Working Paper

Gendered Knowledge and Perception in Managing Grassland Areas in East Sumba, Indonesia

Elok Mulyoutami, Gerhard Sabastian, James M Roshetko

World Agroforestry Centre

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Abstract

Dynamics of land use changes in this earth induce the land quality is often reduced, and the ability to support our livelihood be on the skids. Efforts to recover or restore the land to its original state needs to be done. Gender studies conducted to understand how the roles of women and men in the management of land and other natural resources as part of the restoration process in Haharu Sub-district, Sumba Timur. Social classes are still prevails in some group of Sumba communities and vertically arranged into three classes, the nobleman, the ordinary people, and the slaverian.

Our finding shows that women and men have almost the same contribution in farming, animal husbandry, and tapping watter as one of productive work in each household. Women seems have more burden in compare to the men, as they have more responsibility in household activities. On the knowledge about land use and land preferences, men's perception usually focus on long term, something related with longterm economic forecast, while women are usually focus on shorter periods and more on economic calculation, reducing the capital through low labour need and low cost on fertilizer. Related to gender relation intra household, we found that there are some weak relation which is showed that not many women has high confidence to evince their opinions. Weak gender relation is getting stronger while we look at the lowest social status. In sum, involvement of men and women in restoration process is essential, but need to take into account the burden and the social strata in the community.

Keywords: Land restoration, land management, gender, social class, Sumba communities

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The authors would like to thank to Bapak Nikolas Hanggawali for his excellent support in facilitating the survey and discussion with local community. High appreciation to Ibu Kitri Widaretna from World Vision International, and most of WVI team based in Sumba Timur who also involve in this activities for their excellent inputs and good coordination. Special thanks to all of the communities in Haharu subdistricts who involve in group discussion and survey.

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Introduction

Dynamics of land use changes in this earth induce the land quality is often reduced, and the ability to support our livelihood be on the skids. Efforts to recover or restore the land to its original state needs to be done. Communities (farmers) are land managers who best understand their natural conditions, therefore they must be involved in this restoration effort. Discussion about the land managers, we should understand that they are not only a man (or head of households) who becomes land managers, but women (other member in household) are also involved. The selection of plants and land managements often involves women, particularly in certain population groups according to their cultural and social background. Thus, understanding on how women and men involved in managing their land is important as basis in planing more appropriate restoration program.

Pursuing this further, restoration program should be based on local aspiration in order to develop good commitment from local communities as main actor. Therefore, we might know on how to support and facilitate farmers (as the main actor) to regenerate degraded farmlands and forests, increase yields, improve quality, enhance market access and boost their income. As we all are aware, local community has many different layer, on wealth, age structure, social structure as well as gender aspects. We need to make sure that restoration or development program has already represent all the layers exist in the community that direct and indirectly may influences the suceed of the restoration program.

Sumba, is the exotic island in eastern part of Indonesia, with very unique landscape compare to other areas in Indonesia. Expanse of savanna sprawling ground with a number of cattle, goat, horses (*ndara*) and pigs roam freely enjoying the grass savanna, especially during the rainy season. The stretch of green visible and tidy, in the form of short grass which is accompanied by a group of shrubs scatter (*Bakau*/Mangrove tree or *Sonneratia sp.*) and some tall trees (*Kehi*/*KayuCina* or *Lannea coromandelica*) and Kosambi (*Scheilecheraoleosa*) are grown to cluster. If at first glance the grass just look like planted in a neat, which is in reality just a bunch of grass that can grow in the overlay. The rocks hidden in the ground, and others sticking to the surface with a height of 1 meter to 3 meters and establish the distribution of boulders. Cluster of trees which form like a mini forest were stand in the valleys between the hills of savanna, and, if there are in the plains, the amount of tree is not much and is simply a plant species of *kehi* tree or locally called as *angsana*.

This charming landscapes did not promise a decent life for people who live in District Haharu. Its people live in conditions of poverty with the productivity of agricultural land is very low and difficult to get clean water. The landscape that does not have a comprehensive number of stands of trees turned out to only provide minimal water source for the community. Moreover, rocky topography makes people not easy to get the water source

Efforts to restore and/or to make landscape function better was an important step that should be implemented immediately. However, what is most appropriate activity to do?

Efforts to develop nutrition gardens and maintenance of plants that grow wild in order to develop feasible and can still fulfill forest functions carried out by Wahana Visi Indonesia (WVI), formerly called the World Vision Indonesia, for approximately 10 years. And now, WVI took ICRAF and Lutheran World Relief (LWR) in the project IRED (Indonesia Rural Economic Develeopment) to jointly develop a model of recovery and restoration of the environment of the landscape in the District Haharu without ignoring the importance of improving the livelihood of people living in the area. Inside the IRED project, ICRAF is trying to improve the function of the environment (restoration) of the landscape by building community through the development of priority tree species nursery farmers and improved management of farmland and stands of trees. The resulting seedlings will of course be planted on their farms, and possibly also in other critical locations. The seedlings can of course be sold and provide additional income for the community.

Who actually fits perform the recovery and restoration of the environment of the landscape? Of course, the local community and all the components and social layers in it. They are the main actors in the development of their region, who best understand the physical and social environment and local culture is a factor that must be considered in a packed restoration efforts to be more appropriate. Gender studies conducted to understand how the roles of women and men in the management of land and other natural resources.

This report focus on gender issues in some aspects, such:

1. Assessing on how women and men contribute to household income, and how to empowered women and make their role more visible but not to burdening women in doing their work
2. Understanding different experiences, practices and strategies of both men and women in managing natural resource and addressing environmental problems. Taking into accounts differences between gender is necessary in the course of designing and implementing a development programme.
3. Understanding how differences men and women generate knowledge about environmental changes and making decision over land use. This analysis will be useful to empowered female headed household and also improved the communication between husband and wife in male headed household then men and women may gain the equal benefit.

Methods

Study sites

Study was conducted in 7 villages in Haharu Sub-District, Sumba Timur District, East Nusa Tenggra Province, with different topographical condition which lead to different strategies, practices and priorities in their farming practices. Different topographical condition were illustrated in Table 1, and

the class were defined based on the position of those villages from shoreline, topography position (in the valley, in the plateu, and closeness to forest areas). The land use class were define together with local community through discussion process (FGD).

Table 1. Illustration of villages location, topography and natural resources

Topography		Villages grouping	River availability	Other water resources	Type of major land
Plain and coastal	A	Kadahang (20 asl), Rambangaru (18 asl)	Within the village	Digging well (26 – 46 depth) Rain water storage Water tanki from other areas *Way Kulup* (water accumulated in rock crevice) Brackish lake	Savanna 25 – 34%, Bareland 8 – 18%, *Woka* (highland garden) 15 – 22%, Forested areas (9 – 14%), Garden in the valley or *Lola* (only in Napu 13%), Homegarden 11%, *Mondu* (Riverside garden) 4 – 15%
Plain, coastal, near to forested areas,	B	Napu (207 asl), Wunga (234 asl)	No river		35% Savanna 25% Forested areas, 20% of Bareland, 15% of *Woka* and 5% of Garden
Village in valley areas	C	Kalamba 227 asl (village in the couldron)	Within the village and Waterfall Makandoruk		Savanna 27%, Bareland 22%, *Woka* (Garden) 16%, Shrub 12.5%, Homegarden 9%, Irrigated paddy 7%, and *Mondu* (Riverside garden) 6.25%
Plateu village	D	Praibakul (79 asl)	Within the village		Savanna 22%, Homegarden 19%, *Woka*/Garden, Forested areas and Bareland 11%, *Mondu* 7.5%, Valley garden/*Lola* 6%, Irrigated paddy 5%
	E	Mbatapuhu (375 asl)	No river		Savanna 50%, *Woka* Lola 20%, Homegarden and forested areas @10%, Bareland and *Woka* Palindi @5%

Data collection

Data was collected through series of sex-disaggregration focus group discussion and semi structured interview with some key informant. Focus group discussion were conducted in two phases, the first phases is for general question about the village, this is related to the question of land use change and general livelihood pattern. Phase two is gender disagregrated data group discussion which is conducted in parallel (separate group between men and women) in 6 villages, while in the other one village, due to the village situation contraint, we just conducted semi structured interview using the same set of question as in FGD. Sex-disaggregrated discussion were employed to make sure that women's opinion is not dominated or influenced by the men. However, due to resource limitation, we conducted FGD on the same location with one facilitator, we asked some general question in prior, then its continue by separating men and women, and asking more specific question about their opinion, preferences and strategies. This might be become the resource limitation but then we also can get other advantage to also observe well on how men and women interact each other (during general question were asked). Details data collection methods and participant number as well as informants number were illustrated in Table 2.

FGDs participants were selected purposively, mostly are the land managers and/or village personage who may have better understanding on village boundary areas, land use, village history and other general information about the village. Ideally, we expect 6 – 8 attendees in each groups, however due to certain condition in each villages, we might get more and in few cases we get fewer participants than we expected. Since our analysis is in the group level, the un-balance number of participants is not impair the analysis process. So far, we score the situation in each discussion from 1 to 5, the highest score indicating the ideal situation on the discussion. We use three categories, the first is about the composition of discussion participant that we expect, for example are they all the land managers who understand the real situation. The second categories is the domination from some of discussion participant, this is to measure whether the discussion have reflecting most of the discussion participant or only several people. The third is the conducive situation of the discussion, we put highest score (5 point) if the condition of has less nuisance. We consider that our discussion participants composition were covering 73% of our expectation on ideal situation, and the liveliness of participants were about 73% while the conduciveness is 80%.

In the FGD, we conducted three different participatory approach. The first is, pebble game to assess gender-specific role in natural resource management as describe by Mulyoutami (2014). This game were used to gather information on the main livelihood source and how it changed over time, as well as the information on land use change over period of time. The second is, analytic hierarchy process to assess gendered preferences on land use as describe by Janudianto (2014). The question we used in this game is 'what kind of land use they prefered for restoration program?'. The last approach, is the simple group interview, asking the reason on what are they choices and preferences.

Data analysis using simple descriptive statistic and some simple tabulation using excel programe. Mann-Whitney test were employed to check the differences between men and women.

Table 2. Detail information on data collection

Villages	Number of FGD (and the participants)		Individual interview		Total respondent and informants	
	Men	Women	Men	Women	Men	Women
Kadahang	1 (13)	1 (5)	1	-	14	5
Kalamba	1 (13)	1 (5)	1	1	14	6
Mbatapuhu	1 (8)	1 (7)	1	-	9	7
Napu	1 (6)	1 (5)	1	2	7	7
Praibakul	1 (9)	1 (11)	1	1	10	12
Wunga	1 (10)	1 (7)	-	-	10	7
Rambangaru	-	-	3	2	3	2
Total	6 (59)	6 (40)	8	6		

General overview

Topography

The topography of Sumba Timur is generally flat (in the coastal areas), gently sloping to undulating (lowland region <100 meters) and hilly (mountainous). Areas with altitudes above 1000 meters slightly in the hills and mountains. The range of mountains and steep limestone hills that dominate the area center in areas near Kalamba village. Agricultural land mainly in the northern coastal plains that have enough surface water and big rivers.

This district tropical climate with rainy season is relatively short and the long dry season (eight months). The average temperature was 22.5 degrees to 31.7 degrees Celsius, so this area includes dry climates. Total rainfall of 1,860 millimeters a year, with rainy season usually occurs in December and Marc. In most of Sumba Timur District, water deficit happened due to low water availability, both from lack of ground water recharge as well as low rainfall.

Meadows spread out across vast plains, as well as hilly terrain, thus forming a small mound with extensive lawns adorned several groups of trees. Rocky meadows are also found in some areas. It sometimes become the benefit, while water were trapped in the rock crevice and use as livestock drinking water source.

Socio-Cultural background

Sumba Timur embraced patrilineal system, with wife entered into husband's clan and their descendants involving their rights and obligations. Patrilineal kin group called kabihu. A wife goes into a clan of her husband, as well as their children directly into the clan of his father with all the rights and obligations. The form of traditional marriage of Sumba is exogamy (*asymmetric comnubium*) marriage performed outside kabihu with unidirectional relationship (Soelarto 2000). Exchange of goods in marriage, where the groom (men's) should pay belis or bridewealth (*wili, weli*) and the countergift (*Mbola ngandi*), "Basket of the bride". Bridewealth can be livestock, mainly horses, buffalo, and pig, and countergift usually cloth (*kamba).*

J J Fox (1980) mention that female goods move in the same direction as the woman who marry out, while male goods go in the opposite direction, as gifts to the bride's family. Female goods given by the brides family include pigs, cloths and ornaments. One special task of young woman at her new home is *tauna peni manu* or *tauna nga'a wasi (*feed chicken or pig).

Kinship according kabihu (tribe/clan) is very strong, as reflected in various community activities. Kabihu (clan) play a pivotal role as a unit community cohesion. Each Kabihu has rights, priviledge, and obligations that would depent on their tradition and history that was developed by their ancestors. Paraingu is a territory ruled by community rules that was developed by several kabihu/clan who established the Paraingu. In simple, paraingu allied with village.

Social classes are vertically arranged into three classes, Maramba, Kabihu and Ata (Fox 1980, Forshee 2001, Melalatoa 1995). Maramba is the nobleman, the highest caste who usually controlling and overcome the resources. Kabihu are the ordinary people (middle class), they all independent, and majority of the community member were from Kabihu caste. The lowest caste is Ata, or slaverian, the one who should serve the nobleman. They don't have right to make decision on their own life, they should follow what the nobleman commanded. Actually, the relationship between the nobleman, the ordinary people and the slaves corresponding the relationship of father and son (Wellem 2004), the nobleman should protect the community. Nobleman called as *ina ma paraingu, ama la paraingu* (father and mother of the community). The same as nobleman that can only get by inheritance systems, the ata caste were also can be inherited from one generation to other generation. Once people become the Ata, they and their descendent family will become Ata forever.

Currently, social classes is no longer strongly applied due to the number of nobleman and ata is on the wane. However, in some villages, where maramba still exist, the relationship nobleman – slave still also exist, but might be changed. This aristocratic system is almost fading due to the function of the nobles had slowly changed (Renda 2012). The nobles who usually has prerogative right to controlling all of human aspects in the community, but now only in a few sectors. Secondly, influence of new religion, technology developments that affect to the change of mindset of local people. The loyalty to the nobleman is decreasing. The traditional three tiered social hierarchy is almost replaced by the egalitarian classless society.

Land use

The expanse of Haharu district covering with grass hill, patchy of forest in valleys areas, and stone spread over on the grass land, starting from the coastal plain (0 asl) areas up to 375 meters above see level. Due to the small amount of standing trees, the areas appears to be open and we can see all the land curves. Grass hill were become the domination landscape in particular in highland and inland areas. The crowd of standing trees were usually appears in valley areas like a small forest, near the stream. Sandstone cliff also appears in some areas in particular on the way to Kalamba village, the village of the couldron.

Most of the land in Haharu district were owned communaly as tanah adat or belong to the clan or Kabihu.There were also land that owned individually and the owner paid for the tax. Land titled only they get based on the letter of 'land and building tax'. Only housing areas, productive garden near the house, or some productive garden near the settlement areas that have the land titled. Figure 1 shows the main topographical position of land in Haharu district and all of the farming practices in each areas. There were five main land use practices in Haharu.

***Mondu* (A)**, is the land in the riverside or near other water sources. Since river usually located in valley areas, *mondu* is almost practices in valley areas. Maize (*Zea Mays*), sweet potato (*Dioscorea alata*) and some kind of vegetables as tomatto (*Solanum lycopersicum*), chilly (*Capsicum annuum L.*),

long bean (*Vigna unguiculata sesquipedalis*), as well as fruit trees were deliberately cultivated by clan of farmers in this areas. Fruit trees were maintained not only for the products, but also to protect the land from flood. While wooden trees, were still maintained there, aside to land protection, but also as the life fence avoiding the livestock entering their farming areas. While *mondu* is usually the garden on the riverside with maximum distance from the river edge is about 2 – 3 meters, *Tana Ping* were also riverside garden but more to inland areas, with distance from the river edge is more than 3 meters. *Mondu* and *Tana Ping* ownership were usually based on traditional claim and belong to certain clans. People who are not in the clan were still possible to managed the land, they may borrowed the land.

Woka is the term refering the productive land in dry areas. Most of vegetation planted there, such as maize, peanut (Arachis hypogaea L), any kind of vegetables, coconut (*Cocos nucifera*), etc, are growth depend on rainfall. ***Woka Lola* (B)**, is the areas in valley area without any river nearby. The valley areas were used because it has good fertility and less stone, so they could manage the land more efficient. ***Woka Palindi* (C)** (*Woka Palendu*), the productive dry land located in the plateu. *Woka*, that close to the settlement areas were called as ***Woka* Uma**, and it refered to homegarden, the productive land surrounding the house. Most of the vegetation they plant in *Woka* Lola can also be planted here.

Maradda (*padang* – sumba term or *sabana* – Indonesia term) or Savanna spread widely both in the highlands, as well as in the lowlands. Savanna's become an area that is used for the location of grazing livestock, some of them were also covered with huge stone. Savanna ownership usually through clan lines, and often closely related to a social status. However, people are still allowed to use any savanna areas for grazing, some people mention that the location for grazing usually based on the closeness to the settlement areas, other argue that it can relate to the clan. Maramba generally have a broad savanna areas. In some villages, Mbatapuhu and Praibakul for example, in 1990s is the era of granting residential land to the landless majority community. Some of savanna's areas were divided to settlement areas, and may get land titled from National Land Agency, though this raised some social conflicts and jealousy.

Utang or **forested areas (D)** areas were mainly naturally covered the valleys areas. This might due to the soil condition there were more fertile, and the stone in the soil is less. Natural vegetation may growth in this areas are Kesambi (*Scleicera oleosa*), Bidara/Kom (*Zizipus Jujube*), lamtoro (*Leucaena leicocephla*), Beringin (*Ficus sp*), Mojo/Maja/Wabiila (*Aegle marmelos Correa*), Mengkudu (*Morinda citrifolia*) dan *Kedondong hutan* (*Spondias pinnata*), Kasuarin (*Casuarina Junghuhiana*), Kayu Merah (*Pterecarpus Indicus*), Johar (*Cassia Siamea*), Aisuli (*Acacia Oraria*) and akasia (*Acacia auriculiformis*). There were 3 375 ha forested areas in Haharu Sub-district assigned as 'Production Forest' as part of the total 58 422 of 'Forest Production' areas in Sumba Timur district.

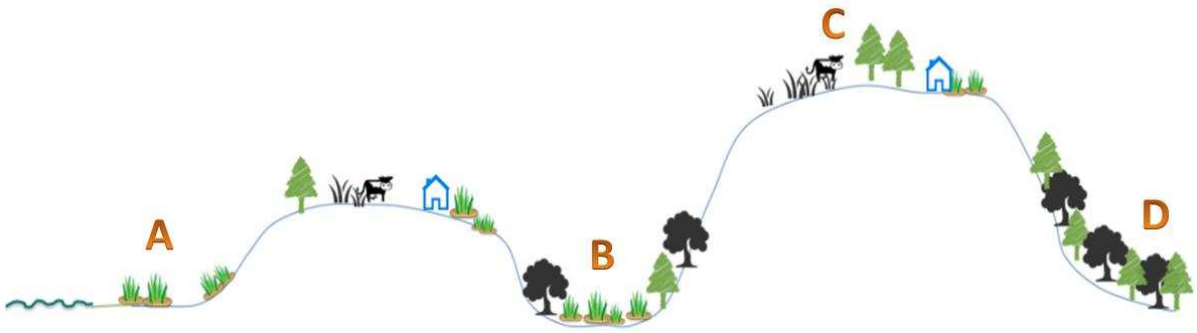


Figure 1. Landscape view in Haharu Sub District, Sumba Timur

Table 3. Detail description of each land use and landscape in Haharu Sub District, Sumba Timur

Land use	A *Mondu*	Maradda (Savanna)	B *Woka* lola	C *Woka*: *Woka* palindi, *woka* uma	D Forested areas
Type of vegetation	Wet Paddy Maize, Sweet potato Tomato (*Ambalai*), Chilly (*Bokuhawu*), Paria, Labu (*Kallah*). Fruit trees	Kehi trees Grass (Pennisetum spp).	Dried Paddy Maize, Sweet potato Sorghum (*Watar Hamu*)	Maize (*Kamboru*) Cashew Kehi trees Kacang tanah (*Manila*) Kacang turis (Kacang gude) Coconut (*Kokur*)	Kehi Teak
Soil type (local perception)	Black soil Sandy soil Mixture soil	Sandy soil Grey soil	Black Soil Grey soil	Red soil Black soil White soil	Black soil Fertile
Gender roles			Men and Women		
Water sources	Nearby river	Water storage in crevice stone	Small spring Rain water storage	Rain water storage Wells (few)	Small spring Rain water storage
Time for cultivating	End of rainy season (avoiding flood)	-	During rainy season (depend on rain water)	Plant during rainy season, but can be cultivated through the years	-
Tenurial issues	Communal land, individu who can manage the land usually from the same clan, or if its not, they should get special permission from the clan of the land owner	Communal (clan) land It can be utilize by everybody in *Paraingu* (villages)	Some of land were belongs to communal land, though in some areas *woka* lola were also owned individually	Usually owned individually	Communal land (sometimes its belonging to the *maramba*)

Non (semi) productive land use were also indicated, they called as Ramang and Kanguma. **Ramang** indicated the bare land, usually its owned but without land tittle. **Kanguma**, is also the bareland, located in steep valley areas, and usually planted with *lamtoro* (*Leucaena leicecophla*). Some people may utilized the kanguma areas to plant vegetables.

Figure 2. *Woka*, farming areas in the valley of the hill

Figure 3. *Mondu*, farming areas in the riverside

Figure 4. Forested areas (*utang*) in the hillside

Change of land use in the last decades

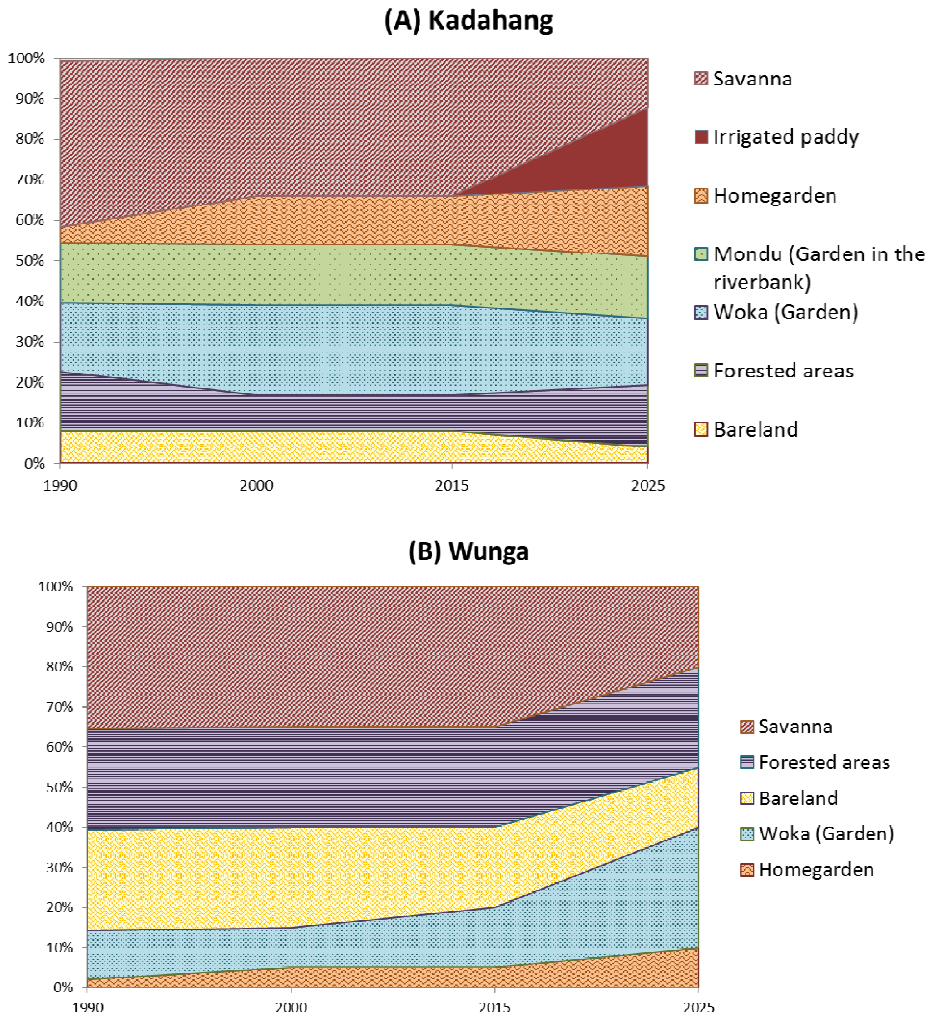
This part illustrating how the major land use in the surveyed village change from time to time (presented in figure below). Land use change illustration were taken from the farmers' point of view. In focus group discussion series that was conducted in some villages, we asked farmers to indicate how the land use size for periods of 1990, 2000, 2015 and what will be the estimation of land use available in their village on 2025 based on current condition. Since the information is based on farmers perception, the information on those figures will not very accurate, but it can show the tendency of what are the largest and smallest land use in each villages.

Figure 5 shows that from 1990 to 2015, savanna were always be the vast land in each villages areas, although currently has begun to wane and change to other productive land use systems (*woka* or mixed garden in dry areas) and settlement areas (including homegarden or locally called as *Ana Woka*). *Woka* area expansion increase, indicating that people started to be more intensive cultivating their fields. People utilize bare land (*ramang*) and shrubs areas (*kangoma*) for intensifying their farming practices. For people living in the highland, *mondu* and *lola* are the important land use to produce vegetables and other source of food, as well as fruits. Due to the topography, access to *mondu* and *lola* usually slightly difficult because the location is in lowland. Some people living in the highland are still maintained *woka* in the highland area that is near their home.

Homegarden areas expand due to the expansion of settlement areas. In mid of 1990s, local governments have resettled program with opening new settlement territories in highlands. The area that they use are mostly the savanna. The program is conducted to move the people who originally

settled in the valley-floodplain areas to the highland areas. Each household may get 0.075 – 0.1 ha of land for housing and home garden.

The coverage of forested areas still remained the same in the decades. Those tendency is happened due to the low interest of people to cut the trees. Labor issues become the main reason as it mention by the focus group discussant. People just managed the shrubs areas in the forested areas, sometimes collect deadtree as firewood. They may also collect fuelwood from the bareland areas to fulfil the needs for household consumption.



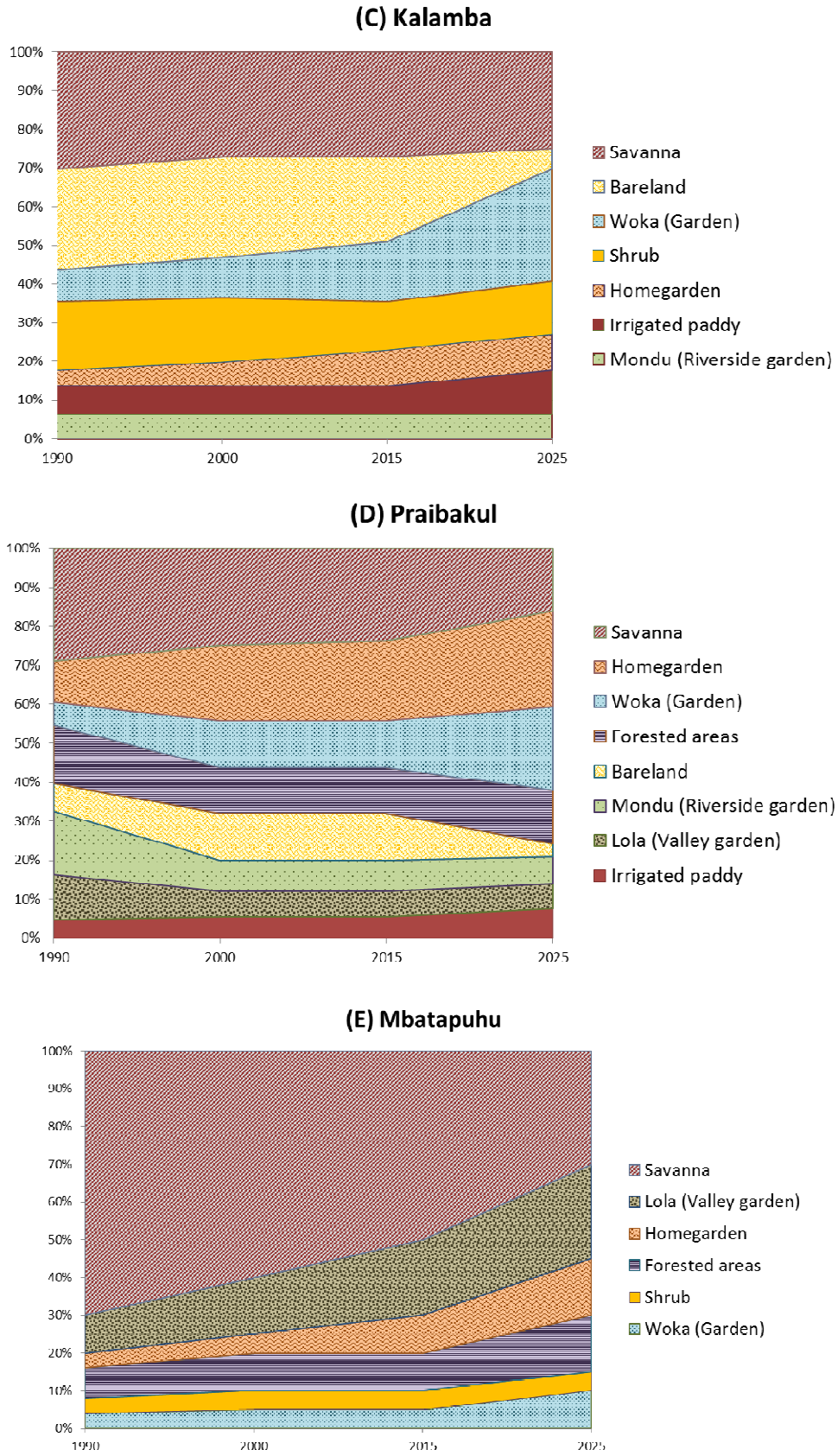


Figure 5. Land use changes from 1990 – 2025 based on farmers perception.

Data sources: focus group discussion

In 2025, people are expected to have more productive land such *woka* (garden) and *lola* (valley garden) that far from the house or *woka uma* (home garden). They are quite optimistic based on current situation, with some helps from National Non Government Organisations (WVI) based in Waingapu, they have community owned plots (demonstration plots), nutrition garden (kebun gizi), and raised bed farming. They plan to plant some more vegetation and trees in their land. However, we also noted some disagreement face from few discussant. They worried with the main problem in their villages, that is water availability. They contend that if they have not enough water, how they can manage the land. The second problem is the availability of good planting materials, they have not enough knowledge on this. Seems, that some mentoring on producing good planting materials is necessary, also improving people knowledge on how to be better management on rainwater harvesting or water protection.

Some villagers argue that forested areas will not change much, they contend the benefit from forest areas is not commensurate with the difficulties on how to exploit the forest, so they may not do nothing with the forest. The other villagers contend that the forested areas will increase, because they already have strong effort to plant the trees and do the '*palotang* (pruning)' with support from the National NGOs based in Waingapu. No villagers indicate the forest areas is decreasing to add more some productive land. Seems, they commit to protect forested areas as it very scarce in this areas, and instead of converting forest, they plan to convert the bareland or savana to be more productive land. Though, in reality with the condition of the grassland ecosystem in Sumba which has quite a lot of rock/stone, the areas that may suitable for farming areas is quiet limited.

Livelihood sources dynamics

The livelihood source of people living in Haharu sub-district mostly relied on farming activities and raising livestock. Farming activities to fulfil their subsistence need, as well as small livestock as chicken and pig. Large livestock, such cattle and horse, were usually used for asset and customary purposes. Savanna, the vast landuse in their environment, such a benefit for livestock husbandry, though it also a challenge on doing better farming. Rocks and soil texture is quiet large spreaded in the landscape, and it makes the available farming areas is limited. People living in this areas need good knowledge on how to maintain the land better.

Livestock can be a symbol of social status of the family in Sumbanese family (Onvlee 1980, Melalatoa 1995). Livestock referes to the *banda la marada* or possesion in the field, and designated as banda luri or living goods or life property. The more live property (*banda luri* or livestock) you have, the higher social status you get.

Chicken owned by nearly 100% of household, except in Kadahang village. Each households at least have 3 – 10 chicken. Pig are also almost owned by 100% household, except in Kadahang and Napu,

with 1 – 3 pigs per household. Mbatapuhu is the village with higher percentage of pig ownership. The same as pigs and chickens, dog is also owned by majority household in each villages with 1 – 3 dogs in each household. Since Kadahang is the poorest village, dog's owner is only about 90% of total villagers. In each villages, goat is usually owned by 50 – 70% household, with average per household is only 1 – 2 goat. Many of them owned the goat through government program. Cow usually owned by 30% of the communities, while buffalo less than 15% of the community in each villages. People may upkeep cow and buffalo using scroll system, they feed the cattle until gets calves, and preserve the calves as theirs. After that, cattle raising turn to others. The scroll systems applied based on support of local government programs.

Horse may owned by high social status of people. Horse owner in Praibakul and Mbatapuhu covers half of the population, while in other villages, only less than 10%. Praibakul and Mbatapuhu were known as the villages where social caste still strongly exist. Each horse owner household may owned 1 – 5 horse. The same with cattle, people may get horse with 'borrowing scheme'. Borrower keeps and feed a pair of horses belongs to the owner up to twice foaling, after that, the horse and one of the foal was returned to the owner, and the other foal was taken by the borrower.

Most important commodity in farming activities of Sumbanese family is maize. Result of FGDs in each villages always performing that maize is an important source of food for people (subsistence), though it also can be marketed. Fowler (2005) describe on the importance of Maize for Kodi People living in western Sumba, as also can illustrate the situation in Haharu Sub-District where most of people perceived that maize is very important commoditiest to cultivate. If paddy is very expensive and laborous in production, in contrary, maize is easy to cultivate and also suitable with the soil condition in Sumba Timur. It can be planted anywhere, in riverside areas, in valley areas, as well as in highland areas.

Aside from Maize, sumbanese family also cultivating sorgum (*Sorghum bicolor L.*) or locally called as *Jagung Rote* or *Cantel* (Javanese). Sorgum or Jagung rote is a crop being developed by the government on a large scale, and NTT provinces became one of the areas most suitable for this crop. Sorghum is a native species has been known many years ago, but then increasingly marginalized, due to the low preferences in compare to rice and maize. One of the distinctive properties of sorghum is resistance to drought, acid soil, and high salinity, therefore it suitable for the marginal land as in Sumba Timur. Sorghum is also have good resistency to pests and diseases and high tolerant to waterlogging. Nowadays, people just utilize the seed as food sources, other potential as roots, leaves, and stalks only useful for fodder and compost.

When severe food shortage happen, people are usually began to consume wild parsnip (*ubi hutan* or *sikapa* or *iwi*, latin names *Dioscorea hispida Dennst.*). The parsnip is easily grown in every condition and can be found in forested areas. Though it's poisonous, but due to no other alternative, people are still consume this with good processing. The benefit of cultivating the parsnip, it has high resistency to drought, and easily to cultivate.

Nutritious garden was mentioned as one of important livelihood sources, mainly for subsistence needs. Initiative of nutritious garden were from the national NGOs based in Waingapu who have almost 10 years side by side with the sumba people in Haharu develop their villages. Nutritious garden is an important land use for women, because they are the one who responsible to maintain it. Location of nutritious garden were in *Woka Lola*, *Woka Mondu*, and few of them in *Woka Uma*. Thats also the land use where usually women do the farming practices with their husband and other family members.

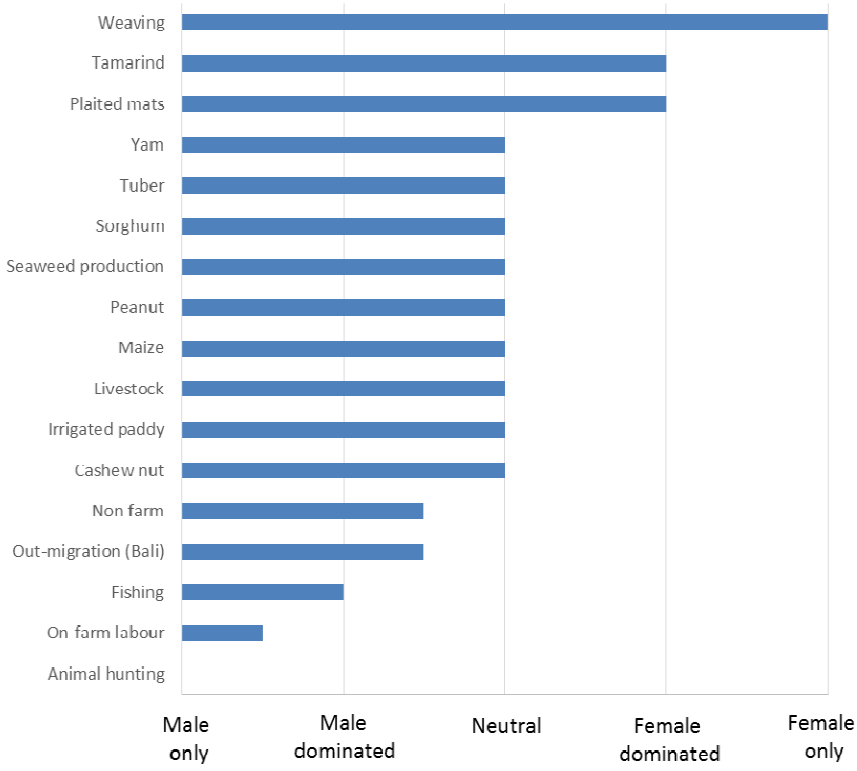


Figure 6. Source of important livelihoods and women involvement in each activities.

Data source: group discussions

For people in Wunga, Napu, Kadahang and Rambangaru, fishing is also an important livelihood sources. Palekahelu (2010) describe that in Wunga, aside from farming in dryland areas, men are usually go to the sea to catch fish and produce is become salty fish. Women's are usually in search and collect of *trepang* or sea slug for delicacy and it's also marketable. Women and men are working together producing salt and salty fish.

Rambangaru and Praibakul become the most important centre of peanut production in Haharu Sub-district. In 2013, production of peanut is 106 ton and 102 ton in Rambangaru and Praibakul respectively, and both are covers for about 84% from total production in Haharu Sub-district (246 ton). Peanut is planted in *woka*, and it can be in any kind of soil condition, in valley areas, in riverside,

as well as in highland areas. Men and women are working together in planting and harvesting peanut, while on maintenance it usually done by men, who more often go to the field.

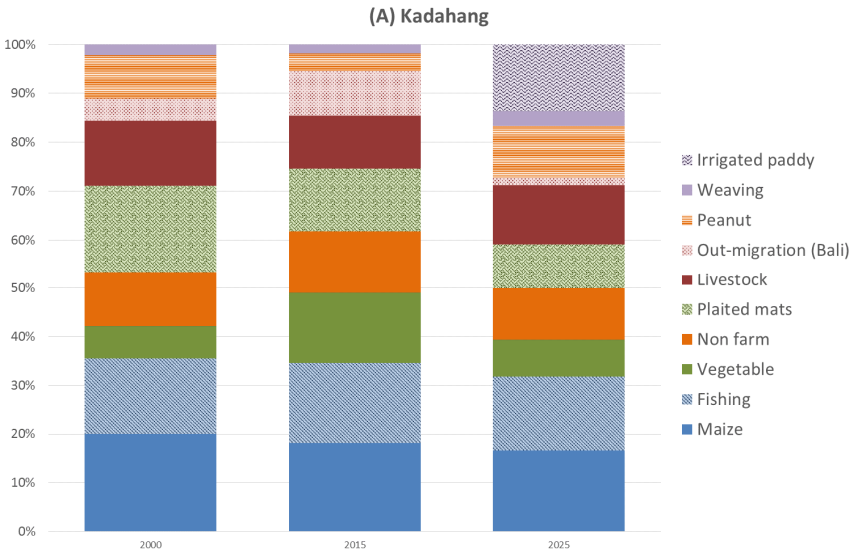
Some of Kalamba people planted kacang turis or known as *kacang gude* (*Cajanus cajan*), in Africa it known as congo pea, and internationally known as *pigeon pea*. In Indonesia, '*kacang gude*' were planted in the island of Java, Bali, East Nusa Tenggara, South Sulawesi and Southeast Sulawesi (Wakatobi). In East Java, kacang gude cultivation in dried highland areas (2000 asl), while in eastern part of Indonesia, it can be planted in any kind of areas. As shrubs, kacang turis can live in a variety of soil conditions, height can reach 1-2 meters. People may utilize the seed and the leaves for consumption, and also has high quality of manure materials.

Imperata cylindrica is useful as thatch roof for traditional house of sumba people. People were harvesting imperata reeds and selling it in local market as raw materials for roof. Cutting the reeds become important livelihood source to get cash income or for barter. Both men and women are involved in this type of activities.

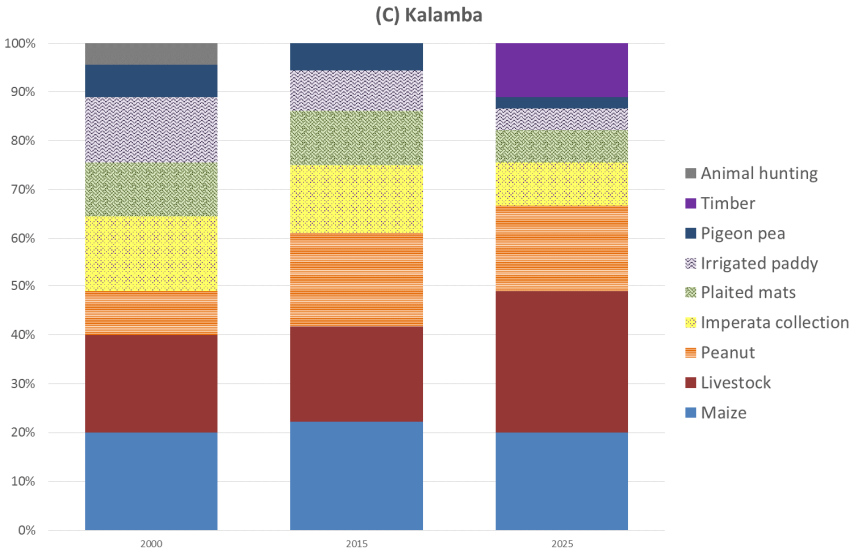
In Local Regulation of Sumba Timur, No 12 Years 2010, about Regional Spatial Plan for Sumba Timur District year of 2008-2028, Haharu sub-district were assigned as rice development centers. Though in reality, irrigated paddy rice become an important source of livelihood only for few peoples in Rambangaru, Praibakul and Kalamba. In 2014, there were 9 ha and 5 ha of paddy field in Rambangaru and Praibakul respectively, with total production is about 62.5 tonne and 19.14 tonne per year (Haharu in Figures, 2015).

In the household with limited land or less land for farming production, out-migration to Bali be an important alternative livelihood source. Migratory activity is typically performed in a number of villages such as Napu and Kadahang. The group that migrated mostly young men, both men and women with the aim of working as tourist guides or waiters at the boutiques, shops, etc. It is interesting to know why the out-migration case is only found in Napu and Kadahang villages, and not in the other villages.

Haharu sub-district play an important role as the hinterland in the seaweed (*Eucheuma cottonii*), minapolis areas, in particular in Wunga, Kadahang, Rambangaru dan Napu villages. This is formally stated in Decision Letter of Sumba Timur head of District (Bupati) No: 204/Dis. PKL.523.3/1.169/XI/2010. Initiation of seaweed production were in year of 2001. Short rainfall periods (8 – 9 months of dry season and 3 – 4 months of wet season) be a benefit of production process and harvesting of seaweed.


(A) Kadahang
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2000
2015
2025
Irrigated paddy
Weaving
Peanut
Out-migration (Bali)
Livestock
Plaited mats
Non farm
Vegetable
Fishing
Maize


(B) Wunga
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2000
2015
2025
Seaweed
On-farm labour
Peanut
Livestock
Fishing
Tuber
Maize


(C) Kalamba
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2000
2015
2025
Animal hunting
Timber
Pigeon pea
Irrigated paddy
Plaited mats
Imperata collection
Peanut
Livestock
Maize

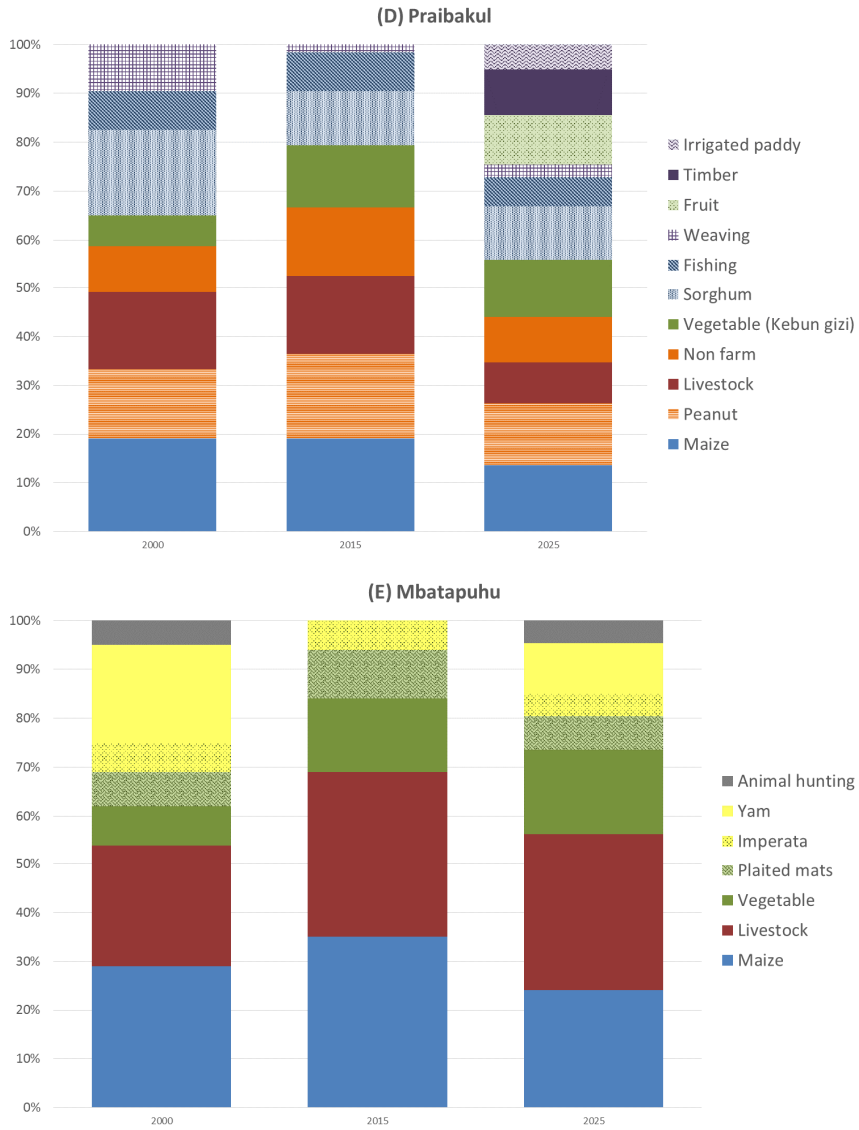


Figure 7. Change of livelihood sources in two different periods and the projection livelihood sources in the future.

Data Source: Focus group discussion

Division of work in household and productive activities

In household and farming activities

Men and women have different task and responsibility in household task and farming activities and its complementary. While men usually more responsible on farming activities, women's responsibility more on the household task. Figure 8 illustrating the roles of men and women in each task in household and some farming activities. Men dominating the work related to opening the new land and also do the *mandara* (looking for material support from the extend family). Opening the new land, due to heavy work, it is usually dominated by men, and the men also become the one who make

decision where and when the best time to open the land, including if they need to hire or add additional labor.

Build the house is mostly under men responsibility. *Palotang* (pruning, under farmer manage natural regeneration or FMNR program by WVI, national NGOs based in Waingapu), is the activity can be done by both men or women, though usually the role of men is bigger. Selling farming and livestock products, purchasing farming and livestock input and also household things were mostly become join work and join decision making of men and women. Men and women have almost the same proportion of role on this. On the decision making process, men usually asked women before they make decision.

Interestingly, in term of land management, aside land management and *palotang* or pruning the natural regeneration plants, women have bigger role in compare to the men. Women's role are also essential in household financing administrative, as well as make sure all the household members have consume a dietary food.

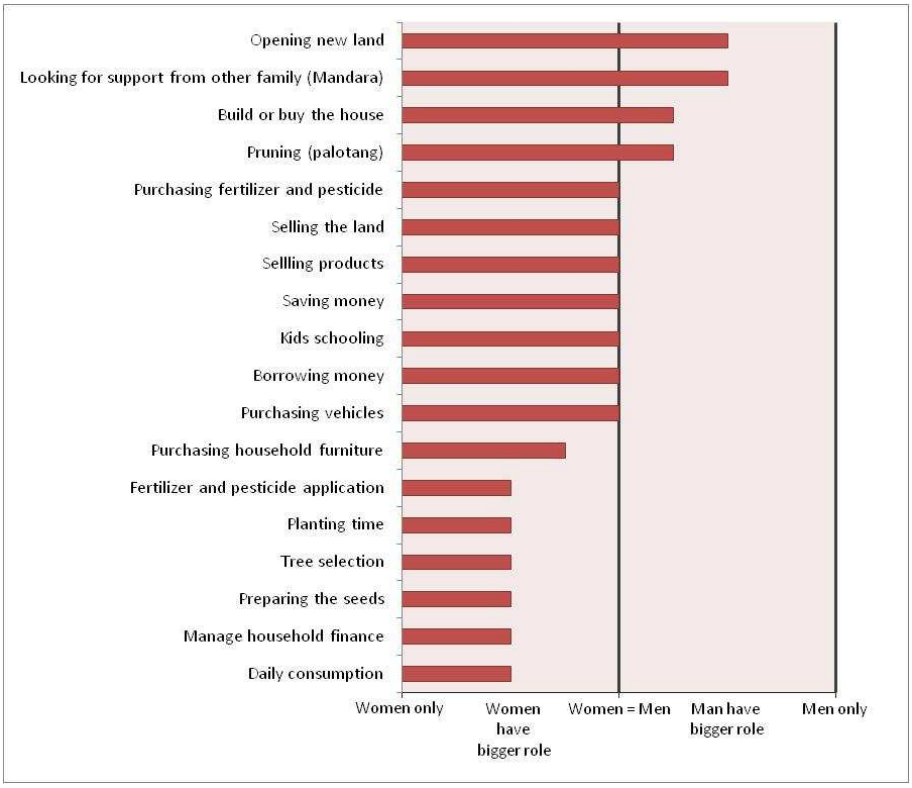


Figure 8. Gendered role on basic activities in household and farming practices

In farming practices

Role of gender in farming practices were simply just the same as in any other areas in Indonesia, though the difference is also seen in two different land location. Men are usually have higher role in land preparation, both in the land areas that near from the house in highland or inland area (*Woka*) as

well as in land areas in the valley (*Lola*) (**Figure 9**). Planting and harvesting in both *woka* and *lola* dominated by women (58% and 65% respectively). This is mostly happened in anywhere, any places in Indonesia. Planting and harvesting is labourous work, therefore men and women are usually working together to ease and fasten the process. Post harvest processing were usually done together. Farming maintenance in Lola were dominated by men (63%), due to the distance and difficulties to reach the location, while in *woka*, though men still dominated, however, women's involvement is a bit higher (48%).

Selling the products and nursery production in *Woka* (near the house) were dominated by women, while in *Lola* (the valley), women's work are more less the same as the men's. The frequent of women go to the valley is less than the men, due to their responsible in the house, therefore women's work focus on the laborous work. Work that related to selling and preparing nursery become the less priority of women. However, overall, women involvement in farming practices in *woka* is 51% while in *lola* is 49%. Still, women's contribution to the farming practices is relatively high.

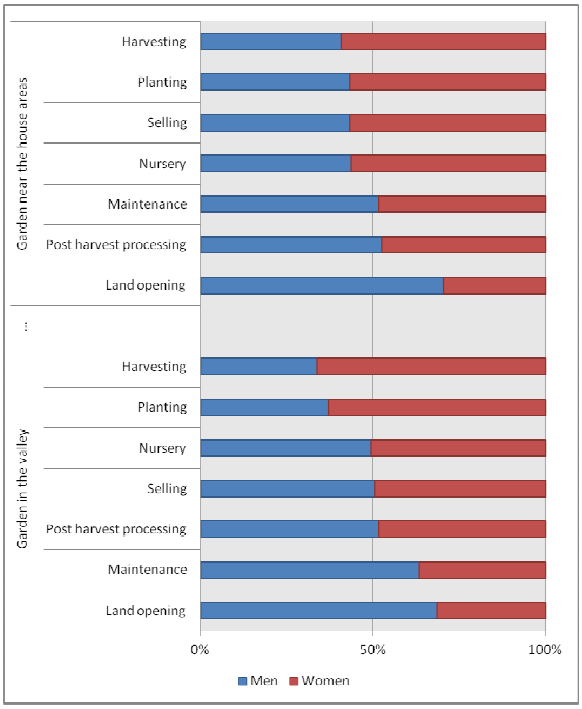


Figure 9. Gendered roles in farming practices

Animal husbandry

In Sumba, animal is the important assets in each household. Cattle, horse and pig have strong cultural value, as *belis* or dowry. Chicken is mainly for food security, while dog is for the guardian and hunting companion. The importance of cattle depends on the social status of the owner (Fox 1980). If we compare all of the figure in **Figure 10**, **Figure 11**, and **Figure 12**, we might see that division of work in pig husbandry were luminous in compare to other animal husbandry. The proportion of

men's role in pig raising is 50%. The graphs also shows that perception of men and women in term of pig husbandry is not so different, men and women almost have the same perception. It is clear that feeding, provide water and clean the dung were become the main responsibility of women, while men more responsible on selling the animal or the products of the animal and the heavy task as build the stall for the animals.

Raising cattle were usually done by men (56%), with main responsibility in build stalling and selling the cattle when necessary. Women's role on cattle husbandry mainly on feeding and clean the animal dung. Almost the same as in pig husbandry, women's involvement in selling the cattle and its products were smaller than man, also in build animal stall. Gendered division of task in horse husbandry were showing almost similar pattern as cattle husbandry. Woman have slightly higher responsibility in grazing, binding the animal, provide water and the santitation. However, degree of answer variety between men and women about gendered roles in pig husbandry is moderately lower than in the other two animal husbandry types. We would say that division of task between men and women are more clear, and both men and women are have almost the same opinion on this.

In horse husbandry, taming the animal is only by men due to the hard skill and also considering the safety. Taming the horse is very important work to do, especially long time ago, when the horse is very useful as the ride or the transportation media. Currently, horse still important in *pasola* festival (ceremony of a gratitude to the ancestral) and as dowry, as well as it has high social status.

Interesting story from Kalamba village on grazing the animals that different from the other villages. Due to the topography condition of Kalamba that like living in couldron, as well as river strategic position within the village, the Kalamba people have a good sytem of herding cattle. They use rolling systems with some of cattle owner. There were two or three cattle owner have a duty to herd their cattle in a week. The next week, the herders replaced by other person (the other cattle owner, or someone that specifically paid as herderes). The people on duty of herd will be free from the other duty in the community. For example, they allowed for not attending the burial process, or any work together (*gotong royong*), and other duty in the village. If there were a relief programme or rice ditribution, their share will be saved by their colleagues or the spouse who are not in herd duty. People of Kalamba also has separate grazing areas, so their garden is safe from the animals. Interestingly, in Kalamba, the garden areas, is not using the stone fence nor tree fence for protection.

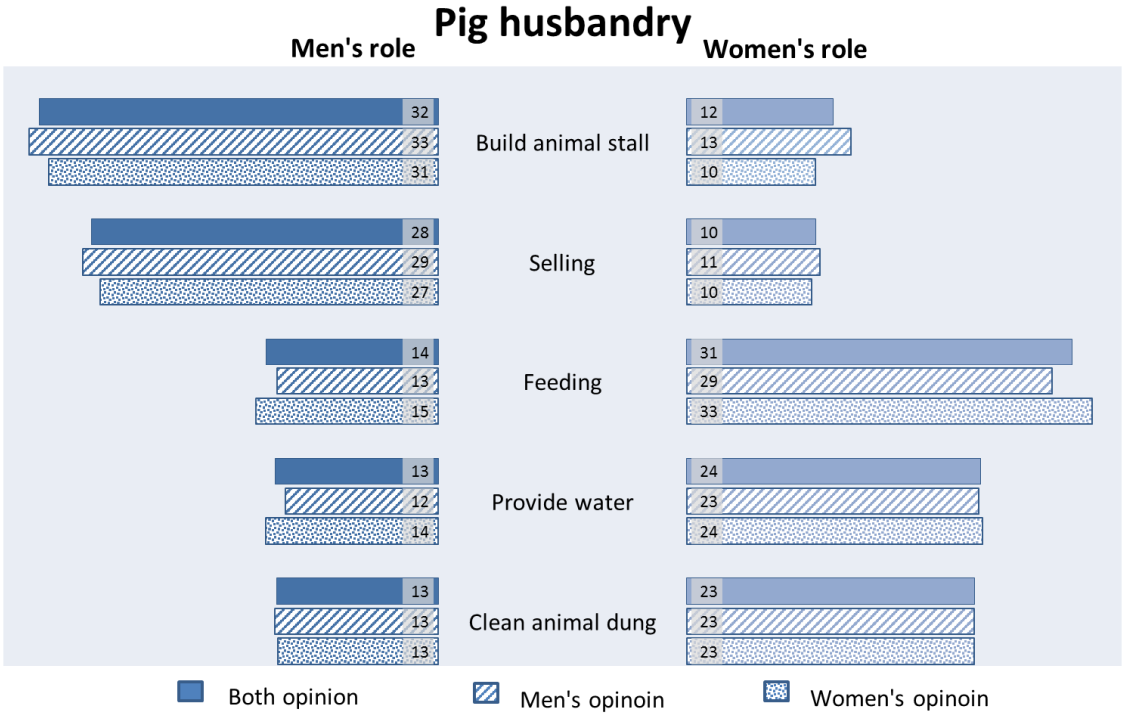


Figure 10. Division of role in pig husbandry

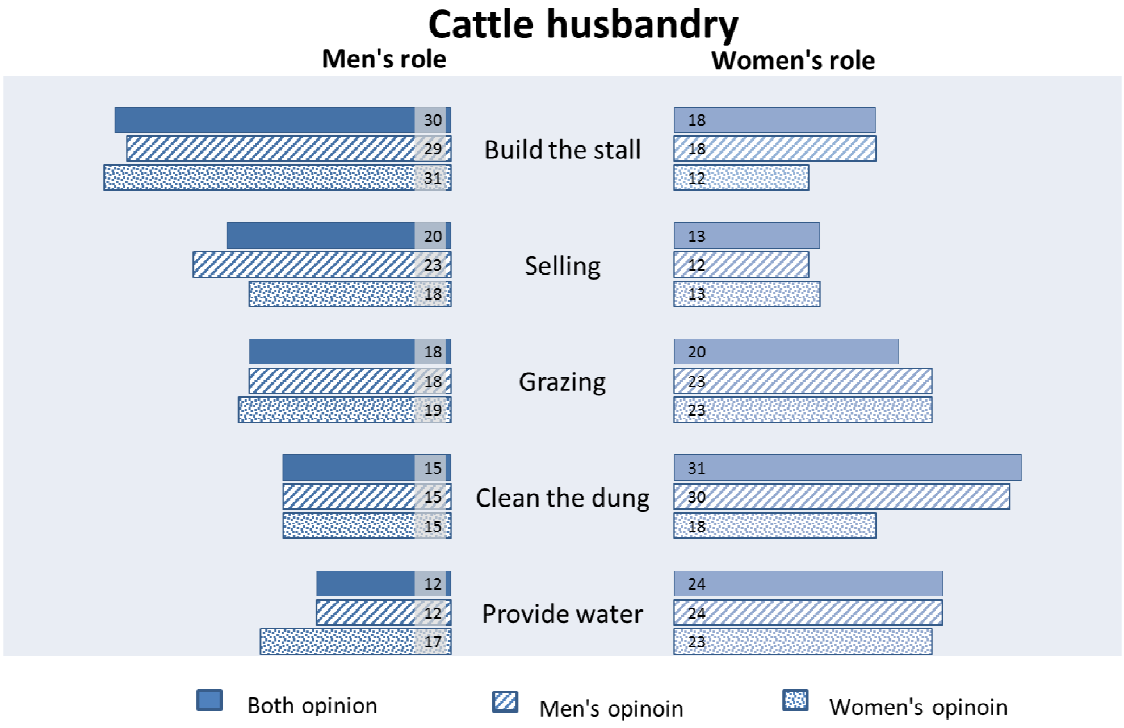


Figure 11. Division of role on cattle husbandry

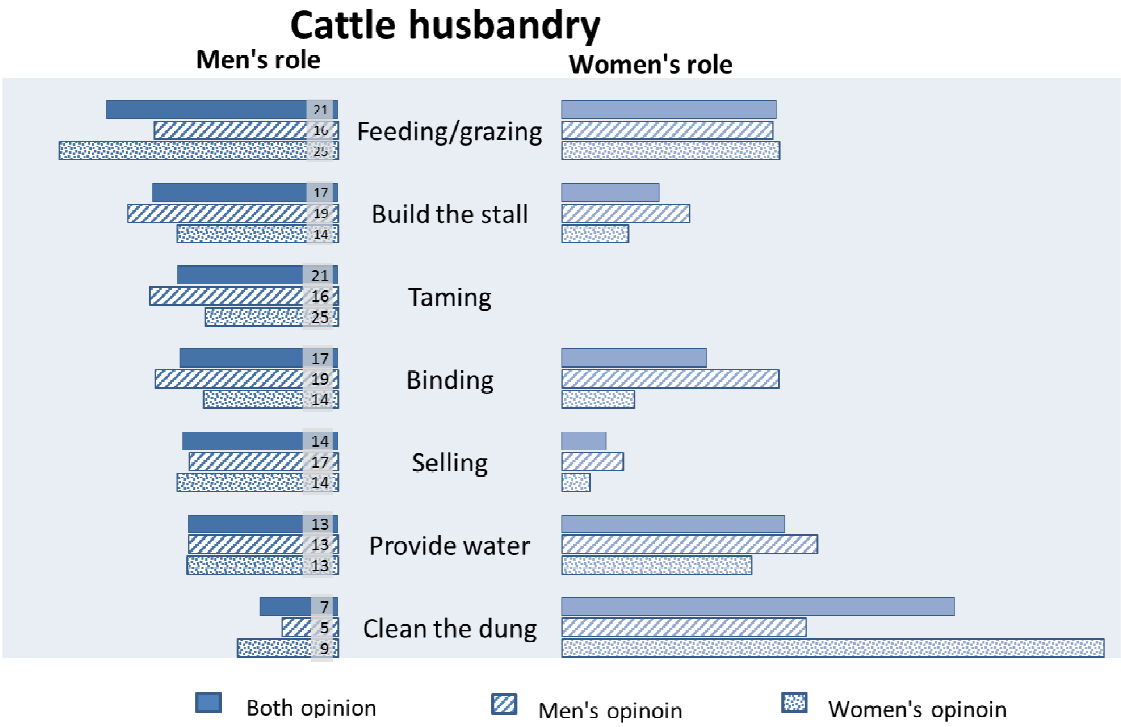


Figure 12. Division of role on horse husbandry

Water tapping

Water is very crucial for all human being, and in Sumba water is very scarces. As indicated above, women have big responsibiliy to find water to fulfil household needs, for human consumption as well as for the animals. People may get clean water for drinking and cooking from the nearest water sources. Wunga and Mbatapuhu village is the most severe village in term of water issues. Many of the community living in those villages need to go to the nearest source of water by walking for almost 2 hours with the steep road and its usually located in ravine (*lindi*). Some of them try to find water that trapped in rock crevice (*way kulup*), and if its has good quality they may consume it, but if its not, it is just for the animal. While for farming practices, aside from the land areas that near to the river or other water sources, they rely on the rainfall. For body sanitation, they may go to the nearest rivers once per week to have proper shower and washing the clothes. **Figure 13** shows the old women collect water for animals from the rock crevices. In Wunga, there is also brackish water lake which can be used as an alternative source of water. Some of the community have already supported by the government, NGOS, and other organization to build rainwater storage (both on the rooftop or tanki/locally called as fiber) that can be used for household consumption and farming activities.

In household, the task to tap water, is not mainly become women responsibility, it is join responsibility. Though in reality, usually women go to the water source because they need to clean them self as well as washing the clothes, the dishes, and use the water for cooking. A woman may carry 1 bucket (15 litre) and 1 jerry can (5 litre), and/or the clothes that they need to wash. During

rainy season, women may save more time not to go to the water source, they rely on water in rainy water storage near the house areas.

Figure 13. Old women tapping rain water from the stone

Gendered knowledge and perception

Different perception of men and women in valuing each land use systems were captured from series of focus group discussion. The group discussion were implemented in each village by using analytical hierarchical process. The first step, discussion participant mention some of the land use existing in each villages, then we discuss which are the land use as their priority location to plant the new trees or other vegetation for restoration purposes. Separate discussion between men and women allow us to get different perspective of men and women.

Figure 14 shows the results of the analysis on the land use priority where to plant more trees for restoration that may fit with their household needs and their potentiality to maintain the plot were captured in the FGDs in most of the surveyed villages. The figure divided to 4 quadrant. The bubbles that falls in this quadrant are the land use bubbles that prioritized by both men and women for planting more trees in term of reforestation process. The bubbles in quadrant 2 were the land use more prefered by the man, women's high preferences in quadrant 4. Quadrant 3 were the location of the bubbles with low preferences by both men and women.

There were no significance differents view between men and women (tested by Mann-Whitney). Both men and women are agree that the areas good for reforestation is their garden areas, in particular garden that near from the house. The consideration is not on the environmental function, but on how

they could manage the land efficient and more effective. Planting more trees near their housing areas is less laborous. Moreover, planting more trees in their current productive land will also less capital needed. The second priority is on the bareland. For men's, planting in the bareland can improve the soil condition and also make their bareland become more productive. They also mention about the division of task, if the men focus on the bareland, then women can be more responsible in the garden that near to the house. While women's, although many of them were not fully agree on this, arguing that planting in the bareland will give them any additional income. Here we might see slight different opinion between men and women. Men's opinion were usually based on the needs to expand the land, while women more on economic issues.

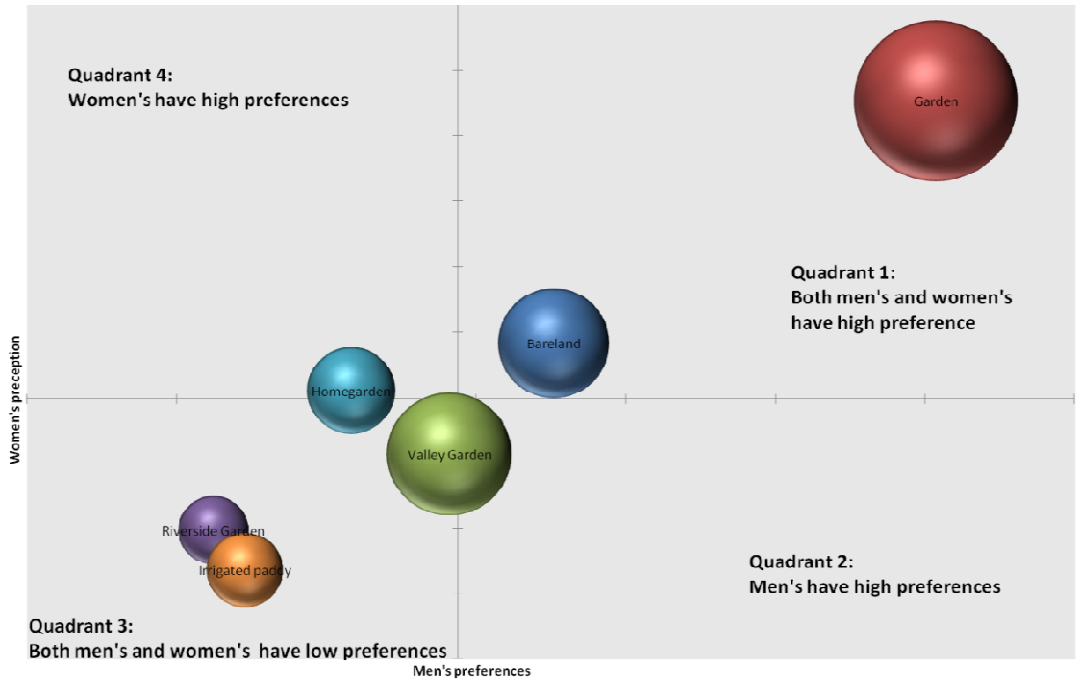


Figure 14. Gendered preferences on land

In term of fire causing factors, we also tried to differentiate opinion between men and women. The result (as presented in **Figure 15**), shows that no signicifant difference perception between men and women. Both men and women perceived that human error factors is the most often happen in fire incidence in Haharu areas. Savana in dry season were very fire prone situation, but people are usually not really careful, they just throw out the cigarette with fire in anywhere. For men, bird hunting were become the second factor causing fire, while women mention that deer hunting and grass rejuvenation (people are usually deliberately fire the grass for rejuvenation, but then become uncontrolled and causing severe fires). Land opening become the last factor that causing fires.

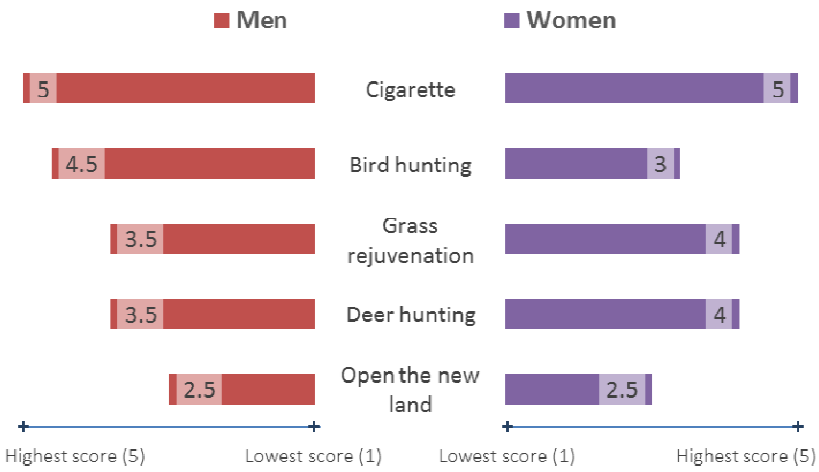


Figure 15. Gendered perception on fire causal factors. Numbers in the bars indicate the median score from all of the discussion numbers in each villages. Data source: focus group discussions.

Men and women: how they involve in grassland restoration?

From all the information that we gathered and we presented in earlier part of this working paper, we might see that women and men have almost the same contribution in farming, animal husbandry, and tapping watter as one of productive work in each household, while women have also other responsibility in the house for cleaning, cooking, and take care the kids. Fowler (2012) on her ethnographs in Kodi community, perceived that division of work of Sumba people appears relatively egalitarian and complementary between men and women. However, this research perceived that women still have more burden in compare to the men, they have more responsibility, in particular in household activities.

Nurdiah et al (2015) perceived that based on gendered space analysis in Sumba Timur, in term of domestic life, relation of men and women were also equal, both men and women were have adequate space though the location might be different. Spaces of men considered as publics areas while women's are more private and usually located in or at the back house. Spaces of men generally open without any vertical elements, while spaces of women usually have strong boundaries.

As we indicate in the earlier part of this report, due to limited resource factors, the discussion were started with mixed group between men and women in. Then, in some following question or games, the discussion were splitted between men and women. The process make the opportunity of researcher to observe the difference process of discussion, from the mixed group and the separated group. Interestingly, we found that from the total of 6 villages, discussion in three villages showing the low participation of women. Our observation depict women rarely speak out, especially when the discussant consist of people from various social strata and combination between men and women. In two discussion that were conducted in one of the house of our discussant, women are prefer to be in the house and answered questions from the house, instead of sitting together in the meeting in the terrace. When the discussion were set to be for women's only, women are more open to speak out. In

the other three discussion, though some women were dare to speak, but usually only dominated with two or three persons who's indicated as the public figure in the villages. This is confirming the statement of Listiorini (2015) on her paper which illustrate that communication skill of women is usually interpersonal and limited on the homogenous group.

The role of women is actually have recognized by some village leaders. In the comparative visit of nursery group facilitated by ICRAF to Sulawesi, two participants, of the seven participants representing each villages, are women. Actually, ICRAF were not specifically mention that the participants can be either women or men. Based on her performance in the community, these two women's got the opportunity to learn more about nursery practices. However, we understand that this recognition has not been quite uneven across the region. Perhaps this is related to social stratification that still exist in several villages. It's interesting to examine more on this issues.

Looking at the 14 as an aggregrat data from all of the villages, seems that women's and men's perception is almost similar. However, if we go to more detail data per villages, seems that men's and women's have different views on where will be the best place for restoration. Bareland is the place that mostly prefered by the men, while women more prefered to do the restoration or planting in *woka*. While men focus on how to expand the land, to utilize more land become more productive, and then it could give additional income, women are focus on the efficient thing. Women thought that intensively managed their garden (that near to the residential areas), with adding more high economic value tree commodity, is very low cost and low labour absorption. We might see the difference between men and women, men are usually focus on long term, something related with longterm economic forecast, while women are usually focus on shorter periods and more on economic calculation, reducing the capital through low labour need and low cost on fertilizer etc. Both men's and women's preferences are need to take into account, because both aspect are so important to consider in prior the designing the restoration or rehabilitation program. While looking at the aggregrat data as presented in Figure 14, we commend that the planting for restoration can be done in either bareland or garden, depend on local or village needs.

Weak gender relation is seen while we look at the lowest social status. Maramba is the highest social class , who usually fully control the natural resources in villages. Kabihu, the clan who are free and independent, are able to perform all of their economic activities freely. They have right to choose whatever economic activities they want to take. The lowest group, Ata, have to serve the Maramba. Economic life of Ata were determined by the Maramba (nobleman). Vel and Makabombu (2009, 2010) giving some interesting analysis that women and men from Ata (slave) caste has a very weak position and their decision making power is very limited. From land perspectives, men from slave caste cannot owned the land. Women, both from the lower caste or from the high caste also can only have the land by purchasing or through marriage dowry. Overall, Vel and Makabombu (2009) pointed out that women have limited access and control over land, and even doubled disadvantage if they were in the lower caste.

Points to note

Results of this studies shows that womens involvement in restoration are very essential in order to make sure that the restoration process and result that would give more beneficial to the community. Women and men will have different strategies and practices that should be important to take into account in the designing proces, hence, the restoration effort will give benefit to the community and fit with local needs. As we are aware that involving women in the project is a kind of challenge, instead of projects outcome achieved, women even more burdened. Several thing that we should considered in prior:

The practical approach

Strengthening women's groups. In some villages, since women usually less communicate in the mixed group, would be better if women's groups is separated from the group of men. However, in group activities, with considering the difficulty of the topography and limited water resource, working together between men and women would be the best, as they can help each other. So, the group of women is necessary, but exchange resource between groups of men and women might be a good idea to make sure they will help each other.

The strategic approach

- Understanding on the importance of giving a chance to women to be actively involved in decision-making for public and social activities, without burdening them, will necessary in household level as well as community level. To accomodate this, more involvement of men in household activities therefore women’s burden can be shared.
- Sorting out customary rules which will give possibility to enlarge the gap for women and people on the lower caste to speak out and enforcing their decision making power.

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