AgFor SULAWESI
Agroforestry and Forestry

Canadian International Development Agency

REPORT 2

BASELINE COMMUNITY SURVEY IN SOUTH SULAWESI

(FOCUS GROUP DISCUSSION AND PROFITABILITY ANALYSIS)

This report was prepared by:

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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. Degraded land with annual crops, majority maize and paddy
B. Agroforestry based system (cacao, cloves and coffee) that were in Bantaeng District.
C. Agroforestry based system (cacao, cloves and coffee) that were in Bulukumba District.
D. Timber based system that were laid in Bulukumba District.

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. Clear difference of livelihoods option, tree-crops and farm management were seen in four villages types. These differences were influenced by uniqueness of each village history in land management, social and ecological condition, as well as markets access. Villages in the first typology (degraded land – Group A) had more intensive management on their agricultural systems. Land and soil condition need more intensive management to be more productive. In Campaga, Pattaneteang, Borong Rappoa, and Balang Pesoang villages as categorize as agroforestry based villages both in Bantaeng and Bulukumba districts (Group B and C). They practising mixed farming systems consist of some important trees as coffee, cacao, and clove together with some crops and fruit trees. The fourth typology, (Group D) timber based villages, were laid in lowland Bulukumba district near the coastal areas. Within these villages, timber system were integrated into mixed systems. Tugondeng villages perform rather different as in this village there were farmers producing sugar palm from the coconut trees.

In term of migration issues, villages that were categorize in degraded land and agroforestry based villages were having high out migration rate due to uncertain condition in their farming systems. The problem face in degraded land were the intensive management of farming system which require high capital made interest of people to cultivate the land is decreasing. In many villages include in agroforestry based typology, decreasing productivity of clove as the main commodity were become the main reason of high outmigration rate. Though the villages in the fourth group performing almost similar situation, but in Tugondeng villages, as it has sugar palm as the main commodity, out migration were relatively lower than other villages.

Profitability. Study on profitability focus on several main land uses identified in the study area ranging from crops (maize), simple mixed garden (candlenut, kapok, coffee, coconut-cacao, coconut sugar), complex mixed garden (cacao-coffee, cacao-coffee-clove), timber garden to monoculture system (clove). Analysis on profitability showed that most profitable land use system based on annual equity measure is clove garden, followed by complex mixed garden, and timber garden. The highest return to labor (56 $/psday) were performing by mixed garden coconut-cacao systems; while the coconut for sugar system shows the lowest (6 $/psday).

Gender in 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. Villages in highland area such as the degraded land village (Group A), AF-Bantaeng village (Group B) and AF-Bulukumba village (Group C), clove is become the most important tree-based species, while in lowland area such as in timber village group, coconut was become the most important tree-based species. In most of all the village groups, crops as maize, cassava, peanut, chili, cabbage, carrot were also important species contribute to the local livelihood.

The main problems face by the farmers is hot 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 cultivation techniques. 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, television was the most effective media for on farm information, and handphone as the second most effective. However, frequency of agricultural extension programs in television were relatively rare. CD or DVD can also be an effective communication media in agricultural extension if it is produced and distributed regularly. Handphone may become effective communication media to updating price of agricultural commodity.

Introduction

Elok Mulyoutami, Suyanto and James Roshetko

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.

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.

Site characteristics and typologies

South Sulawesi, the province laid in southern part of Sulawesi Island consists of 20 districts and 3 municipalities with total area 45,764 km2. With more than 57% area were forested area, wet paddy system 9%, wetland (swampy area) more than 10%, and Agriculture were nearly 10%, this province was famous as the first producer of paddy and other food crops as maize, cassava, sweet potato and peanut in eastern part of Indonesia. Plantation crops that were famous from South Sulawesi were Cacao, Coconut, Clove, Coffee. Those crops were mainly managed on smallholder scale rather than large scale.

Bantaeng and Bulukumba were become 2 districts that were selected for Agfor sites . In 2007, production of maize, as one of food crops, in Bantaeng and Bulukumba District were the second and the fifth highest respectively, together with Gowa, Jeneponto, and Bone district as the five highest producers. In term of paddy production, though Bantaeng not the highest, but their production on paddy were still above average of South Sulawesi production (5.01 over 4.7), while Bulukumba a bit lower than the average (4.68) (Sulawesi Selatan Dalam Angka, 2007).

In South Sulawesi, Bone, Luwu, Luwu Timur, Luwu Utara, and Pinrang were the five districts which has large area of cacao production (more than 20,000 ha). As mention earlier, the large area of cacao production were mainly on smallholder scale (265,985 ha; and for the private scale were about 4,075 ha). Cacao production in Bantaeng and Bulukumba districts covering 5,377 and 7,456 ha respectively, with the productivity on 2010 in Bulukumba were 4,626 ton and in Bantaeng for about 2,157.

http://regionalinvestment.bkpm.go.id/newsipid/id/commodityarea.php?ia=73&ic=3

Clove production in South Sulawesi were mainly from smallholder plantation with mixed garden system that were covering for about 44,524 Ha. From 16,385 ton of total clove production on 2010 in South Sulawesi, clove production in Bulukumba and Bantaeng were about 5.2% and 1.9% from the total, respectively.

http://regionalinvestment.bkpm.go.id/newsipid/id/commodityarea.php?ia=73&ic=85

From the total coffee production on 2010 in South Sulawesi, 36,554 ton, coffee production in Bulukumba were about 11.3% and in Bantaeng covering 4.38%. Total area for coffee production in South Sulawesi that were managed by smallholder were about 70,412 ha, and in Bantaeng 3800 ha, while in Bulukumba 5179 ha.

http://regionalinvestment.bkpm.go.id/newsipid/id/commodityarea.php?ic=62&ia=73

In order to catch general characteristics on each Agfor site in South Sulawesi, group typologies was developed during the field trip after the inception meeting in Makassar at 25 January 2012. The typologies were based on physical condition that lead to different main land use activities and farming practices on each area with also considering the administrative status. List of typologies were presented in Table 1.

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

	Degraded land w annual crops	Agroforestry system (Cacao, coffee, cloves)	Agroforestry system (Cacao, coffee, cloves)	Timber based system	Total group based discussion
	A	B	C	D	
Districts	Bantaeng	Bantaeng	Bulukumba	Bulukumba	
List of Villages	Onto, Kayuloe, Bonto Bulaeng, Bonto Karaeng, Pabumbungan	Campaga, Labbo, Pattaneteang, Kampala	Borong Rappoa, Balang Pesoang, Batu Karopa, Kahayya, Bangkeng Bukit	Karassing, Tugondeng, Tana Towa, Tanah Beru	
Mini workshop or group discussion	1 in Kayu Loe 1 in Bonto Karaeng	1 in Pattaneteang 1 in Campaga	1 in Borong Rappoa 1 in Balang Pesoang	1 in Tugondeng 1 in Tana Towa	8

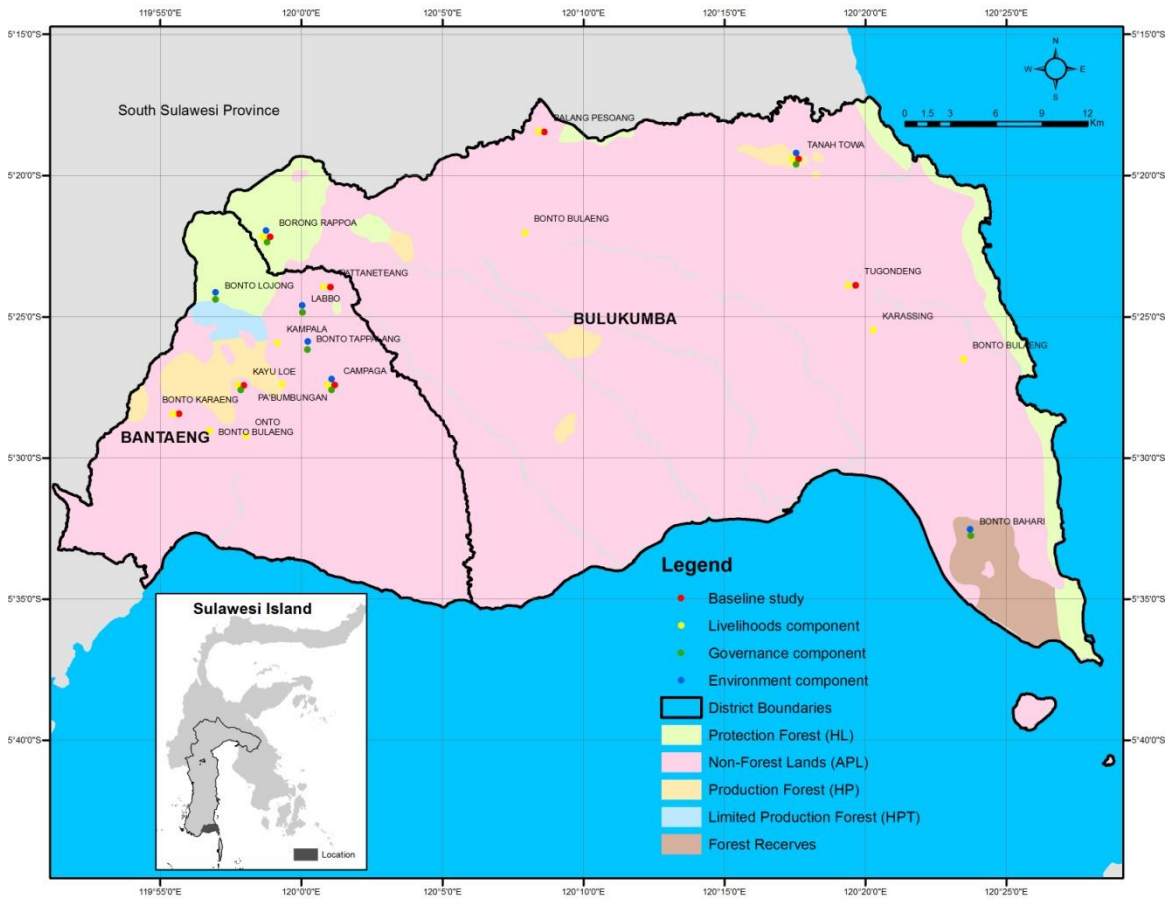


Figure 1 Location of baseline study

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 Bantaeng and Bulukumba.

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 8 full day mini workshops for 8 villages, 4 in Bantaeng and 4 in Bulukumba.

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, Elok Mulyoutami, Kusdianawati, Badri Dwi Meyldi, Syamsidar, Pratiknyo Purnomosidhi, Suyanto and 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 are 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. Maize, paddy system and commodities tree based system become the main land use systems in most of villages in each typologies. Maize was quite dominant in degraded land typologies, while clove, coffee and cacao based agroforestry systems were relatively dominant in Agroforestry system typologies.

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

	Landuse Systems															
	Agroforestry Systems								Agriculture			Forests/Openland				
	Cacao	Clove	Coffee	Candle-nut	Coco-nut	Nut-meg	Rub-ber	Mixed	Maize	Rice	Fish ponds	Pro Forests	Com Forests	Shrubs	Open-land	Settlements
Degraded land																
Kayu Loe	6	10	17						31			4	14	3	9	6
Bonto Karaeng	20			5					60	9				2		4
Agroforestry Systems Bantaeng																
Pattaneteang		21	27			3				3		34				12
Campaga	6	15	4					35	3	10	1	14	8			4
Agroforestry Systems Bulukumba																
Borong Rappoa	5	19	10						5	10		11	31	4		5
Balang Pesoang																
Timber-based Systems																
Tugondeng					55		5		17	13						10
Tana Towa								20	17	16		37				10

Degraded land with annual crops as major farming system villages typology

In this village typology, farmers were practiced croplands systems as major farming system in the area since many years ago. At the early historic, upland paddy, maize, coffee were the main farming product in the area. Starting in 1980s, farmers started to hybrid maize which lead to conversion of forest area into farmland.

Kayu Loe

Kayu Loe was established in 1930s, the ancestors were Makassar ethnic who is the native ethnic in this area. In the early periods, the main livelihoods were maize (as staple food), cassava, coffee (local coffee namely 'bugis coffee' or 'bantaeng coffee'*)*, potatoe, sweet potato, taro, and upland paddy. The land use was dominated by forest (protected and community forest), only small number of maize area at that time. In 1980 farmers started to plant arabica coffee from Jember, then continued with hybrid maize (local name: 'jagung kuning') in 1985. Since booming of hybrid maize, the conversion of forest area into maize was increase rapidly in this village.

In beginning of 1990s farmer also planted clove which seedlings came from Manado. They were very interested in clove because of more profitable. In order to support farmers, the Government delivered 5,000 of clove seedlings, 45,000 of 'surian', number of durian and timber species ('bayang jawa', mahogany, gmelina, and 'sengon') in 2010 and 2011.

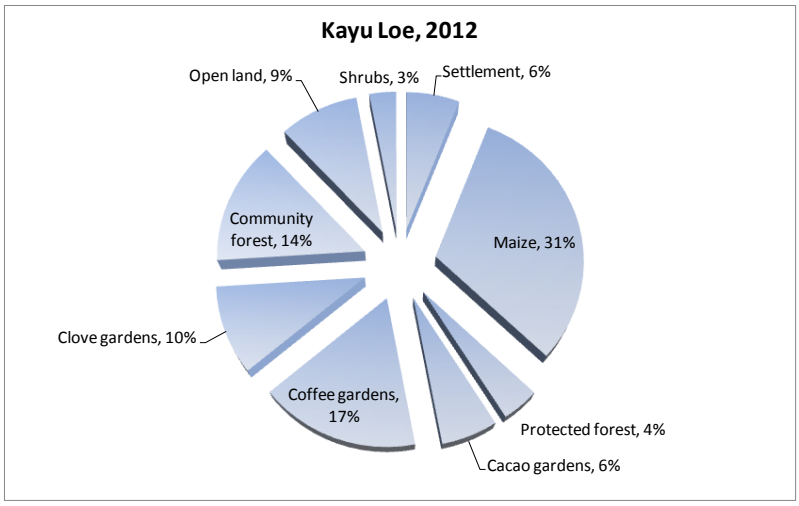


Figure 2 Existing land use in Kayu Loe village based on community perspectives

The discussion result showed that recently maize area were dominated the land use in Kayu Loe, around 1/3 of village; continue with coffee gardens, community forest and clove gardens. In community forest, farmer still allowed to plant candlenut*,* mahogany*,* surian, sengon*, '*kayu putih', and 'jati putih'. Farmers also mentioned the existence of open land (*Bonto Rampan*) which was high degraded land because of the inappropriate intensive farming practices in the sloping area.

Bonto Karaeng

Bonto Karaeng was established in 1970s when seven households who were Makaserese from Enrekang and Bantaeng decided to settle in Dusun Papasangan (Bonto Macini). They slash and burn a small number of forests and converted into maize and settlement area. Main livelihoods were maize, collecting candlenut, bamboo and sell it to Bantaeng. Early 1990s, farmer started to develop paddy and also planted the hybrid maize and soon it became the main livelihood until now.

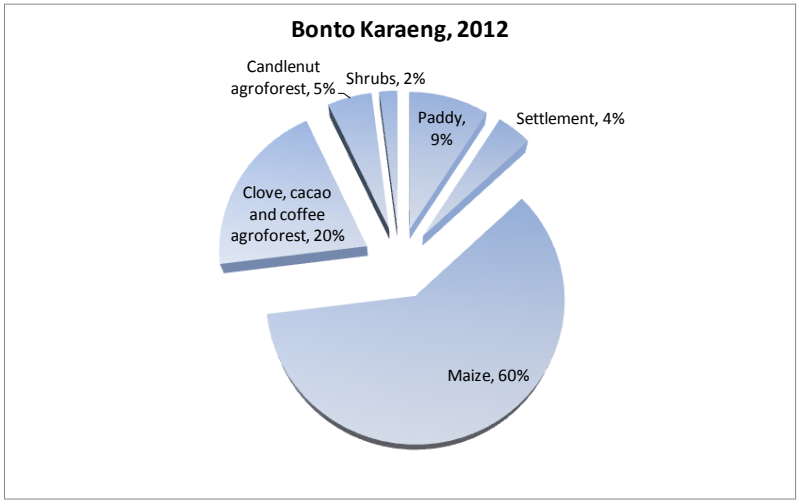


Figure 3 Existing land use in Bonto Karaeng village based on community perspectives

Cacao was first introduced in 1996; and in 2000 government support for 100,000 of cacao seedlings to farmers but many of these seedlings was damaged due to serious drought. Fortunately, farmers started to generate money from remaintaining cacao in 2005 with the price around IDR 10,000/kg.

In 2009, when the price of clove was higher than cacao, farmers interested to cultivate clove. They found the seedling from Bulukumba district. In order to support farmers, the Government was distributed around 3,000 clove seedlings in 2011. Although, recent land use in Bonto Karaeng was still dominated by maize area (more than half of total village area) followed by mix systems (clove, cacao and coffee agroforest).

Agroforestry system (cacao, coffee, cloves system) villages typology

This village typology is existing in both Bantaeng District and Bulukumba District of South Sulawesi province. At the early historic, people in this typology were rely on maize, cassava, and upland paddy. Since 1990s when people was introduced various types of plantation crops (coffee, cacao, and cloves), the farming system historic was change into more complex systems.

Agroforestry system villages in Bantaeng District

Pattaneteang

The ancestors of Pattaneteang were Bugis ethnic from Wajo who lived in this area and established the village in 1930s. The main livelihoods were coffee, maize, sweet potato and paddy. In 1945, farmer had irrigated paddy (the irrigation system was the Dutch legacy in the area) and planted coffee (bugis coffee) which came from Wajo. Until 1960s, there were many varieties of coffee that cultivated in Pattenetang such as bugis coffee, arabika, robusta, dwarf coffee, and 'husda coffee'.

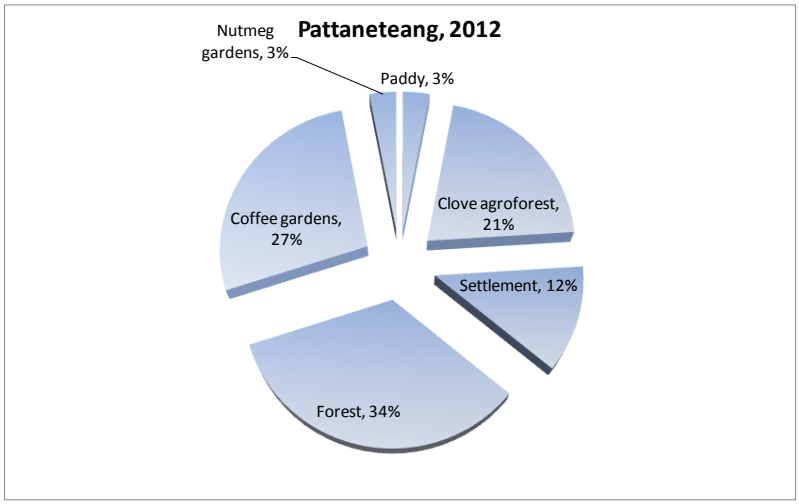


Figure 4 Existing land use in Pattaneteang village based on community perspectives

Starting early 1970s until 1980s, many farmers planted clove for the first time using the seedling which they took from Ambon Island. In 2000s, people also accessing the village forest to cultivate coffee in around 150 ha, although not yet planted in the whole area. In 2011, cacao was seriously damaged by cacao pod borers *(Phytophthora palmivora)* or local namely 'penyakit busuk buah kakao' while clove also suffered from stem borers or local namely 'penyakit penggerek batang'. Now, coffee and clove agroforest still became main tree crops and were the second to third largest land use in Pattaneteang right after forest.

Campaga

Campaga was established in 1930s when the ancestors (Makassar ethnic) lived in the area. The three earliest households were relying on maize, coffee (bugis coffee), fruits and upland paddy for their livelihood. In 1965s, farmers started to plant robusta coffee, and in twenty years after they also cultivated arabica coffee.

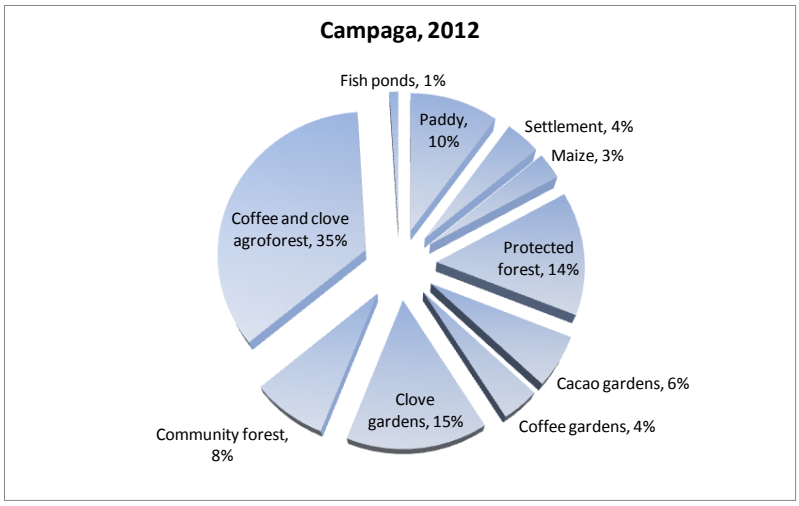


Figure 5 Existing land use in Campaga village based on community perspectives

Then during the 1970s until 2000s periods, clove and cacao were introduced to farmers. The Government was delivered 30 of cacao seedlings for each household. There was also Arabica coffee support from the Government through PRPT program in 1985 using credit schemes, also 'durian aceh' and local durian seedlings in 1990. GERNAS program in 2010 was also support for cacao grafting to farmers. Unfortunately, in 2002, cacao was attacked by many pest and disease that significantly decreasing the production. Recently, land use system in Campaga was dominated by mixed system (coffee and clove agroforest), followed by clove gardens and protected forest ('hutan desa').

Agroforestry system villages in Bulukumba District

Borong Rappoa

According to the villagers, Borong Rappoa was established in 1900s. The early family live in this village were Bugis and Makassar ethnic who came from Sinjai and Gowa, and they relied on maize and upland paddy. In 1945, farmers planted robusta coffee, maize, banana and sweet potato. Then in 1950s, they established rainfed paddy field which can cultivated once in a year. Clove was first planted in early 1971, while cacao and arabica coffee were in 1986. In 1971, the farmers got the clove seedlings from PT. Sulawesi and Plantation Agency. This company was cultivated around 480 ha cloves garden, but they only operated in one year and then stopped due to land tenure conflicts with the locals.

In 1987, there was cacao seedlings support from the Government. Unfortunately, in 2006 cacao was also sufferd from cacao pod borer and stem pod borer, which lead farmers to cut down the cacao trees and change it using clove and Arabica coffee. Recently, main land uses in Borong Rappoa were forest, clove agrofrest and protected forest.

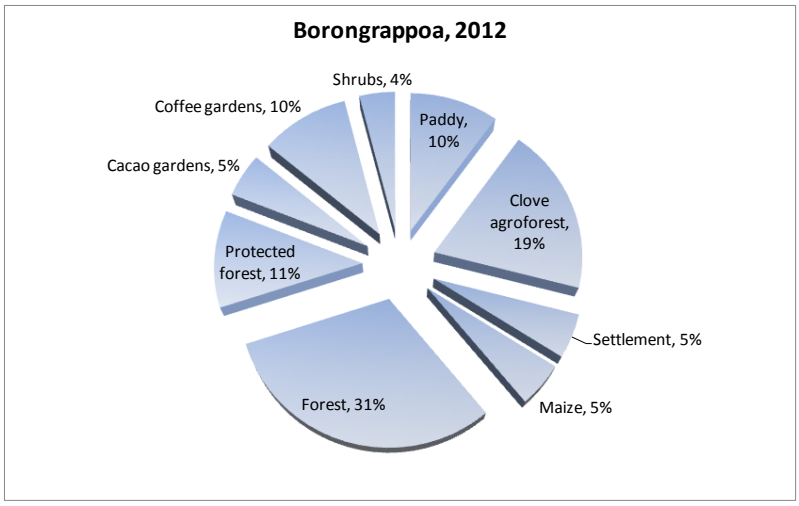


Figure 6 Existing land use in Borong Rappoa village based on community perspectives

Balang Pesoang

Balang Pesoang was established in 1920s by Bugis people who came and lived in the area. The major livelihoods were maize, cassava, bugis coffee and upland paddy. Then in 1970s many migrants people came from Sinjai, Bulukumba, and Ujung Pandang to buy land and planted clove. At the end of 1970s, many locals also following the migrants establishing their clove gardens. Besides clove, in early 1980s, people also planted pepper and cacao.

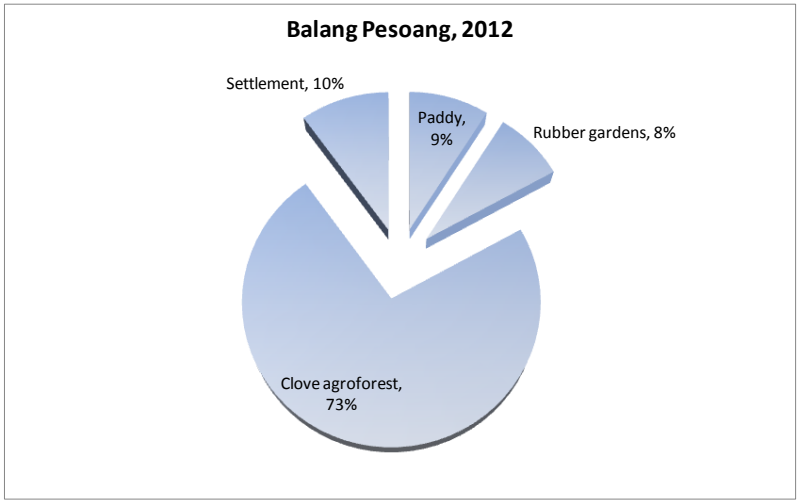


Figure 7 Existing land use in Balang Pesoang village based on community perspectives

In 1998, around 5 ha rubber gardens were developed by the outside villager and sell the rubber to PT. Sulawesi in contract base. Recently, many farmers planted fruit tree species such as rambutan, 'durian otong', 'durian cipaku', and manggis. The surveyed showed that the recent village land use was dominated by clove agroforest which intercropped with coffee, cacao, fruits and timber trees.

Timber based system villages typology

In the timber based system typology the people were familiar in timber systems which consist of some marketable timber such as teak, mahogany, surian, gmelina, and sengon. Although, coconut agroforest, coffee and clove agroforest, maize and forest were the main land uses in these villages.

Tugondeng

Tugondeng was established during the Ducth colonial and the ancestors were Bugis ethnic who came from Bone. The main livelihoods of people were maize, upland paddy, and sweet potato. In 1945s the village was still known as 'kesultanan' (the empire). In line with the population growth, Bugis ethnic were now no longer exists, nowadays the Konjo ethnic become the majority of Tugondeng.

In 1980s, there was Government's support of coconut hybrids, and at the same time cacao has been planted by farmer. They intercropped coconut and cacao in the same gardens. In 1995, there was three months programme of intensive extension support to farmers on how to tap coconut wine and make the palm sugar. The programme was also support the tapping tools, stove, pans that used in the palm sugar making process.

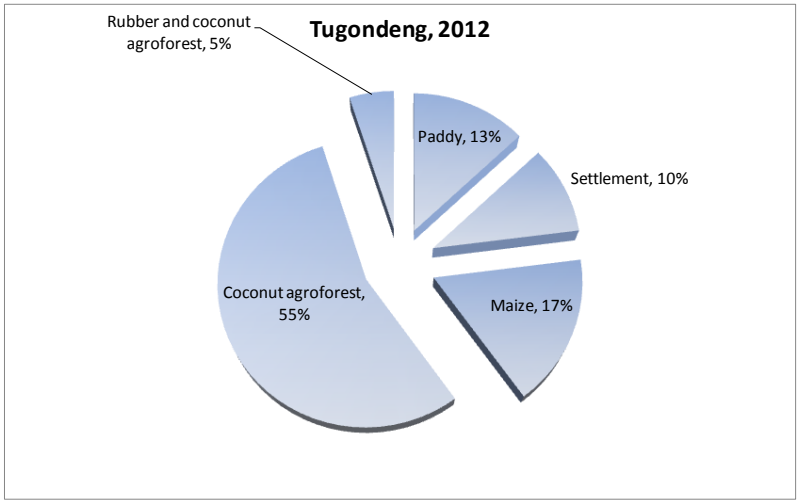


Figure 8 Existing land use in Tugondeng village based on community perspectives

Coconut agroforests now become the main land use in the village, continue with maize and paddy. Commonly, cacao, paddy and timber trees were integrated into coconut agroforest. Survey also showed that specific timber gardens (such as teak, mahogany, surian, gmelina, and sengon) were exists in the village.

Tana Towa

Tana Towa village means the oldest village. The village was famous as traditional village that has very strong culture in South Sulawesi. The ancestors who lived at the early periods were come from the Konjo ethnic. They relied on upland paddy, maize, coffee, coconut and banana as the major livelihood at that time.

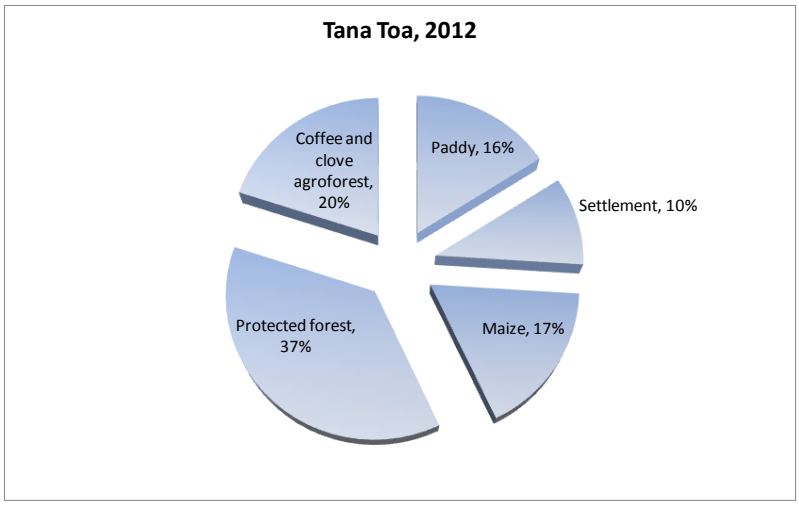


Figure 9 Existing land use in Tana Towa village based on community perspectives

In 1990s, people were interested in planting clove as new livelihoos since the Government was first introduced to villager. Later in period 1991 - 1998, major livelihoods derived from pepper, cacao, and cloves.

Recently, major land uses of Tana Towa were protected forest which covers 1/3 of the village. Strong tradition and customary system that role the people keeps their forests from deforestration. Coffee and clove agroforest were the second largest landuse and major three crops for community.

Livelihood options

Degraded land with annual crops as major farming system villages

Maize, potatoes, onion and paddy were major livelihoods commodity for villages in this typology. The survey found that there was no dominant tree-based commodity in these villages since the declining of candle nut ear in the past.

Maize and other crops

Maize was major commodity for several villages in the Bantaeng district, especially in the western part. The survey of two villages, Kayu Loe and Bonto Karaeng, showed that maize was the main livelihood of the people.

In the beginning, farmer planted local maize varieties who's had low productivity. They planted maize as a food staple and to meet daily needs, not for sale (subsisten). Along with the influx of hybrid maize which was began to be introduced around 1985 to 1990, the production of maize was much increased. Many farmers in two villages were interested in planting maize and other crops such as potatoes and onions.

High demand for maize area leads to land conversion from forest or shrub into maizefields. In some places, many farmers did not into account the conservation of soil during maize cultivation

which causing the soil fertility decrease drastically. As a result, currently we can see highly degraded land called Bonto Rampan.

Maize

The maized seeds used were generally improved seeds such as Bisi-2, NK-22, and NK-33. Communities were also use the yellow maize which came from the Government support, some seeds are made by people themselves. Maize planting were using 20 × 80 cm or 20 × 75 cm spacing.

Farmers applied the ZA and urea fertilizers which were given 2 times a year. The first fertilizers application usually at the age of 25 days, while the second application at the age of 40 days. Harvesting was started in the 4^{th} to 5^{th} month with the average production was 3-4 tonnes/ha (dried maize). People generally sell maize to nearby town (Bantaeng) with the price of IDR 1,300/kg (dry).

Currently, the main obstacles in maize farming which communities experienced were:

- Maize seeds was costly
- Expensive fertilizer and chemical used for maize crops
- The selling price of maize was very fluctuates

Potato

The farmers were use potatoes seedlings such as P-2, Arnola, B-1, and B-2. The spacing used were 50 × 50 cm. The maintenance was done by once a year weeding and fertilizer application using urea, organic fertilizers or manure.

In one cropping season, the 3-4 months old of potato were able to produce 400 cans/ha of potatoes (1 can was equivalent to 15 kg) or about 6 tonnes/ha. Potatoes were generally marketed in or outside the village with the price of IDR 60,000/can or about IDR 4,000/kg. The main obstacles suffered by farmers were the expensive- hard to get of potatoes seeds, and other constraints due to rainy season which could fail the harvest.

Onion

In general, farmers were use Palipi, Flores and Bima seeds which were available at farm shops. Onion spacing used was 20 cm × 20 cm. Urea fertilizer and manure were given once a year, and about 2 times a week of liquid fertilizer application to the potatoes planting.

The onion can harvest at the age of 70 days with a production of 4 tonnes/ha. Onion marketing were sold to markets inside and outside the village with the selling price reaches IDR 2,500/kg.

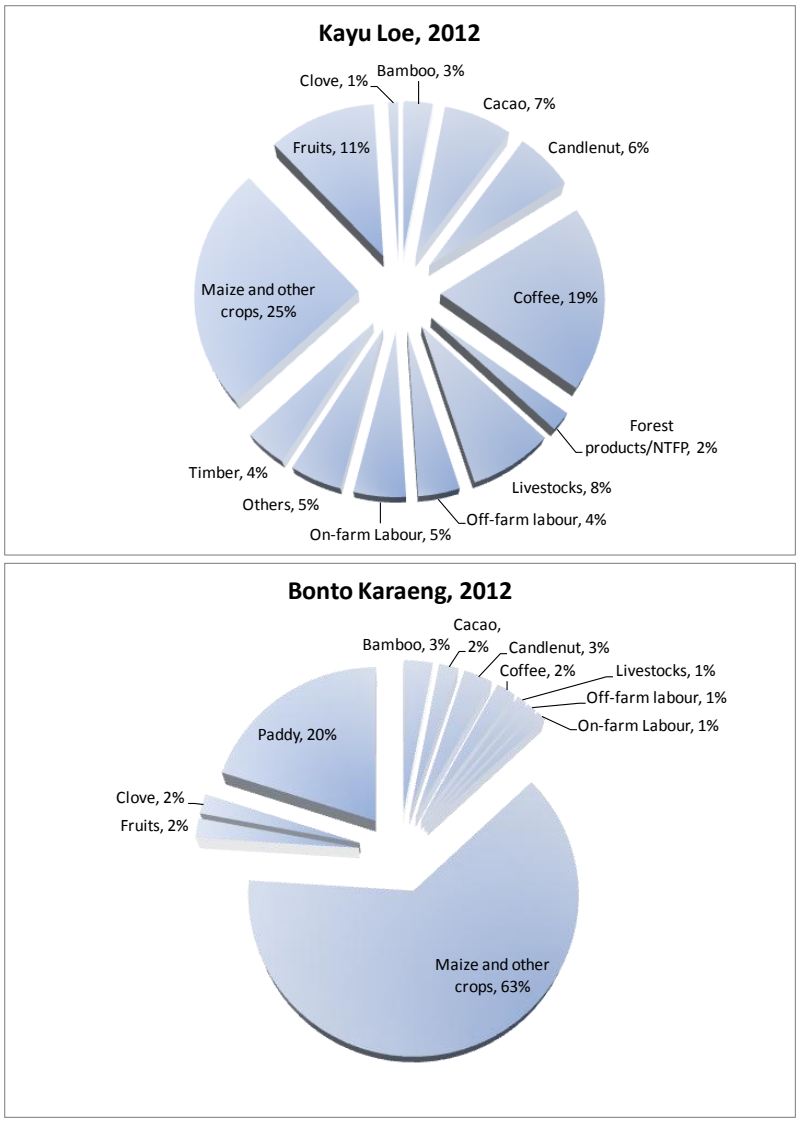


Figure 10 Recent livelihoods option in Kayu Loe and Bonto Karaeng based on community perspectives

Paddy

Paddy cultivation area in Bonto Karaeng was developed by farmers in 1990s. The varieties of paddy used were Memberamo, Ciherang, and Ciliwung. The maintenance was 2 times a year of fertilizer application using ZA and urea.

In term of paddy production, planting 14 packages of seeds (around 5 kg) could produce 70 big sacks of paddy (around 550 litre of rice) per ha. The rice price was IDR 6,400/litre, but little number of farmers who sell their rice, most was used to met their subsistence need to fulfil their daily lives.

The main obstacles in paddy cultivation were the pest attacks. Rodent and birds was commons pest for paddy cultivations.

Agroforestry system (cacao, coffee, cloves system) villages

Coffee, cacao, cloves and fruits were the main tree-base commodities which were widely cultivated in this typology. The Government support to farmers was quite dominant for promoting tree-based commodities in this area.

Coffee

Coffee was one of the main crops which were widely cultivated in the surveyed village. At the beginning, people only know the local coffee (coffee bugis). Furthermore, in order to increase the cultivation and productivity of coffee, the Government support farmers through a series of robusta and arabica coffee seedlings in the period 1970s - 1990s. The survey showed that one-tenth until more than a third of people's livelihoods in Pattaneteang, Campaga, and Borong Rappoa were relied on coffee.

Currently, the community was still using arabica and robusta coffee in their gardens, although other coffee types such as bugis coffee was still cultivated in the villages. They used the coffee seedlings which came from the Government support or created themselves from derivative of existing robusta/arabica in the village.

Coffee fields were generally established through forest clearing, shrubs and former maize field. Coffee spacing used was 2 × 2 m, 2 × 3 m, 3 × 3 m, and 2.5 × 2.5 m. Most farmers do not just planted coffee in the garden, as well as other crops such as cacao, cloves, fruits and timber trees in the mix systems with different intensity.

The weeding was carried out 1-3 times a year by slashing, spraying and hoeing. Fertilizer application was done 2 times a year, usually given at the beginning of the rainy season and at the end of the rainy season. Fertilizers are usually given, namely urea, ZA, KCL and manure.

Coffee began to bear fruit at the age of 2 years, and it was able to produce good fruit at the age of 3-4 years. Arabica coffee harvested during April-July while robusta coffee at June-August. Coffee production was ranged from 350 kg - 400 kg per ha (dry coffee). Pattaneteang has high productivity of coffee where arabica coffee can produce up to 600 kg/ha and robusta 400 kg/ha.

Coffee marketing was through traders in the village who later sold it to the nearest town or to Makassar. Traders came from inside villagers or from outside the region such as Gowa and Jeneponto. The selling price was ranged from IDR 12,000 to IDR 17,000/ kg of dry fruits. The sale price of fresh fruit was lower than the dry ones.

The main obstacle of coffee cultivation were

- Drying process of coffee beans which was harvested in the rainy season
- Low sale price for arabica coffee, because of fresh fruits sell just after harvesting without any drying procees (in Patteneteang)
- Peet and diseases: stem borers, wild boars, monkeys, squirrels, and raccoons.
- Difficult location to grow coffee in the mountainous area (Borong Rappoa).

Cacao

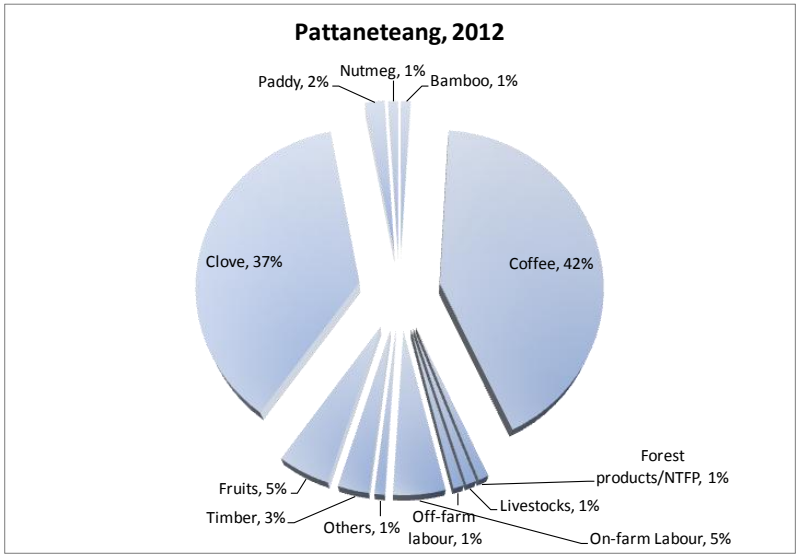
Currently, cacao was one of the significant livelihoods options in the surveyed area, in particularly in village of Campaga, Balang Pesoang, and Kayu Loe. In the 2000s, the survey results stated that cacao was a source of throughout village livelihoods. In Campaga, the first cacao cultivated widespread was in the 1980s when the Government provided assistance of cacao seedlings to farmers. At that time, many farmers planted cacao in the former farm fields.

Most farmers make their own cacao seedlings while some of them were get seedlings support from the Plantation Agency. Some farmers also bought outside the village with the price about IDR 1,000/seedlings (15 cm height), or fruit at a price of IDR 250/piece. Spacing between other farmers used 4 × 4 m, 3 × 4 m, 4 × 5 m, 2 × 2 m, 3 × 3 m, and 3.5 m × 3.5 m. As well as coffee, farmers also planted cacao along with coffee, fruit, and timber species with different intensities.

The maintenance of cacao agoforest was done 3 times a year by spraying, slashing and hoeing. Some farmers applied fertilization while some were not. Fertilizer applications were using urea, ZA or liquid organic fertilizer once a year. Right after the fruiting cacao, the fertilizer applications were given twice a year. Prunning of tree branches was also done twice a year.

Production of smallholder cacao was quite varied, depending on age and level of maintenance; the survey mentions ranged between 100-350 kg/ season. The selling price was varied also, IDR 16,000-18,000 per kg of dry cacao. Farmers sold cacao to the city and to the traders who came into village to buy from farmers.

Problems were encountered in the general discussion were cacao pod borers (*Phytophthora palmivora*), stem borers, pests and rodents. Farmers' knowledge in managing pests and diseases was still fairly minimal, so the increased capacity of farmers to become an important means of pest control.



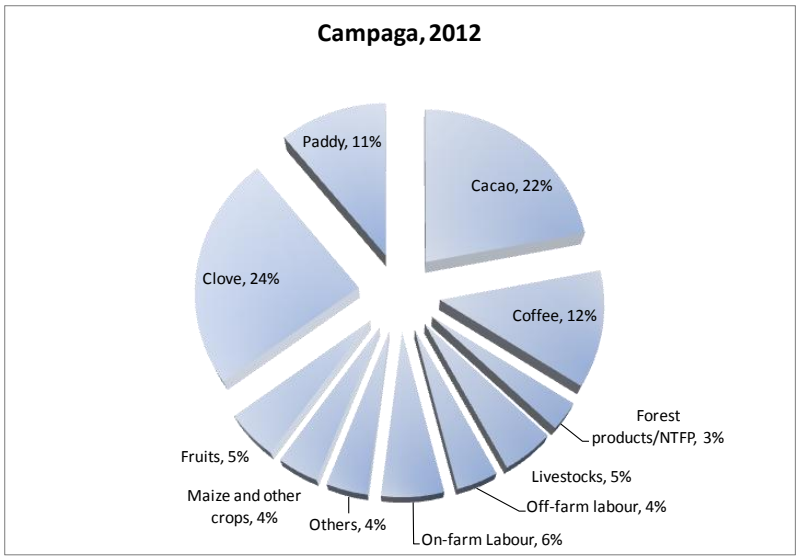


Figure 11 Recent livelihoods option in Pattaneteang and Campaga based on community perspectives

Clove

Pattaneteang, Balang Pesoang, Campaga, and Borong Rappoa were villages that rely on clove plantations as the main livelihood options and become the main products of smallholder plantation. Farmers started plant the clove around the period of the 1970s and increasingly widespread in the early 1980s.

There were several types of cloves in Pattaneteang such as Sansibar, Sikotok, and Siputih (clove of Ambon). Many farmer bought seedlings and cloves in the Banyorang area and also in Bulukumba. The price of cloves seedlings were IDR 5,000 (25 cm height) and IDR 10,000 (50 cm height). In addition, there were also people who created their own cloves seedlings.

Clove spacing which farmers use were 6 × 6 m, 6 × 7 m, 7 × 7 m, and 8 × 8 m with planting hole of 70cm x 70cm x 70 cm or 100 cm x 100 cm x 100 cm. In general, many people did not applied fertilizer on their clove plantation and weeding as much as 2-3 times a year by spraying, clearing and hoeing. But there were some farmers who also giving a dose of fertilizer twice a year (urea, SP36, KCL or manure).

The clove began to bear fruit at the age of 5 years, and could produce good fruit at age of 5-7 years old. The harvesting normally in the month July-October which can produce 50 litres of fresh fruit per tree. While the clove with age of 15-20 years old can produce ± 200 litre of fresh fruit per tree.

In Pattanetang, clove was outside the village, usually in the market in Banyoran sub-district. While in Balang Pesoang, clove sold to traders in the village or to the market in Bulukumba and Makassar. The sale price of fresh fruit of clove was IDR 45,000/kg while the dry ones was IDR 125,000/ kg.

The main constraints in clove cultivation faced by the community were

- Stem borer pests that attack crops clove occurred since the last 10 years.

- Not routinely harvest seasons, clove bear fruit depends on the weather; In Pattenetang within the last 5 years, only has 2 years clove harvesting.
- Decreasing price of clove in the rainy season harvesting

Fruits

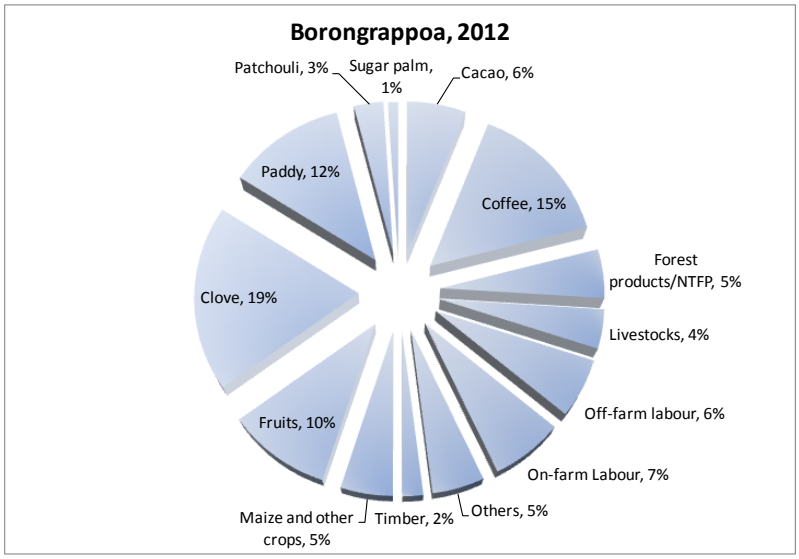
Balang Pesoang was also produced fruits that quite productive in the area, the survey results indicated that fruits was a fifth of livelihood options of the community. In addition to Balang Pesoang, fruits also provided significant input to community livelihood in Borong Rappoa, and Kayu Kayu. Common fruits that generated were parkia, lansium, durian, rambutan, mangosteen, banana, avocado, jackfruit, and 'labbusiang'.

Since the 1990s, people of Balang Pesoang started to plant many fruits like rambutan, mangosteen, durian and durian cipaku, durian montong. This led by many number of infected cacao suffered from cacao pod borers and stem borers. So that cacao has been felled and replaced with fruit trees.

These fruits were planted with spacing of 8 x 8m in between cloves. The seeds used were improved seedlings or grafting seedlings. The maintenance was done by weeding and fertilizing routinely followed the cloves weeding schedule.

The main constraints faced by farmers were:

- Marketing, especially in big harvest seasons
- Pests and diseases: fungus on the leaves, mushroom stems and fruits
- Fruit fallen during the rainy season.



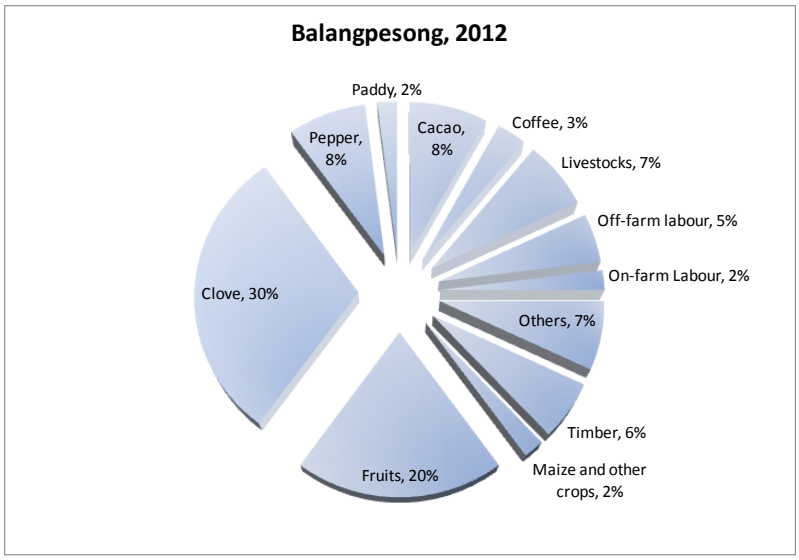


Figure 12 Recent livelihoods option in Borong Rappoa and Balang Pesoang based on community perspectives

Timber based system villages

Timber was a rising commodity in several parts of this typology. In other hand, coconut and palm sugar, paddy, and maize were considerable livelihood source for communities in this area.

Timber

The farmers interest against timber started from the information from outside the village that the trees can also produce good timber. So that in 2005, people in Tugondeng village started to plant timber using the seeds from the Forestry Agency, as well as some local wood species growing by itself. In the 2011/2012, the Agriculture Agency and Forestry Agency provide seedlings support to farmers in Tugondeng and Tana Towa such as paddy,maize, also the timber species (teak, mahogany, surian, gmelina, and sengon). However, not many people producing timber as main livelihoods in the village. Currently, timber production center located in a neighbouring village that was still in the District Herlang.

Paddy

Paddy was a considerable livelihood source for communities in this area, especially in Tana Towa. In Tana Towa, the use and area of paddy fields has not changed much from year to year. The communities cultivated both of the locals and hybrid paddy from the Government support. Local paddy exist, such as black rice (‘pare leleng kuru’), red glutinous rice, white glutinous rice, plain rice (‘pare sahe’), while the government support which was the hybrid rice PB-5.

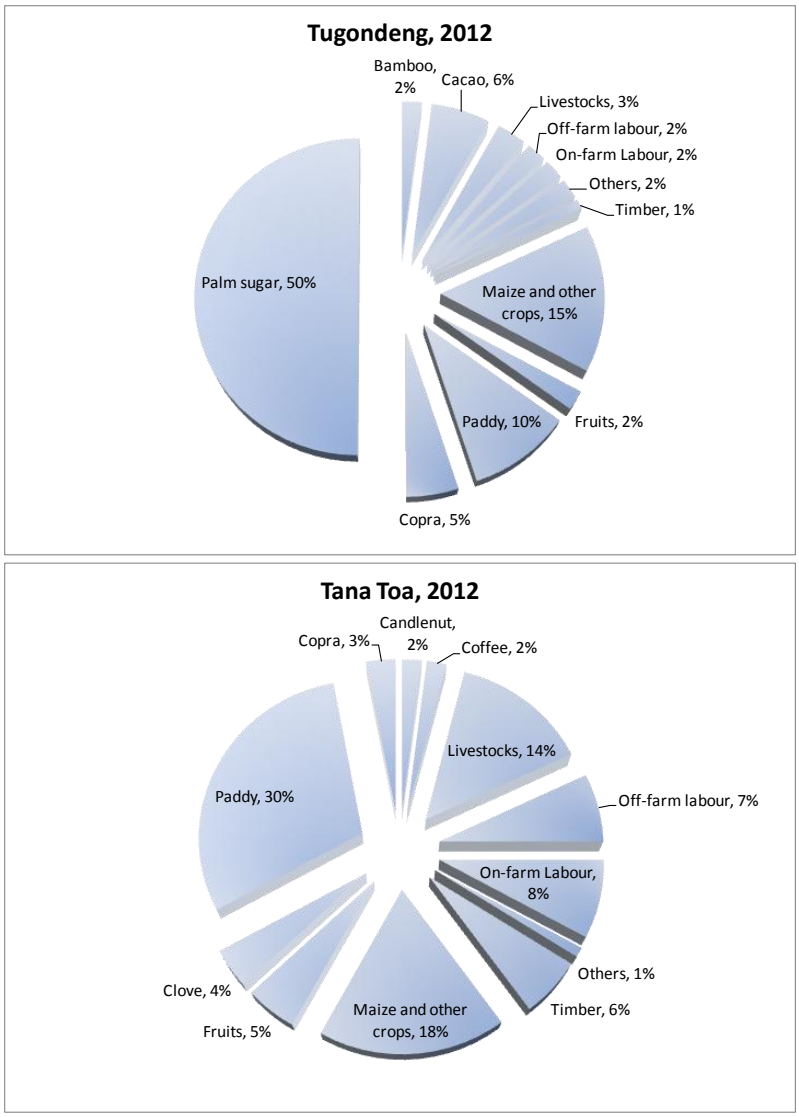


Figure 13 Recent livelihoods option in Tugondeng and Tana Towa based on community perspectives

Tana Towa farmers also applied fertilizer twice a year using TSP and urea by 10 sacks for the one planting season. The production could reach about 3 tonnes/ha of wet grain or ± 2 tonnes of rice, that mostly kept to their daily needs. The main obstacle in the management of paddy were peast and disease such as planthopper pests, rodents, wild boars, and stem borers.

Maize and other crops

Farmers planted hybrid maize which they got from the Government support in the fields two times a year. Bisi-2 seedlings could produce up to maximum of two tonnes/ha (dried maize). The maintenance was done by weeding two times a year, and fertilization using a 7 sacks/ ha of mix fertilizer (Urea, TSP, ZA, NSPK). Currently, farmers sold maize to the village market/traders or to the market in Bulukumba, prices range from IDR 1,500/ litre. The main obstacles which encountered in the management of maize were pests: earthworms and rodents.

Coconut and palm sugar

Coconut was one main livelihood source of community, especially in Tugondeng village. Coconut agroforests spread to more than half of land use in Tugondeng. In the 1980s many farmers planted coconut using hidbrida seedlings from the Government support programme. Currently, coconut seedlings which used by the people were also came from the Government supports, purchase at a price of IDR 1,500/seedling (50 cm height), or even create their own seedlings. According to far,mers, the good seedlings characteristics used to be coma from good and healthy mother trees, and lots of fruit production. It was quite easy to make coconut seedlings, fruit picked directly and then put in beds or polybags for 3 months, then it will be ready planted in the fields.

Coconut was planted using a spacing of 8 × 8 m. Fertilizer application of coconut was conducted twice a year, using TSP fertilizer, urea, ZA, and kiserit. The combination of all these fertilizers was applied in 4 sacks/ ha/dosage in every application using sown method. Coconut hybrids began to bear fruit at the age of 4 years and fruiting peaks reached at age of 10 years. Coconut harvested was every 4 months or 3 times a year, and can produce around 3,000 fruits/ha. Around 7 coconut fruits will produced 2 kg of fresh copra. Local people selling copra to village traders at a price of IDR 2,100/kg (fresh copra) and IDR 5,000/kg (dry copra).

Many farmers also produced palm sugar in Tugondeng village. Farmers tapped the coconut sap starting in the morning (06:00 to 07:30) and afternoon (15:00 to 17:00). In every coconut tree, farmers tapped 2-3 young shoots and produced an average of 2 litres of coconut wine/tree. Number of total tapped tree were 30-33 trees, which resulting 75 liters of palm winw. These amounts of coconut wine could produce ± 10 kg of palm sugar. Generally farmers use firewood for producing the palm sugar.

Farmers sold palm sugar to the traders who came to the villages, and they will sell it back in big market in Makassar. Palm Sugar prices in the collector was IDR 8,000/kg. It was quite high compared to copra. Gross income for the copra farmers could be as much as IDR 2 millions/month per 1 ha, while for palm sugar could reached as much as IDR 3 millions/month per 1 ha.

The main obstacles encountered in the management of coconut plantations today were the high attack on wild boar, old coconut trees in the gardens, as well as the fluctuation of copra and palm sugar prices in the farm gates.

Migration Pattern

Population dynamics are characterized by movement from one region to another is called migration. Population movement is difficult to measure 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, to find better economic or agricultural option, and it can also relate with the cultural value for certain ethnic. 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.

Interestingly, between the current AgFor projects sites, in South Sulawesi and Southeast Sulawesi, those two areas have very close relation in term of migration. People from South Sulawesi migrate to Southeast Sulawesi due to land expansion for cacao cultivation. This study discuss about migration pattern in South Sulawesi.

Migration pattern in provincial level

Population census 2010 calculated that population of South Sulawesi about 8,034,776 people, that are including those who reside in urban areas for about 36.66% and the rest is in rural areas. Population distribution per district varies from 1.52% to 16,66% that represented by Selayar island and Makassar city respectively. With the sex ration for about 95, male population are around 3,924,431 people and women as much as 4,110,345 people.

BPS release data on population census 2010 and indicated that recent migration in South Sulawesi continue to increase over time. It recorded 296,043 people or 4.1 percent of the population are the recent incoming migrants between districts. Recent incoming migrants in urban areas were 3.6 times greater than in rural areas, each of 7.5 and 2.1 percent respectively. This show that in migration were mainly happened in urban area. Male migrant workers (149 199 people) perform higher than female (146 844 people) with sex ratio was about 98.

Migration pattern in study area

Figure 14 and Figure 15 shows the pattern of out and in migration within some villages in Bantaeng District, while Bulukumba District were illustrate in Figure 16 and Figure 17. In migration rate from years to years in most of villages are varies depend on the condition on each villages. In Bonto Karaeng villages, in migration in around 1980s were driven by the expansion of clove cultivation. Few people from Jeneponto were coming around 1980, buy the land and cultivate clove. In Kayu Loe villages, in around 1990 to 1996, people from Jeneponto and Takalar, also from Sinjai were coming periodically to expand maize production. They usually come for about 1 – 5 household only. In migration rate in Pattaneteang and Campaga were seen rather high in current period. People from Campaga and surrounding areas who previously moved to Malaysia for several years are returning back to the village in around 2012 for maize cultivation.

While in Pattaneteang, there were some Makassar ethnic from Jeneponto and Takalar come to the villages for cacao cultivation. There were also people from Selayar and Bone who come around 2002 for the same reason. However, information on what kind of the reason make them interest to move to Pattaneteang were not clearly explain. It might need more in depth study to elaborate more.

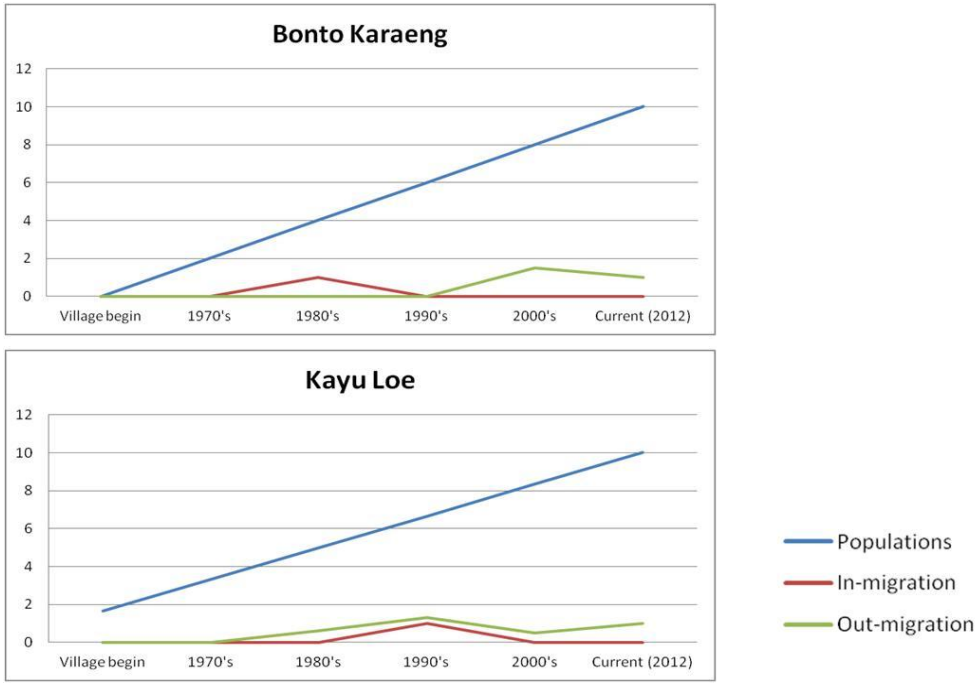


Figure 14 Population, in migration and out migration pattern on some villages in degraded land in Bantaeng District

In migration in Balang Pesoang villages were relatively high in around 1972 to 1980 due to clove cultivation expansion. Few bugis people from Sinjai and Bulukumba were coming around 1972, buy the land and use local labor to cultivate their cloves. In 1980, few Makassar ethnic from Jeneponto were also coming to cultivate the same farm commodity. At that time, clove expansion were quiet increase since government also promote this commodity and give free clove seedling for local community.

During cloves harvesting periods, usually within month 7 to 9, people from Jeneponto, Sinjai and other surrounding villages were coming to some villages such Borong Rappoa, Pattaneteang, Balang Pesoang and Campaga do the harvest for the local communities. It can be seen on the figure in particular for current periods that shows high but figure out this kind of temporary in migration. Harvesting cloves need a lot of labor and due to the owner didn't have a lot of labor they invite people from out of the village become the clove picker (as labor). Moreover, harvesting periods between each village are different, so they can harvest cloves in rotation, one period in one villages, the other periods in the other villages. They come as clove pickers with wage per litre for about IDR 1000 – 1500. They may get ± 70-80 liters per hectare per person. While they live in the villages, they may live with their family or living together with some other labors in rented house for about two months.

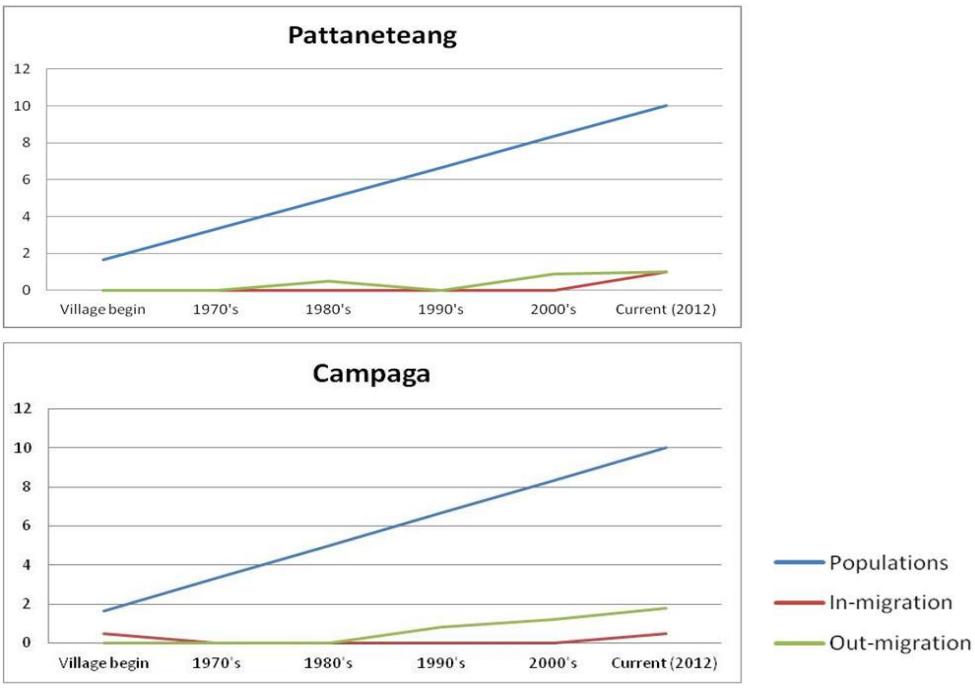


Figure 15 Population, in migration and out migration pattern in agroforestry type of villages in Bantaeng District

In Tana Towa and Tugondeng (villages in timber based systems typology in Bulukumba), in migration rate were almost zero. There were only individual moving and usually due to marriage.

Outmigration can be seasonal, temporary or permanent. Seasonal migration were defined as migration in particular time, while the migrants will live in the destination areas for some periods of time and back to their villages, but then they will go again to the location. Temporary migration is happen when the migrant move with or without the family in one new villages for several years and will return to the village after the work is done. Permanent migration were defined for people who move to other areas and not expected to come back to their origin villages.

Bugis and Makassar people from South Sulawesi were move to other area also for the reason to expand their land for cacao cultivation. They may be classified as permanent migration because they will buy land in new area and cultivate it. They may back to the villages sometimes just to visit their family. Around 1980 there are massive out migration from the South to Central Sulawesi for cacao plantation expansion, while Southeast Sulawesi becoming more popular destination in around 1990 to 2000. The reason to move to the Central and Southeast Sulawesi is for land expansion. Some villagers mention that the land in the Southern Sulawesi were now getting limited, also the land price were also very high. With their network, they may get the land in Central and Southeast Sulawesi with more reasonable price (cheaper than in the South).

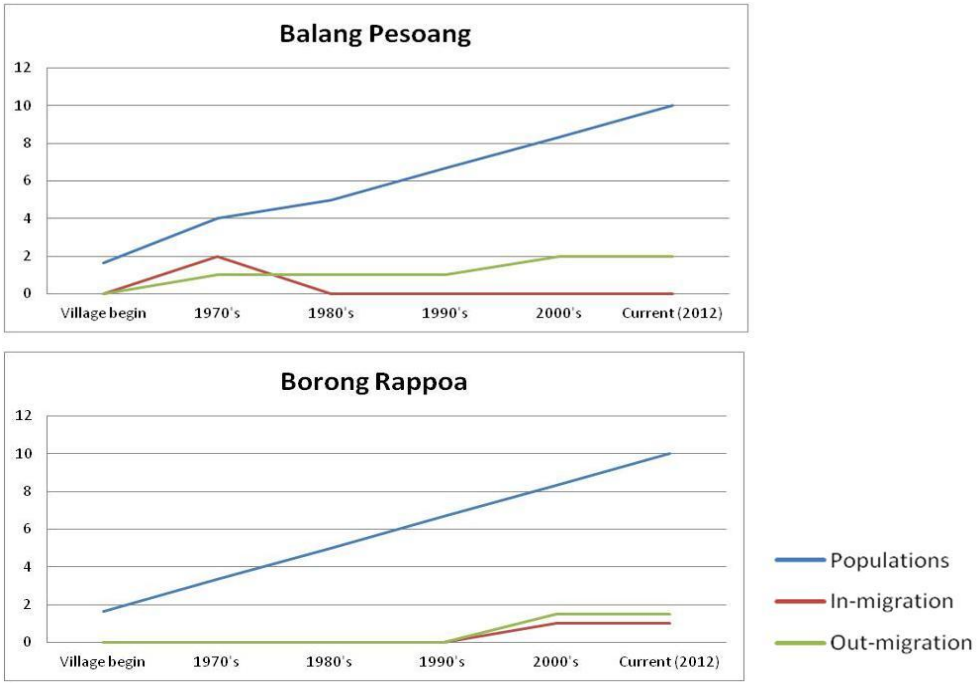


Figure 16 Population, in migration and out migration pattern in agroforestry type of villages in Bulukumba District

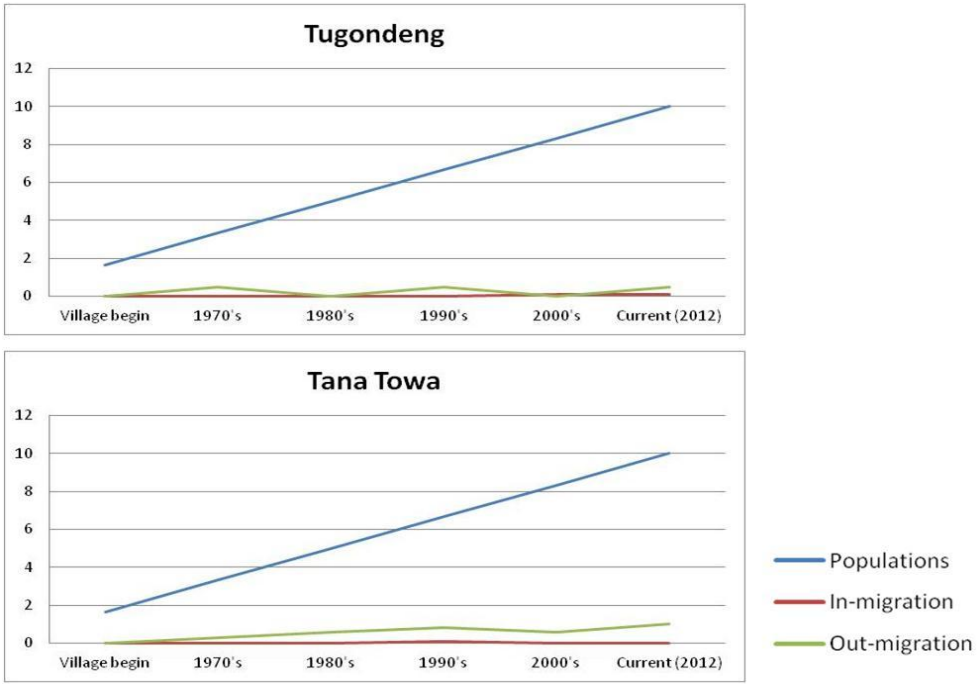


Figure 17 Population, in migration and out migration pattern in timber based type of villages in Bulukumba District

Working in oil palm plantation as farm labour in Malaysia becoming another alternative of livelihood source that were increase recently in Borong Rappoa, Balang Pesoang and Campaga villages due to harvest failure. Cloves, as one of the main commodities in this areas, were not well produced due to climate condition in the last two years. People mention that their cloves were not flowering since the last two years periods due to high intense of rain (long rainy periods or locally called as *pabosi/pahosi*). Clove production for the last two months were

significantly decrease, also with coffee as another important commodity in this area. As strategy to continue their live, people were going to Serawak/Malaysia to get cash income for the family. They work as oil palm worker at least for two to three years period during the low production of cloves. This kind of migration were categorized as temporary migration.

Villagers were moving to the city or urban areas such Makassar, Bulukumba, and Bone. They were involved in nonfarm activities as non farm labour, trading, becak or motorcycle driver. This kind of migration usually only happen individually, one or two household members migrating to the near villages or interregional area. The reason of this migration were mainly due to increasing their incomes, as they don't have land or could be also because of they don't have any particular skill for farming. Temporary out migration also happen in some villages to work out of the island as Borneo (Kalimantan) and Papua (in Timika) for coal mining or gold mining labor. They may return to the village when all the mining work is finished.

Table 3 List of out migration in South Sulawesi

	Origin	Destination	Ethnic	Years	Livelihood source in destination area	Reason
Degraded land	Bonto Karaeng	Kolaka (Southeast Sulawesi)	Makassar	2000s	Cacao and clove cultivation	Limited land
	Bonto Karaeng	Makassar	Makassar	2000s	Trader Non Farm	Lack of income Limited alternative non farm income
	Kayu Loe	Makassar	Makassar	1990s	Non farm activities	Lack of income
	Kayu Loe	Bulukumba	Makassar	1995s	Non farm activities	Lack of income
	Kayu Loe	Kolaka	Makassar	1990s	Cacao and/or clove cultivation	Lack of income
	Kayu Loe	Malaysia	Makassar	1985s 2012s	Oil palm worker	Lack of income
Agroforest – Bantaeng	Pattaneteang	Malaysia	Makassar	2012s	Oil palm worker	Lack of income
	Pattaneteang	Kalimantan	Makassar	2012s	Oil palm worker	Lack of income
	Pattaneteang	Makassar	Makassar	1980s	Off farm activities	Lack of income
	Pattaneteang	Southeast Sulawesi	Makassar	2000s	Cacao and land cultivation	Lack of income
	Campaga	Kendari	Makassar	1993 - 2000	Cacao and/or clove farming	Limited land
	Campaga	Malaysia	Makassar	1993 - 2000	Oil palm worker	Lack of income
	Campaga	Kalimantan	Makassar	2010s	Mining worker	Lack of income
	Campaga	Timika	Makassar	2010s	Gold mining worker	Lack of income
	Campaga	Makassar	Makassar	1990 – 1994	Non farm activities	Lack of income
	Campaga	Urban area – Bone,	Makassar	2005s	Non farm activities	Lack of income

Agroforest - Bulukumba	Balang Pesoang	Kalimantan	Bugis	2000 – 2012	Oil palm worker Coal mining worker Manufacture worker	Lack of income
	Balang Pesoang	Kendari (Southeast Sulawesi)	Bugis	2000 – 2012	Cacao farming	Lack of income
	Balang Pesoang	Palu (Central Sulawesi)	Bugis	1980 – 2012	Cacao farming Oil palm worker	Lack of income
	Balang Pesoang	Makassar	Bugis	1980 – 2012	Non farm labour	Lack of income
	Borong Rappoa	Malaysia	Bugis Makassar	2011 – 2012	Oil palm worker	Decreasing farm production
	Borong Rappoa	Kalimantan	Bugis Makassar	2000s	Oil palm worker Coal mining worker Manufacture worker	Lack of income
	Borong Rappoa	Kendari North Kolaka	Bugis-Makassar	2000s	Cacao and/or clove farming	Lack of income
	Borong Rappoa	Gorontalo Java island	Bugis-Makassar	1990s and 2000s	Civil servant/ Military	Lack of income
Timber	Tana Towa	Sulawesi Tenggara	Konjo	1990 – 2012	Cacao, clove oil palm and/or rubber cultivation	Land expansion Lack of income
	Tana Towa	Kalimantan Timur	Konjo	1990 – 2012	Cacao and/or clove cultivation	Land expansion
	Tana Towa	Makassar	Konjo	1970s	Non farm activities	Lack of income
	Tana Towa	Bone	Konjo	1985s	Non farm activities	Lack of income
	Tana Towa	Palopo	Konjo	1985s	Cacao production	Land expansion Lack of income
	Tugondeng	Kalimantan	Makassar-Konjo	2011s	Oil palm worker Non farm activity	Lack of income
	Tugondeng	Riau	Makassar-Konjo	1972s	Oil palm cultivation	Lack of income
	Tugondeng	Malaysia	Makassar-Konjo	1990s	Oil palm worker	Lack of income

Table 4 List of in migration in South Sulawesi

Origin area	Ethnic group	Destination	Year	Livelihood source in the destination areas	Reason of migration
In migration to degraded land					
Bulukumba	Campuran (Bugis dan Makassar)	Kayu Loe	1992	Maize cultivation	Land expansion/economic
Sinjai	Bugis	Kayu Loe	1996	Maize cultivation	Land expansion/economic
Jeneponto	Makassar	Kayu Loe	1990	Maize cultivation	Land expansion/economic
Takalar	Makassar	Kayu Loe	1990	Maize cultivation	Land expansion/economic
Jeneponto	Makassar	Bonto Karaeng	1980	Clove production Trading	Land expansion for clove cultivation
Bantaeng	Makassar	Bonto Karaeng	1980	Farming	Family
In migration to Agroforestry villages in Bantaeng District					
Bonto tappalang	Makassar	Campaga	1940	Maize cultivation	Economic
Campaga	Makassar	Campaga	2012	Maize cultivation	Economic
Jeneponto	Makassar	Pattaneteang	2012	Farming	Land expansion/economic
Bulukumba	Bugis	Pattaneteang	2012	Farming	Land expansion/economic
Takalar	Makassar	Pattaneteang	2012	Farming	Land expansion/economic
Selayar	Selayar	Pattaneteang	2002	Farming	Land expansion/economic
Bone	Bugis	Pattaneteang	2000	Farming	Land expansion/economic
In migration to Agroforestry villages in Bulukumba District					
Makassar	Makassar	Balang Pesoang	1972	Clove cultivation	Land expansion for clove cultivation
Sinjai	Bugis	Balang Pesoang	1972	Clove cultivation	Land expansion for clove cultivation
Jeneponto	Makassar	Balang Pesoang	1980	Clove cultivation	Land expansion for clove cultivation
Kota Bulukumba	Bugis	Balang Pesoang	1972	Clove cultivation	Land expansion for clove cultivation
Sinjai	Bugis	Borong Rappoa	2000	Farm labour	Family
Jawa	Sunda, Jawa	Borong Rappoa	2000	Non farm work	Family
In migration to Timber villages					
Kajang	Makassar-Konjo	Tugondeng	2000	Maize and Paddy cultivation	Land expansion/economic
Jawa	Jawa	Tugondeng	2010	Non farm	Land expansion/economic

Discussion and recommendation

Main land use system and livelihoods options

Based on the focus group discussion, within the three village typologies, there were quite clear differences in terms of livelihoods option, tree-crops and farm management which farmers do in these villages. These differences could be influenced by historical differences in land management, management pattern of farmers does, and markets access.

Furthermore, the first village typology (Kayu Loe and Bonto Karaeng) have to deal with the fact that they were manage likely degraded land due to prolonged erosion that occurs. Farming system which uses maize as the main commodities tends to make farmers manage their lands very intensive. This intensive farming system was not followed by adequate and proper land management to prevent the erosion. As the result, many forest or candlenut agroforest were converted into intensive maize field, which in recent years suffered severe erosion. Numbers of eroded land condition can be seen from the number of open land (Bonto Rampan) in these villages which was actually the degraded land because of inappropriate intensive farming practices in the sloping area.

Different condition was found in the second village typology (Campaga, Pattaneteang, Borong Rappoa, and Balang Pesoang) where the complex tree-based systems pattern occurs. Farmers in these villages typology, both in Bantaeng and Bulukumba districts, had long been practising complex agroforestry systems. Coffee, cacao and clove were mixed with various types of crops and fruits. This condition also influenced by the Government policy in the village. In the past, various plantation trees (coffee, clove, and cacao) were introduced to the people in these villages simultaneously. The limited amount of land owned by farmers lead them to mix these trees in an agroforest plot they have. Nowadays, these plots classified as complex systems, which was difficult to distinguish the main trees cultivated by farmers, all were important to farmers.

Lastly, the third village typology showed the existence of timber based system which was integrated into mix systems. These villages had the same pattern of complex agroforestry system as well as practised in the second village typology. However, the development of smallholder timber plantations in these villages led timber to become one of the rising and popular sources of livelihoods. The area was actually well known as a source of natural timber (biti/vitex, local teak, etc.) in South Sulawesi as well as supports from government policy. The active promotions from the Government on smallholder timber were also led farmers to develop more timber trees in their plots.

Several suggestions and input for the improvement of livelihoods and farming systems in the community were tapped from the discussion in the villages during the survey, which includes:

- Increasing farmers' access and knowledge to affordable quality seedlings;
- Increasing extension activities; extension activities not only by providing the material, but couple with the direct practice to the field. Develop good and proper material guidance which includes cultivation techniques (coffee, cacao, clove), as well as pest and disease management;

- Better marketing process and product quality improvement with competitive prices as well to compete the market. It is also including assessments and development of micro-economic institution in village that supports local community in rural marketing of agricultural products.
- Supporting capital for farmers in developing business and market of agriculture products
- Supporting the rejuvenation of smallholder plantations, such as coconut agroforest in Tugondeng
- Capacity building on other potential crops, such as training on cultivation of rubber
- Providing appropriate technology for the improvement of product quality and diversification of plantation crops in the village
- Increasing and strengthening the capital of farmers.

Migration issues

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. This is mostly happened on the villages which relying on clove production as their main livelihood sources. Clove productivity were significantly decrease due to high rainfall intensity from the last two years in Balang Pesoang, Borong Rappoa, Campaga and Pattaneteang. The area which has more alternative agroforest products were having better alternative. For example in Tugondeng, out migration on current periods were relatively low. The livelihood source in this villages were mainly from sugar palm production from coconut tree, which not facing any problem with current climatic condition.

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.

More indepth study on migration with considering social stratification within the community would be very important to portray the reason behind people decision to move from one villages area to another.

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.

Material 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 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 5). 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 5 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

Land use system identification to be analyzed in this profitability assessment was selected based on FGD on livelihood conducted in each village. The FGD identified existing main land uses that managed by villagers to generate their main income. There were eleven land uses in the study site to be assessed in this study. The eleven land uses as shown in Table 6 were identified through field work carried out in March 2012, followed by observation, in-depth interview and FGD to collect more data to develop farm budget as the basis of profitability assessment.

Table 6 Land cover of South Sulawesi and the selected main land-use systems

Category	Land use type	Products	Scale of operation	Location
Crops	Maize	Maize	0.5-1 ha	Bonto Cinde
Simple mixed garden	Candlenut garden	Candlenut, maize	1 ha	Bonto Cinde
	Kapok garden	Kapok, maize	1 ha	Bonto Cinde
	Coffee garden	Coffee, maize	1 ha	Kayuloe
	Coconut sugar garden	Coconut sugar	1 ha	Tugondeng
	Coconut-cacao garden	Coconut, Cacao	1 ha	Tugondeng
	Cacao-coffee garden	Cacao, Coffee, fruit	1 ha	Campaga
	Cacao-coffee-clove garden	Cacao, Coffee, Clove, fruit	1 ha	Campaga
Timber garden	Gmelina garden	Gmelina	0.5-1 ha	Karassing
	Sengon-gemelina garden	Sengon, Gmelina	0.5-1 ha	Karassing
Monoculture garden	Clove garden	Clove	1 ha	Bonto Rappoa

The study noted maize cultivation widely practiced in around Bonto Cinde of Bantaeng sub district. Farmers cultivate maize intensively, even in the area with hilly topography. By seeing the landscape, it shown how maize cultivation was dominating the agriculture activities in this area. Most maize lands were managed added with fertilizer up to 600 kg of urea in a year. Farmers were using hybrid seed so they can harvest it two or third in a year. Each harvesting farmer gained about 5000 kgs of maize. In this mountainous area, there were spotted candlenut (*Aleurites moluccana*) garden and kapok (*Ceiba pentandra*) in lower areas. According to farmers, there were many candlenut trees have been felt and replaced with maize.

In lower area of Bonto Cinde, there were farmers who manage kapok gardens. We meet the head of farmers group to collect the information around kapok cultivation. Generally, kapok garden was started with the maize cultivation in first two years when the garden has open space allowing the sun light to enter.

Farmers recognized that kapok tree is a fast growing tree with low input needed. They used fertilizer for the maize during the first two year as well as other chemical herbicide. Kapok farmers began to harvest at the third year, with average yield of 0.5 kg for each tree. Some farmers sold the kapok within sacks and some of them processed it to make a flexible thin bed that shipped up to Surabaya.

Complex mixed garden were found in Campaga villages. This type of land use refers to multi species of tree planted in the same land. Farmers usually manage about three species, e.g. cacao, coffee, clove (*Syzygium aromaticum*) and some type of fruit trees. This type of land use reflects the change of farmer's preference in choosing the tree species. At the first, their land were planted with annual crops such maize or just shrub. Then they began to cultivate cacao in 1992. Several years later, they heard about Arabica coffee and they planted it between the cacao trees. However, they experience the lower production of cacao and trying with clove trees in 2009. Some fruit trees also maintained such durian (*Durio sp*) and rambutan (*Nephelium lappaceum*) in smaller number.

Farmers in Campaga applied chemical fertilizer around 400 kg each year for their mixed garden. They also used manure at the beginning of both cacao and coffee planting. About 4 litters of chemical herbicide were sprayed each year to remove the unwanted vegetations. Other activities were done by farmers in the system include pruning, manual weeding, harvesting and drying of coffee beans. The coffee-related activities were dominated with the figure around 86% of total labour used.

Mixed garden with different tree composition was found around Tugondeng. Farmer of Tugondeng mixed 143 trees of coconut trees with 1000 cacao tree. Farmers fertilized up to 480 kgs each year regularly for both coconut and cacao trees. Instead of routine fertilizer, farmers also conduct manual weeding and spraying. Cacao pruning was done each year during the productive period. Under this type management, a hectare of this land use type can produce coconut fruit around 27000 units on average each year and 946 kg dried cacao bean.

In this area we also found farmer who utilize its cacao to make sugar. We noted this type of land use was very highly labour intensive. Everyday farmer tap the nira twice a day, in the morning and the evening. They collect the nira with a bucket or plastic bottle and then put into a boiling

pan. Every day they cook using a fuel wood cooking stove in a wooden simple house in garden area. Every 30 -35 of coconut trees, they produce 10 kgs of coconut sugar every week. It's estimated that their annual sugar production requires 44 m3 of fuel wood for a hectare of plantation.

Timber garden was found in Karassing, not far from Tugondeng. In this area, farmer utilize their land include home garden, by planting fast growing trees such sengon and gmelina. According to farmers, they started to planting trees as government shared free seedlings in 1990. After the first harvesting, more farmers attracted to plant sengon and gmelina. During fieldwork, we found a farmer who trying another species growing tree of teak.

Clove garden mostly found in upper Bulukumba such Borong Rappoa. In this area, the landscape was dominated by trees, mostly productive clove trees. Farmers usually manage 200 clove trees in a hectare of land. Every year they conduct manual weeding to clean the ground from shrubs and dried leaves. The harvesting was done every two years by hiring harvesting specialized labour. According to farmers, at the beginning of harvesting years each tree can produce about 2 kg of clove. The production then increases to 30 kg/tree at the year of 7.

Profitability

Table 7 shows the result of profitability assessment in mountainous area of Bantaeng-Bulukumba. There were 11 land uses identified and assessed during the fieldwork. The table also indicates different period of estimation. Mixed garden and clove employs 30 years of period, while timber based is use shorter period.

Using the annual equity, the result shows that the most profitable land uses system is clove garden, followed by complex mixed garden which consisting of coconut and cacao. Clove that cultivated in monoculture system was performs as the most profitable, but it's not as in the mixed garden in Campaga. Farmers in Campaga have planted clove in their mixed garden in last three years and they haven't enjoyed the production yet. In contrary, they have to provide more labour at unproductive period.

The low profitability land use is shown by coffee garden in Kayuloe. This system has no commercial product except coffee bean. Farmers only plant Arabica coffee mixed with shading trees that has no economic value. In this system, farmers have allocated lower input (even no fertilizer application) that lead to low production of Arabica bean. Coffee farmers also experience drop price of Arabica bean recently. In March 2012, they receive coffee price as low as IDR 10,000 per kg.

Our estimation on candlenut garden shows that the system generates low return to land. As observed during the fieldwork, we found that many candlenut garden were replaced by others crops such maize. This replacement perhaps happened during the booming of maize cultivation several years ago. When the booming period, farmers were received higher price of maize, higher than current price (1600 per kg). The fast-cash income could be contributed to the farmer preferences on maize. They like to receive income twice a year compare to candlenut which only produce once a year with highly resources of labour for collecting the fruit.

Table 7 Profitability and return to land of land-uses system in South Sulawesi

Category	Type of land use	Main Product	1 cycle period (year)	Return to land ($/ha)	
				at 1 cycle period	equal per year
Low	Candlenut garden	Candlenut	30	5,380	478
	Coffee garden	Coffee bean (arabica)	30	5,946	518
	Crops	Maize	1	953	953
	Kapok garden	Kapok	30	10,506	933
Medium	Timber garden	Sengon, gmelina	9	6,766	1,074
	Mixed garden	Cacao, coffee, fruits	30	12,478	1,088
	Timber garden	Gmelina	8	7,629	1,317
	Mixed garden	Cacao, coffee, fruits, clove	30	19,430	1,691
	Coconut	Sugar	30	19,872	1,732
	Mixed garden	Coconut, cacao	30	22,547	1,965
High	Clove garden	Clove	30	36,459	3,239

Reading Table 7, we can separate all land uses systems into three groups: the high profit land use (>2500 USD/ha/yr); middle profit (around 1000-2500 USD/ha/yr) and the low profit land use (<1000 USD/ha/yr). The low profit land use mostly located in Bonto Cinde; the middle group is located in Tugondeng-Karassing area; while the highest one located in Borong Rappoa and Campaga.

Labor engagement

In labor engagement, there's unique figure showed by Table 8 as return to labor is another indicator of profitability for labor, the higher of return to labor of a land use means the higher level of attractiveness to farmer for engage.

In the study area, it's difficult to find real labor wage. There were collective working practiced in some activities such land preparations. The real labor wage commonly found in harvesting activities such clove, coffee, timber and Kapok. This study use 30000 IDR/psday (3.3 USD/psday) as one of the assumption in all land use system. This value was raised when we asked to farmers, and it's lower compare to harvesting fee.

Table 8 Labor engagement in South Sulawesi

	Type of land use	**Return to Labor ($/psday)**	**Labor Req (psday/ha/yr)**
1	Candlenut garden	4	666
2	Coconut sugar	6	1,006
3	Crops maize	14	86
4	Kapok garden	15	103
5	Coffee garden	19	28

6	Mixed garden cacao coffee	28	49
7	Mixed garden cacao coffee clove	34	80
8	Clove garden	40	82
9	Timber garden sengon gmelina	40	26
10	Timber garden gmelina	45	29
11	Mixed garden coconut cacao	56	43

The highest return to labour is shown by mixed garden coconut-cacao (56 USD/psday) followed by timber garden, clove, mixed garden on cacao-coffee.

Based on labor requirement on Table 8, we can separate three group with highly labour (>200 ps-day/ha/yr); medium labor requirement (100-200) and low labor requirement (< 100 psday/ha/yr).

We noted the coconut sugar system as the high labour intensive. This system is included in the middle profitability group, showing the feasibility for investment. However, the labour usage of this system has altered the return to labour to the lowest level. Each year, in a hectare of coconut plantation used for sugar, they require about a thousand of ps-day.

This figure confirms why in the field there' was a contract based-system in managing coconut garden for sugar. Under this system, farmer can rent 30-35 coconut trees with charge about 50000-100000 IDR for each coconut tree for a year. This rent system commonly practiced with 30-35 trees for a household farmer.

Conclusion

- There are several main land uses identified in the study area ranging from crops (maize), simple mixed garden (candlenut, kapok, coffee, coconut-cacao, coconut sugar), complex mixed garden (cacao-coffee, cacao-coffee-clove), timber garden to monoculture system (clove).
- The most profitable land use system based on annual equity measure is clove garden, followed by complex mixed garden, and timber garden.
- Mixed garden coconut-cacao generate the highest return to labor (56 $/psday) among other land use in South Sulawesi; while the coconut for sugar system shows the lowest (6 $/psday).

Part Three: Gender and Natural Resource Management

Elok Mulyoutami, Endri Martini, Syamsidar, Badri Dwi Meyldi, Janudianto, 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.

Gender and cultural identity

Sulawesi, was formerly known as Celebes, has hundreds ethnic group. Those are indicated in ethnologue (http://www.ethnologue.com/show_country.asp?name=IDL) that it has about 114 local dialect. South Sulawesi is inhabited by five main ethnic groups: Bugis, Makassar, Toraja, Mandar and Duri. Bugis and Makassar were the largest ethnic community. Makassar (Macassarese or Macassar) were majority in southwest corner of the peninsula, most of Pangkep, Maros, Gowa, Bantaeng, Jeneponto, and Takalar districts. Bugis were mainly found in the coastal swamp such as Bulukumba, Luwu, Polewali in Polmas, Pasangkayu in Mamuju districts, and in other areas in Central Sulawesi,

Southeast Sulawesi even in minor area in Sumatera, Malaysia and Singapore. Bugis were popularly known as the great migrant in many areas. Mandar ethnic in Majene and Polewali-Mamasa districts, a few settlements in Mamuju District, on the islands of Pangkep District, and at Ujung Lero near Pare-Pare. Majority toraja ethnic were in Tana Toraja District with large enclaves in Luwu District, and Duri ethnic in Enrekang District. Ethnic groups that was common in Bantaeng is mostly Makassar with few Bugis, and in Bulukumba dominated by Bugis. Ethnic groups distribution information were extracted from Lewis (2009).

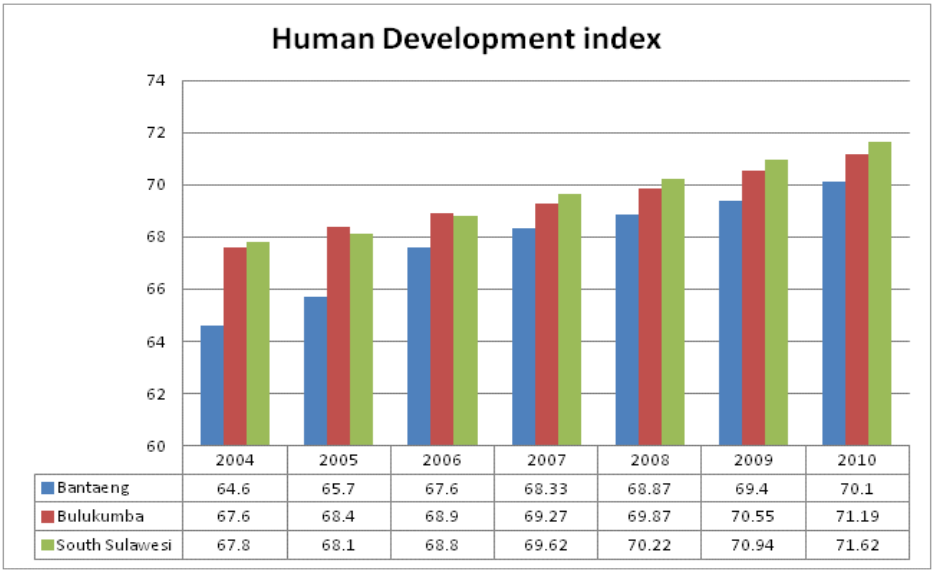
Gender issues in South Sulawesi were widely discuss among sociology and anthropology as it has closely link with cultural issues. In particular to Bugis culture, gender is really interesting issues as it not only consist of men (*oroane*) and women (*makkunrai*), but also another gender role as *calabai* (anatomical males with social roles as women), and calalai (anatomical females with social roles as men), and *bissu* (who has masculine and feminine and acknowledge as priests, the highest caste, with men and women transcendent) (Graham 2001). Shelyn Graham, an anthropologist from Australia, examined that *siriq* (shame) within Bugis community have closely link with the gender. Women as primary symbols of family honor can only perform their status as being women if they become wives and mothers, embody femininity, marry heterosexually and bear children. Women who cannot be the expected women as in local notion were considered as 'siri' or causing shame. Then they were thought of as other than women, as *calalai*. Also, the men who cannot perform as a real man, were considered as *calabai*, another than men (Idrus 2003).

Bissu is Bugis priests who have important role to hold rituals for the nobles and taking care of the sacred treasures of the kingdom. Bissu is also known as the fifth meta gender within Bugis community which combine the feminine and masculine, therefore they accentuate attribute combination of men and women. Bissu is usually associated with pre Islamic tradition, and in 2004, where the movie of the Last Bissu being produced, there only 8 bissu left in South Sulawesi.

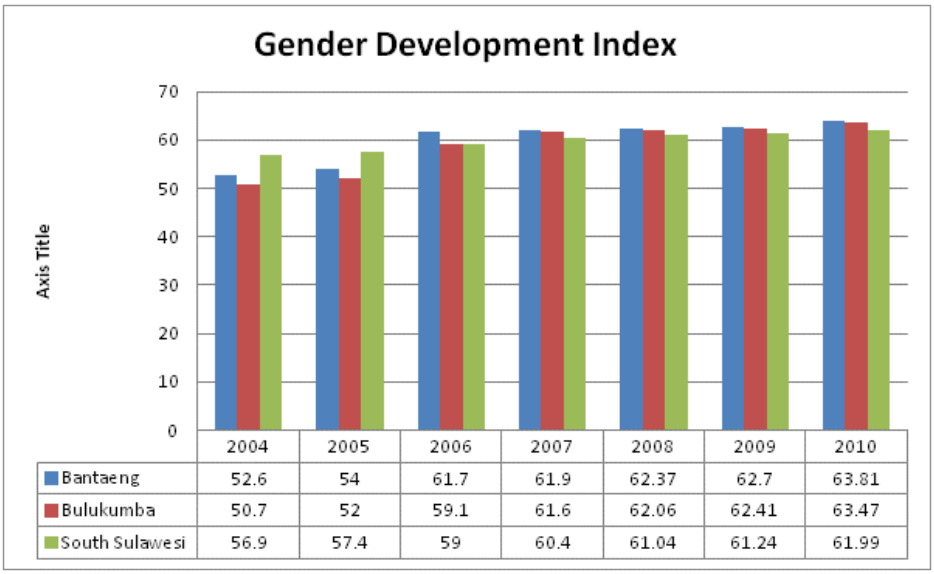
All the gender identities illustrate above is only to give cultural view on Bugis ethnic as the majority ethnic in South Sulawesi. Those gender identities is necessary to elaborate to give better understanding how gender roles on natural resource management in the context of Bugis communities. However, our discussion within this report will only focus on the gender identities as common in other areas, men and women.

Gender and human development index

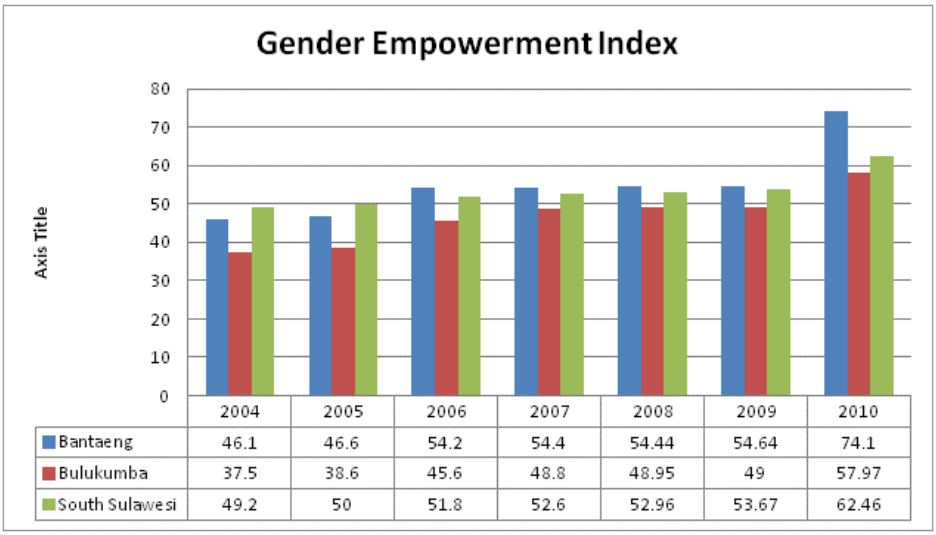
Human Development Index (HDI) is a simple or composite measurement which describing level of human development. HDI shows the progress of development in three basic human capabilities, life expectancy, education enrollment, and standard of living. Gender Development Index (GDI) describing development progress for women and for men, therefore it could explain the gap between those two gender. GDI has the same dimensions as HDI; life expectancy, education, and income, while GDI use equally distributed index which dissagregrated female and male in each dimensions. However, GDI is not specifically a measure of gender inequality. Large gaps between HDI and GDI can show that the development is not in particular considering gender equality issues.



	2004	2005	2006	2007	2008	2009	2010
Bantaeng	64.6	65.7	67.6	68.33	68.87	69.4	70.1
Bulukumba	67.6	68.4	68.9	69.27	69.87	70.55	71.19
South Sulawesi	67.8	68.1	68.8	69.62	70.22	70.94	71.62



	2004	2005	2006	2007	2008	2009	2010
Bantaeng	52.6	54	61.7	61.9	62.37	62.7	63.81
Bulukumba	50.7	52	59.1	61.6	62.06	62.41	63.47
South Sulawesi	56.9	57.4	59	60.4	61.04	61.24	61.99



	2004	2005	2006	2007	2008	2009	2010
Bantaeng	46.1	46.6	54.2	54.4	54.44	54.64	74.1
Bulukumba	37.5	38.6	45.6	48.8	48.95	49	57.97
South Sulawesi	49.2	50	51.8	52.6	52.96	53.67	62.46

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

Human Development Index (HDI) of South Sulawesi in 2009 to 2012 were increasing from 70.94 to 71.62, and the rank in national level in respective year were from 20 to 19. Report of Human Development Based on Gender Aspect mentioned that this is due to shortfall reduction on education aspect in those area. Rank of Gender Development Index (GDI) in South Sulawesi were also increase from 28 in 2009 to 27 in 2010, with GDI in respective year were 61.24 and 61.99. However, HDI and GDI in those two years were still below national HDI. There were 42% province in Indonesia were still below the national level, including Southeast Sulawesi. Gap between HDI and GDI in South Sulawesi were relatively high, indicate that development between man and woman is not balance yet. Men were still dominant in economic sector.

On 2010, HDI rank in national level of Bantaeng and Bulukumba were 312 and 248 respectively, and in Sulawesi Selatan they were in 18 and 12 respectively. HDI and GDI of South Sulawesi, Bantaeng and Bulukumba distritct 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 South Sulawesi, Bantaeng and Bulukumba district from year 2004 to 2010 were relatively decreasing, gender equality were tend to increasing from year to year. Initially, gap between HDI and GDI in Bantaeng and Bulukumba higher than in South Sulawesi, but then showed that it were decreasing and even lower than in South Sulawesi. This is showed that development progress in Bantaeng and Bulukumba is quite progressive in reaching gender equality compare than some other areas in South Sulawesi. Bantaeng, though the HDI and GDI were lower than in Bulukumba and South Sulawesi, but has the gap which is lower than those two areas, showed that their development program might be employed gender equality program more effectively.

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 South Sulawesi in 2010 was below national HDI (72.27), and also the GEM was below national GEM (68,15). HDI and GDI Bantaeng and Bulukumba 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.

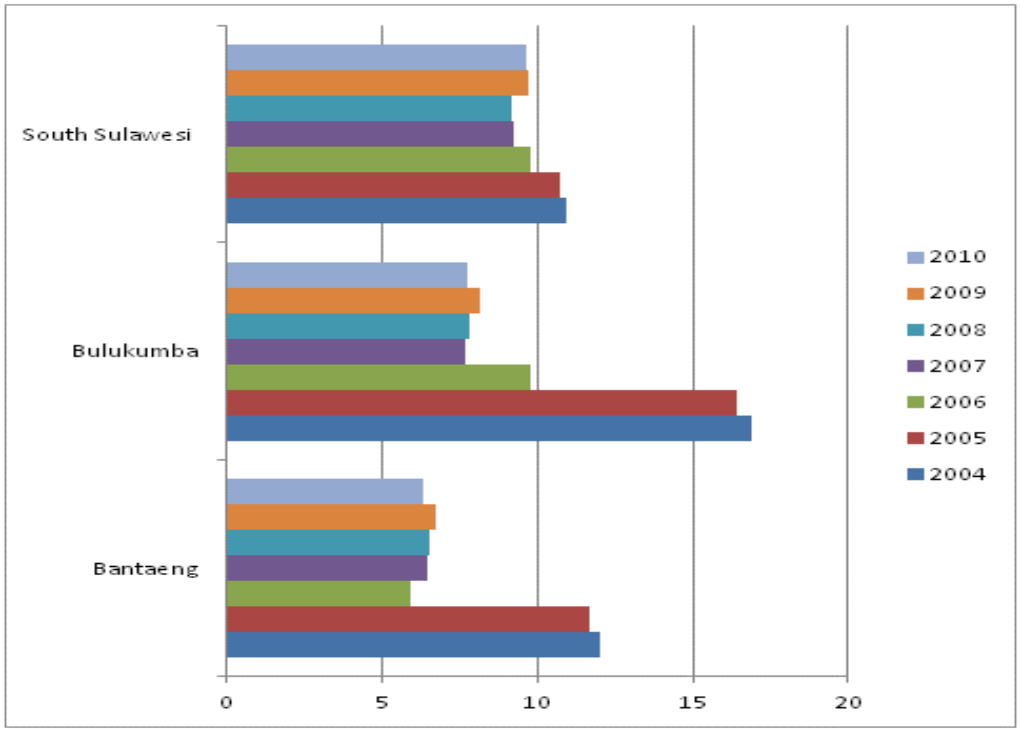


Figure 19 Gap between HDI and GDI from 2004 to 2012 in South Sulawesi, Bulukumba and Bantaeng (Data source: Pembangunan Manusia Berbasis Gender Tahun 2005-2011, Corporation between BPS and Kementerian Pemberdayaan Perempuan dan Perlindungan Anak)

Gender in livelihood source

This study will elaborate 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.

Table 9 Livelihood source and its importance for a whole community and for women in each village typologies group

Values for:	A (Degraded land)		B (Agroforestry – Bantaeng)		C (Agroforestry – Bulukumba)		D (Timber based system)		Total women	Total com-munity
	women	Com-munity	women	Com-munity	women	Com-munity	women	Com-munity		
Mixed Garden	7.75	7.08	7.78	8.80	8.42	8.42	6.35	6.05	7.55	7.54
Irrigated paddy field	7.79	8.29	6.99	6.81	5.83	6.19	6.41	7.00	6.61	6.90
Maize and other crops	7.90	7.90	6.88	7.16	6.33	6.33	5.01	5.41	6.66	6.83
Farm labour	1.33	3.33	4.29	7.14	5.57	5.57	3.68	3.54	3.64	4.58
Tenant	4.67	5.17	3.85	4.95	4.64	4.64	1.74	1.74	3.74	4.21
TKI	4.10	4.10	3.81	2.98	4.46	3.71	3.60	4.83	4.00	3.95
Non timber forest	2.00	3.36	4.05	2.52	2.00	1.00			3.37	2.54
Forest (timber)	4.00	2.00	0.63	0.63	3.00	2.00	4.44	6.67	2.54	2.38

Source: Focus Group Discussion

Two separated discussion with women's group and men's group were conducted to assess what are livelihoods sources exist in the area and its importance for the whole community and for women only. One of the important results was illustrated in Table 9. Mixed garden, irrigated paddy field, and horticulture (maize and other crops) plot become the main important land based livelihood source for the community as well as for women in the whole study location. Off farm work that remain important in every area were consist of any activities such mainly farm labour (labour who work on individual farm), few company labour (labour who work on state or company plantation or agricultural systems), and other non-farm activities such handyman/builder, transportation service, and others.

Mixed garden were the importance livelihood source 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. 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. TKI or labor working in abroad also important both for a whole community and also women. Some community went abroad have been starting from the last three years due to harvest failure. Though they argue that not many people prefer to go abroad for working, but due to increasing number of TKI from year to year, this livelihood source become more important for community.

Within group A (Degraded land), Kayu Loe and Bonto Karaeng Villages in Bantaeng District, found that the most important livelihood source for women is horticulture, followed by irrigated paddy field, mixed garden, tenancy system, working abroad as TKI, income from the forest, then farm labour. Horticulture (maize and other crops) production in Kayu Loe and Bonto Karaeng were mainly maize cultivation, that they use for source income and also subsistence need. Maize or locally common as *jagung kuning* were already cultivated by local community for many years ago. Types of soil become the main reason why local community preferred to cultivate maize. For the community, irrigated paddy field were more important compare to horticulture cultivation. Interestingly, women argue that timber from forest were more important compare than non timber products, however community have different opinion where non timber forest products were more important compare to timber products.

Mixed garden system were the important livelihood source system for community and women in Group B (Agroforest System in Bantaeng), Pattaneteang and Campaga village. Horticulture, farm labor and irrigated paddy field become the livelihood source important for the whole community, though off farm labour remain very important. For women, after mixed garden system, irrigated paddy field were become the second, since women's mention that paddy were very important for their consumption. Different with the condition on Group A (degraded land) who really depend on maize production for their staple food and source income, paddy remain important particularly for women in this two villages, though there also poor community who only depend on maize.

Physical condition in Group C (Agroforest System in Bulukumba) was almost similar with Group B (Agroforest System in Bantaeng). The social condition is also more less the same, the typical of community that were dominated by Makassar people. However, in term of importance of

horticulture (maize and other crops) and irrigated paddy field compare with farm labor, people in Group C argue that horticulture were more important rather than farm labor both for community as well as for women. Working abroad, though in the 2 villages group community were not so important, but for women, income from TKI were value as important.

Discussion with men's group indicate that the most important land based livelihood source for women in the whole study areas were mixed garden, irrigated paddy system, and horticulture, this is relevant with the discussion in womens group. Figure 20 shows different perception of men and women on how the importance of some landbased livelihood source for women on each villages typologies. In Group A (degraded land), men's perceived that both mixed garden and irrigated paddy have the same level of importance for women, but women perceived that horticulture (maize and other crops) were more important. Women thought the horticulture were important because as their responsible on fullfiling food needs for their family. Within this area, maize was important for women not only for markets products but also for their daily food.

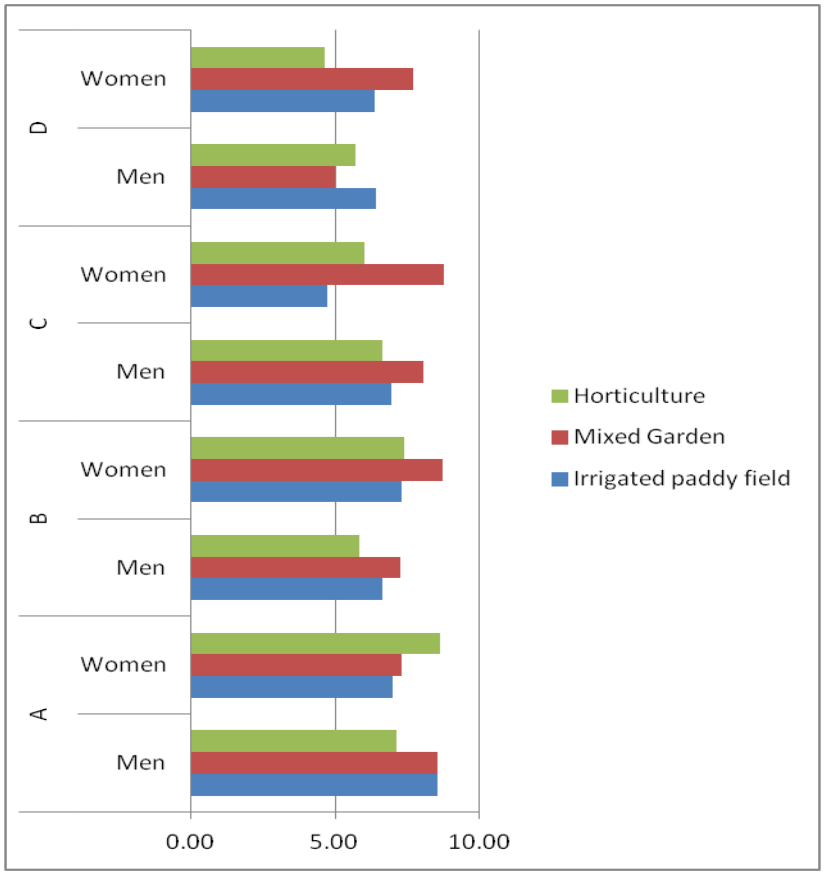


Figure 20 Importance of land based livelihood source for women in men and women's perception. Horticulture refers to maize.

Interestingly, the other groups (men and women in Group B, men and women in Group C and women in Group D) were indicate the same opinion that mixed garden become the highest importance land based livelihood source for their community as well as for women. The discussion with some men's group in Group D (Timber based) were performing slightly different opinion with women's group, where mixed garden perform not too important for women. In women's discussion, mixed garden still consider importance. This is show that women and men have different perception

on what makes the land use importance for women. Learning from the condition in Group A (degraded land), women give importance values not only about their involvement but also on the role of livelihood source for the community, and in Group D (Timber based), the difference perception between men and women could be causing by the men were think that the importance value of livelihood source were related with women involvement. Men in Group D (Timber based) were thought that women were usually involved more on paddy and horticulture (maize and other crops) system.

Group D (Timber based) perform different livelihood source pattern. Timber production, were becoming important livelihood source. However, timber production were not come from the forest, because there only limited forest areas can be accessed by community. Timber production were not consider being very important for women compare than irrigated paddy field, mixed garden, and horticulture (maize and other crops) though it can give significant contribution for household income. Women argue that though this can give high return but because of they have fewer things to do in timber production, so they don't consider the importance of timber production become high.

Next discussion will be more on gender involvement in livelihood source. Role of men and women in each livelihood source were discussed with local community. The discussion result indicated that in overall villages, women's roles (29.14%) within mixed garden system were indicating have higher proportion compare than men's role (26.78%) in the same system. Women's role in horticulture plot and irrigated paddy field were also higher than men. Gender roles in forest for timber and firewood production were dominated by men, also in many off farm works. Women's involvement as farm labour were a bit higher (10.6%) compare than men's (10%).

Figure 21 configure gender involvement on each village typologies based on discussion with women's and men's group. In mixed garden, Group A (degraded land) were indicated the same gender roles, both men and women have the same proportion. While in Group B (Agroforest System in Bantaeng) and C, women were indicated having more role as their proportion involved in mixed garden activity were higher than men. Interestingly, Group D (Timber based) perform quiet different situation where men's involvement in mixed garden have higher proportion than women. Mostly work in villages within Group D (Timber based) were related with timber based product mainly dominated by men. In Group A (degraded land), higher proportion of women were seen in horticulture (maize and other crops) cultivation, irrigated paddy field and farm labor. Farm labour mostly related with the work in irrigated paddy field, farm labour, and harvesting cacao, clove or coffee that more relevant to women's work. Those illustration are the same in Group B (Agroforest System in Bantaeng).

From the figure, we can see that no significant different between women and men's perception. Interestingly, different opinion between men and women were clearly seen in Group A (degraded land) where men were mostly 100% thought that only men who have involvement in forest production either for timber and non timber forest products. Women's group discussion still considering that women have role to be involved in forest production. However, discussion process were not reflecting much on what happen with this difference, we might need to recheck the information or digging more information to know the reason behind.

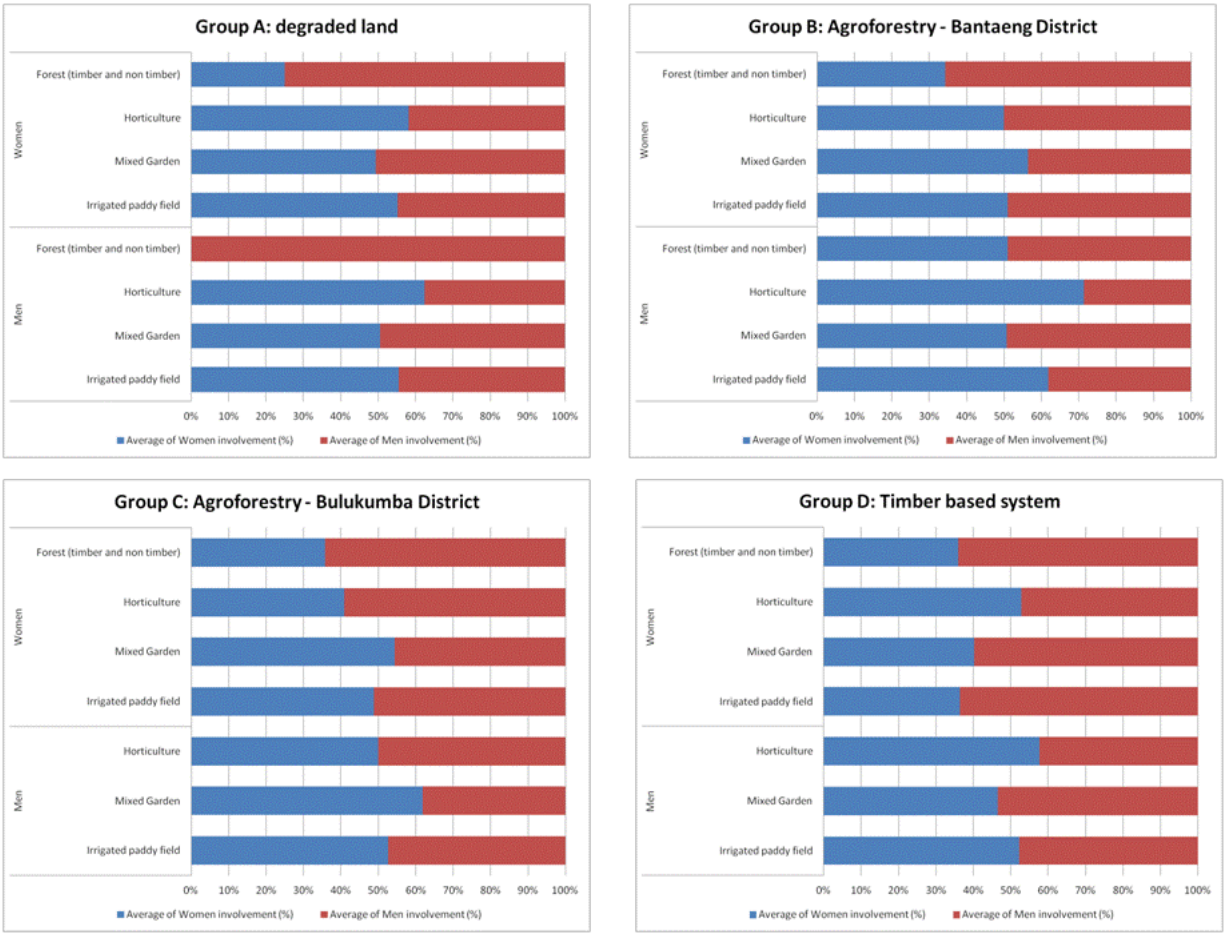


Figure 21 Gender involvement in livelihood source based on men and women perception

Consistent in every group, the work related with timber production, from the forest or in private land were usually dominated by men. Non forest timber product will be related with what kind of products from the forest. Rattan and fuelwood harvesting usually relate with the men's work, though women also involved. Mushroom and wildfruit collection usually involved women in higher proportion than for fuelwood and rattan collection.

Gender role in household

Generally, gender role in household were performed on how they divide the role in daily basis. Women have responsibility to maintain domestic aspects, taking care the kids, fulfill family nutrition and other needs. Men have more responsible as the main cash earner, therefore they have more chance in public activities. The difference between men and womens roles in household, including agriculture production, is the amount of time spent carrying out the activities. Women wake up early in the morning, prepare the food for all the family member and taking care the kids before they go to school. They going out after all the morning work done, and spend time in the fields, then they returning home to prepare food in the middle of the day, and then some of them back to fields to work again until the afternoon. When they back home, they need to prepare dinner and accompany kids for doing school homework. On the harvesting periods, though they working near the house, but they have responsible on post harvesting process which also time consume. Men work in the

field in morning and afternoon session, however during the break they may get rest. In the afternoon, they can engage in other activities, including marketing and non productive activities.

Gender role on farming activity

This section discussing about how gender role on some farming activities in whole study sites as illustrate in Figure 22. That figure describing gender role in each farming systems based on men's and women's perception on separate discussions. Seems that high proportion of women's role in every farming systems mainly is in harvesting, post harvesting and marketing and planting. Both men's and women's perception perform the same pattern. Land preparation is clearly seen as men's domain, involvement of women's in the activity were lower than men's. In each village groups, the pattern is almost the same as illustrate above. There are some difference that women's roles in Group D (Timber based) in nursery were perform a bit higher than men's role, while in other villages, men's role were seen higher.

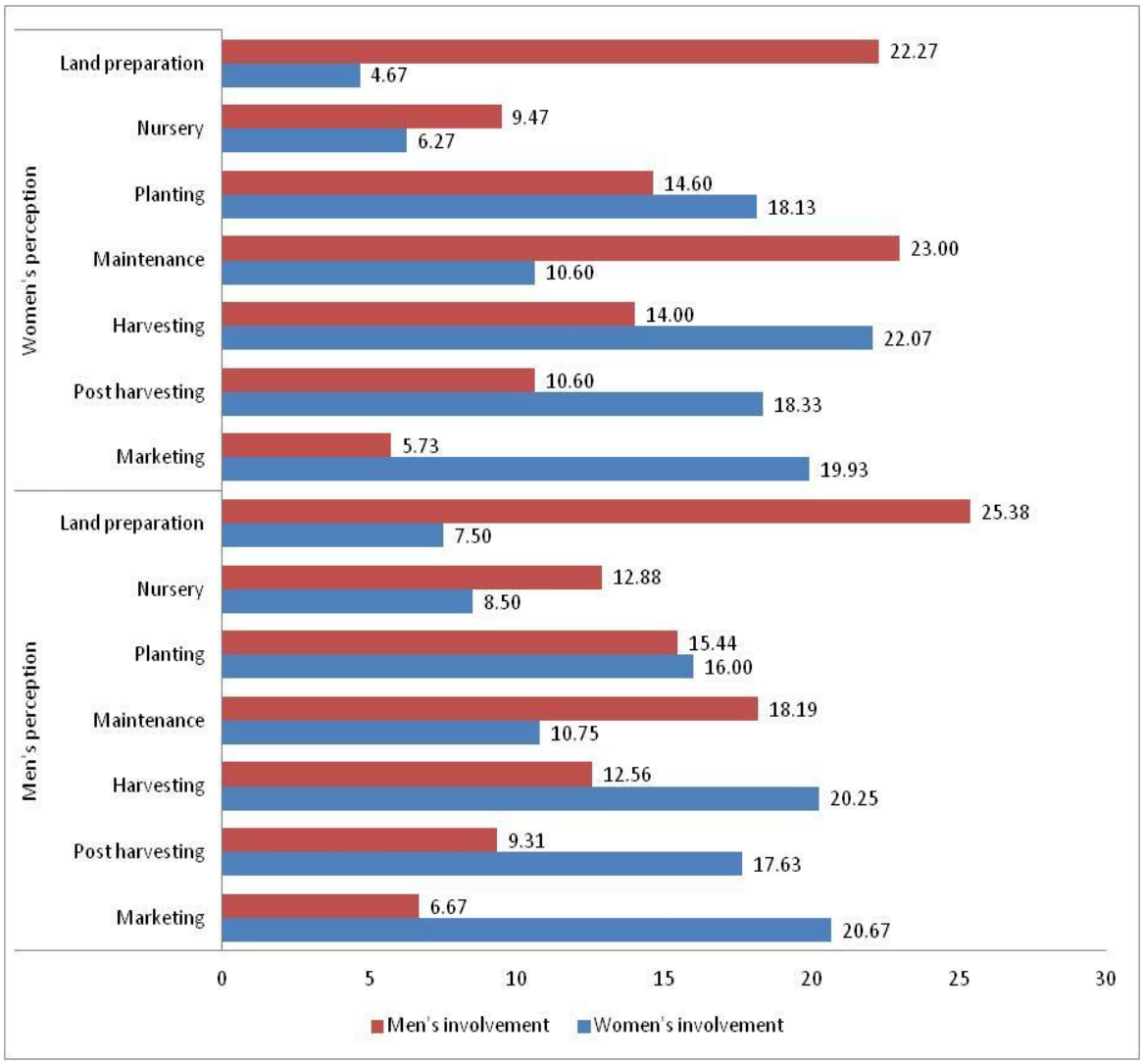


Figure 22 Gender roles on some farming activities in a whole study areas

Detail discussion on gender roles will be focus on three main farming activities in whole study sites. Three main farming activity were mixed garden system based on cacao, coffee and candlenut cultivation, horticulture (maize), irrigated paddy field. Similar with the configuration of gender role in the whole farming systems, within traditional agroforest system or mixed garden, men and women were involved in each activity. Agroforestry system were define here is referring to mixed garden which based on some economic commodity such cacao, coffee or clove. The proportion of women involvement were high in particular on harvesting, post harvesting as well as marketing. As commonly known that land preparation were closely related with man's domain of work, this activity were dominated by men. While men preparing the land (clearing, slashing and hoeing), women were usually involve in preparing and bringing the food for the worker (*maddokol)*, and sometimes they also help in hoeing or slashing light trees.

In nursery, women have responsibility to fill polybag with soil and seed. There also few women who have responsible in seed selection but mainly men were having more roles in selecting high quality seed. While men hoeing the soil to prepare the planting hole, usually women have responsibility on planting, put the polybag to the hole and pour the water to newly planting vegetation.

In coffee and cacao cultivation, discussion result found that women spend more time in crop husbandry than men. Planting, shaping and pruning are largely done by men, and weeding and harvesting, post harvest processing and packaging by women, while digging, mulching, dealing with pests and diseases are shared tasks. Usually men have better access to extension service and gaining higher level of skills. Women tend to spend more time in the field and near the house for coffee processing. In post harvesting activities, men were usually found carrying and weighting while women mostly do the sorting jobs, peeling, soaking, drying, and selling it.

In maize and paddy production, the pattern is the same. Women were usually involved in planting, harvesting, post harvesting and marketing activity. Within maize harvesting activity, women have responsible in picking the maize from the stem (*massepe*), while men tote the collected maize (*mateke*) from the land to the house for further processing. Women have more responsibility in peeling the maize from the cob, drying under the sun, and men help to grind the maize while necessary, and tote kernel or grinding kernel for storing or marketing.

In vegetable production, women are responsible for most of the activities such land preparation, seed preservation, planting, weeding, composting, harvesting, post harvest, selling the surplus to farm gate traders. Men usually involve in interacting with input and output markets—the purchase of input supplies (seeds, fertilizer and pesticides) and selling the surplus in the markets. Both men and women apply the pesticides and fertilizers. If the vegetable production particularly for commercial purpose, men were usually have more involvement.

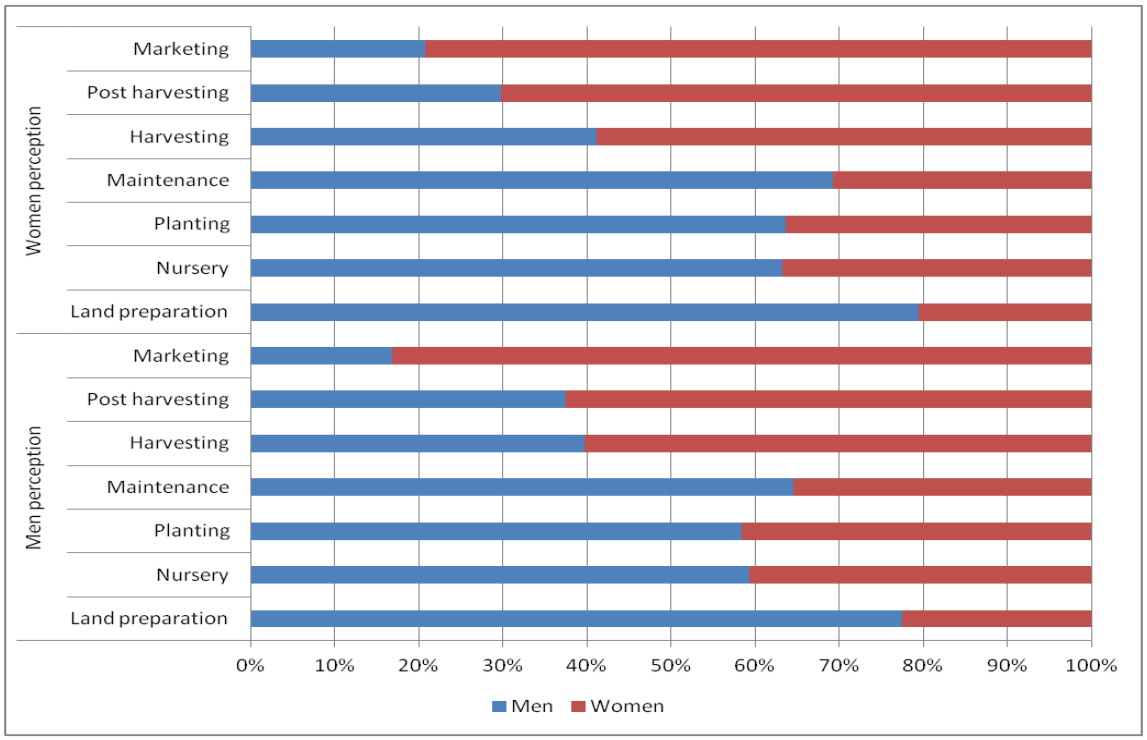


Figure 23 Gender role on traditional agroforest

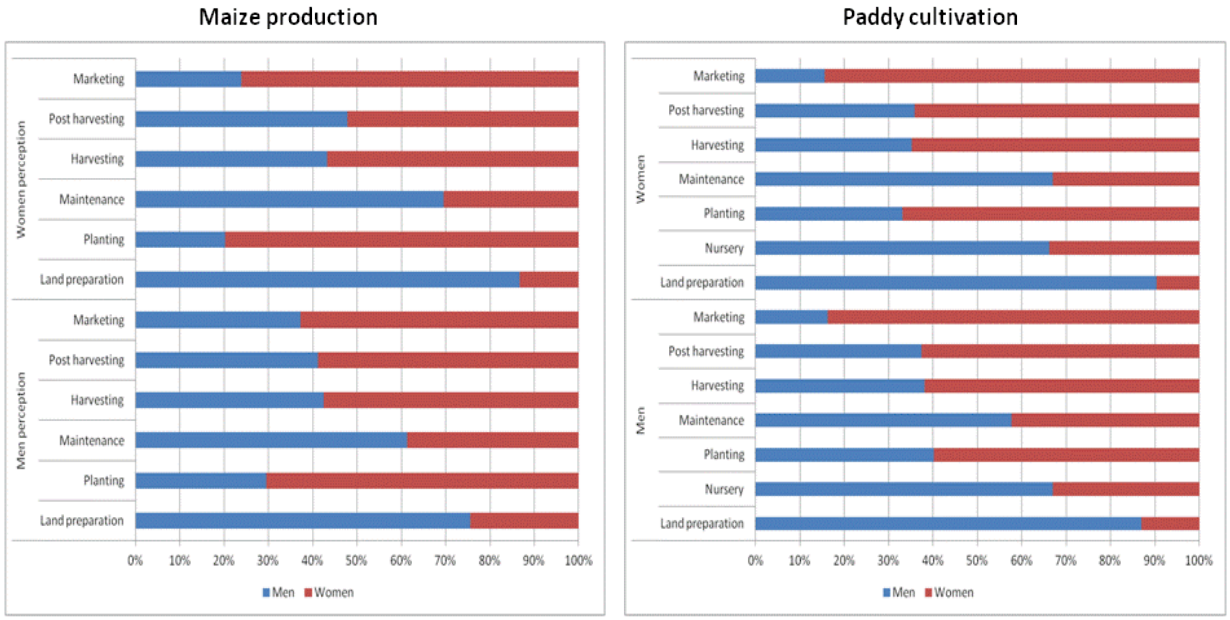


Figure 24 Gender division of task in maize production and paddy cultivation in irrigated paddy field

Land and gender

Discussion on gender and land will closely relate with the equality of men and women in property right and their decision making. This section will discuss on how gender role influence or being influenced by the land and property right system which existing now.

Land ownership

Land ownership in study area were usually belongs to men. When families buy the land, the land usually will belong to the husband or the man. Women may get land from inheritance process, then they may claim that the lands belong to women. However, formally, the name in the certificate is usually using men's name especially when they buy the land. Possibility for women to put their name in the letter is also there, and only possible when women get the land from inheritance process.

Table 10 Land holding status in surveyed village in South Sulawesi

	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?**
Irrigated paddy field	0.2 – 1 ha	Women Men	Women and Men with the proportion of women is half from the men	Men have bigger right to cultivate the land
Maize farm	0.2 – 2 ha	Women Men	Same as above	Same as above
Mixed garden	0.5 – 4 ha	Women Men	Same as above	Same as above

Land use perspective

This section exploring local perception on land use system and their functions, which will be reflected on their perception on the importance value of existing farming systems. Weight ranking or pebble distribution methods was employed as practical methods to assess the importance value of land use system for the locals. Land use classification in this study was defined based on local's point of view. People were asked for the main land use system in their village and surrounding areas, then they put value or importance which will be the most important for each criteria on each land use system using a hundreds button. Criteria were defines based on environment and livelihood criteria. Environment means the land use value (importance) related with the environment services, such as biodiversity, soil protection, water reservoir, and climate issues. Livelihood values indicate the importance of land use for their source of income, subsistence fulfillment, also some other values related with ritual/cultural and medicinal plants.

Data compilation from the whole discussion showed that local community were put more weight in livelihood function rather than environment function (Figure 25). They put high score to most of livelihood criteria because they may gain direct benefit which relate on their daily life. Environment value were perceived as indirect benefit, therefore they just put low score on each value/importance.

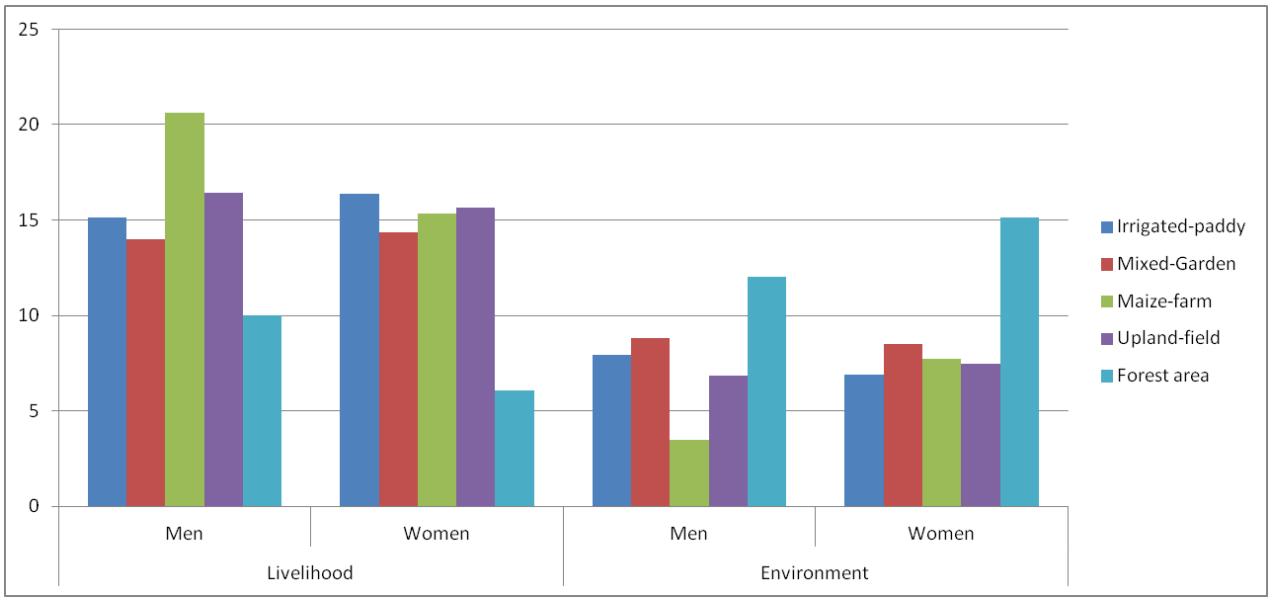


Figure 25 Livelihood and environment function from each land use systems based on gender point of view

Forest were consider has high environment importance value. Both women's and men's group discussion shows the same tendency that forest were relatively high in term of environment value compare than other land use system. This pattern were also similarly found if we see the data from village typologies, forest were more valued in term of environment rather than for livelihood source (Figure 26, Figure 33). Forest value were more on land and soil conservation (weight on women's group 22.75 and men's group 13.6), followed by water conservation issue (men's group 17.2 and women's 16), then by climate (men's group 11 and women's 13.75) and biodiversity issues (men's group 9.8 and women's group 12.25). Issue about soil and water conservation were more popular for local community, some of them have already aware on this through the information from television etc. Biodiversity and climate regulator is more abstract for local community, and then farmers haven't (yet) pay a lot of attention on this.

Mixed garden were become very important livelihood source for the local community (Figure 27). Main function of mixed garden for both women and men were for income source and fulfill they subsistence need. Mixed garden value for the environment mainly for land and soil conservation and for biodiversity. For women, the main function of agroforestry were for biodiversity and men perceived that environment function were mainly for land conservation. People knowledge on natural resource and land use were related with how often they get benefit related with their daily life. It maybe because of men farmers usually deal with the condition on how to avoid soil and land erosion or landslide, then they tend to put value on soil and land conservation more high compare than other criteria. While women, they have responsibility to make sure the household nutricion were fulfilled well, therefore issue of biodiversity become more important for women. They may get varieties species of vegetation from the mixed garden system for food, making simple tools, collection medicinal plants, and etc.

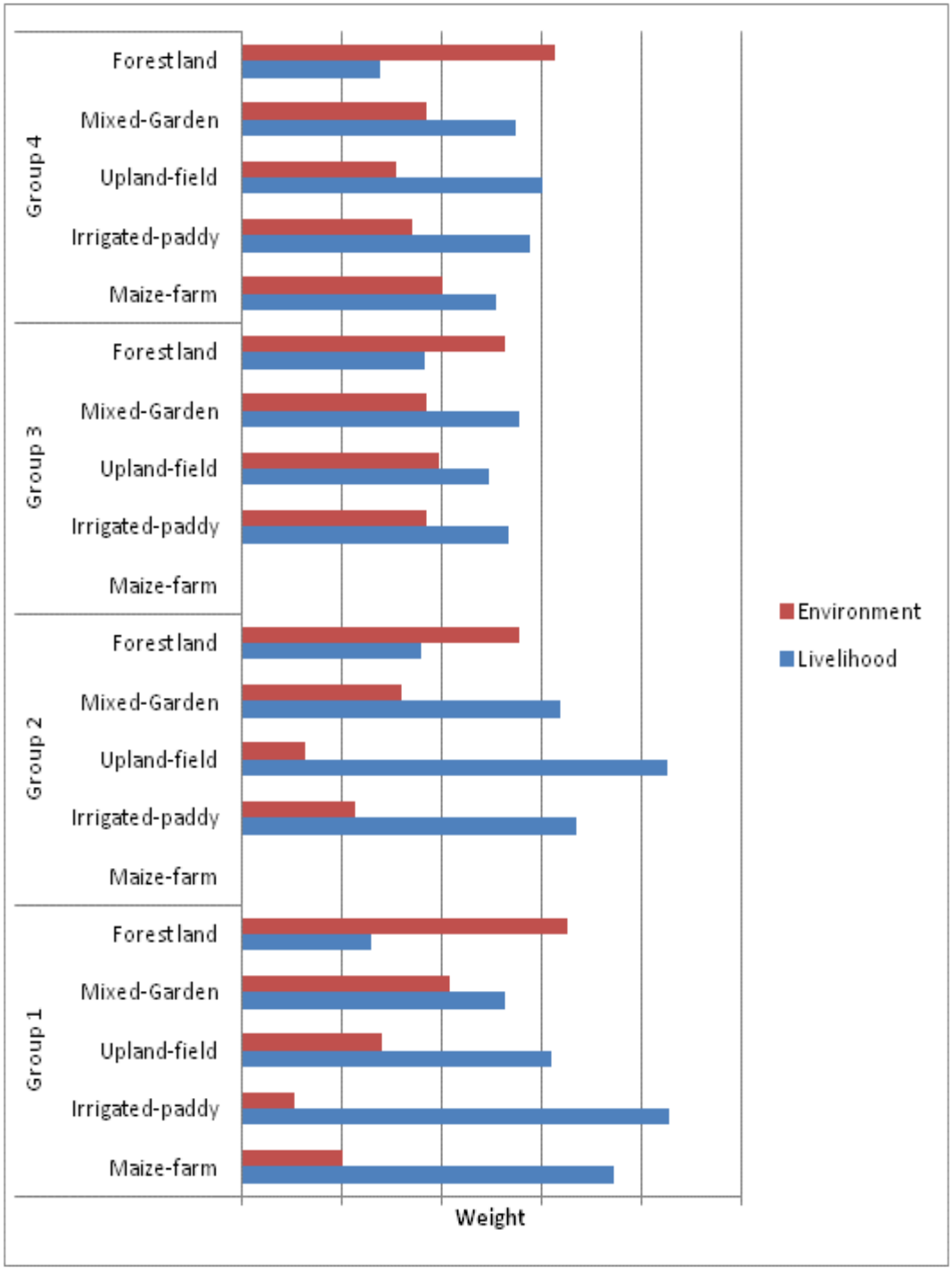


Figure 26 Livelihood and environment function from each land use systems based on village typologies

This become a good example on making connection the masculine and feminine trait which influence on how people measured the gender. Protector is one of masculine trait that usually relate with man task. Women has feminine principle as producers of life (Shiva 1988), and this can be related with their understanding on biodiversity function that usually maintain by women. This can be very interesting issue to be discuss more depth in future.

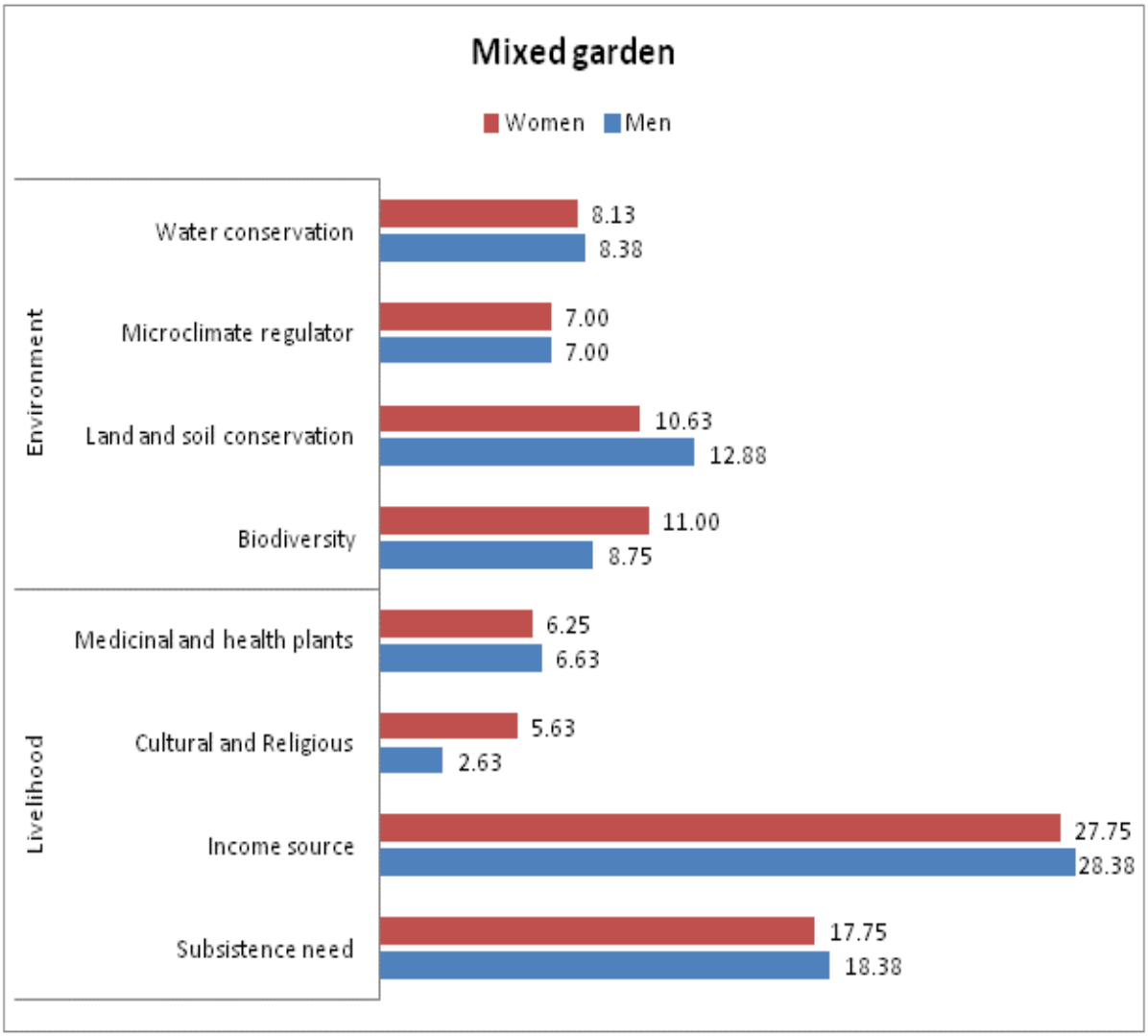


Figure 27 Gender perception on the importance value of mixed garden

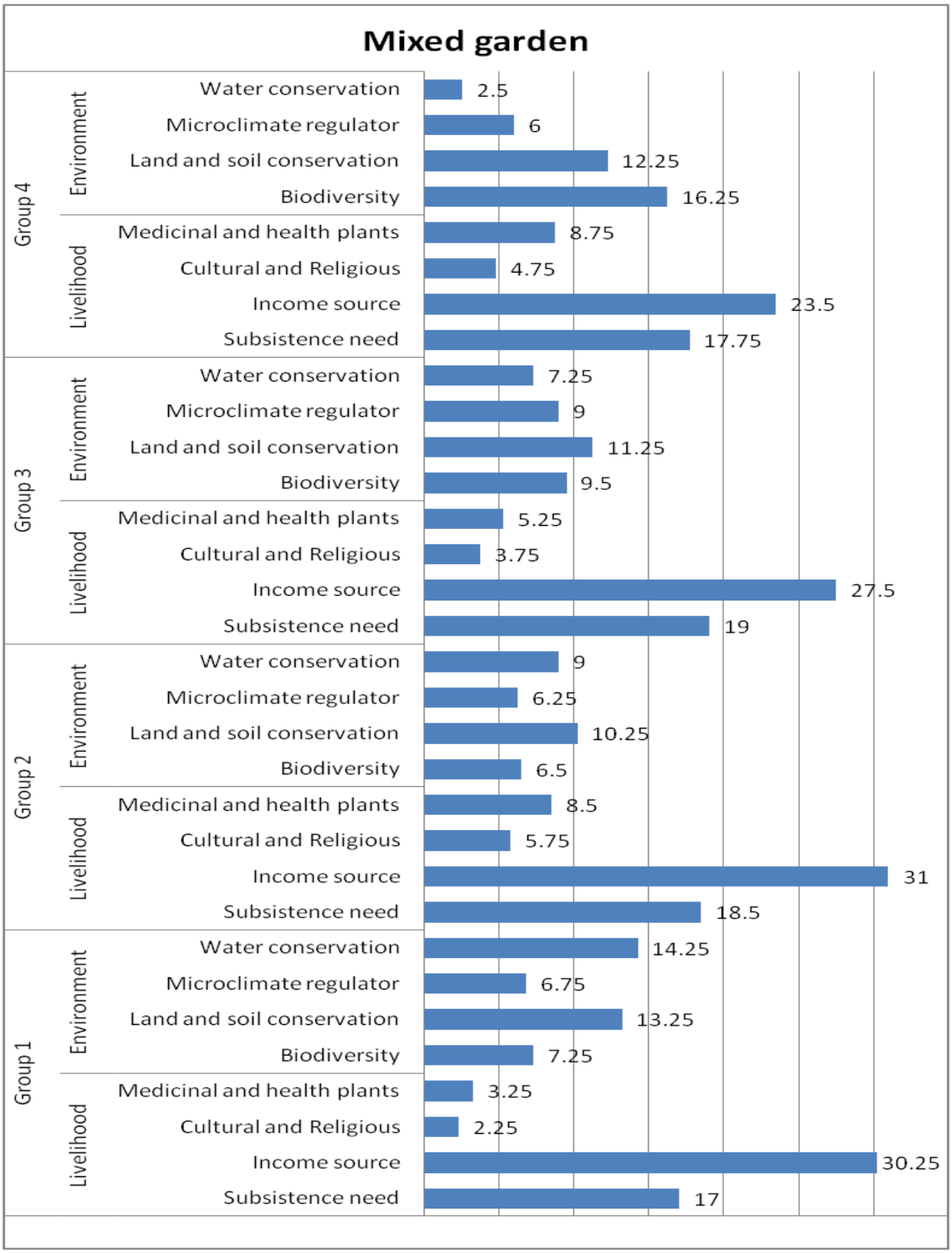


Figure 28 Perception on the importance value of mixed garden in each village typologies

Irrigated paddy field value for women and men mainly for fulfilled subsistence need, then for source of income (Figure 29). Difference perception between men and women are in the value of this land

use for medicinal plants. No one from man see that this value is important for irrigated paddy field. Women were usually using the wild plants near the paddy field for traditional curing. This is become the reason why women see that this value is important. This figure also show us that men's perception were more for land and soil conservation, while women for biodiversity. Same with the analysis on mixed group systems, women are more concern on the use of vegetation within the system, while men have more concern on wider level (landscape) to protect the landslide and soil erosion. Need more deeper analysis to prove this premise, and might become an interesting research topic in the future.

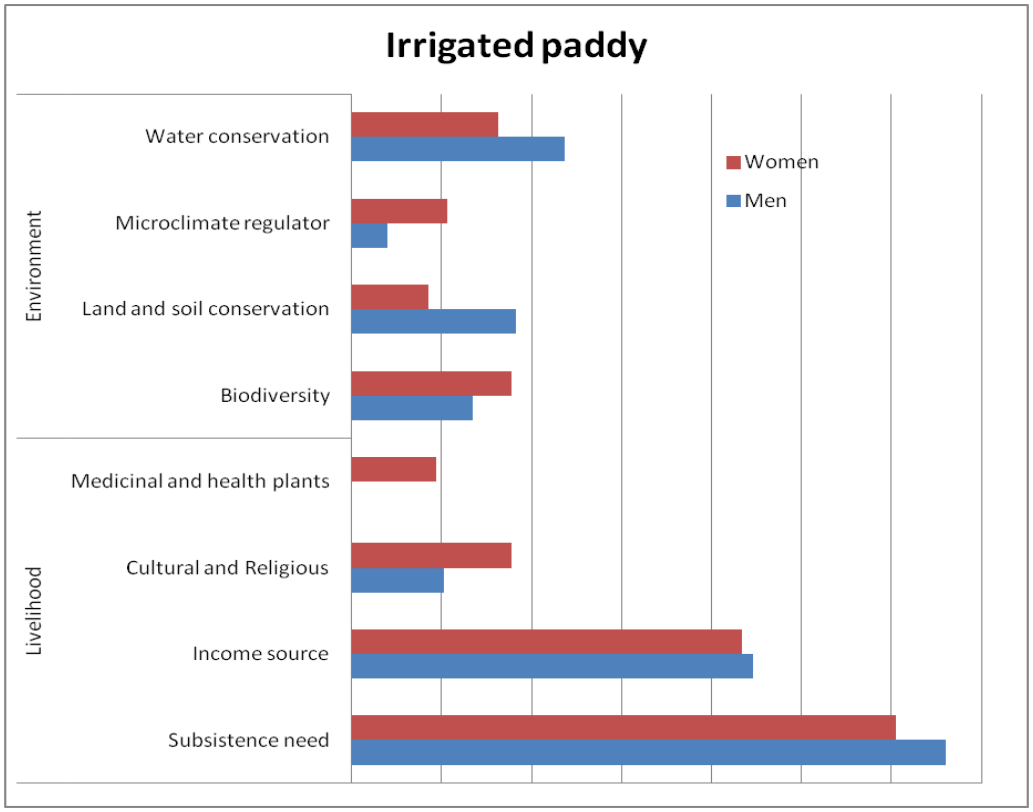


Figure 29 Gender perception on the importance value of irrigated paddy field

Maize farming (Figure 32) become an important source of income for local community in Bonto Karaeng and Kayu Loe villages (Group 1), and also in Tana Towa and Tugondeng villages (Group 4). People on this area are also use maize for their subsistence need. Significant value of maize plot for income source and subsistence were seen in Group 1 only. This is relevant with general observation and also other findings about the livelihood source that quiet different within these two groups. Community in Group 1 were really depend on the maize farm for source of income, while in Group 4 people have more alternative livelihood sources. In terms of different perception of men and women on the land use value, the pattern were almost the same as in irrigated paddy field. Environment value were perform low (Figure 31). Men's groups were not seeing that maize farms have microclimate function regulator, but women perceived this valued as women argue that there are some trees nearby the plots, and it has function to make the climate near the maize farm not too hot.

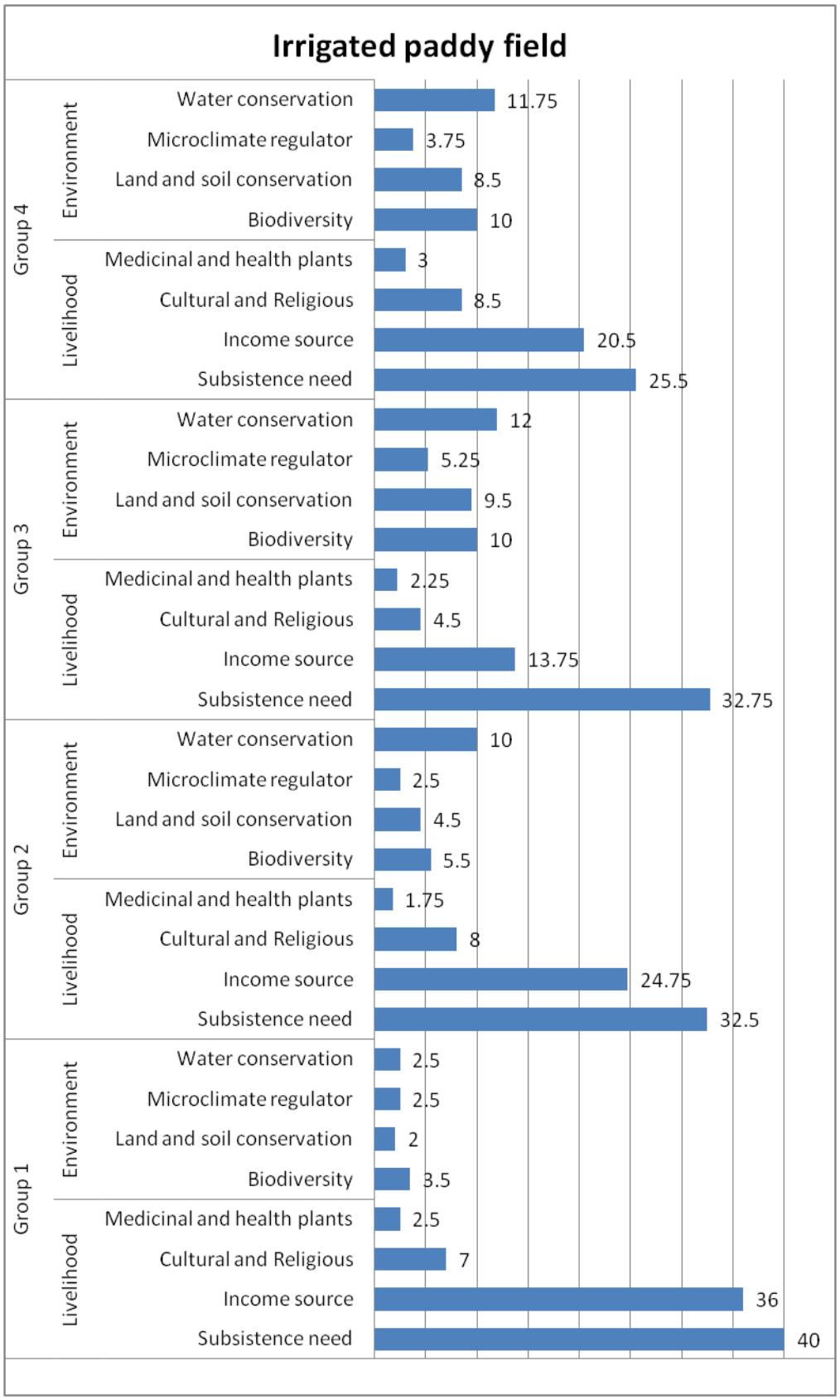


Figure 30 Perception on the importance value of irrigated paddy field in each village typologies

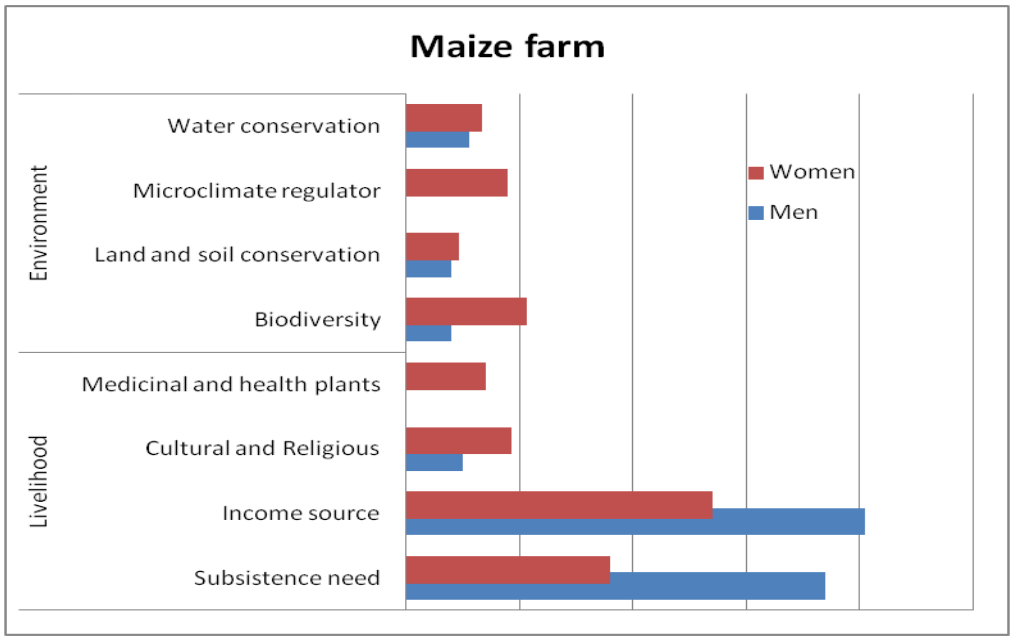


Figure 31 Gender perception on the importance value of maize farming

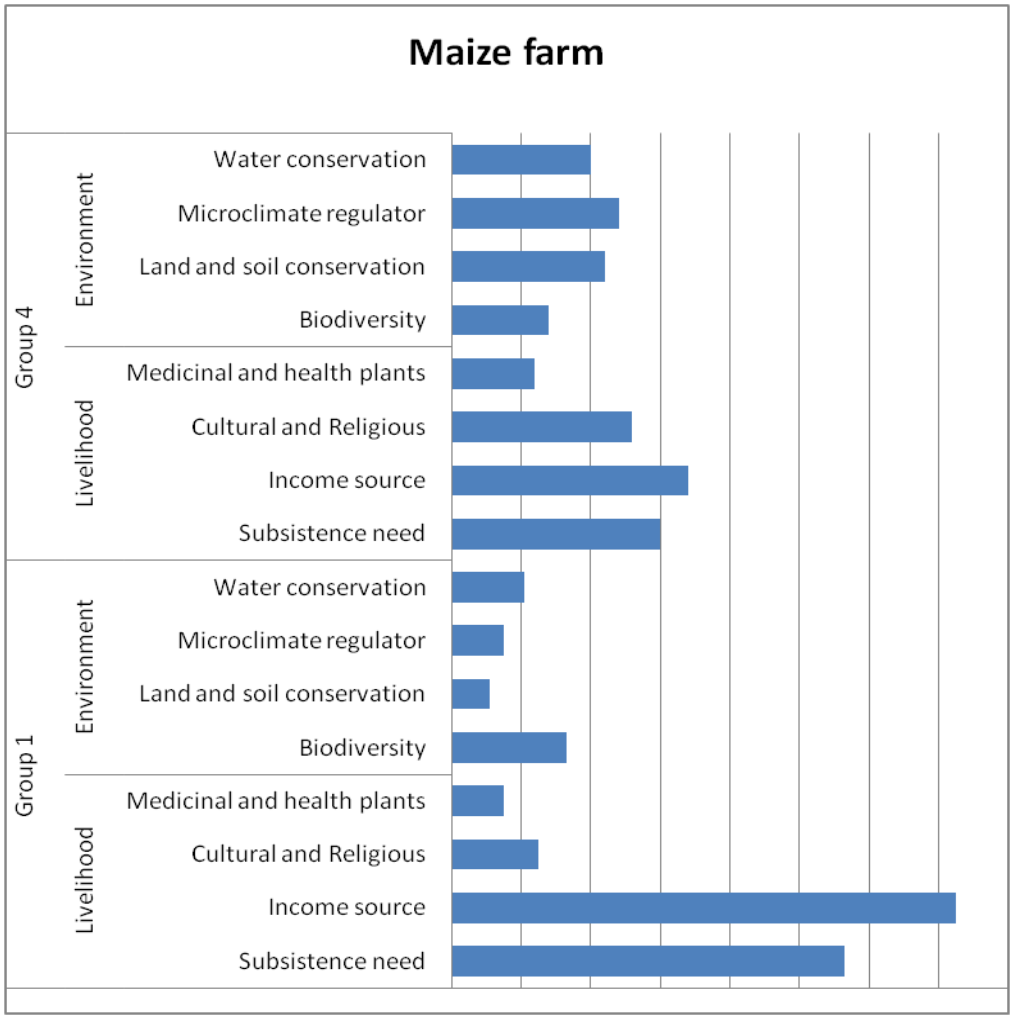


Figure 32 Perception on the importance value of maize farming in each village typologies

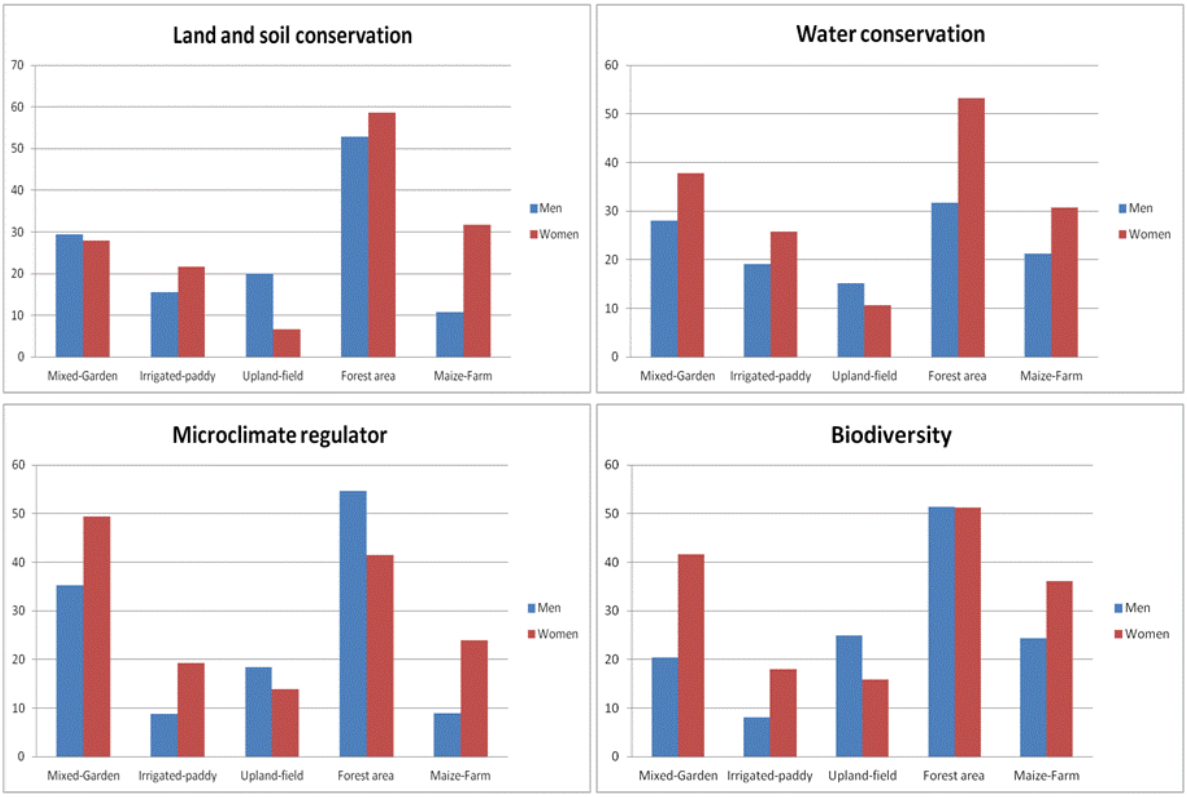


Figure 33 Perception on environment value of the land use

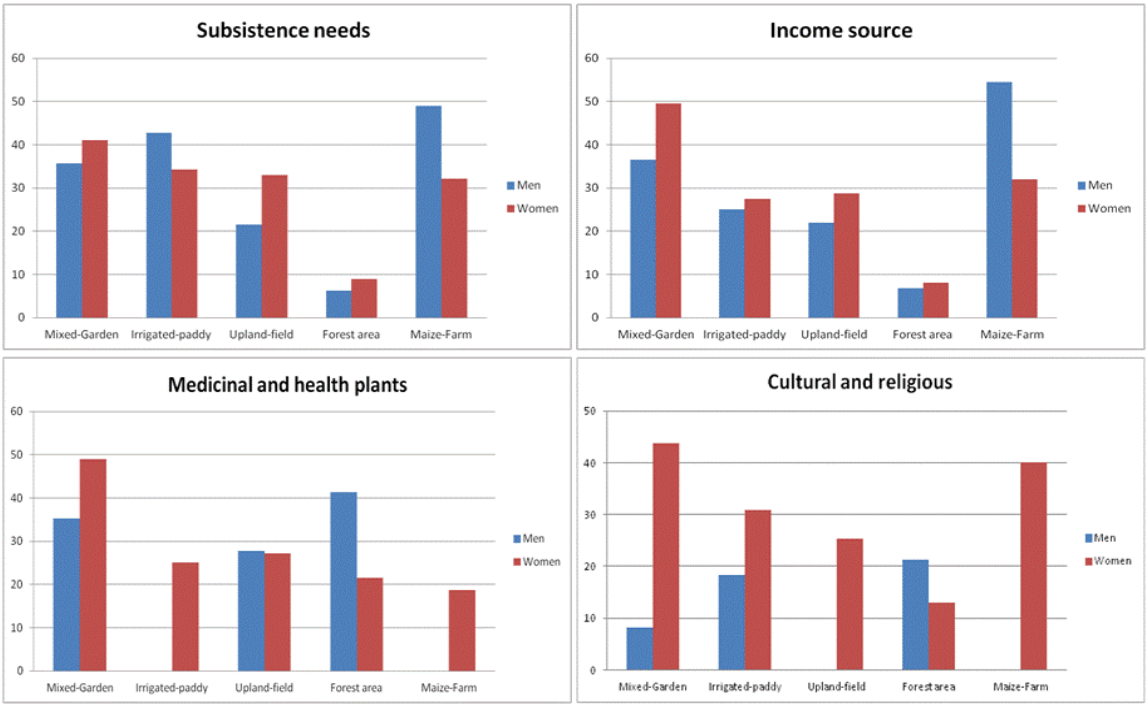


Figure 34 Perception on livelihood value or its importance for the land use

Gender and market

Economist said that market were the place where buyers and sellers are brought into contact with each other and goods and services are exchanged. The term refers to the condition in which buyer and sellers make transactions (bought and sold) in any arena. Sociologists define the market as a social institution constructed from elements of culture. Markets are controlled and regulated by the particular social group or certain classes, which has links with other institutions, processes and social structures. In this study, we will see the market is not only about the place for transaction but also market in relation with social structure and cultural who contribute to construct the market itself.

As discuss earlier, discussion with groups of women and men in study area indicated that women's involvement in market were relatively high comparing to other areas. Figure 35 shows that women's role in marketing aspects for common commodities such coffee, cacao, candlenut, vegetables, maize and cloves were higher than men. Men's role on marketing timber, firewood, and rubber latex were higher than women. Commodities that usually associated to women's domain were vegetable. It is because of vegetable usually cultivated near the home (homegarden) on in any particular plot easily accessed by the women. While timber and wood were not women's domain as women usually cannot estimate timber value and have limited information about the price. One discussion participants mention that due to timber transaction is usually near the forest or where timber located, and it sometimes far from the house that would become men's domain.

While women sell the cacao, the transaction happened in housing areas. Women gathered the cacao from the garden, peel it, clean the cacao seed, dry under the sun for several days, then they sell it while the middleman/buyer come to their house periodically (once per two weeks). This situation were become unique and this is causing the involvement of women on marketing were relatively high. Women not necessary to leave their house and their domestic responsibility, but they also become more productive. Though women benefited from this system, but should be noted that by allowing farmer dependent only to system alone can be detrimental to farmers' markets. Moreover, by recognizing the market chain, farmers can have more bargaining power and price information.

Women argue that they could bargain the cacao price with the seller; women's were considering have a good skill in bargaining. Both discussion with men's group and women's group, they consistently mention that the cacao price women get is higher than men. However, should be noted that the ability of women's farmers to bargain only to negotiate the current price and the range will be not too high, means farmers still get the lower prices. Therefore, though women have high potential for being more involve in marketing agroforest production, their position (not only women, but this supposed to be for a whole farmers/producer) on market chain should be strengthen. Farmers access to market information should be more expanded.

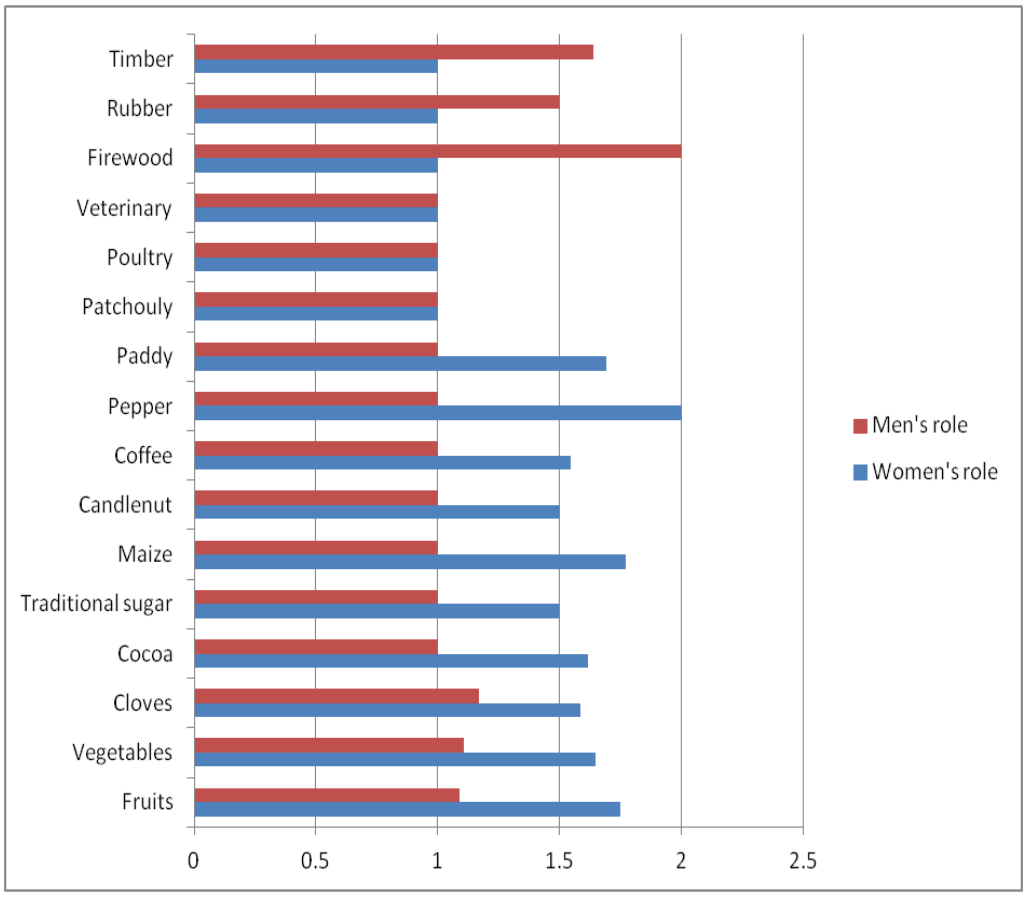


Figure 35 Gender roles on marketing of each common commodities

Gender issues in market chain can be seen through the linkage of economic or market agents. Farm and plantation production were sold to middlemen at village level, and then resold to intermediaries or wholesaler in sub-district and district levels, and then sold to traders, sold again to the exporter traders at the provincial level or manufactures. This study encountered very few farmers who sell directly to big traders out of the village because the middleman or local trader come to the site to deal with women. So the connection between farmers to the strategic trader being hindrance by local trader and put the farmers to the end line with very little price. Though farmers can negotiate the prices, but the range of price were already fixed.

Understanding the market chain to the end consumer would be important in determining the quality of commodities produced would be like, and will help to raise the price of these commodities. Economic agents or agent of market was still dominated by male traders. The analysis Kiptot (2011) showed that women as agents of the market is usually involved in small-scale trade, linking smallholder producer to the big merchants. In her study, Kiptot also mentioned that men are more dominant in the large-scale trade. In Sulawesi shows a pattern that is not much different. Female broker or middleman can be found at the local level who take directly from the farm household, usually the traders are also a retail merchant who sells household goods directly to consumers in local level.

Gender and poverty

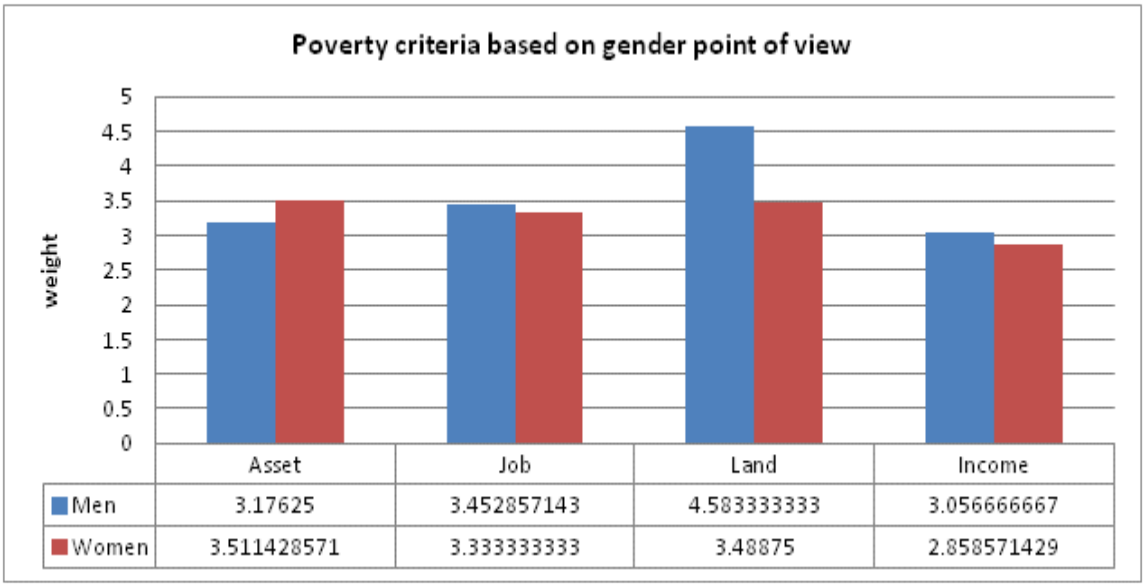
Talking about poverty alleviation would be relates on how people define the poverty. Most of program to eradicate or alleviate poverty use the criteria developed from general and standardized indicator, and it sometimes don't match with the local condition. Deprivation and poverty were define base on poor people wants and needs. Moreover, poverty is not perceived only on income and expenditure dimension but also other dimensional that may be more relevant with local context. Poverty should be seen as a process of deprivation and the relations between the 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. Do not have proper land for farming
- Land size less than 0.5 ha per household
- Do not have land
2. Do not have permanent job
3. Do not have proper house
- Quality of house from bamboo, round timber, etc
- Do not have house
4. Income

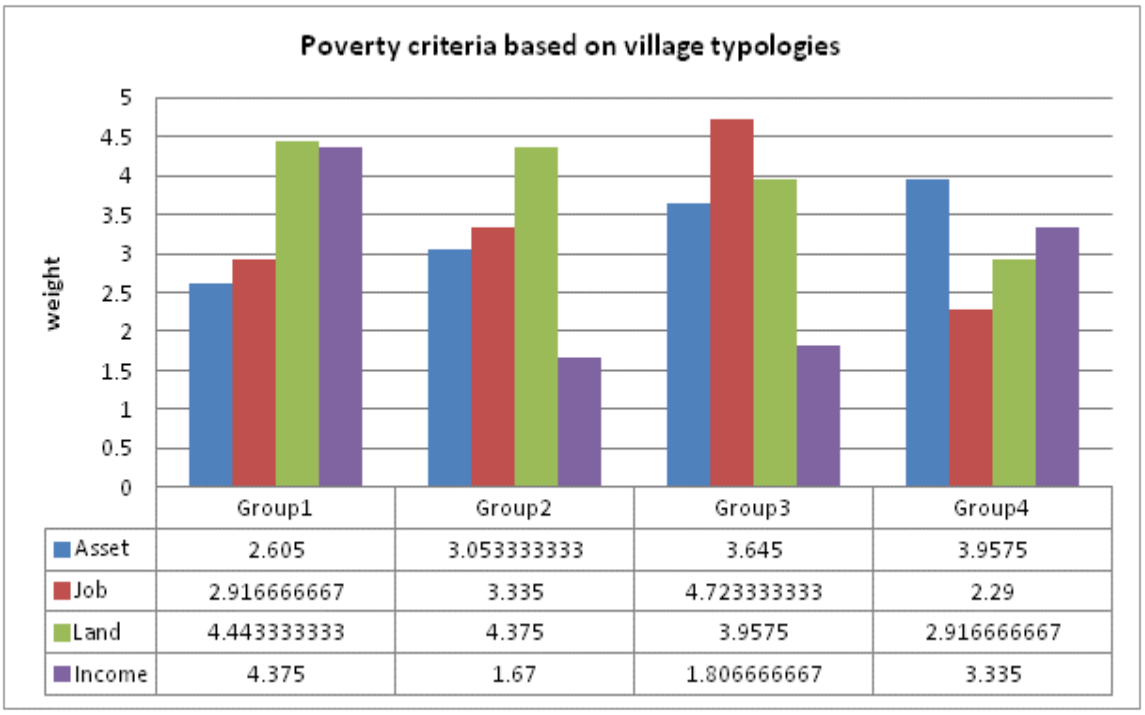
People without land were categorized as the very poor, and people with land less than 0.5 ha were still categorized as poor. Permanent job or certain income (regular income) were become the second rank to define poverty. People without certain job that could provide regular income were categorized as poor. Third category were assets or house condition. People were define as very poor if they don't have house or land for house, and people with low quality of house were perform as poor. The amount of income that people get become the forth ranking. Income below 1 million per month were categorize as the poor. For the minimum, people may need income around 1.5 million per month to reach the category lowest well being.

Figure 36 shows the different perception on how to define poverty between men and women. Men's define that land availability on each household, regular income from certain job, household assets, and amount of income become the indicator from the highest rank to the lowest, respectively. For women, well being should be defined from household property and assets, then land ownership, followed by job availability and income amount. Those different showed that for women and men, physical criteria is more important than the income itself. Land were considering important as it can provide income as well as to fulfill subsistence needs for man as income earners in the family. House property become important for women as it can describe on how family can have decent living.



	Asset	Job	Land	Income
Men	3.17625	3.452857143	4.583333333	3.056666667
Women	3.511428571	3.333333333	3.48875	2.858571429

Figure 36 Criteria use to define well being and/or poverty based on gender perspectives



	Group1	Group2	Group3	Group4
Asset	2.605	3.053333333	3.645	3.9575
Job	2.916666667	3.335	4.723333333	2.29
Land	4.443333333	4.375	3.9575	2.916666667
Income	4.375	1.67	1.806666667	3.335

Figure 37 Criteria use to define well being and/or poverty based on villages typologies

Base on local definition on what is poverty, communities were asked to assess their own condition on poverty level from previous to current condition. The welfare pattern from past to present in each group of communities were almost similar in each villages (Figure 38). Interestingly, the figure shows that men's perception value their well being is mostly below women's valuation, except in Kayu Loe villages. This might be causing by the technical reason on the discussion process in those two groups, or might be other interesting factors related with gender matters. It is also interesting to

analyzing this issues in deeper ways to get more comprehensive story on how the relation between well being and gender issues.

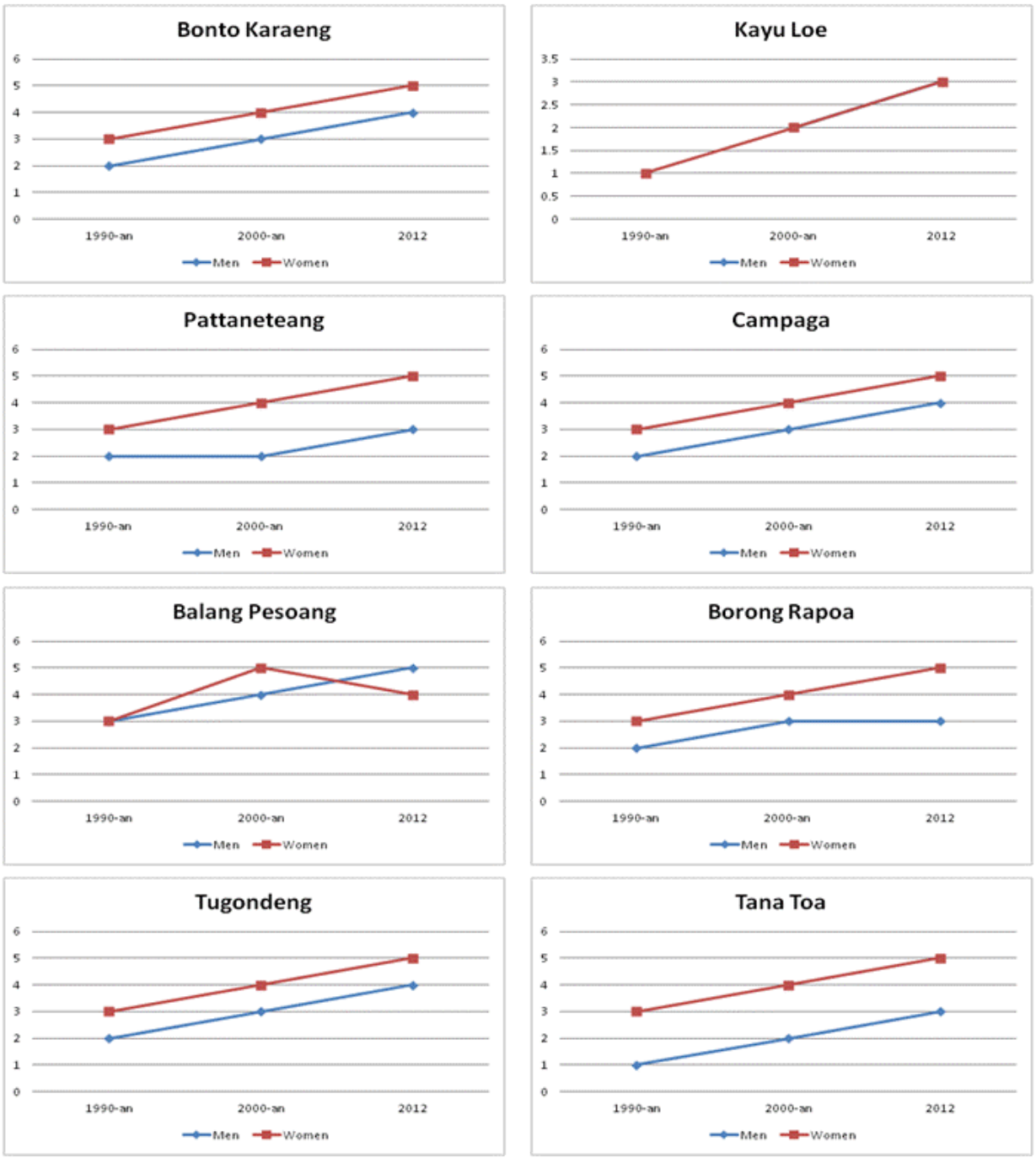


Figure 38 Men and women perception on valuing their well being and poverty status from 1990s to current condition

Most of well being status in study villages were shows the same trend, they go to the same direction, current condition is better than the previous. However, there are some exceptional cases such in Pattaneteang on 2000, Balang Pesoang on 2000, and Borong Rappoa on 2012. The causing factors is very site specific, but we can summarized the 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

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 discuss on land rights and ownership, but also on how gender have 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 or importance 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 South Sulawesi were already take women into account. Women have equal position in market (at least) though women have responsible on cacao, 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.
- 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, Pratiknyo Purnomosidhi, Andi Prahmono, Mulus Surgana, Megawati, Elok Mulyoutami, Badri Dwi Meldy, Syamsidar, Suyanto

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. Hence, to support the implementation of the extension services in the AgFor project, a baseline survey was conducted. The objective of this baseline survey was to list and analyze the existing conditions of agricultural extension practices in South 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 Sulawesi was conducted in mid February 2012 to end March 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.

Research agencies were located mostly at provincial level, and for this survey, in South Sulawesi, forestry and community based forest activities issues were discussed with agroforestry researchers in Makassar Forestry Research Agency (*Balai Penelitian Kehutanan Makassar*) and Hasanuddin University. Discussion with extension agents were conducted at district level, i.e. at 2 AgFor project districts: i) Bantaeng district, South Sulawesi province; and ii) Bulukumba district, South 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*. 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, with number of participants varied between 5 to 12 persons per group of FGD. Villages were randomly sampling from total list of AgFor project villages (see Introduction chapter).

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 1.). 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.

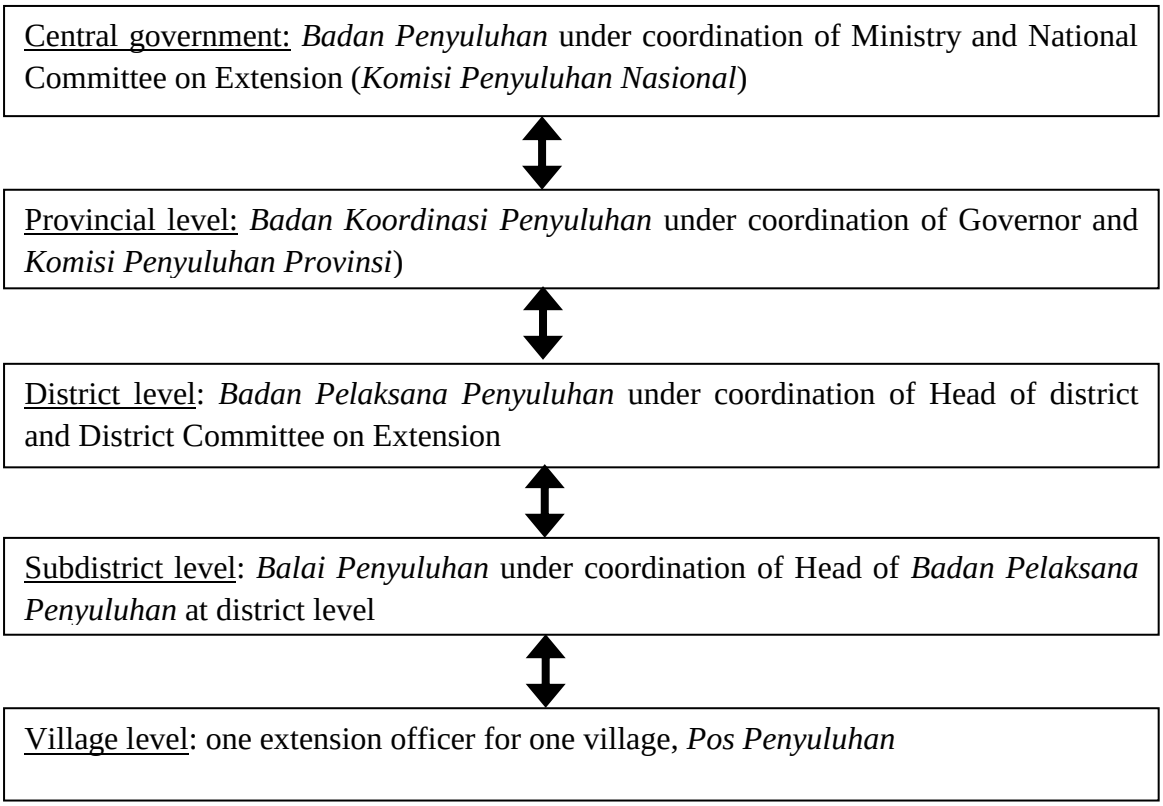


Figure 39 Structure of Government Extension Organization based on regulation UU No. 16/2006.

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 officer who has 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 district level, every saturday, extension officers in Bantaeng regularly gather at the extension district office to share experiences. 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.

Most of the head 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. In this survey, only Bulukumba extension office has shared their strategic plan with AgFor.

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.:

1. Based on its marketable products, i.e. the species has marketable products that are consistently contribute to the local livelihood.
2. Based on farmers preferences by current condition, 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.
3. Based on farmers expectation in AgFor intervention programs, 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, species priority was different between the groups (Table 1.). However, by current condition, all village groups selected short-term crops (such as chili, cabbage, vegetables, pumpkin, chayote) as first priority. From all village groups, the timber village group has the most different species priority, this particularly because the area is located in lowland (50 to 200 m asl) if compare to the other village groups that were located in area ranges from 200 to 800 m asl. Coconut, teak and gmelina were become the species priority that only utilize in timber village group as source of livelihood. Staple food species such as paddy and maize were also important species in the timber village group as source of income and for their own consumption. Degraded land group, AF-Bantaeng group and AF-Bulukumba group have relatively same species priority, i.e. clove, cacao and coffee as the most important species in the local livelihood. However, in degraded land village group, candlenut and bamboo were also selected as the species priority, where in other village groups weren't. And in degraded land maize was more important than paddy, opposed to the situation in AF-Bantaeng and AF-Bulukumba. On the other hand, in AF-Bantaeng, NTFP species for firewood and brown sugar (from Arenga pinnata) was still utilized as source of income, where in other village groups wasn't. And in AF-Bulukumba, pepper was the species priority that wasn't selected in the other village groups.

In summary, AF-Bantaeng and AF-Bulukumba has relatively same species priority, i.e. cacao, clove, coffee, short term crops and fruits species (lansium, banana, durian). In degraded land village group, cacao, clove, short term crops, maize, candlenut, bamboo and some fruit species (banana, jackfruit) were the important species for current local livelihood in the area. And in timber village group, coconut, short term crops, paddy, maize, teak, banana and rambutan were the species priority in the area.

Table 11 Top ten species priority by farmers in South Sulawesi per village groups (degraded land, AF-Bantaeng, AF-Bulukumba, timber). 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	Degraded Land			AF-Bantaeng			AF-Bulukumba			Timber		
	ex-pect	cur-rent	mar-ket	ex-pect	cur-rent	mar-ket	ex-pect	cur-rent	mar-ket	ex-pect	cur-rent	mar-ket
Cacao	1	2	3	3	2	2	4	6	5	2	5	6
Clove	1	2	3	2	2	5	1	2	2		10	8
short term crops	5	1	1		1	1		1	1	6	1	4
Coffee	9	2	8		2	2	4	3	2		10	
Candlenut		5	3									
Coconut											5	1
Pepper							4	6	5			
Rubber							8			1	1	
Nutmeg				3	10		1	3				
Patchouli				7								
Gaharu				7			4	6		6		
Bamboo		10	3									
NTFP (arenga, firewood)						8						
Paddy	5	10	8	1	2	2	8	6	5	2	5	2
Maize	1	5	2	3	10	8		6		2	5	2
Timber species												
mahagony							8			6		
Gmelina												8
Teak											5	6
Toona							8					
Paraseri-anthes		10									10	
Fruit species												
Durian	1	10		7	2		1	3	5	2	10	
Banana		7	3		8	5		6	2		1	4
Rambutan	5	10			8			6	5	6	1	8
Lansium					2	5	8	6	5			8
Avocado		7										
Pomelo										6		
Papaya		10										
Mango	5	10								6		
Mangosteen				3			8	6				
Jackfruit		7	8								10	
Longan										6		

Based on its prospective or community expectation through AgFor program, there was slightly different species priority between village groups (Table 1.). As prospective species, only durian that was listed as the most priority in all village group, this particularly because of the high price of durian otong fruit (Rp 50,000 to Rp 150,000 per fruit or equals to 5-15 USD/fruit) which has increased farmer motivation to plant good quality durian species in their garden. Clove was the second prospective species that was prioritized to be developed by smallholder farmers in South Sulawesi,because currently the price of clove reached the highest over the past 10 years, i.e. up to Rp 200,000.00/kg dry flower or 20 USD/kg dry flower. However, not all village group selected clove as their prospective species, timber village group, which was located in lowland, didn't prioritize clove as the prospective species.

With same reason as for durian and clove, due to its high and relatively stable price, cacao was become the third prospective species for AgFor intervention that was requested in all village groups. Gaharu was other interesting species that was selected by farmer as prospective species, although farmers don't have information or experience on its market potentials. Rubber, nutmeg, rambutan and mango were the next prospective tree-based species after durian, clove and cacao. Timber village group, which was located near the rubber plantation belong to PT. London Sumatra, prioritized rubber as the most prospective species in AgFor intervention. AF-Bulukumba group was also considering rubber as prospective species, while in degraded land and AF-Bantaeng group, rubber was not a priority species. Mahagony was also priority prospective species in timber village group and AF-Bulukumba village group. Other prospective species as paddy was more priority than maize in AF-Bantaeng, AF-Bulukumba and Timber group, while not the case for degraded land village group that prioritized maize more than paddy as prospective species. Maize and paddy were chosen as the prospective species, mainly due to its function as staple food in the area.

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 of those selected species. Since more than 10 years ago, government has a seedling distribution program to answer the challenge of farmers' lacking access to planting materials. In most of the AgFor project villages, at least once per year, government distributed tree seedlings based on farmers proposal. *Dinas Pertanian*, *Dinas Perkebunan* and *Dinas Kehutanan* were government institutions at district level that frequently distributed seedlings to farmer groups who have submitted proposal in advance. Species of the distributed seedlings were varied, depend on the request and the available resources, from vegetables, fruits species, estate-crop species to timber tree species (Table 16).

Extension services

In this survey, extension services were classified into 2 different forms, i.e. i) in-class activities; and ii) the practicum or training. In South Sulawesi, in the past 5 years, most farmers have received extension services both training (Table 17) and in-class activities (Table 18) on agricultural issues such as vegetables cultivation, cacao side-grafting, composting. In the former extension services, 0% to 80% of the participants were women. Level of women participation in extension activities was depended on the subject in the training or in-class activity.

Table 12 Potential topics for in-class activities of AgFor extension services in South Sulawesi

Village	Topics			
	Cultivation and crops maintenance techniques	Pest and Disease handling	Plant varieties identification	Livestock management
Degraded land villages				
Kayu Loe	Maize, Clove, Onion, Potato, Cabbage			Horse, Goat
Bonto Karaeng	Maize, Paddy, Clove, Poultry, Vegetables, Patchouli, Chili, Tomato	Cacao, clove	Cacao	Poultry
AF Bantaeng villages				
Campaga			Cacao	Cow, Horse, Fish
Pattaneteang	Paddy, Clove, Nutmeg, Patchouli, Durian	Clove	How to select superior plant variety?	
AF Bulukumba villages				
Borong Rappoa	*Gaharu* and nutmeg	Fruits tree, vegetable, paddy, maize	Paddy, maize, clove, *gaharu*, and nutmeg	
Balang Pesoang	Cash crops, Clove	Clove	Clove	Cow, Poultry, Fish
Timber villages				
Tana Towa	Rubber, Paddy, Cacao			
Tugondeng	Pruning for timber trees and cacao; garden rejuvenation	Cacao and timber trees		

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 Sulawesi (Table 12). Cultivation and crops maintenance techniques was the most demanded in all village groups, except in Campaga that has received more in-class extension activities than other villages. Pest and disease handling and plant varieties identification become the second most demanded topics for in-class extension in all villages. Livestock management become the third 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 Borong Rappoa wanted to focus on gaharu and nutmeg only, while in Balang Pesoang wanted to focus on cash-crops and clove.

For type of expected training at village level under AgFor extension services in South Sulawesi, there was no significant different priority in the training topics between village groups (Table 14). However, AF-Bantaeng village group has least number of topic if compare to other village group, farmers in AF-Bantaeng wanted to focus the training only on vegetative propagation, pest and diseases handling, organic fertilizer and tree spacing in agroforestry. In degraded land village group, farmers wanted to focus the training on vegetative propagation, pest and disease handling, organic fertilizer, honey production and tree spacing in agroforestry. In AF-Bulukumba village group, farmers selected topics for training on vegetative propagation, cacao rejuvenation, pest and diseases

handling, organic fertilizer, post-harvest cacao, honey production and land suitability assessment. And in timber village group, eight topics were selected for training, i.e. vegetative propagation, cacao rejuvenation, pest and diseases handling, organic fertilizer, rubber agroforestry, honey production, home garden management and tree spacing in agroforestry.

In summary, vegetative propagation was the most demanded training topic in South Sulawesi, followed by pest and disease handling and the organic fertilizer production as the second most demanded, then the tree spacing in agroforestry as the third, honey production as the fourth, cacao rejuvenation as the fifth. Training on rubber agroforestry and home garden management only demanded in timber village group. And training on land suitability assessment only demanded in AF-Bulukumba village group.

Table 13 Former demplots and potential expected demplots in South Sulawesi AgFor project villages

Village	Former Demplots in the village			Expected Demplots under AgFor	
	Year	Extension agency	Demplots	Garden demplot	Nursery demplot
Degraded Land village group					
Kayu Loe	2010	Dinas Pertanian	Talas Safira	Mixed system (Clove+ Cacao+Coffee+Peanut+Onion+Strawberry+Apple)	
Bonto Karaeng	2011	Hasanuddin University		Mixed system (Maize+ Durian+Coffee+Rambutan+Cacao+Clove)	
AF-Bantaeng village group					
Campaga	2011	KTNA		Mixed system (Maize+ Coffee+Cacao+Clove)	
Pattaneteang	2006	Dinas Kehutanan	Coffee; Land rehabilitation with maha-gony, gmelina, african tree, surian	Mixed system (Nutmeg+Mangosteen+ Coffee)	Nutmeg, Mangosteen, Cacao
AF-Bulukumba village group					
Borong Rappoa	2011	Dinas Pertanian	Vegetables	Mixed system (Nutmeg +Gaharu+Clove+Cacao+Coffee+Vegetables (Tomato, Chili,Potato, Onion))	Clove, Coffee, Nutmeg
Balang Pesoang	None			Mixed system (Clove+Pepper+ Mangosteen+Nutmeg) Monoculture system: Rubber	Clove, Durian, Pepper, Mangosteen, Nutmeg, Lansium, Cacao, Rubber
Timber village group					
Tana Towa	None			Mixed system (Rubber+Durian)	
Tugondeng	2011	Dinas Pertanian	Paddy, Maize, Cacao rehabilitation	Mixed system (Maize+Cacao+Timber trees+Rambutan)	Rubber, Cacao, Coconut

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

Village	Topics									
	Vegetative propagation	Cacao rejuvenation	Pest and Disease handling	Organic fertilizer	Rubber Agro-forestry	Post harvest Cacao	Honey pro-duction	Home-garden management	Tree spacing in agroforestry	Land suitability assessment
Degraded Land village group										
Total percentage	100%	0%	100%	100%	0%	0%	50%	0%	100%	0%
Kayu Loe	v		v	v			v		v	
Bonto Karaeng	v		v	v					v	
AF Bantaeng village group										
Total percentage	100%	0%	50%	50%	0%	0%	0%	0%	50%	0%
Borong Rappoa	v			v					v	
Balang Pesoang	v		v							
AF Bulukumba village group										
Total percentage	50%	50%	50%	50%	0%	50%	50%	0%	0%	50%
Campaga		v	v			v	v			
Pattaneteang	v			v						v
Timber village group										
Total percentage	100%	50%	50%	50%	50%	0%	50%	50%	50%	0%
Tana Towa	v			v	v					
Tugondeng	v	v	v				v	v	v	

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 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 this baseline survey, farmers at village level were asked to list type of demplots that has been established in their village and type of demplots that were expected to be established through AgFor.

From the FGD, not much farmers understand the term of demonstration plots and formerly not much demplots established by government agencies or by non government agencies in the area (Table 4.). All the villages has had a demonstration plots that were mostly developed by agriculture government agency (*Dinas Pertanian*), only Balang Pesoang village that has not have a demonstration plot. Plant species that were planted in the former demonstration plots were mostly

vegetables, coffee, cacao, paddy, maize, taro (*talas*) and some timber species in the land rehabilitation area.

In AgFor intervention, demplots will be classified into garden demplots and nursery demplots. Based on the FGD results, not all villages listed nursery demplots for AgFor intervention, this maybe because they still don't understand the context or because they are not interested in the nursery demplots. Thus, before demplot establishment, the list of this potential demonstration plots need to be reconfirmed with the community.

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 of extension services in AgFor Sulawesi.

In South Sulawesi, only farmers in Balang Pesoang village that has not yet experienced cross-visit (Table 19). Cross-visit was conducted by local government *(Dinas)*, at least once per year. *Dinas Pertanian*, *Dinas Kehutanan* and *Dinas Perkebunan* were the local government agents that supported cross-visit activities in every district. Unfortunately, participants who attended the cross-visit was limited to 1-5 persons per village with women participation varied between 0% to 50%. Issues studied during the cross-visit in the past 10 years for farmers in South Sulawesi, were: a) poultry management; b)vegetables cultivation; c) honey production and d) cacao cultivation.

From the FGD at village level in South Sulawesi, farmers were interested to learn on cultivation of fruit trees, vegetables, rubber, cacao, clove and *gaharu* by visiting other location such as Malino, Loka-Bantaeng, Enrekang, Sidrap, Tana Toraja, Takalar, Sinjai Barat, Palopo, Bulukumba, Sinjai, Soppeng and Kendari (Table 20). Enrekang, Sidrap and Palopo were become 3 most interesting places to be visited by farmers in South Sulawesi.

Marketing

Marketing is essential issue that affect farmers income and farmers motivation in improving their garden management. In South Sulawesi, some farmers has high dependency to specific trader in selling their products because the farmers own money to the trader to fullfil their daily needs particularly when the clove fruiting season is uncertain. This sensitive issue of farmers high dependency to specific trader has hindered farmers in requesting marketing issues to be included in AgFor extension services in South Sulawesi. However, if compare between South Sulawesi and Southeast Sulawesi, infrastructure development is more advance in South Sulawesi which has implication to better opportunity on farmer access to market. There was no significant different between village groups on their demand in marketing intervention under AgFor program.

Gender preferences for extension

From the discussion at village level, in South Sulawesi, there was no difference on gender preferences in the expected AgFor extension services. 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. both gender reflected same needs in AgFor extension services as listed in Table 12 and Table 14. However, female groups tended to be interested with short-term crops (such as vegetables and other commodity that can produce less than 3 years) than long-term crops (timber and fruit trees).

In the former agricultural extension activities, women participation ranges broadly from 0% to 80%, depend on type of extension activities (Table 17 and Table 18). Also, women were rarely become members of farmer groups. Most of the farmer groups members were men, this maybe because men has stronger role as the decision maker in garden management than women. In all the villages that were visited, 100% of the respondents agreed that men is the decision maker in garden management.

Important subject for extension services per gender can be identified through allocation time provided by both gender in garden management. Normally, men are allocating more time in garden management 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 four main activities mentioned. Although women has minor position as the decision maker in garden management, women also play roles in garden management, mainly in the maintenance of nursery, harvesting and post-harvest handling process. From the discussion, around 75% of the respondents were agreed that women play important role in marketing the agricultural products. Thus, women capacity and skills need to be improved particularly with activities that related to: i) nursery maintenance; ii) harvesting and post-harvest handling process; and iii) the product marketing.

Communication media

Besides 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.

Table 15 Top-five priority for effective communication media in agricultural extension in South Sulawesi

Village groups	**Media effectiveness**				
	1*	2	3	4	5
Degraded land	Television	Handphone, Newspaper		Radio, Magazine	
AF Bantaeng	Television	CD/DVD	Handphone	Magazine	Radio
AF Bulukumba	Television	Handphone	Radio	Newspaper	CD/DVD
Timber	Television	Handphone, Radio		Newspaper	CD/DVD

Note: * = 1 is the most effective

From the discussion, television was considered by all village groups as the most effective communication media for agricultural extension (Table 5.). However, currently there was a decreasing number of agricultural extension programs in television, and in some part of the AgFor villages still has no electricity. Handphone was considered as the second most effective communication media by all village groups, except the AF-Bantaeng village group that considered CD/DVD as the most effective media. Handphone was considered as an effective communication

media, particularly for updating information on price of agricultural products. Radio, Magazine and Newspaper were considered as least effective as communication media for agricultural extension.

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.:

1. 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.
2. Lack of technical capacity and motivation to facilitate innovation.
3. 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, in both province, 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 community species prioritization. In South Sulawesi, for villages in highland area such as the degraded land village group, AF-Bantaeng village group and AF-Bulukumba village group, clove is become the most important tree-based species, while in lowland area such as in timber village group, coconut was become the most important tree-based species. Besides tree-based species, short term crops (vegetables, beans, chayote, cassava, peanut, chili, cabbage, carrot) were also most important species that contribute to the local livelihood in all village groups. While for AgFor intervention, durian was the most demanded species in South Sulawesi.

Lack of access to information on innovative technology for improving farmers land productivity, has motivated farmer to join extension activities. Farmers demand for capacity building to improving their skills were not signifiantly different between village groups. Based on the discussion, training on vegetative propagation is the most requested by farmers, and topic on cultivation techniques was the most demanded for the in-class extension activities. 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, televisionwas the most effective media for agricultural extension, and handphone as the second most effective. However, frequency of agricultural extension programs in television were still few. CD or DVD can also be an effective communication media in agricultural extension if it is produced and distributed regularly. 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 16 Seedlings distribution from former government programs to farmers in the AgFor project villages in South Sulawesi (Note: receivers are members of farmer group).

Village	Year	Frequency	Goverm't Agency	Seedlings species
Degraded Land village group				
Kayu Loe	2011	2-3 times per year	Dinas Pertanian; Dinas Kehutanan	Maize, potato, KBR (clove, coffee, durian)
Bonto Karaeng	2011	1 times per year	Dinas Pertanian	Maize (15-20 kg/HH); Clove 50 seedlings/HH; cacao 50 seedlings/HH; Paddy (15-20 kg/HH)
AF-Bantaeng village group				
Campaga	2007 to 2008	1 per year	Dinas Pertanian; Dinas Perkebunan	Paddy, Maize, Cacao
Pattaneteang	2011	1-2 times per year	Dinas Kehutanan dan Perkebunan	Clove, Lansium, Suren, Durian
AF-Bulukumba village group				
Borong Rappoa	2007, 2012	1 times per 5 year	P2BM, Dinas Pertanian	Paddy, maize, durian, onion, mahoni, nutmeg, African timber, Gmelina
Balang Pesoang	2005 to 2012	1 times per year	Dinas Pertanian	Mangosteen, Surian, Teak, Pepper, Clove, Durian, Coffee, rambutan
Timber village group				
Tana Towa	2012	1 times per year		Maize, Paddy, Surian, Teak, Cacao, Candlenut, Rubber, Gmelina, Mahoni, Enterolobium (colo)
Tugondeng	2011	1 times per year	Dinas Pertanian, Dinas Kehutanan	Paddy, Maize, Teak, Coconut, Mahoni, Gmelina, Kayu Sengon

Table 17 Former training in agricultural-based activities in AgFor project villages in South Sulawesi

Village	Year	Fre-quency	Extension agency	Material	Female parti-cipants
Degraded Land village group					
Kayu Loe	2011	1 per 3 years	Dinas Pertanian	Vegetables cultivation	20%
Bonto Karaeng	2011	1 per year	Extension officer at district level	Home industri (chair making)	20%
AF-Bantaeng village group					
Campaga	2010	2 per year	Extension officer at district level	Honey production	50%
Pattaneteang	2011	1 per year	Dinas Pertanian; Dinas Kehutanan	Fertilizing	10%
AF-Bulukumba village group					
Borong Rappoa	2011		Dinas Pertanian	Vegetables cultivation	20%
Balang Pesoang	2011	1 per year	Dinas Pertanian	Side grafting for cacao	0%
Timber village group					
Tana Towa	2011	1 per year	Dinas Pariwisata, Dinas Pertanian	Home industri, plant spacing management	50%
Tugondeng	2010	1 per year	Dinas Pertanian, Dinas Kehutanan	Cacao agriculture	30%

Table 18 Former in-class activities as part of extension services by government agencies in the AgFor project villages in South Sulawesi

Village	Year	Frequency	Extension agency	Subjects	Female participants
Degraded Land village group					
Kayu Loe	None				
Bonto Karaeng	2011	2 per year	Extension officer at district level	Paddy and maize cultivation; Livestock management	30%
AF-Bantaeng village group					
Campaga	2011	2 per year	Unhas, Dinas Pertanian, Dinas Perkebunan	Staple food crop and estate crop cultivation; Protection forest; Ecotourism	30%
Pattaneteang	2009-2010	1 per year	Dinas Pertanian; Dinas Kehutanan	Cultivation	30%
AF-Bulukumba village group					
Borong Rappoa	2011	1 per 5 years	Dinas Pertanian	Vegetables and paddy cultivation	30%
Balang Pesoang	None				
Timber village group					
Tana Towa	2011, 2012	4 per 3 years	Lapesda-UGM	Organic fertilizer industry, traditional textile industry	80%
Tugondeng	2010	1 per year	Dinas Pertanian, Dinas Kehutanan	Cacao side grafting; Coconut sugar production	30%

Table 19 List of former cross-visit activities hosted by government and non government agencies in South Sulawesi

Village	Year	Frequency	Agency	Destination/agenda	Female participants
Degraded Land village group					
Kayu Loe	2011	2 per year	Dinas Pertanian dan Hortikultura	To Bali and Bulukumba	30%
Bonto Karaeng	2011	1 per year	Dinas Pertanian	Poultry management	? %
AF-Bantaeng village group					
Campaga	2010	1 per year	*Dinas Pertanian dan Hortikultura*; Kelompok Tani Nelayan Andalan (KTNA)		50%
Pattaneteang	2011	1 per year	*Dinas Kehutanan*; Universitas Hasanuddin	Honey production	0%
AF-Bulukumba village group					
Borong Rappoa	2009	1 per 10 year	Dinas Pertanian	Enrekang and Tana Toraja to study vegetables cultivation (27 participants, 4 female)	20%
Balang Pesoang	None				
Timber village group					
Tana Towa	1996, 2003, 2006			Meeting for National Customary Group	0%
Tugondeng	2010	1 per 5 years	Dinas Kehutanan dan Perkebunan	Cacao to Banyuwangi, East Java	0%

Table 20 Cross-visit requested by South Sulawesi farmers in AgFor project

Village	Species to be studied	Location for cross-visit											
		Malino (coffee, vegetable, fruits)	Bantaeng-Loka (vege-tables, apel, strawberry)	Enrekang (Vegetables, Cow, Snakefruit)	Sidrap (Paddy, Poultry)	Tator (Coffee)	Takalar (Maize)	Sinjai Barat (Passion fruit)	Palopo (Cacao, Sagu)	Bulu-kumba (Rubber, fruits)	Sinjai (Durian)	Soppeng (Gaharu)	Kendari (Clove)
Degraded land village group													
Kayu Loe	Cabbage; Onion; Clove; Durian, Mango; Cacao; Poultry; Sagu; Maize; Rambutan; Lansium;			V	v				v	v			
Bonto Karaeng	Vegetable; Cow; Poultry; Fruits	v		V	v								
AF-Bantaeng village group													
Campaga	Paddy;Cacao;Cow; Snakefruit; Maize; Passionfruit			V	v		V	v	v				
Pattaneteang	Nutmeg; Mangos-teen; Paddy; Cow; Goat; Gaharu; Clove; Cacao								v			v	v
AF-Bulukumba village group													
Borong Rappoa	Coffee;Vegetables; Poultry; Clove	v	v	V	v	v							
Balang Pesoang	Rambutan, Durian, Apple, Strawberry	v	v										
Timber village group													
Tana Towa	Rubber, Durian									v	v		
Tugondeng	Cacao, Coconut, Rubber								v				

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