, therefore it could explain the gap between those two gender.

Human Development Index (HDI) of Southeast Sulawesi in 2009 to 2010 were increasing from 69.52 to 70, but the rank in national level were still the same in level 25. Though the rank of Gender Development Index (GDI) in Southeast Sulawesi were remain the same in 20, index were increase from 62.89 in 2009 to 63.87 in 2010. On 2010, HDI rank in national level of Konawe and Kolaka were 332 and 267 respectively. HDI and GDI of Southeast Sulawesi, Konawe and Kolaka district were lower than national average HDI (72.27) and GDI (67.20). Achievement of human development in general is already considering gender but still relatively low when compared to the national average.

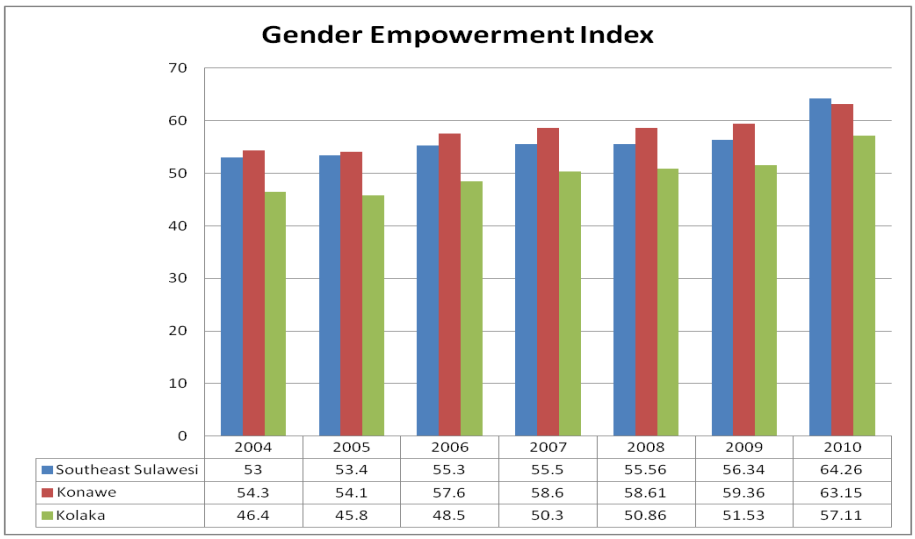
Gap between HDI and GDI in Southeast Sulawesi, Konawe and Kolaka were relatively high, indicate that development between man and woman is not balance yet. Men were still dominant in economic sector. However it perform decreasing from year 2004 to 2010, showing that gender equality were tending to increasing from year to year. However, in Konawe, though it is decreasing in 2005 to 2006, but then the trend tent to be increase until 2010. Compare with the two other areas, the gap in Konawe is already the lowest in each year. Gap in Kolaka were larger compare than Konawe and Southeast Sulawesi, due to high HDI but low GDI, that can be interpret that the development happen in Kolaka were not considering gender equality. The low GDI were predicting due to women contribution to income that were quiet low.



	2004	2005	2006	2007	2008	2009	2010
Southeast Sulawesi	66.7	67.5	67.8	68.32	69	69.52	70
Konawe	65.9	66.8	67	67.96	68.72	69.27	69.77
Kolaka	68.2	68.8	69.6	69.76	70.06	70.41	70.83



	2004	2005	2006	2007	2008	2009	2010
Southeast Sulawesi	59.1	60	61.4	61.8	62.48	62.89	63.87
Konawe	59.9	60	63.7	64.5	65.11	65.14	65.23
Kolaka	50.6	50.8	52.4	55.2	55.82	56.15	57.33



	2004	2005	2006	2007	2008	2009	2010
Southeast Sulawesi	53	53.4	55.3	55.5	55.56	56.34	64.26
Konawe	54.3	54.1	57.6	58.6	58.61	59.36	63.15
Kolaka	46.4	45.8	48.5	50.3	50.86	51.53	57.11

Figure 18 Human and Gender Development Index, and Gender Empowerment Index in Southeast Sulawesi, Konawe and Kolaka District from 2004 to 2012 (Data source: Pembangunan Manusia Berbasis Gender Tahun 2005-2011, Corporation between BPS and Kementerian Pemberdayaan Perempuan dan Perlindungan Anak)

Another human development indices being used in Human Development Report is Gender Empowerment Index/Measure (GEM) or a composite index measuring the ability of men and women to achieve equality in terms of participation in various forms of decision making (political participation) and have the opportunity in economic activity (economic participation and power over economic resources). Indicators used to measure political participation were the percentage of men and women involvement in parliament. Level of women's involvement in economic activity were measured through the strategic indicators as the percentage of women as workers, managers, professionals, technicians and administration, as well as describing the involvement of women as contributors to household income through the percentage contribution of women in household income. In short, GEM was consisting of three important component, political involvement, women's as professional, and women's contribution in economic income.

In order to analyze the relation between HDI and GEM, Report of Human Development Based on Gender used National HDI and GEM as cut off point. With using HDI and GEM data from 2010, HDI Southeast Sulawesi in 2010 was below national HDI (72.27), and also the GEM was below national GEM (68,15). HDI and GDI Konawe and Kolaka district also perform below the national level. The low achievement of human development has resulted in the low capability of men and women to actively participate in various aspects of life.

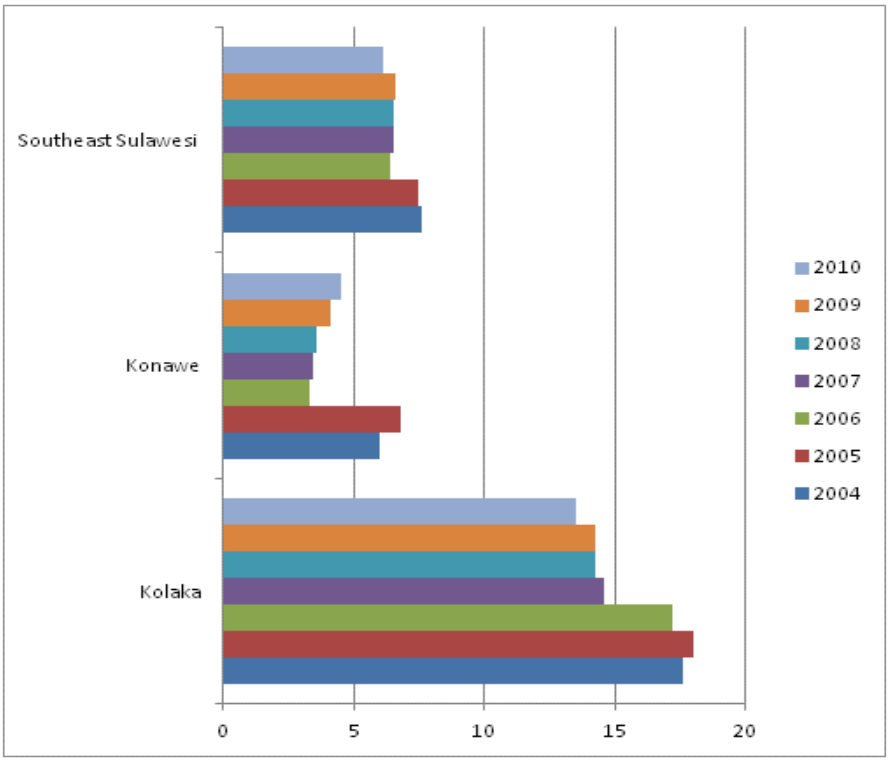


Figure 19 Gap between HDI and GDI from 2004 to 2012 in Southeast Sulawesi, Konawe and Kolaka (Data source: Pembangunan Manusia Berbasis Gender Tahun 2005-2011, Corporation between BPS and Kementerian Pemberdayaan Perempuan dan Perlindungan Anak)

Gender in livelihood source

Women's role in Southeast Sulawesi were mainly in domestic sector and maintaining homegarden and men are more on public sector. This study will elaborate more on how women's have roles on land based livelihood source in rural community. Our finding within this study can explore more on how women's involve in natural resource management also in public sector.

Mixed garden and cocoa cultivation become the main important land based livelihood (Figure 20 and Table 10) source for the community as well as for women as it can provide not only source of income but also for their subsistence need. Majority community practiced mixed garden system though the main commodity in each system is not always the same, usually coffee based, cacao based, and clove based. Group discussion participants in Group B and C were fully agreed that mixed garden becoming the most important livelihood source for community as well as for women.

Irrigated paddy system were also important in some villages such Lamunde and Wanoa Hoa. In Wanoa hoa, irrigated paddy system were mainly found in the local people settlement area, while in migrant settlement area main farming system were cocoa based system, many of them were monoculture and few simple agroforestry system. Horticulture plots usually dominated by maize production and some main vegetation, long bean, spinach, etc. People who don't have land, can cultivate paddy and horticulture with tenancy system or sharecropping/deelbouw, which locally called as tesang or teseng. Sharecropping usually at the rate of fifty percent to each of the two parties.

Off farm work that remain important in every area were consist of any activities such mainly farm labour (labour who work on individual farm), company labor (labor who work on state or company plantation or agricultural systems), farm labor (labor work on other smallholder farming systems) and other non farm activities such handyman/builder, transportation service, and others. Company labor were common in Lawanoa village since it's close to PT AGRINDO MAS, a large oilpalm plantation.

Table 10 Livelihood source and its importance for a whole community and for women based in each village typologies group

	Group1		Group2		Group3		Group4			
Livelihood source	Community	Women	Community	Women	Community	Women	Community	Women	Total community	Total women
Farm Labour	5.95	3.63			7.14	1.43	8.75	3.75	6.75	3.21
Tesang (sharecropping)	6.61	4.46	1.99	2.82	3.33	4.44	4.29	1.43	4.13	3.41
Forest	5.58		5.60	3.00			5.71	7.14	5.60	4.04
Teak garden			3.77	4.77					3.77	4.77
Pepper cultivation	5.44	4.88	4.50	4.87	6.59	7.30			5.37	5.48
Cocoa cultivation	7.92	7.08	7.14	7.14	4.76	5.48	2.50	2.50	6.02	5.98
Horticulture	3.63	6.31	5.31	6.11	5.56	5.56			4.87	6.12
Company Labour			7.22	6.67					7.22	6.67

Irrigated Paddy	8.57	8.57	5.60	5.04					7.08	6.81
Homegarden							5.45	7.23	5.45	7.23
Mixed Garden	7.87	7.98	8.09	6.96	8.57	8.57	8.04	6.79	8.02	7.45
Grand Total	6.51	6.46	5.90	5.64	5.91	5.69	6.03	5.36	6.14	5.88

Source: Focus Group Discussion

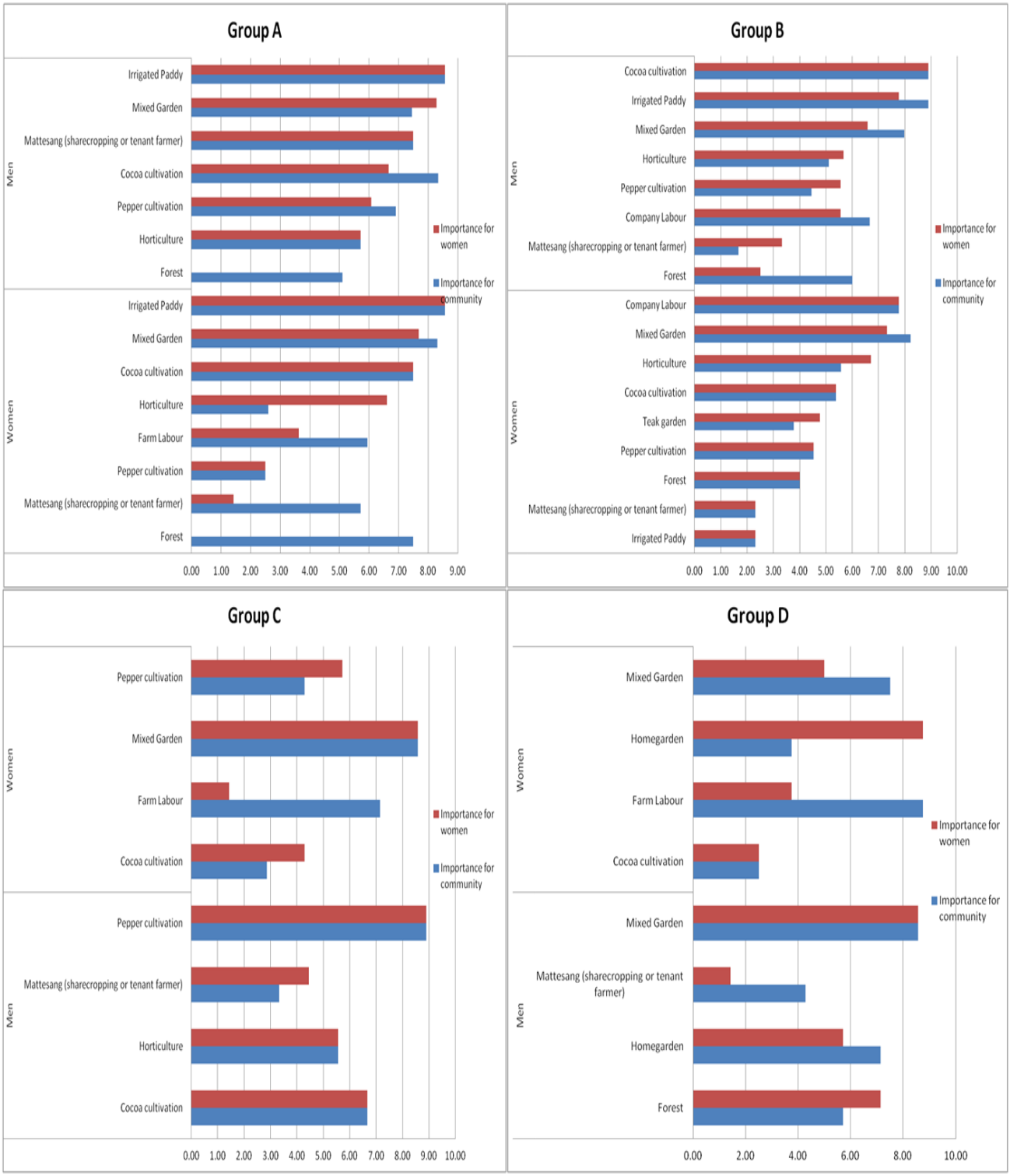


Figure 20 Livelihood source and its importance for a whole community and for women based in each village typologies group

Figure 20 illustrate that women and men have slightly different opinion on defining what are the importance livelihood source for women and for the community. In Group A, both men and women were arguing that irrigated paddy, mixed garden and cacao cultivation were important for women and community. Forest were not considering important for women but have high important for the community. Situation in Group B were slightly different while men were think that farm activity were more important both for women and community, but women were argue that off farm work (company labour, such in oilplam company) remain an important livelihood source both for women and community as a whole. Discussion in womens and mens group in Group C performing that forest were not consider as an important livelihood source for women and community. In Group D, women's group discussion didn't acknowledge that forest is an important livelihood source both for women and a whole community, but men's group performing different situation.

Forest is still important livelihood sources in most of three groups except in Tasahea villages, the long establishment transmigration area. For the community, forest were important land use since many years ago as it can provide honey, rattan, Arenga Pinnata starch for sugar production, and firewood or timber extraction. Currently, farmers still can get honey from the forest, few rattan and also timber, but in Tasahea village, no forest in surrounding areas.

Tesang or sharecropping system or tenancy system were also found an important livelihood source in study areas as it can be found in all of the areas. Landless farmers were cultivated paddy in other surrounding villages depend on their location. For example, farmers in Wanoahoa village cultivate irrigated paddy in Lambuya village, a village nearby their location.

One of the reason why mixed garden is important both for the whole community as well as for women because of women involvement within this system were relatively high compare than men (Figure 21). High women involvement also found in agricultural production such paddy within irrigated paddy system and horticulture cultivation. On Labor issue, women are more involved in the work within the company rather than in smallholder farming system. The oilpalm company worker were usually women as the work related to women, fertilizing and put pesticide on the plants, and some light weeding activities.

Both for women and for men in surveyed area, involvement of women in mixed garden were consistently high in each discussion, except on the discussion on Men's in Group C. In the group D, though women's involvement in mixed garden were still considering high, but women's role were mainly in home garden, which is also consist of mixed vegetation species. Group participants mention due to the location is surrounding the house, women may still maintain their family and small kids nearby their house with also practicing agricultural production. In pepper cultivation, women involvement is also considering high, women were more involve in planting, maintaining also harvesting, processing afterharvest, and marketing.

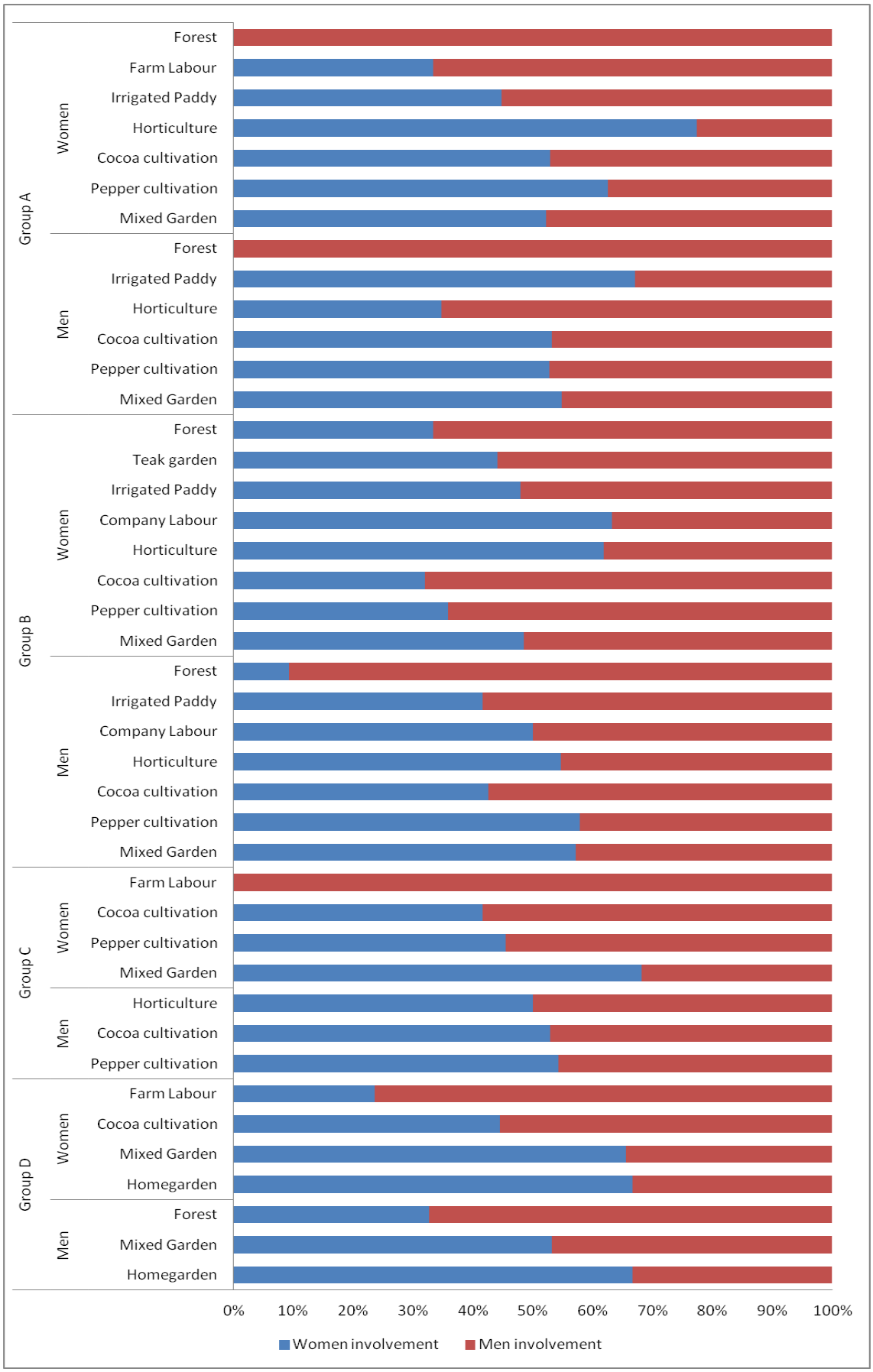


Figure 21 Gender involvement in livelihood source per village groups

Gender role in household

Task division in each household in this area same as in other areas where women were more responsible on household task such taking care the kids, preparing food and make sure all the family members have enough food, while men have responsible as income earner and in public domain. Discussion with the community shows that women spent more time in do all their activities, while men have more leisure time compare than women.

Gender role on farming activity

Women's roles on farming were relatively high in harvesting, post harvesting, and marketing (Figure 22) while men were high in clearing and preparing the land. Similar pattern were found in agroforest production, irrigated paddy cultivation, and vegetable production. Discussion between men and women separately perform almost similar pattern. The contrast case were found while men's argue that in irrigated paddy cultivation, very few women are involved in nursery activity while women's group indicated that women are also involved in this activity for about 20% (Figure 24).

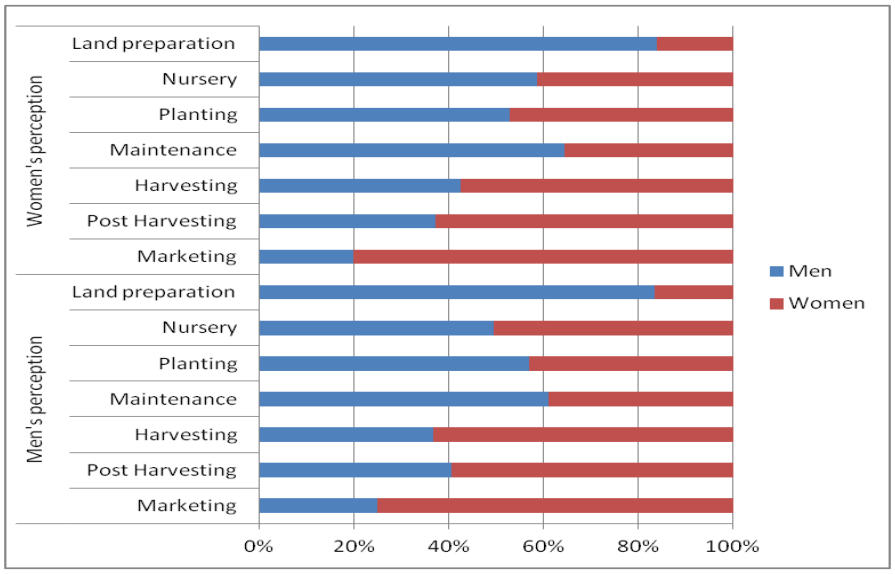


Figure 22 Gender roles on some farming activities in a whole study areas

In some work related with forest area, women's role are relatively high in vegetable and pandanus collection. In Anggawo villages, pandanus become an important livelihood source as raw material for making traditional floor mat (tikar). Though women also have responsible in collecting pandanus in the forest, but their role mainly for support the men's work. Extracting timber, collecting rattan and honey bee were mainly becoming the men's domain of work.

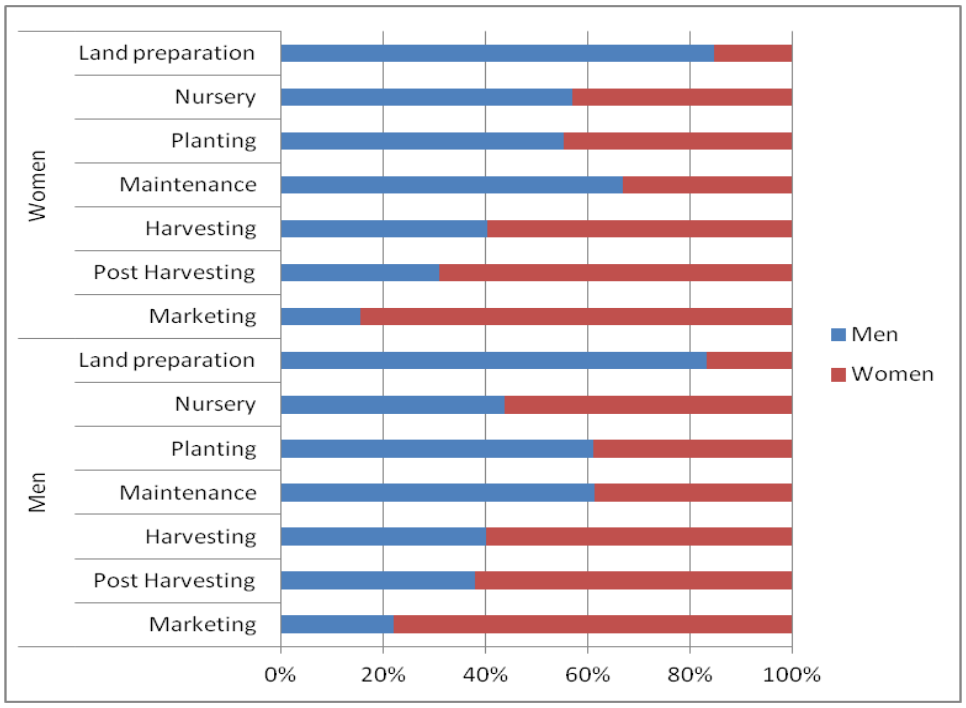


Figure 23 Gender role on traditional agroforest

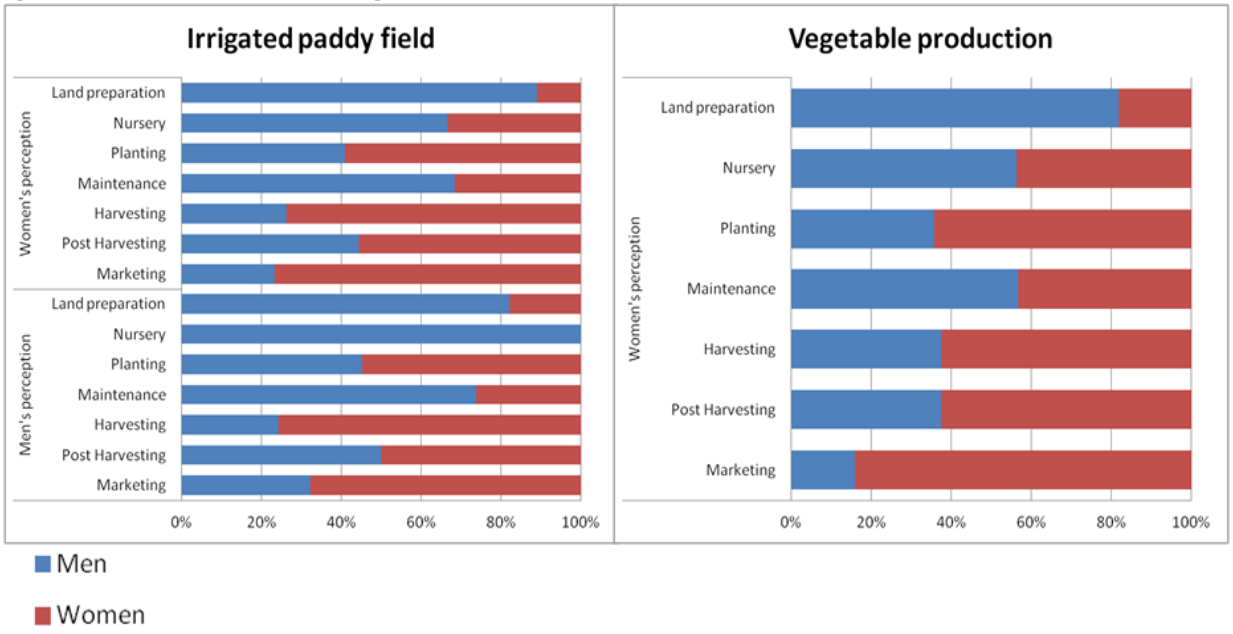


Figure 24 Gender division of task in vegetable production and paddy cultivation in irrigated paddy field

Difference between mens and womens perception not really significant seen from the discussion result. The interesting finding is when we discuss about gender roles in timber extraction while women think that they have contribute their work, but men's were not acknowledge women's work. Women's group were also considering women headed household which also producing timber, but men's were not really accounting them all. Though maybe women not really involve physically in timber production,but women's group considering that women should have power on making decision that timber will be harvest or not.

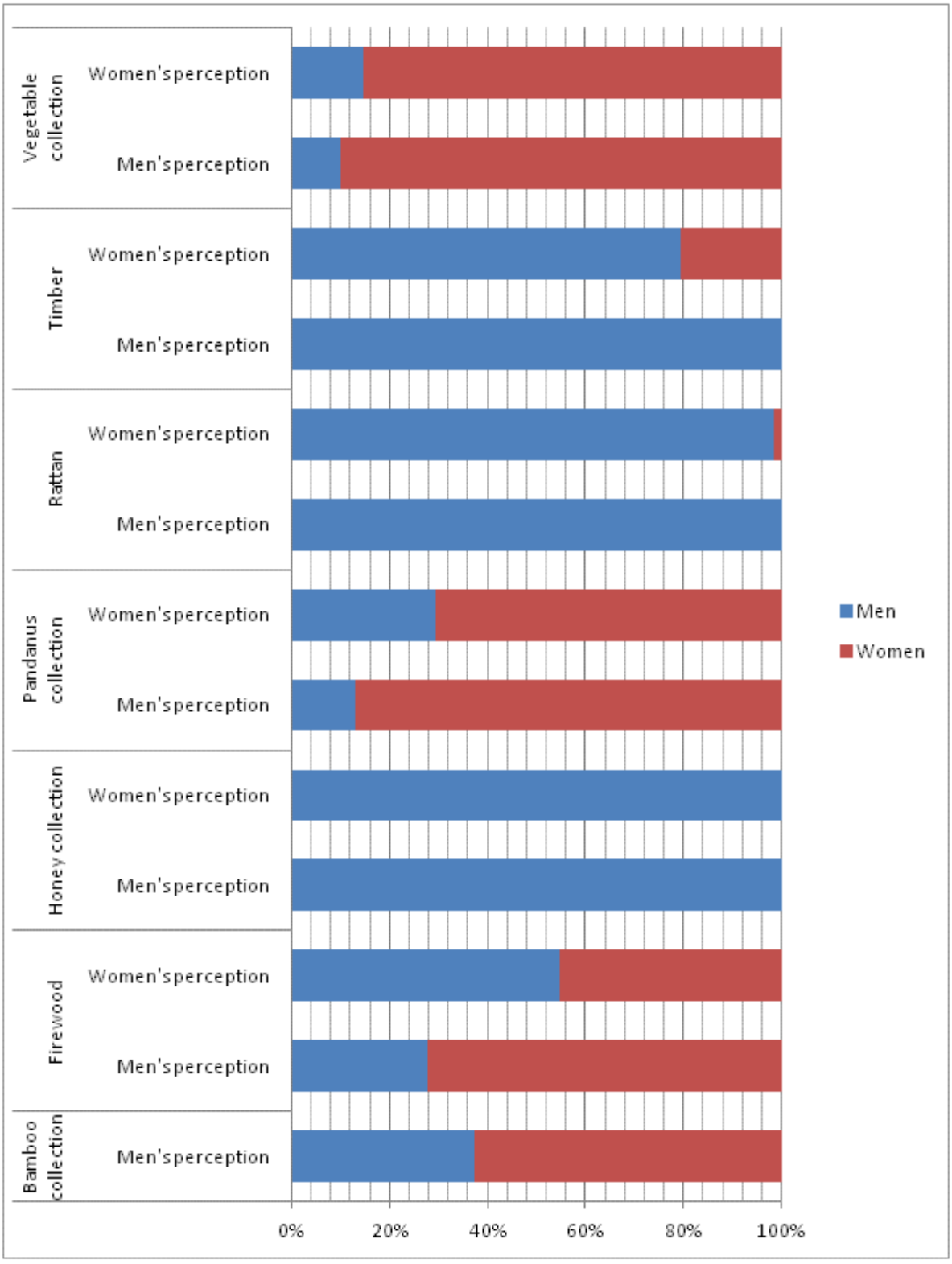


Figure 25 Gender division of task in forest

Land and gender

Land and ownership based on gender were important topic to be discussed in order to see equality on gender issues. Discussion on this section not only about the land ownership, but also on how gender perception about land use value for livelihood and environment.

Land ownership

Same as the situation in South Sulawesi, land ownership usually belongs to men. Women can only having the land or put their name on the certificate if they inherited the land from their parents. Whenever local community get the land by buying it, the name in certificate were supposed to be the husband as family head.

Table 11 Land holding in surveyed village in Southeast Sulawesi

	%Land holders in village	Average area in each villages	Who owned the land? (mention in land letter)	Who have right inherited the land?	Who have right to manage the land?
Mixed Garden					
Anggawo	80	2 – 4 ha	Men (could be also women if the land they get by inherited)	Men and women	Men and women (the owner)
Simbune	95	0.5 – 2 ha			
Lawonua	25	0.5 – 2 ha			
Tasahea	95	0.5 – 5 ha			
Taosu	75	0.5 – 6 ha			
Lamunde	75	0.5 – 2 ha			
Wanoa hoa	80	0.3 – 1 ha			
Ambondiaa	75	0.5 – 1 ha			
UPT Asinoa	95	0.5 – 1 ha			
Irrigated paddy			Men (could be also women if the land they get by inherited)	Men and women	Men and women (the owner
Taosu	10	0.5 – 2 ha			
Lamunde	70	0.5 – 2 ha			
Wonuahoa	75	0.5 – 1 ha			

Land use perspective

Local perception on land use system and their function were identified on scoring exercise using 100 button. Community were divide all of the button to each land use and their function that were identified prior the discussion. There were 3 games within this activities, first community were asked to weight the land use value based on their function on livelihood and environment, and also they have been asking to weight the function base on each land use.

Almost similar with the result in South Sulawesi, in land use types as agroforestry system, irrigated paddy and upland paddy, the function were more on livelihood, while forest were more valued for its environment function. Both men's and women's group discussion perform the same pattern of answer. Looking at the Figure 27, shows that each village typologies performing the same pattern of answer also, forest were more highly valued for its environment function, irrigated and upland paddy field for livelihood function, while mixed garden or local agroforestry

systems were valued both for environment and livelihood, though livelihood is a bit higher than the environment.

Use of mixed garden for source of income and to fulfill basic subsistence need were valued higher than other function (Figure 28 and Figure 29). Both men and women's group argue that the function of mixed garden is indeed as income source, through some economic commodities such as cacao, coffee, clove and candlenut. Subsistence need were performed by some vegetation that used for daily consumption such from some fruit trees as rambutan, candle nut, and sago.

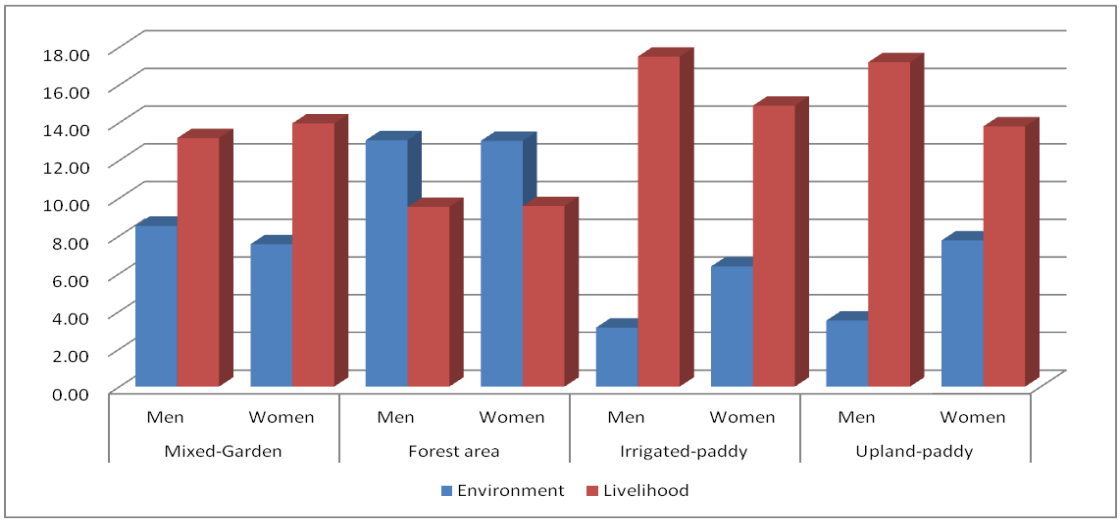


Figure 26 Livelihood and environment function from each land use systems based on gender point of view

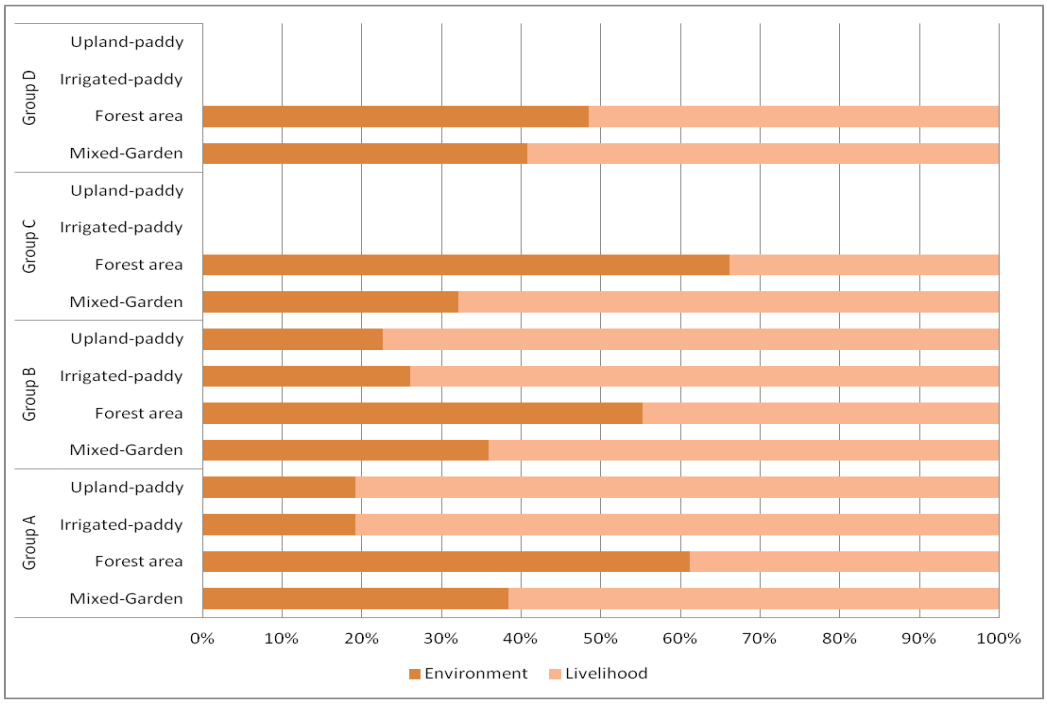


Figure 27 Livelihood and environment function from each land use systems based on village typologies

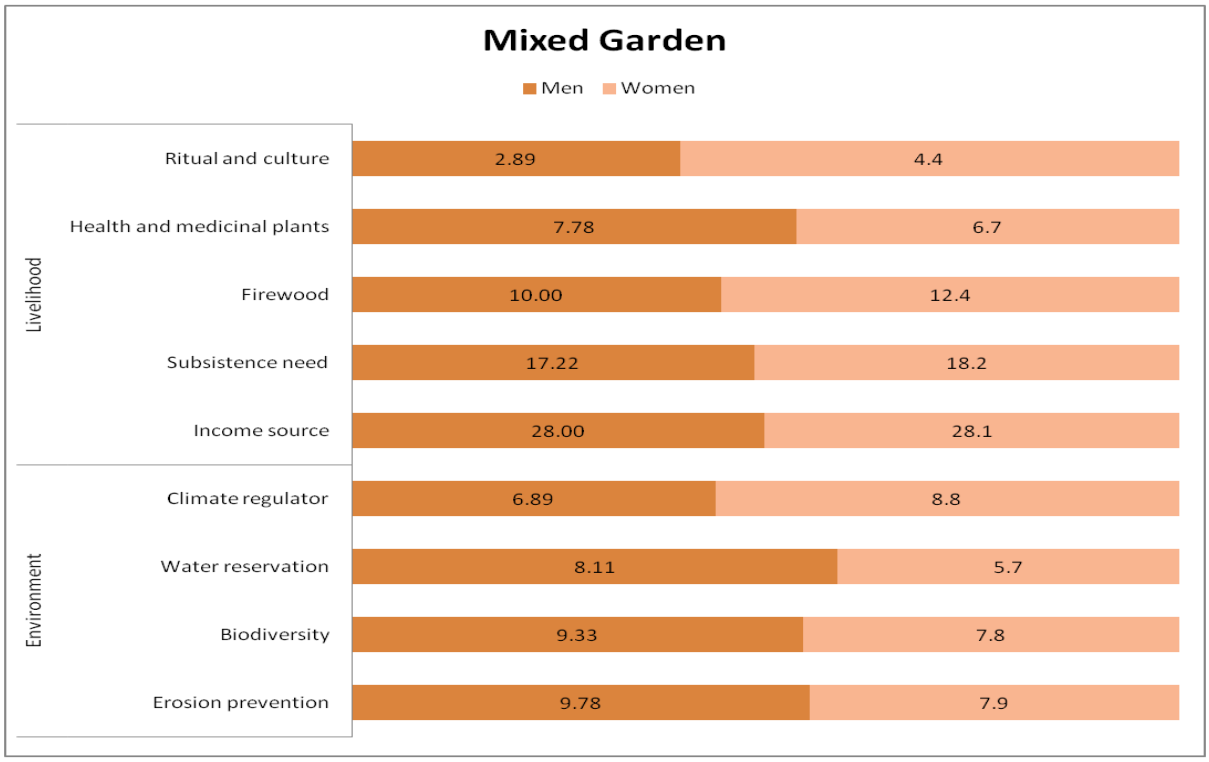


Figure 28 Gender perception on the importance of mixed garden

Irrigated paddy field were valued highly in term of livelihood function. Observation on the discussion process shows that both men's and women's groups were difficult to valued this system in term of the environment function (Figure 30). They don't have similar understanding on the value about water and land conservation, and also for climate regulation issues, they sometimes mixed up the answer. However in term of biodiversity function they understand fully, and shows the tendency that though irrigated paddy have only paddy as the main crops, but it also consist of any other vegetation nearby such miscellaneous kinds of grass and trees, also the animal that can be found within the field.

Consistent with some findings discussed earlier, in some function related with environment, forest were always valued as the highest, both in women's and men's group (Figure 27, Figure 32). Community valued mixed garden as the highest land use that has function as source of income and to fulfill subsistence need, followed by irrigated paddy field (Figure 33), also for ritual and scultural function. For firewood, though forest still become the main alternatives land use, but mixed garden also perform an important land use to fulfilled community needs for fuelwood.

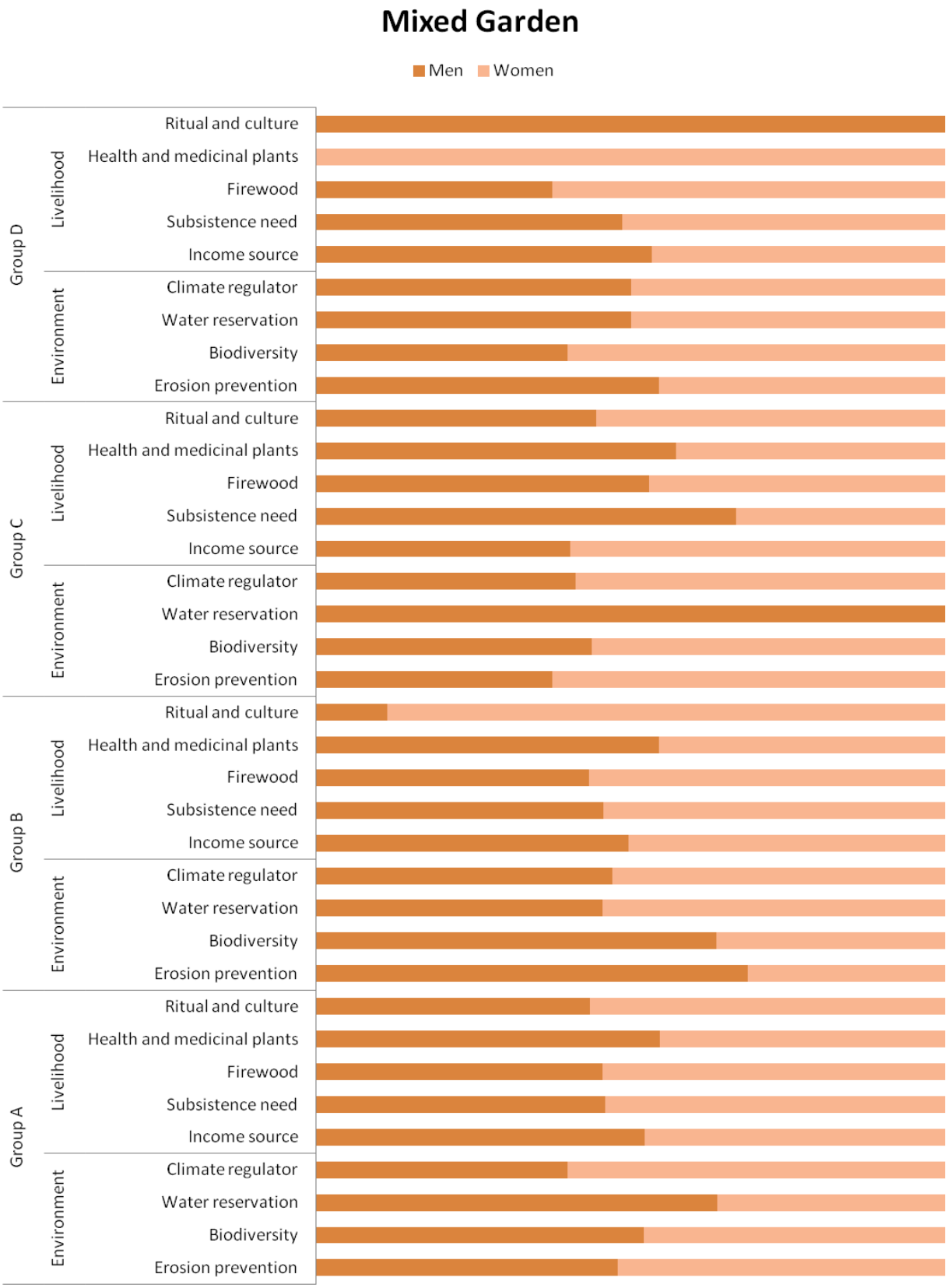


Figure 29 Perception on the value of mixed garden in each village typologies

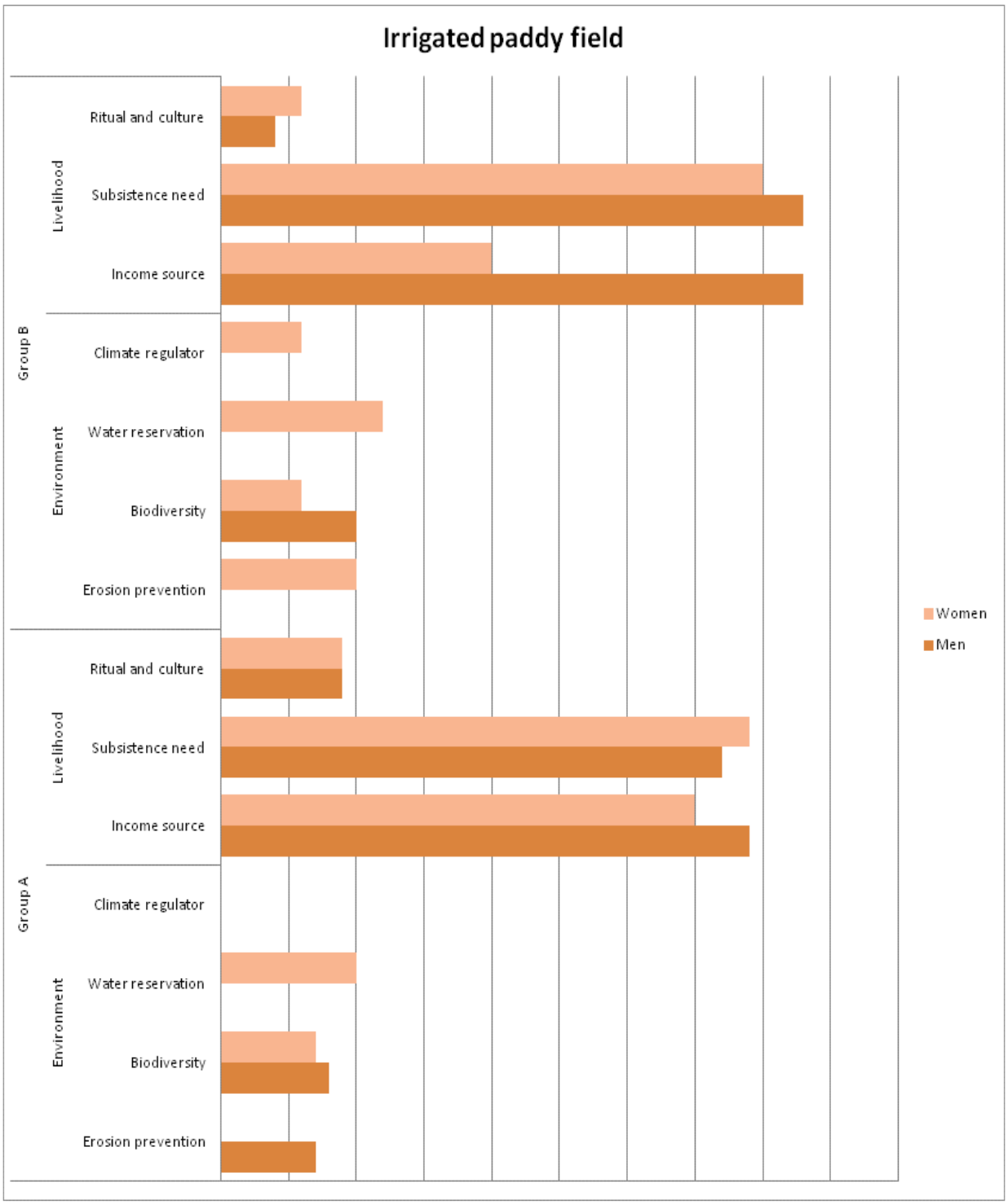


Figure 30 Gender perception on the value of irrigated paddy field

Gender and market

Marketing aspect discussing within this paper mainly on household level, in related to the role of farmers as producer, the entry point of the market chain. Within household, women and men are involved in marketing, while women more on vegetable, paddy and some high market value commodities as cacao, candle nut, clove, and coffee, and men were more responsible on timber

commodities such teak, gmelina, and rattan (Figure 31). Women are usually responsible in marketing farm commodities which around their house and settlement area, while men usually marketing products taken from the forest and heavy (timber). Women argue that timber trade were become men domain since they don't have knowledge on how to estimate timber volume also because of they may need to go to the field or the forest for the transactions. Women are more responsible to market products near the house only because of local trader are usually come to the household house to make transaction and pick the commodities. Therefore, women still can manage their household responsibility and marketing their farm products.

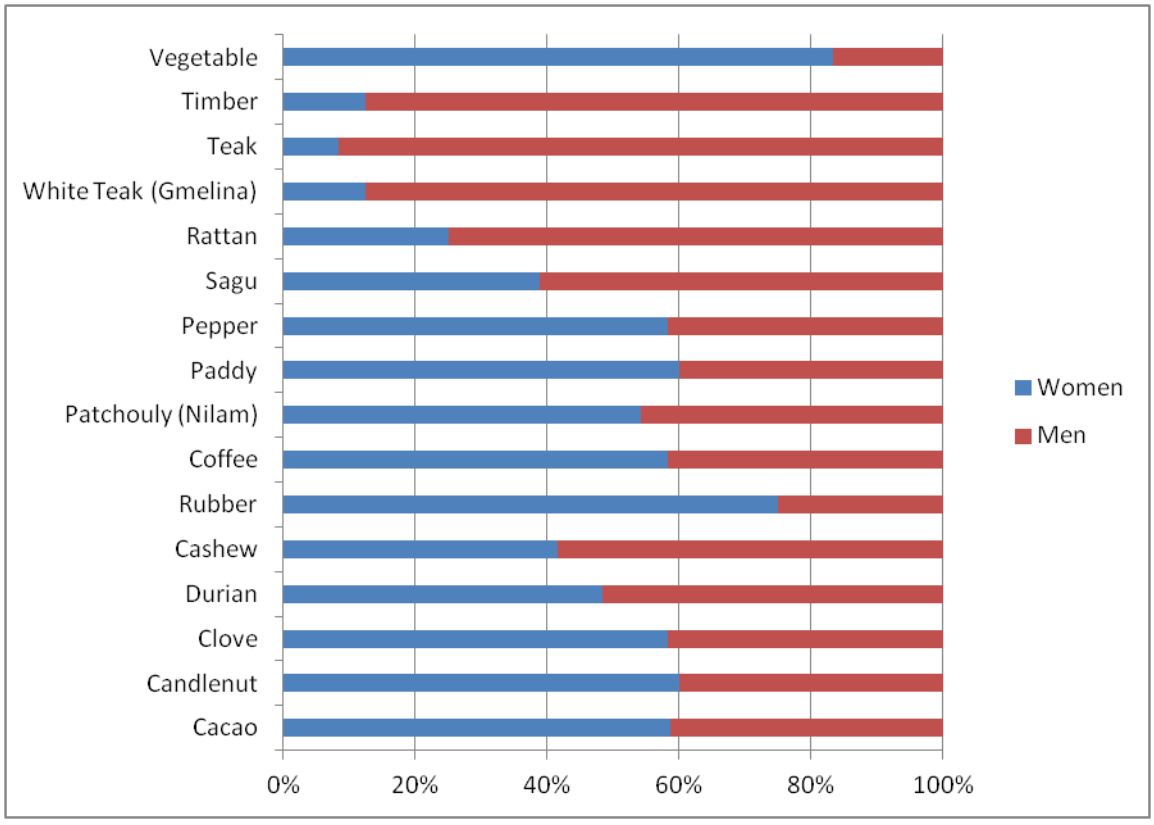


Figure 31 Gender roles on marketing of each common commodities

While doing transaction with local traders, both men's groups and women's group discussion were agree that women have a good skill in negotiating the price rather than men. However, for timber and rattan, due to lack of information on price fluctuation and how to measure timber value, men have better chance to get a good price. Interestingly, in term of rattan transaction, group discussion in some villages (Ambondia, Wanoahoa, and Simbune) mention that women can get higher price rather than men, but still the involvement of women in rattan marketing are still low. However, important to note that though women have a good skill ini bargaining the price, but they still have lack of information about the price fluctuation. Trader usually relate the price with the quality products but producer (farmers) have very limited information on how to get high quality products.

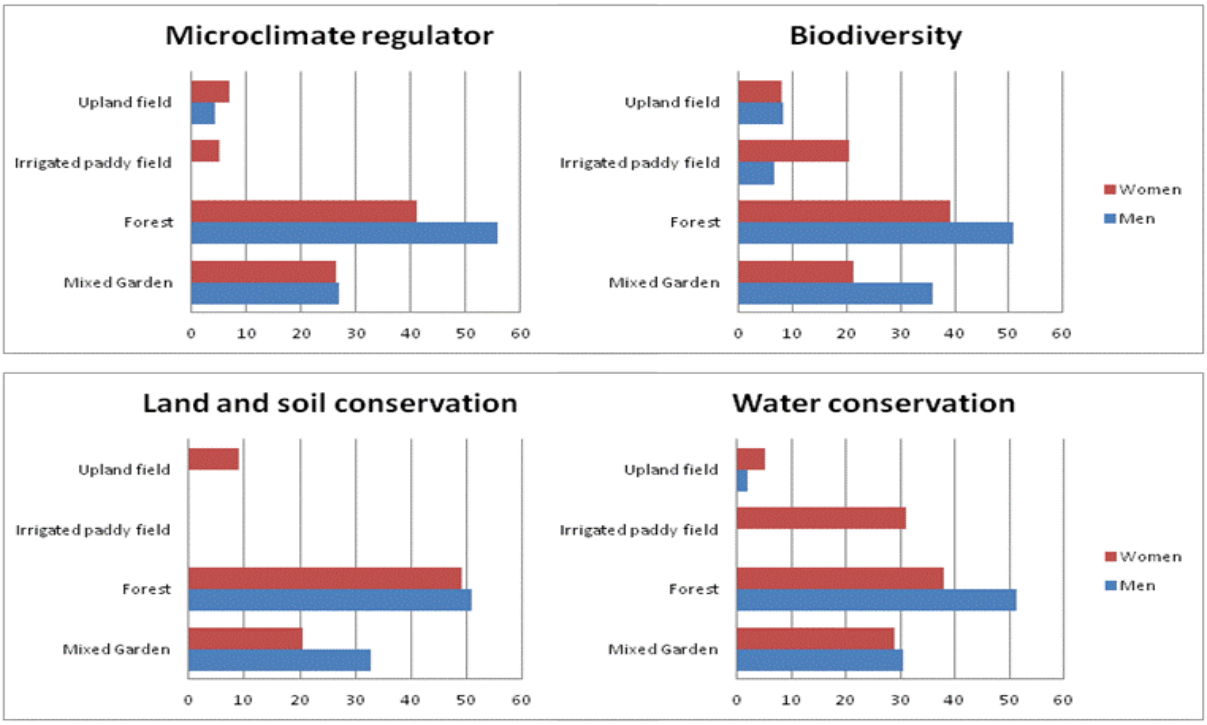


Figure 32 Perception on environment value of the land use

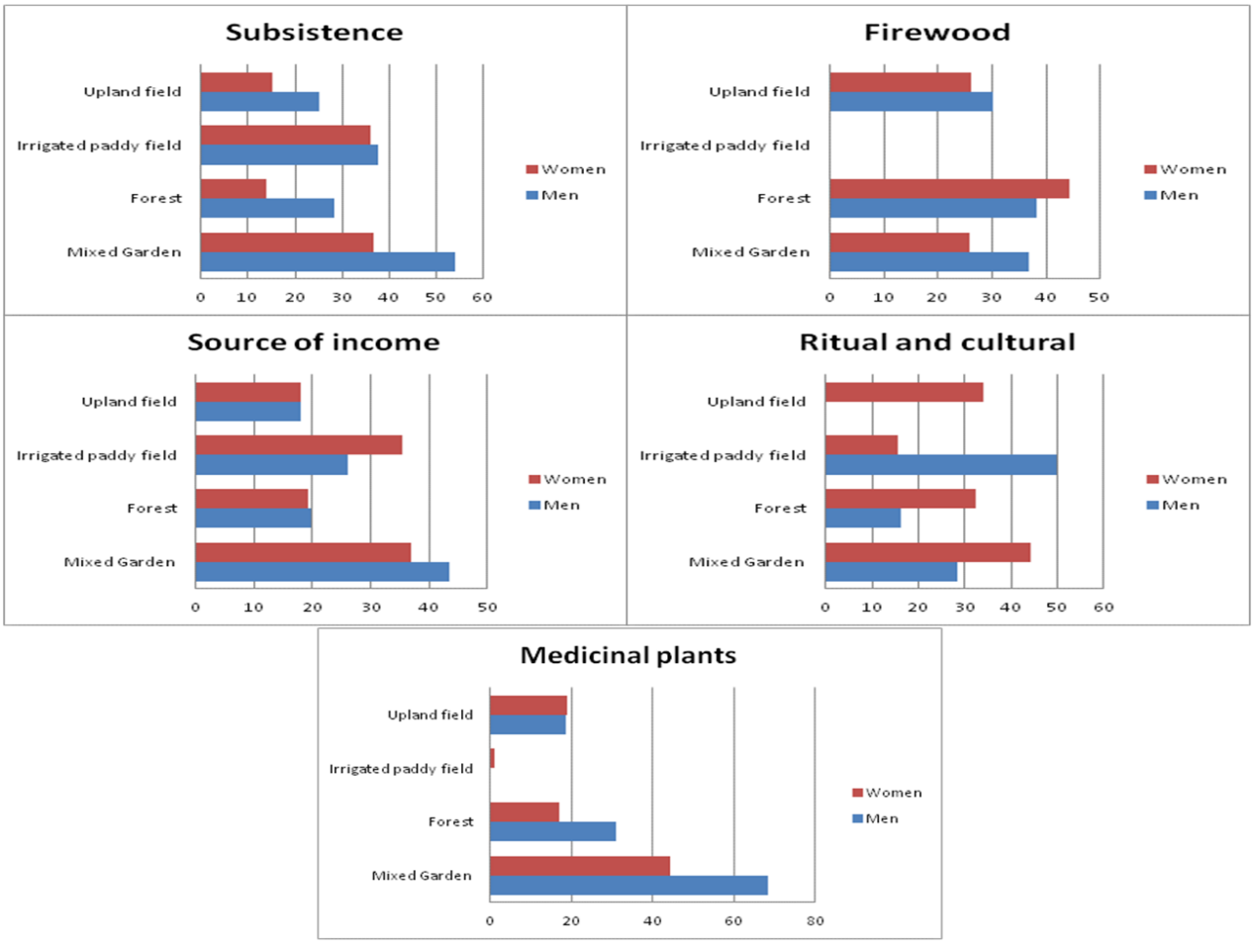


Figure 33 Perception on livelihood value of the land use

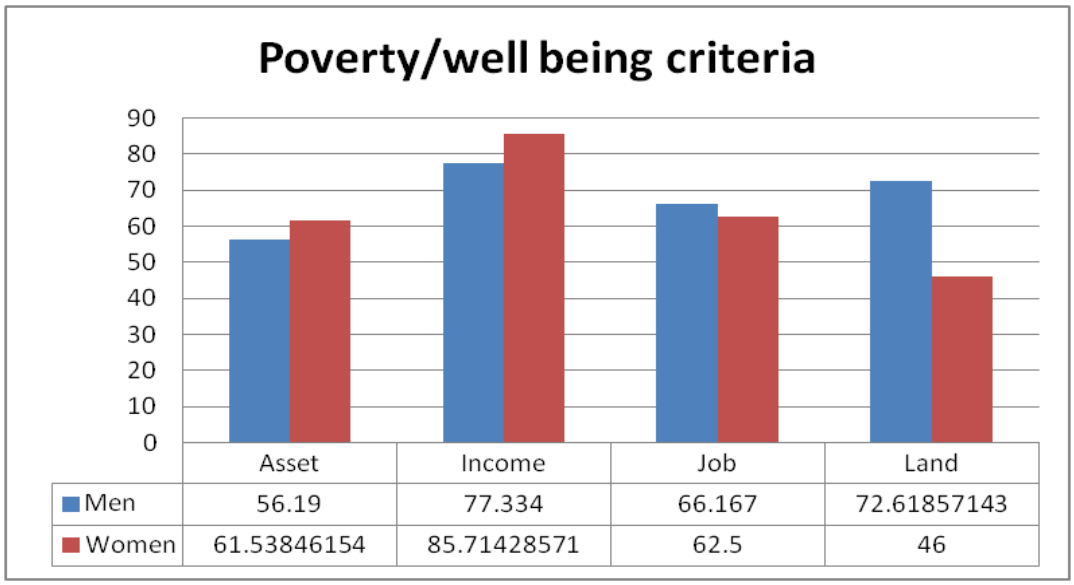
Gender and poverty

Defining poverty in the effort to alleviate poverty is an important step in order to understand people perceived about the poverty. Most of poverty alleviation program use the criteria developed from general and standardized indicators and it sometimes don't match with the local condition. Poverty in not perceived on about income and expenditure dimension, but must be considering other dimension that might be more relevant with local context. Moreover, poverty must be define base on people wants and needs and shoulde be seen as the process of deprivation and relation amoung poor and non poor.

Defining poverty status based on local perception is an important stage in defining local criteria and indicator to identify and design of interventions. It can capture the multidimensional of poverty and the process within. Poverty definition was used to assess the current condition of communities, on what level of their well being. On the discussion, farmers were asking to define what kind of criteria they use to differentiate community in poverty or well being condition. Criteria as describe below were summarized from all discussion with community:

1. Income
2. Do not have permanent job
3. Do not have proper land for farming
Land size less than 0.5 ha per household
Do not have land
4. Do not have proper house
Quality of house from bamboo, round timber, etc
Do not have house
5. Do not have assets
Vehicles

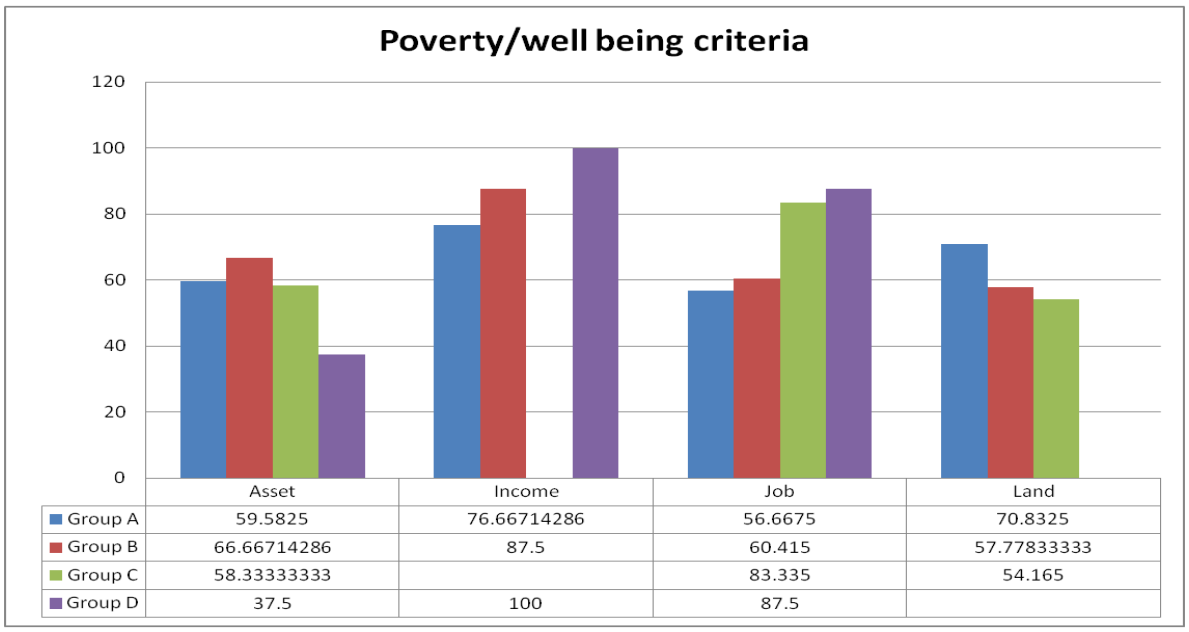
People who don't have certain income and/or job were categorized as the very poor. For the minimum, people may need income around 1 million per month to reach the category lowest well being. People with income below that is categorized as poor. Job was remaining important to indicate well being. People without job that can gives income were define as lazy people, they sometimes have land and resource, but because of they don't use resource to get income then they become poor. On the third position, land were also important to indicate the well being. People with limited land (less than 0.5 ha) were categorized as poor. The last category is house and its assets, such vehicles, etc. People who have house with poor condition (bamboo wall, thatch roof, and soil floor) were categorize as poor. And, in some areas, people who don't have motorcycle also define as poor, though they have a good house.



	Asset	Income	Job	Land
Men	56.19	77.334	66.167	72.61857143
Women	61.53846154	85.71428571	62.5	46

Figure 34 Criteria use to define well being and/or poverty based on gender perspectives

The difference of women and men in defining poverty criteria were figure out in Figure 35. Both women and men were agree that income is become the first criteria to define well being though women put higher value on this criteria. Men were thinking that land would become the second important criteria to define well being. The more people have land, then the more well being he/she is. Women argue that job and asset were more important to define well being; while land holding was considered less important.



	Asset	Income	Job	Land
Group A	59.5825	76.66714286	56.6675	70.8325
Group B	66.66714286	87.5	60.415	57.77833333
Group C	58.33333333		83.335	54.165
Group D	37.5	100	87.5	

Figure 35 Poverty and/or well being criteria as perceived by local community per village typology groups

Income were mostly become the main criteria to define well being and poverty in each typology Groups in the study area (Figure 35). However, in Group C (Tasahea village), income is not considering important to define poverty. People within this village were arguing that certain job,

asset and land the main criteria to define well being. Within Group D, land were not considering important, their mainly mention that regularly income through certain job is important to indicate well being, while people with very low income and has job as free labour or don't have any occupation will be defined as the poorer.

Communities were asked to assess their own condition on poverty level from previous to current condition. This is important to portray on how they define their condition based on their poverty or well being criteria. Well being pattern from past to present were almost the same in each village, they go to the same direction, well being were increasing from time to time. While women mostly argue that their well being status were always increasing, men's in some group discussion argue that their current condition were still below the condition of previous period of time due to farm productivity and the price fluctuation. The causing factors is usually very site specific, but we can summarized other factors which influence on how people perceived their well being status as listed below:

- Natural cause: Pest/Disease, plants and farm production, harvest failure and natural hazards
- External intervention: technology introduction, plantation and farming program from government, electricity
- Market pressure: price fluctuation
- Infrastructure development: asphalt road define the accessibility, the more accessible place, the higher well being due to the development program

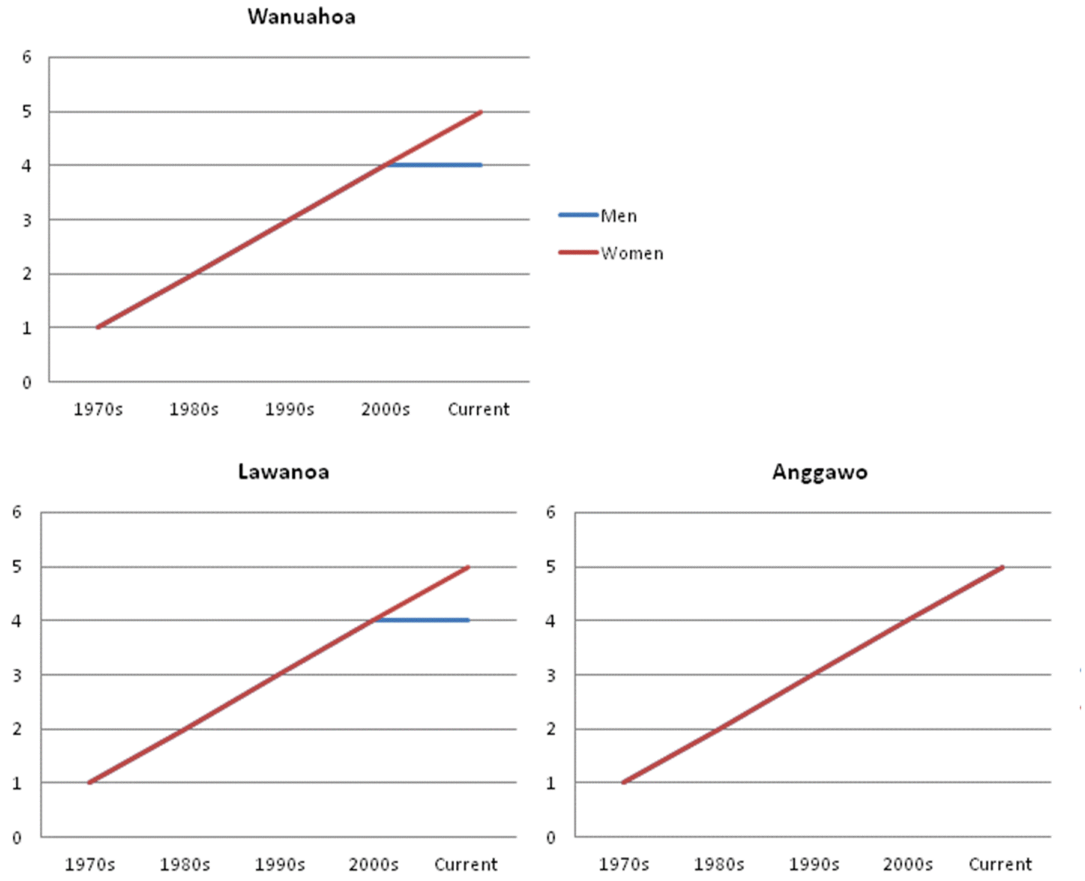


Figure 36 Men and women perception in villages within Group B on valuing their well being and poverty status from 1990s to current condition

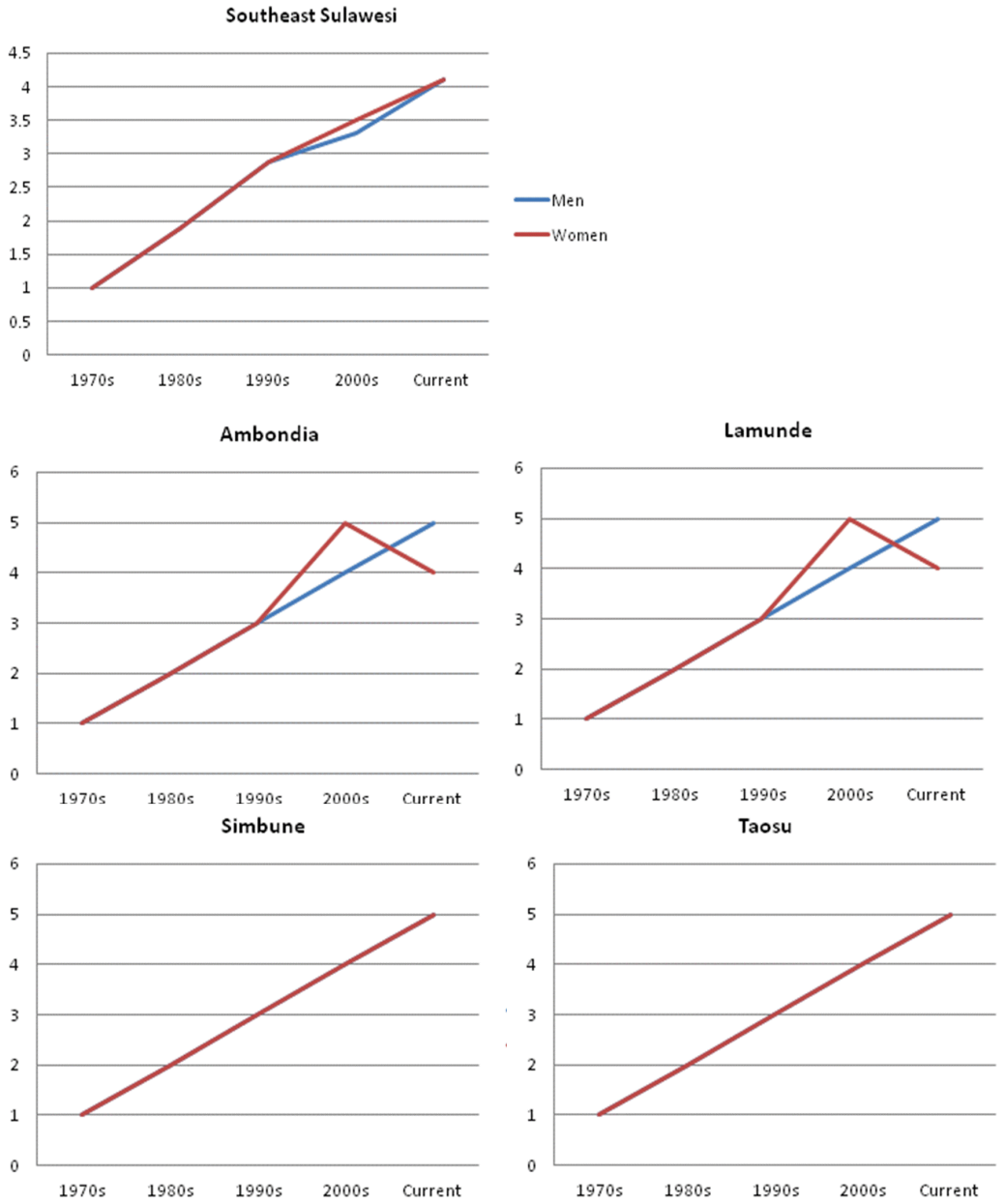


Figure 37 Men and women perception in South Sulawesi and villages' within Group A on valuing their well being and poverty status from 1990s to current condition

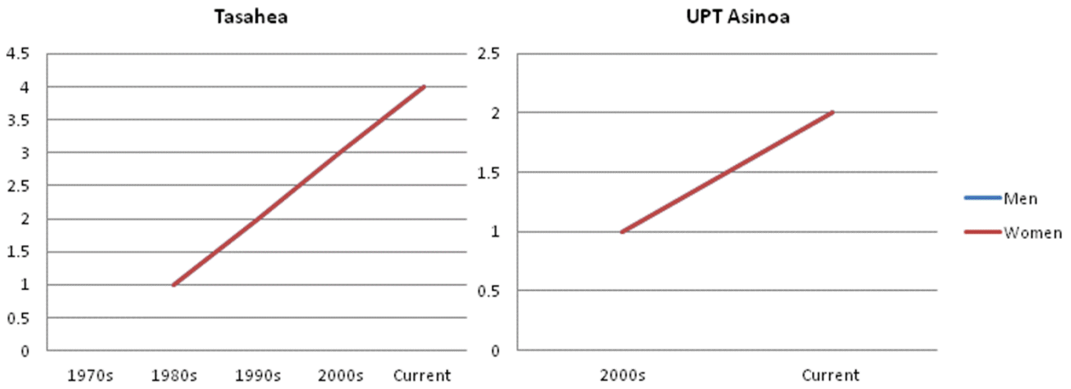


Figure 38 Men and women perception in Village within Group C (Tasahea villages) and Group D (UPT Asinoa) on valuing their well being and poverty status from 1990s to current condition

Closing

Gender issues in provincial level shows that there are some gaps on gender in development issues. There are still some issues related with inequality between women and men, as shown through GDI and GEI that were still below national level. Therefore there must be an integrated program to promote women involvement in community level (considering women as income earner) and also in meso level that women should be more involve in parliament and decision making process.

In household, farm production, land use management, and marketing; women were more responsible in domestic and maintain the land that close to the settlement area, while men have more responsibility as income earner and in public domain. Men were fully responsible in maintaining the land far from the housing complex and related with heavy load of work.

The relationship of gender and land were not only discussed on land rights and ownership, but also on how gender has different perception on land use and their function. In term of land rights, seems that women were still under acknowledge as land holders due to most of land certificate only under men's name. Giving more conducive condition for women to become land owner that were legalized in land certificate will increase the equity of men and women in term of land right. The problem may not be complicated if women were not headed the household, but for women who become head of household, this situation were not fair for women. In relation with how gender perceived the land use value and function, women and men have different perception. The data in those two province shows that women have more knowledge on land use value regarding the environment issues related with biodiversity while men were more on conservation or protecting use of environment. This premise might be interesting to be discussed and analyzed later with more relevant literature. However, to point out with the finding in this study, issue on biodiversity related with medicinal plants, might be important to consider to giving more women involvement in land use management, in particular for mixed garden.

Market chain in Sulawesi, and in particular in Southeast Sulawesi were already take women into account. Women have equal position in market (at least) though women have responsible on cocoa, clove and coffee marketing. However, producer or villager were in the end of market chain and usually they become the actor that always been pressing by the other actors in market. Therefore, in avoiding women to become the pressing victim, women position in the marketing aspect should be strengthen with knowledge on farm products quality and price information.

Recommended criteria and indicator on gender empowerment

- Land and gender → conducive situation to make women is possible as land holder and legalized in certificate, in particular for women headed household.
- Gender, household and farming activities → giving more chance for women to be involved in public, extension service, technical assistance, credit and others, design to be more close to women areas (within the village)
- Gender and livelihood source →program could be targeting the livelihood source preferred by both women and men, as Mixed Garden, irrigated paddy field and maize production in South Sulawesi. In Southeast Sulawesi, in addition to mixed garden and paddy field, homegarden were an important livelihood source for women.
- Gender and market → women's knowledge on cacao, coffee, and clove products in term of their quality should be increase, therefore women have strong bargaining skill not only in term of price but also on their position within the market chain.

Part Four: Agricultural Extension

Endri Martini, Elok Mulyoutami, Syamsidar, Rahma Talui, Jusupta Tarigan, Anang Setiawan, Suyanto

Background

In the AgFor project, farmer extension approach, which is reflected in specific outcomes throughout the project design, will be implemented with the objective to empower motivated farmers of both genders in: i) enhancing and diversifying the productivity and profitability of their tree-based systems; ii) strengthening farmers capacity to seize market opportunities, both existing and potential, and iii) increasing the likelihood these will continue after the life of the project. Series of studies on innovative extension approaches are being conducted to support the effectiveness of farmer extension approach that will be implemented in AgFor project. Hence, a baseline survey was conducted to support the implementation of the extension services in the AgFor project. The objective of this baseline survey was to list and analyze the existing conditions of agricultural extension practices in South East Sulawesi. Results from this baseline survey are useful as basic data to design, implement and analyse the effectiveness of farmer extension approach in the AgFor project.

Methodology

Survey in South East Sulawesi was conducted in end of March 2012 to end of April 2012. Data was collected through discussion with key stakeholders. Refering to AgFor project main goal to link knowledge with action, in this survey key stakeholders were grouped into three, i.e. a) research agencies who produce knowledge; b) extension agents who disseminate knowledge; and c) communities who use the knowledge to perform action in their land.

Issues on agroforestry research was discussed with researchers in Haluoleo University. Discussion with Agricultural Technology Development Agency (Balai Pengembangan Teknologi Pertanian) in South East Sulawesi was also conducted to understand research result on agricultural production and extension activities.

Discussion with extension agents were conducted at district level, i.e. at 2 AgFor project districts: i) Konawe district, South East province and ii) Kolaka district, South East Sulawesi province. At each district, extension or community based activities that has been conducted by government agency was discussed with Forestry and Estate Crop Agency (Dinas Kehutanan dan Perkebunan), Agricultural Agency (Dinas Pertanian), Food security and Extension Agency (Badan Ketahanan Pangan dan Penyuluhan (only for South Sulawesi)), Agricultural, Livestock and Forestry Extension Agency (Badan Penyuluhan Pertanian Peternakan dan Kehutanan (only for South East Sulawesi)). Secondary data from Biro Pusat Statistik was also collected at district and subdistrict level, to provide better understanding on the agricultural production in the project area.

Discussion at community level was conducted through Focus Group Discussions (FGD) at village level by disaggregating the group into women and men groups in each selected villages (sample villages) as described in Introduction. Number of participants varied between 5 to 12 persons per group of FGD.

General Agricultural Extension Issues

In general, since 2007, there was a reformation in the structure of national government extension institution. Based on national regulation UU No. 16/2006, all the extension officers from agriculture, fishery and forestry were merged into one independent government agency that is located at provincial and district level. Based on the regulation, government extension institution at provincial level is Badan Koordinasi Penyuluhan, while at district level is formed by head of district into a Badan Pelaksana Penyuluhan (Figure 39). Formerly, before 2007, extension officers were employed under different departments based on their expertise. Based on the discussion with some of the extension officers in the project areas, situation for extension officers were more difficult after the merger because each extension officer is urged to understand other topics outside their main expertise (polyvalent), for instance forestry extension officer sometimes also need to understand the agricultural issues. Thus, trainings on cross-sectors issues were intensively provided for extension officers at district level. From administrative point of view, after the merger, the administrative channel was more complex than usual. Hence, implementation of this UU No. 16/2006 regulation may need to be reviewed in order to enhance the effectiveness of extension services.

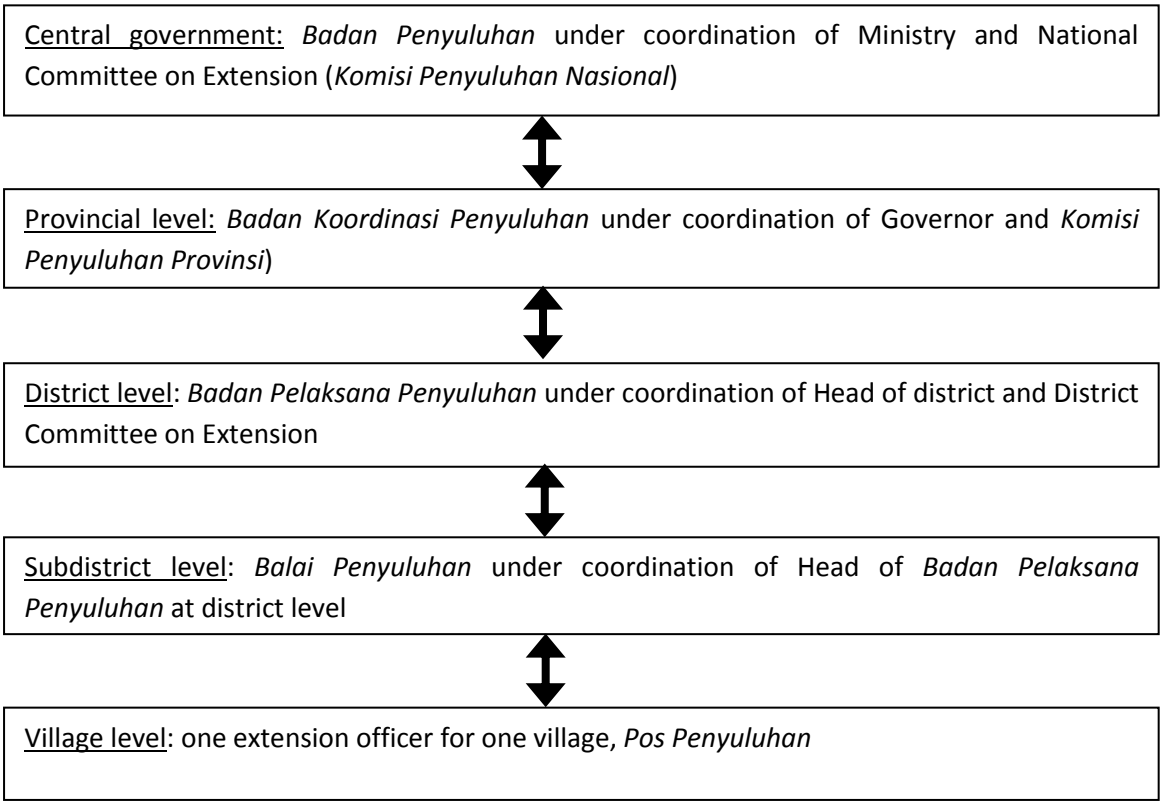


Figure 39 Structure of Government Extension Organization based on regulation UU No. 16/2006.

Other challenge in government extension activities was the lacking of extension officers. This challenge was pronounced in all AgFor project sites, particularly for forestry extension officer. To cope with this challenge, government employs part-time extension officers to fullfil the need of specific project for example the Kebun Bibit Rakyat (KBR) project, which was a project from Forestry Department to establish Community-Based Tree Nursery for rehabilitation program.

Besides the limited number of officers, extension officers were also lacking of motivation and skills in facilitating innovation and adoption of new technology. Most of the extension activities were still based on top-down approach; there were still few extension officers who have good initiatives to proactively provide extension services to community. Thus, to increase extension officer motivation in providing services, annually, government held competition to select best extension officer at district level up to national level. Poor road accessibility and lack of facilities were also the two important aspects that impeded extension officers in providing services to community.

Linkage between the extension agent with the research institutes were also still lacking. Research institutes, that mostly located at provincial level, has less action in disseminating the research results to farmer level. Main challenge in disseminating the research results was the lack coordination between research institutes (who are responsible in producing research result) with the extension agencies (who are responsible in disseminating research result). However, there was an exceptional case for the Balai Pengembangan Teknologi Pertanian (Government Agency for Agricultural Technology Development), which has been doing research together with community, thus research result dissemination process was more effective.

At subdistrict level, different with the extension office at district level who have direct coordination line with the head of the district, extension office at subdistrict does not have direct coordination line with the head of subdistrict. Thus, extension officers were located in different office with the subdistrict local government office. At subdistrict level, extension officers were located in Balai Penyuluhan Pertanian (BPP) office. At least every 2 weeks the extension officers need to visit their farmer group in the village for providing consultation services and also helping farmer develop proposal for fund or aid from departments at district level. However, not all extension officers interact with farmers in villages every 2 weeks, for villages in remote areas with poor accessibility as in Konawe district, extension officers were rarely visiting villages.

Heads of subdistrict that were visited during the survey were dissapointed with the limiting coordination between head of subdistrict and the departments at district level on potential aids provided for farmers. After decentralization, aids from department at district level was given directly to farmers ,and the process was facilitated by extension officer. Thus, head of subdistrict does not have the authority to interfere with the process. However, normally the departments at district level have to inform the head of subdistrict in every program at department level, through meeting for planning sub district development (musrenbang) that is held every year (in Februari or March). Hence, head of subdistricts that were visited during the survey, were requested to be updated on activities conduct by AgFor.

In the future, AgFor is expected to build coordination with the extension officers in all 4 project districts, by involving 1-2 extension officers at each AgFor project village level to do join monitoring and invite them in every training held by AgFor. Thus, it would be interesting to synergize AgFor program with the extension district office strategic plan.

Agricultural extension issues at community level

Agricultural extension issues at community level were explored through FGD with farmers at village level. Relevant information on species priority, extension services, demonstration plots, cross-visits, marketing issues, gender issues and communication media were collected and analyzed. Below are the results from the FGDs.

Species priority

Farmer priority species AgFor project villages were analysed by compiling all information that were collected and categorizing the information into 3 perspectives, i.e.:

- Based on its marketable products (*market*), i.e. the species has marketable products that are consistently contribute to the local livelihood.
- Based on farmers preferences by current condition (*current*), i.e. the species is preferred by farmers to be maintained in their garden because it is the source of income and also because it can be used for own consumption.
- Based on farmers expectation in AgFor intervention programs (*expect*), i.e. the species that in the future is expected to contribute to the local livelihood enhancement, the species can be a new prospective species or can be the existing species that is considered has good prospect in the future.

Based on its market and its current conditions, if compare between village groups, there were different species prioritization between the groups (Table 12). Differences were distinctly seen for the new-transmigrant village that has different species priority if compare to the other village groups. In new transmigrant village, the main species priority was the short-term crops this was mainly because the farmers don't have savings and their tree-crops were still at early stage of planting and unproductive. Interestingly, the transmigrant village group also select the short-term crops as one of the main priority species for their livelihood. The differences between the transmigrant group and the new-transmigrant group was the transmigrant group has sources of livelihood from different species, thus they didn't depend only on short-term crops, but also considering other species like cacao, pepper, durian and rambutan as the main species in their livelihood. For livelihood, farmers in new-transmigrant village and transmigrant also utilize the NTFP such as honey, firewood and brown sugar (from arenga) as source of income.

For the local village group and mixed village group, cacao, pepper and durian were the most prioritized species that contribute to the local livelihood. Differences between the local village group and mixed village group were the occurences of clove as the priority species only in mixed village group. Clove was successfully domesticated in South Sulawesi, thus in mixed village group, migrants farmers from South Sulawesi may share their knowledge on clove domestication to the local farmers. And in mixed village group, NTFP was not considered as the priority species, while the local village still utilize NTFP as source of income.

In summary based on the market and current conditions, between village groups, the transmigrant and new-transmigrant villages were likely has relatively same priority species for their livelihood, however the transmigrant villages has more diverse source of income from different species than the new-transmigrant villages. On the other hand, the local village group and the mixed village group has relatively same priority species, however the mixed group has clove as species priority that

wasn't occur in the local group, and the local group still utilize NTFP as source of income while none NTFP utilization occur in the mixed village group.

Table 12 Top ten species priority by farmers in South East Sulawesi per village groups (local, mixed, transmigrant, new-transmigrant). Plant species was prioritized based on its expected intervention in AgFor (expect), its current market condition (market) and its current priority in local livelihood (current)

Plant species	Local			Mixed			Transmigrant			New-transmigrant		
	ex-pect	mar-ket	cur-rent	ex-pect	mar-ket	cur-rent	ex-pect	mar-ket	cur-rent	ex-pect	mar-ket	cur-rent
Rubber	1			2						1		
Cacao	2	1	1	2	1	1	3	1	2		3	2
Coffee											8	2
Coconut		3	6	9	10			1	2	2		8
Pepper	3	1	2	4	3	1	2	1	2		8	
Clove	5			5		6				3		8
Patchouli		4	6		7	8		5	7			
Nutmeg				5								
Candlenut		7										
Short-term crops (vegetables, chili, tomato, beans)	7	4	4	9	7	5		1	1	3	1	1
Sago			6						7			8
Maize	7								7	3		
NTFP (honey, firewood, arenga)		7						5			2	
Timber species												
Timber	7				1						8	
Teak	5		6	8	10	6		5	7	3	8	8
Fruit species												
Durian	3	7	2	1	3	1	1	5	2	3	3	2
Rambutan		7	4	5	3	4	3	5	2		3	2
Banana					7	8					3	2
Orange											3	2
Lansium		4	6		6	8		5	7			
Jackfruit									7			
Mango									7			

Note: Number 1 to 10 means ranking with 1 as the highest rank

Based on prospective species or expected species for AgFor intervention, the local village group and the new-transmigrant group has same most prioritized species, i.e. rubber. Meanwhile the mixed village group and the transmigrant group has the same most prioritized species, i.e. durian. Durian

was also the second priority species in local and new-transmigrant group. Cacao and pepper were the second most prioritized species for all village groups except the new-transmigrant group. The new-transmigrant group selected coconut, clove, short term crops, maize, teak and durian as the second and third priority species. Interestingly, in opposed to rubber that was considered as the most priority species though there is no market yet for its products, the patchouli was not selected as prospective species though it contributes to the current local livelihood. Farmers didn't want to plant patchouli anymore due to the fluctuative price of the patchouli leaves.

In summary for the prospective species for AgFor intervention in South East Sulawesi, durian was likely the most demanded species. Farmers chose durian because of the high price of durian fruit and also because in the future they can sell the timber if the tree production has decreased. Rubber ranked as the second prospective species in South East Sulawesi, however, up to now only few farmers plant rubber in their garden, this due to the lack of access to rubber planting materials. Also currently there is no local market yet for rubber in South East Sulawesi, thus exploring market potential of rubber is urgent if this species want to be included as the focus species in AgFor intervention. Cacao and pepper, two species that were currently most contributed to the local livelihood, were chosen by farmers as the prospective species for AgFor intervention particularly for intervention on pest and disease handling. Clove and teak were chosen as prospective species because farmers has lack of access to planting material and information on the cultivation of these species. While banana and other short-term crops was chosen as prospective species because it can be harvested in short time, however the pest and disease management and the marketing aspects are still need to be improved.

Main reason why farmers selected the prospective species to be included in AgFor intervention were due to the lack of access to good planting materials, lack of innovation in pest and diseases management, and lack of innovation in marketing strategies. Since many years ago, government has seedling distribution programs to answer the challenge of farmers' lacking access to planting materials. Seedlings were distributed to farmers based on request that was written in a proposal by farmer groups (Table 17). Distribution of planting material by local goverment was conducted to enhance farmers access to planting materials. Government agencies that distributed seedlings were mainly Dinas Pertanian, Dinas Perkebunan and Dinas Kehutanan.

Extension services

For this survey, extension services were classified into two different activities, i.e. in-class activities and the practicum or training. In the past five years in South East Sulawesi, most farmers have received extension services both training (Table 18) and in-class activities (Table 19) on agricultural issues such as vegetables cultivation, cacao side grafting, composting. Except for farmers in Wonua Hoa-migrant, who hasn't received training from any organization may be because of the poor road accesibility from the main road to the settlement area. In the former extension services, 0% to 30% of the participants were women.

Table 13 Potential topic for in-class activities of AgFor extension services in South East Sulawesi

Village	Topics			
	Cultivation and crops maintenance techniques	Pest and Disease handling	Plant varieties identification	Livestock management
Local village group				
Ambondiaa	Rubber, Cacao, Gaharu	Cacao, Durian, Rambutan, Coffee, Patchouli	All plants that suitable to be planted in Ambondiaa	Cow and Poultry
Lamunde	Cacao, Paddy, Pepper	All plants in the village		Cow and Poultry
Simbune	Cacao, Pepper	Pepper		
Taosu	Rubber, Nutmeg	All plants in the village	Cacao	
Mixed village group				
Anggawo	Rubber, Durian (fruiting season)			
Lawonua	Rubber			
Wonua Hoa-migrant	Rubber, Red ginger, Chili		Cacao	
Wonua Hoa-local	Cacao and Paddy (how to utilize the paddy ricefield during the break (*puso*)?	Cacao	Cacao	
Transmigrant village group				
Tasahea	Pepper, Cacao, Coconut, Clove	Pepper (how to select superior pepper variety)	Durian, Cacao and Pepper	Swine and Cow
New-transmigrant village group				
UPT Asinua Jaya (Lasao)	Clove, Durian, Rubber	All plants in the village		

From the FGD at village level, if compare between village groups, there were no significant differences on the major topics for expected in-class extension services in AgFor in South East Sulawesi. Cultivation and crops maintenance techniques was the most demanded in all village groups. Pest and disease handling become the second most demanded topics for in-class extension in all villages. Plant varieties identification was the third most demanded, and the livestock management become the fourth most demanded topics. However, though there was no significant different on preferences for in-class topics between village groups, each village has different focus species in every topic, for example in in-class activities on cultivation techniques, farmers in Lawonua wanted to focus on rubber only, while in Wonua Hoa-local wanted to focus on cacao and paddy (Table 13).

For type of expected training at village level under AgFor extension services in South East Sulawesi, there was different priority in the training topics between village groups (Table 14). In local villages group, 100% of the villages in the group selected vegetative propagation as the topic for training, 75% selected organic fertilizer, 25% selected pest and disease handling, post-harvest cacao and land suitability assessment. In Mixed villages, 75% of the villages in the group selected cacao rejuvenation

as topic for training, 50% selected vegetative propagation and pest and disease handling, 25% selected rubber agroforestry and microhydro power. For transmigrant village group, only selected training on pest and disease handling. While for the new-transmigrant village selected only vegetative propagation.

In summary, vegetative propagation was the most demanded training topic in South East Sulawesi, followed by pest and disease handling, then the cacao rejuvenation and organic fertilizer as the third most demanded training topic. Training on rubber agroforestry and microhydro power only demanded in the mixed village group. And the post harvest cacao and land suitability assessment only demanded in the local village group.

Table 14 Type of expected training at village level under AgFor extension services in South East Sulawesi

Village	Vegetative propagation	Cacao Rejuve nation	Pest and Disease handling	Organic fertilizer	Rubber agro-forestry	Micro Hidro-power	Post harvest Cacao	Land suitability assessme nt
Local village group								
Total percentage	100%	0%	25%	75%	0%	0%	25%	25%
Ambondiaa	V							
Lamunde	V		v	v				v
Simbune	V			v			v	
Taosu	V			v				
Mixed village group								
Total percentage	50%	75%	50%	0%	25%	25%	0%	0%
Anggawo		v	v			v		
Lawonua	V	v			v			
Wonua Hoa-migrant	V	v						
Wonua Hoa-local			v					
Transmigrant village group								
Total percentage	0%	0%	100%	0%	0%	0%	0%	0%
Tasahea			v					
New-transmigrant village group								
Total percentage	100%	0%	0%	0%	0%	0%	0%	0%
UPT Asinua Jaya (Lasao)	V							

Table 15 Former demplots and potential expected demplots in South East Sulawesi AgFor project villages

Village	Demplots from previous program			Expected Demplots under AgFor	
	Year	Extension agency	Demplots	Garden demplot	Nursery demplot
Local village group					
Ambondiaa	2011	Dinas Pertanian	Paddy for dryland (shifting cultivation)	Mixed system (Rubber+Cacao+ Durian)	Rubber
Lamunde			Paddy ricefield	Mixed system (Cacao+Durian+ Pepper+Rubber+ Clove)	
Simbune		University	Side grafting demoplots	Mixed system (Cacao+Pepper)	
Taosu	None			Mixed system (Rubber+Nutmeg)	Rubber and nutmeg
Mixed village group					
Anggawo	None				
Lawonua	None			Mixed system (Rubber+Durian+ Pepper+Fruits)	
Wonua Hoa-local	None			Mixed system of short-term crops (to be harvested in 1-3 years)	Durian
Wonua Hoa-migrant	None				Fruits, durian, rubber
Transmigrant village group					
Tasahea	1986		Monoculture orange cultivation	Monoculture system: Pepper	
New-transmigrant village group					
UPTAsinua Jaya (Lasao)		Dinas Pertanian, Dinas Tenaga Kerja dan Transmigrasi	Vegetables (tomato, chili)	Mixed system (Clove+Durian+ Rubber+Teak+ Coconut)	Clove, Rubber, Durian

Demonstration plots

Demonstration plots (demplots) have proven to be effective in assisting the adoption of innovative technology that is introduced to farmers. Farmers tend to adopt technology that have been practiced or proven can give benefits. Hence, AgFor is interested in establishing demonstration plots in: i) existing gardens to demonstrate the advantages of improved management; and ii) fallow gardens to demonstrate the advantage of good quality germplasm and systematic design. And in order to enhance farmers interaction in the demplots, the plots need to be established in a

participatory manner. And to maintain its existency in post-project phase, the demplots need to be designed by AgFor staffs, extension officers and farmer-landowners.

In the FGD, when farmers were asked to list type of demonstration plots (demplots) that want to be established through AgFor, not much farmers understand the term of demonstration plots. In most of the villages, formerly not much demplots established by government agencies nor by non government agencies (Table 15).

If compare between village groups, the mixed village group never had demonstration plots in their areas, thus when farmers in Anggawo and Wonua Hoa-migrant were asked on their expectation for demonstration plots design under AgFor, none answer received from the farmers. The transmigrant village and new-transmigrant village group had more experience with demonstration plots if compare to the local village and mixed village group, this due to the intensif government program in the first years of the transmigration program.

Designs for expected demonstration plots in AgFor were varied between village groups depend on the main source of livelihood in the area and the amount of land available for demonstration plot. Most of the farmers were expecting the demonstration plots would focus on how to mixed different species under same garden, except farmers in Tasahea who wanted only to focus on improvement of pepper plantation (monoculture).

Cross-visit

Cross-visit is an activity where farmers from one location are visiting other location to learn more by observing and interacting directly with other farmers or relevant stakeholders. Cross-visit benefit farmers in developing network with other stakeholders on the subject they are interested in. Thus, cross-visit is interesting to be implemented as part as extension services in AgFor Sulawesi.

Based on the FGD results, in South East Sulawesi, 5 out of 9 AgFor villages have not yet experienced cross-visit (Table 20). Formerly, cross-visit activities were supported mostly by Dinas Pertanian and Dinas Kehutanan in every district. At least once per year, there was a cross-visit event organized by Dinas, however due to budget constraint, participants who can attend the field visit was limited to 1-5 persons per village with women participation varied between 0% to 30%. In South East Sulawesi, the cross-visit frequency was uncertain. Issues that were studied during the cross-visit held by the government in the past 10 years in South East Sulawesi were: cacao cultivation, vanilla cultivation, and cow livestock management.

From the FGD, South East Sulawesi farmers were interested to learn more on cultivation of cacao, rubber, durian, clove and pepper in Bulukumba, Sinjai, Palopo, Lambandia and Maros. With Lambandia and Bulukumba as the most interesting places to be visited by farmers in South East Sulawesi (Table 21).

Marketing

Marketing is essential issue that affect farmers income and farmers motivation in improving their garden management. In South East Sulawesi, marketing issues mostly related to lack of access to market. High dependency to specific trader as happened in South Sulawesi was not the major

marketing issue in South East Sulawesi. Poor road accessibility was the major challenge in marketing agricultural products in South East Sulawesi. Thus, based on the FGD that were conducted at village level, in Tasahea village, Kolaka district and Simbune village, Kolaka district, specifically requested AgFor to facilitate them in forming marketing group (maybe through cooperation) as has been doing in Ladongi, Lambandia subdistrict, Kolaka district through LEM (Lembaga Ekonomi Masyarakat) that help the community in collectively marketing their cacao seeds. Farmers in new-transmigration areas like in UPT Asinua (Lasao) village that is located in remote area in Konawe district, requested AgFor to help them marketing banana of their garden and if possible to help farmer communicate to local government for improvement of the current road condition in the area. There was no significant different between village groups on their demand in marketing intervention under AgFor program.

Gender preferences for extension

If compare between village groups, there was no significant different between village groups on gender preferences for extension. All the villages have relatively same trend, i.e. discussion at village level showed that in South East Sulawesi there was slight differences on gender preferences for expected AgFor extension services. Female tended to expect extension services that related to post-harvest handling, vegetative propagation and pest and disease handling. While male tended to expect extension services that related to garden management and nursery management. Moreover, female tended to be interested with short-term crops (such as vegetables) than long-term crops (timber and fruit trees) that were preferred by male.

In the former agricultural extension activities, women participation ranges from 10% to 50% (Table 18 and Table 19). Most of the farmer groups members in South East Sulawesi were men. Women activities in the garden were more active, particularly in homegarden.

All surveyed villages in South East Sulawesi were agreed that men is the decision maker in garden management. Men were allocating more time in activities that related to i) garden establishment; ii) planting; iii) maintenance and iv) harvesting, thus, men capacity and skills need to be improved in regards to those 4 main activities mentioned. Meanwhile for women, their capacity and skills need to be improved particularly with activities that related to: i) the nursery maintenance; ii) harvesting and post-harvest handling process; and iii) the product marketing.

Communication media

Besides the face to face interaction, extension services can also be provided through other communication media such as television, radio, handphone, etc. Thus, in the FGD, farmers were requested to rank the effective communication media from the list of potential media such as CD/DVD, handphone/cellular phone, magazine, newspaper, radio and television.

Result from the FGD showed that different village group has different priority for media effectiveness (Table 9.). Local village group selected television as the most effective media for agricultural extension, while the mixed village group selected magazine as the most effective media. Tranmigrant village group considered DVD as the most effective media, while the new-transmigrant village group considered radio as the most effective media for agricultural extension. In the new-transmigrant village group, only 2 media were selected because the other media were not available

in the area due to the remote area and no electricity in the village. However, handphone and radio were the two media that occur in all villages, thus these media have higher potential to become effective media for agricultural extension in South East Sulawesi.

Table 16 Top-five priority for effective communication media in agricultural extension in South East Sulawesi

Village groups	Media effectiveness				
	1*	2	3	4	5
Local	Television	Radio	Handphone	Newspaper	CD/DVD
Mixed	Magazine	Radio	Television	Handphone	Newspaper
Transmigrant	CD/DVD	Handphone, Television		Radio	Newspaper
New transmigrant	Radio	Handphone			

Note: * = 1 is the most effective

Summary

In summary, agricultural extension agents are important stakeholders in linking knowledge to action. Good coordination between extension agents with research agencies will assist the dissemination of new research results that can help farmers in improving their land productivity. However in the implementation, coordination between institutions are still weak. Moreover, currently government agricultural extension agencies still have to struggle with three major challenges, i.e.:

- Lack of number of government extension officers. Thus, farmer specialist or farmer to farmer approach maybe interesting to be tested through AgFor, with expectation to sustain the information transfer and diffusion of innovation process at community level.
- Lack of technical capacity and motivation to facilitate innovation.
- Infrastructure barriers such as number of vehicle to go to the village, lack of research facilities to test and do new innovation/techniques in improving the garden productivity.

At community level, agricultural extension issues were varied, particularly due to the socio-economic variation between communities such as level of education, level of income, ethnicity. Socio-economic and biophysical variation also resulted in differences in community species prioritization. Generally, in South East Sulawesi, cacao has become the most prioritized species that contribute to the local livelihood, except in newly established areas like the new transmigrant areas that depend their livelihood to short-term crops and NTFP (Non Timber Forest Products). While for AgFor intervention, durian was the most demanded species by farmers in South East Sulawesi.

Lack of access to information on innovative technology for improving farmers land productivity, has motivated farmer to join extension activities. Based on the discussion, training on vegetative propagation is the most requested by farmers, followed by pest and diseases handling. Besides agriculture, farmers also interested to learn more on livestock management. There was no significant differences on gender preferences for training needs.

Communication medias were also has not yet been optimized in the current agricultural extension services. Based on the discussion, radio and handphone were the two most effective media for agricultural extension. However, frequency of agricultural extension programs in radio were still few.

In the future, handphone may become effective communication media to updating price of agricultural commodity.

In conclusion, most of the community tended to unsatisfy with the current extension services they received so far. Thus, through AgFor the community were expecting improvement in the agricultural extension services through a) introduction of innovative knowledge or technology that can improve their garden productivity; and b) regular facilitation for broader community.

Table 17 Seedlings distribution from former government programs to farmers in the AgFor project villages in South East Sulawesi (Note: receivers are members of farmer group).

Village	Year	Frequency	Goverm't Agency	Seedlings species
Local village group				
Ambondiaa	2009, 2010, 2011	not sure	Dinas Perkebunan;Dinas Pertanian; Dinas Kehutanan	Cacao, Rambutan, Paddy, Teak
Lamunde	2004, 2008	not sure	Dinas Pertanian; Dinas Perkebunan	Paddy, Durian, Cacao, Pepper, Patchouli, Teak
Simbune	2009	not sure	Gernas, Dinas Perkebunan	Cacao seedlings for budwood garden with cacao variety of Sulawesi 1 and Sulawesi 2
Taosu	1997	not sure		Teak, Paraserianthes, oilpalm, coconut hybrid
Mixed village group				
Anggawo	None			
Lawonua		1 times per 10 years	?	Cacao
Wonua Hoa-local	2009-2010	not sure	Dinas Pertanian	Paddy
Wonua Hoa-migrant	2011	not sure	Dinas Pertanian	Durian Otong (100 seedlings)
Transmigrant village group				
Tasahea	1994, 2011	not sure	Dinas Perkebunan; Dinas Kehutanan	Cacao, Gmelina, Teak, Mango, Vitex, Rambutan aceh.
New-transmigrant village group				
UPT Asinua Jaya (Lasao)	2011	not sure	Dinas Tenaga Kerja dan Transmigrasi	Paddy, Maize, Soybeans, Rambutan, Orange, Mango, Durian (all died, eaten by pigs), Cacao, Vegetables, Banana, Jackfruit

Table 18 Former training in agricultural-based activities in AgFor project villages in South East Sulawesi

Village	Year	Fre-quency	Extension agency	Material	Female parti-cipants
Local village group					
Ambondiaa	2004, 2011	not sure	Gernas, SL	Cacao rehabilitation and maintenance; Side-grafting	30%
Lamunde	2009-2010	not sure	Gernas	Cacao-side grafting; composting	25%
Simbune	2009	not sure	Gernas, Dinas Perkebunan	Side grafting cacao (20 oculators, all male); cacao pruning; Farmer field school (25 participants, 7 participants per farmer group)	10%
Taosu	2004, 2009	not sure	Dinas Pertanian	Orange grafting	10%
Mixed village group					
Anggawo	2011		Dinas Kehutanan	Nursery for timber tree species (KBR)	30%
Lawonua	2008-2009	1 per 4 years	?	Composting	50%
Wonua Hoa-local	2008-2012	1 per 2 years	Dinas Perkebunan	Side grafting cacao	15%
Wonua Hoa-migrant	None				
Transmigrant village group					
Tasahea	2007	not sure	Gernas, Dinas Perkebunan, Farmer Field School (SL-PAT)	Side grafting cacao, organic fertilizer production, biogas management for energy alternative.	30%
New-transmigrant village group					
UPT Asinua Jaya (Lasao)	2010-2011	not sure	Dinas Tenaga Kerja dan Transmigrasi provinsi Sulawesi Tenggara	Home industry (food making); organic fertilizer industry; organc pest and disease management	30%

Table 19 Former in-class activities as part of extension services by government agencies in the AgFor project villages in South East Sulawesi

Village	Year	Frequency	Extension agency	Subjects	Female participants
Local village group					
Ambondiaa	2004, 2011	not sure	Gernas, Sekolah Lapang	Cacao rehabilitation, maintenance, side-grafting	30%
Lamunde	2009-2010	not sure	Dinas Pertanian	Paddy ricefield	50%
Simbune	2007, 2009, 2011	not sure	Gernas, Dinas Perkebunan	Cacao side grafting and pruning; Farmer field school	10%
Taosu	2008, 2011	not sure	Gernas	Cacao side grafting	10%
Mixed village group					
Anggawo	2011	not sure	Dinas Pertanian; Dinas Kehutanan	Integrated pest and disease management; Nursery for timber tree species (KBR)	30%
Lawonua	2009-2011	1 per year	?	Side grafting	20%
Wonua Hoa-local	1998	2 per year	Dinas Pertanian Kendari	Paddy cultivation	15%
Wonua Hoa-migrant	None				
Transmigrant village group					
Tasahea	2011	not sure	Dinas Peternakan	Cow livestock management	40%
New-transmigrant village group					
UPT Asinua Jaya (Lasao)	2009, 2011	not sure	TKPMP, DepNaKerTrans, Balai Transmigrasi Makassar	Cacao and vegetables cultivation	30%

Table 20 List of former cross visit activities hosted by government and non government agencies in South East Sulawesi

Village	Year	Frequency	Agency	Destination/agenda	Female participants
Local village group					
Ambondiaa	None				
Lamunde	2008	not sure	BUMDES	Village governance	0%
Simbune	2004	not sure	Decentralization program	To Sinjai to learn about Vanilla cultivation	30%
Taosu	None			HKm socialization in Bogor	
Mixed village group					
Anggawo	2011		Gernas	To Kolaka to learn about cacao cultivation	0%
Lawonua	2011	not sure	?	To Ladongi to learn cacao cultivation	10%
Wonua Hoa-local	None				
Wonua Hoa-migrant	None				
Transmigrant village group					
Tasahea	2011	not sure	Dinas Peternakan	To Ladono, South Konawe to learn cow livestock management	0%
New-transmigrant village group					
UPT Asinua Jaya (Lasao)	None				

Table 21 Cross-visit requested by farmers in South East Sulawesi

Village	Subject to be studied	Location for cross-visit						
		Bulukumba (clove, rubber, durian)	Ladongi (marketing group)	Sinjai (durian)	Palopo (durian)	?? (pepper)	Lambandia (cacao)	Maros (paddy)
Local village group								
Ambondiaa	Cacao, Rubber	v					v	
Lamunde	Rubber, Clove, Cacao, Pepper	v			v	V	v	
Simbune	Cacao and marketing group (LEM (Lembaga Ekonomi Masyarakat))		v					
Taosu	Cacao						v	
Mixed village group								
Anggawo	Cacao, Durian			v	v		v	
Lawonua	Rubber	v		v				
Wonua Hoa-migrant	Clove, Durian, Rubber, Cacao	v		v	v		v	
Wonua Hoa-local	Paddy ricefield, Fisheries, Cacao						v	v
Transmigrant village group								
Tasahea	Cacao, Pepper, Durian	v	v	v	v	v	v	
New-transmigrant village group								
UPT Asinua Jaya (Lasao)	Rubber, Clove, Durian, Teak, Coconut	v		v	v		v	

Related References

Gittinger JP. 1982. Economic Analysis of Agricultural Projects (second edition). Baltimore: John Hopkins University press.

Lewis, M. Paul (ed.), 2009. Ethnologue: Languages of the World, Sixteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/.

McGregor J. 1994. Climate change and involuntary migration: implications for food security. Food Policy, Volume 19, Issue 2, Special Issue: Climate change and world food security, April 1994, Pages 120-132, ISSN 0306-9192, DOI: 10.1016/0306-9192(94)90065-5. URL http://www.sciencedirect.com/science/article/pii/0306919294900655

McLeman R, Smit B. 2006. Migration as an adaptation to Climate Change. Climatic Change (2006) 76: 31–53 DOI: 10.1007/s10584-005-9000-7. URL: http://perceval.bio.nau.edu/downloads/grail/climate_seminar/section3/McLeman_and_Smit06.pdf

Pelras C. 2000. Patron-client ties among the Bugis and Makassarese of South Sulawesi. In Bijdragen tot de Taal-, Land- end Volkenkunde, Authority and enterprise among the peoples of South Sulawesi 145(2000), no: 3, Leiden, 393 – 432. http://www.kitlv-journals.nl/index.php/btlv/article/viewFile/1793/2554

Raleigh C, Jordan L, Salehyan I. xxxx. Assessing the Impact of Climate Change on Migration and Conflict. Paper commissioned for the “Social Dimensions of Climate Change” workshops.

World Bank, Food and Agriculture Organization, International Fund for Agricultural Development. 2009. Gender in agriculture sourcebook. Washington DC: International Bank for Reconstruction and Development, The World Bank.