Sources of income from HTR areas in Boalemo: no single policy for improving welfare of the communities

Sources of income from HTR areas in Boalemo: no single policy for improving welfare of the communities

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Abstract. Under social forestry programme, community plantation forest (HTR) scheme aims to increase welfare of farmers and provide timber supply for industry, while at the same time also improve the environment. HTR permit has been granted to forest farmer groups in Boalemo District since 2012. This research tries to explore how farmers make use of both their HTR and private land, contribution of these land into household income and how the land-use systems applied would determine environment condition. Results reveals that agriculture and estate crops contributes for about 56% and 38% respectively into total income of households. In addition, when most farmers manage their private land, contribution of the private land provides almost twice to total income compared with income contribution from HTR land. Meanwhile, floods has been hit Boalemo District every year with more people suffering from the floods. Learnt from research results and findings, opportunities to combine various policies are available to utilize the HTR land for growing trees for future income, and the farmers can continue their current land-use system in their private land for short- and medium-term income. Considering the HTR land are located in hilly contour, the trees could potentially reduce erosion and flood incidents.

1. Introduction

Community plantation forest (*Hutan Tanaman Rakyat* or HTR) scheme was launch through Ministry of Forestry Regulation No. 23/2007 and then later has been changed to Ministry of Environmental and Forestry (MoEF) Regulation No.83/2016. HTR is plantation forest in production forest area developed by communities to improve potential and quality of production forest by applying silvicultural system that can sustain forest resources. Under the new regulation, the program become one among five schemes that comprise 'social forestry' (SF) agenda developed by MoEF. The program is intended to increase productivity of logged over area through development of plantation forest by community [1- 2].

HTR permit that is given to group of farmers or cooperation business agency aims to increase welfare of farmers who hold the permit to manage state land in forest production area and provide timber supply for timber industries, and at the same time is also expected to improve the environment. HTR, together with other social forestry schemes (village forest/HD, adat forest/HA, community forest/HKm, and forest partnerships/*Kemitraan*) become alternative tools to resolve tenure conflicts in forest areas. The HTR scheme has key challenges facing smallholders such as : tend to be price takers

in the commercial timber sector due to a lack of market access, limited business expertise and timber production of low-medium quality, face multiple layers of regulation when seeking to sell timber in open markets [3], and condition of the land that is far from settlements so increasing their transaction costs.

Based on research result of Race et al. [4], local economiesare found to be dynamic and volatile, with smallholders relying their income form the planted forests to support their livelihoods. Some studies on HTR topic have been done, for example on policy processes and responses on the HTR implementation [5 -6-7] and promotion development of HTR [8]. However, study on benefits and effects of land use of HTR on smallholders' income and environmental conditions are still hardly found. This paper tries to explore how farmers make use of the HTR land as well as their private land, and to find some possible contributions of these land into household income. Moreover, this paper also explores how the land use system applied would have impact into environment condition mainly on flood risk in Boalemo District, Gorontalo Province.

2. Methodology

2.1. Study Location

This research is conducted in Rumbia Village, Boalemo District, Gorontalo Province, where the HTR permit has been granted since 2012 for two forest farmer groups (FFG) namely Harapan Jaya I (142 ha) and Harapan Jaya II (137 ha). Each group consists of several permit holders based on Boalemo District Head's Decree in 2012. This location is chosen as the object of this study, because this area represents area of state-owned land leased to smallholders under HTR permit, while the farmers also have their own private land.

2.2. Data Collection

Data collected includes primary data at village level and secondary data are taken from provincial level, district and village levels. Primary data is focused on economic and social dimension (ESD); survey – is designed to explore contribution of smallholder forestry to rural livelihoods in Boalemo District. The contribution is explored by identifying and calculating smallholder household's income that is classified into land based income (e.g. rice field, comunity forest and state forest) and non-land based income (e.g. livestock, enterpreneur activities, off-farm business and donations). Commodities produced within land based income are classified into agriculture crops, estate crops, timber and non-timber forest products (e.g herbs, foliage). The ESD survey data collection taken from a diverse sample of families in Rumbia Village. Secondary data collection are in the form of climate and weather conditions, village monographs as well as taking other related information and regulations. Respondents of this research are 70 farmers (including village leaders and forest farmer group leaders) and four government officers.

Table 1. Method of Data Collection

Method	Data source/Respondent	Location
Data record	Government institutions, official reports	Province, district, village
Interview	Farmers group member and key persons	Village
Field observation	Condition and management technique of HTR & private land, etc.	Village
Focus group discussion	Stakeholders and farmers	Province, district, village

2.3. Data Analysis

Data tabulation is done for data processing. Furthermore, the data is analysed using qualitative descriptive method and they are presented in descriptive statistics.

3. Result and Discussion

3.1. General Description of Study Site

Boalemo is a district in Gorontalo Province located between $0^0$23’55’’ - $0^0$54’46’’ north latitude and $122^0$01’12’’ - $122^0$39’17’’ east longitude. Territorial boundaries of Boalemo are: on the north part is bordered by Gorontalo Utara District, Gorontalo District on the east part, Tomini Bay on the south part, and Pohuwato District on the west part. Boalemo covers areas of 1,828.75 km^2 from the coast to the mountains with average elevation of 30.14 meters above sea level. Six rivers flow in this district with the longest is Paguyaman River (139.5 km) and the shortest is Tilamuta River (13.7 km) [9]. This geomorphology and landscape conditions are important elements in determining suitability of the land use or the carrying capacity of the land.

Figure 1. Map of Boalemo District (yellow area: Botumoito Sub-district; red star: Rumbia Village)

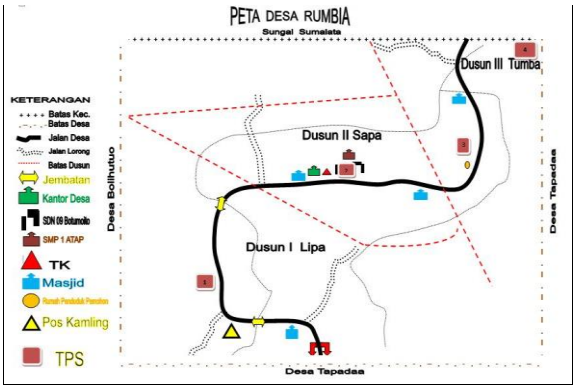

Figure 2. Map of Rumbia Village

Boalemo is divided into seven sub-districts, namely Mananggu, Tilamuta, Dulupi, Botumoito, Paguyaman, Wonosari and Paguyaman Pantai. Botumoito Sub-district has the widest area (479.95 km^2) which is 26.24 percent of areas of Boalemo. Botumoito consists of eight villages, namely Bolihutuo, Tapadaa, Rumbia, Hutamonu, Botumoito, Tutulo, Patoameme, Potanga, and Dulangeya [10]. Most Botumoito area is coastal area, with Rumbia as the only village which has combination topography of slopes and hills. Rumbia is located around 63 km, or a three-hour drive from Gorontalo City, the capital of Gorontalo Province. Community in Rumbia mostly work in agriculture sectors. The average land managed by each farming family is 8 ha which consisted from 4.1 ha of private land and 3.9 ha of HTR land. Detail of characteristics of Rumbia Village is presented in Table 2.

Table 2. Characteristics of Rumbia Village

Village area		7.600 ha
	Average elevation	18 m
	Contour	Hilly & steep slopes
Population		
	Village population	1,989
	Male – female (ratio)	1,022 – 967 (51:49)
	Number of household	548
	Average family size	3
Education (%)		
	<Primary	44
	Primary	28
	Junior high	15
	Senior high	12
	>Senior high	1
Main occupations		

Farmer (crops, estates, forestry, livestock)	88%
Labourer (farm/other)	3%
Trader	5%
Civil servant	1%
Others	3%
Farming characteristics	
Average farm size	8 ha
Main crops	Corn, chilli, coconut, clove, cocoa, palm sugar (*Arenga pinnata*), mixed wood, *jabon* (*Anthocephalus cadamba*), teak (*Tectona grandis*)
Livestock	Chicken, cow, goat

Sources : [3]

HTR permit is given to FFGs of Harapan Jaya I and II for the total area of 279.21 ha. The HTR area is located in hilly and steep slopes with the closest area which is located about 2 km from village residential area. In the past, 'their fathers' opened the forest, which now becomes the HTR area, that time they took timbers and then left it. After years, in early 2010s, government issued HTR program and some farmers applied for the permit. However, until now, even though the HTR permits was obtained in 2012, the HTR area is less managed. One reason they asked the permit is because they need legality to control the land area opened by 'their fathers'. Other reasons are because they have difficulties to reach HTR location while they still have private land that has easier access for farming activities.

3.2. Land-use Change

To detect whether or not there is a sustained change in land-use in Boalemo District, secondary data over a longer period (20 years) is analysed. Two types of land-use, namely 'forest' and 'agriculture', are analysed. The 'forest' land-use is comprised of 'primary dryland forest', 'secondary dryland forest', 'primary mangrove forest', 'secondary swamp forest' and 'plantation forest'. Meanwhile, the 'agriculture' land-use is comprised of 'estate plantation', 'dryland agriculture', 'mixed dryland agriculture' and 'rice fields'. The results is presented in Table 3 below.

Table 3. Land-use for forest and agriculture areas in Boalemo over the period of 1996-2016 (ha)

		1996	**2006**	**2016**
Forest	Primary dryland forest	33,348	21,988	17,386
	Secondary dryland forest	77,160	65,993	66,987
	Primary mangrove forest	1,030	556	316
	Secondary swamp forest	28	0	0
	Total	**112,777**	**89,711**	**86,058**
Agriculture	Estate plantation	9,120	10,246	7,072
	Dryland agriculture	6,276	8,924	34,204
	Mixed dryland agriculture	39,252	45,370	32,827
	Rice fields	7,475	8,847	8,513
	Total	**62,123**	**73,387**	**82,616**

Sources : [3]

There was a big decrease in area of 'forest' land-use in Boalemo over the 1996-2006 periods and a little change also marked as decrease over the 2006-2016 periods. Meanwhile, 'agriculture' land-use was steadily increased both over the 1996-2006 and 2006-2016 periods. Because the land-use change from forests to agriculture lands has direct effect on both soil moisture retention capacity and run off rate of the rainfall [11], it needs to concern on this land-use change .

3.3. Farming System

Farmers are the main occupation of people. In general, farmers in Rumbia, similar with farmers in other Gorontalo areas, are in low wealth condition with subsistence living. Estate and agriculture crops are preferred to be cultivated in their farmland than trees, considering agricultural crops with much shorter harvest duration. Corn, coconut and palm sugar are the main commodities cultivated and it have become their farming culture in years. Some farmers also cultivate coffee, cocoa and clove. The same commodity is also grown by most people in the villages around Rumbia Village; the majority of their agricultural products are rice, corn and coconut [12]. These commodities already have their markets with a more certain selling price and they are easy to sell so the farmers could obtain immediate cash to meet their daily needs.

The farmers applies extensive land farming. Corn as the most favourite commodity is grown twice a year in monoculture system. Generally Gorontalo farmers are also experts in corn cultivation, which is supported by agricultural extension practices [13]. Corn cultivation takes around 115 days to harvest, and is able to produce a profit of IDR 6-8 million per hectare [13]. Besides these reasons, corn has become part of the culture of society since Gorontalo Provincial Government has launched an agropolitan program with corn as the main crop [14]. Although corn is not the only food-producing agricultural commodity developed in Gorontalo, traditionally, the community is very close to corn as their staple food [13]. The farmers have prepared their land for growing corn using burning system (Figure 3). Land clearing technique by burning system is the way most people do because it tends to be cheap and easy to do. Although this can be dangerous if it is without careful control; sometimes the fire could also spread and burns another land parcel next to it. The negative impact that can occur is that the land fire becomes broader and massive, then it can affect the surrounding environment.

However, negative impact of corn planting with a massive monoculture system is undeniable system in the form of land damage. The corn iss not only grown on high-slope lands but also done by cutting down existing trees including clearing areas, both in production forest areas and non-forest areas. The view of bare and arid hills is very easy to find and it is feared that it can experience erosion and landslides during the rainy season. Furthermore, this land clearing is feared to affect the sustainability of water resources [15]. Corn in Boalemo District as well as in other areas which generally could be found in Gorontalo Province are cultivated on hilly or sloping land [16]. From the results of interview with farmers and field observations, it could be identified that corn planting is carried out without soil and water conservation practices. The condition brings impacts on environmental such as erosion, soil fertility, sedimentation, water runoff and turbidity of surface water. The above conditions occurs due to low knowledge of farmers on the environmental impacts from their farming system. This is in line with Bahua's research [14], that states that cultivation of corn using chemical fertilizers and pesticides on a large scale has an impact on decreasing soil fertility, and increase environmental damage, for example erosion in Gorontalo Province.

The farmers work in their farmland from 7 am to 4 pm and they ought to bring lunch from home. Farming activities tend to involve male members than female members. The workload among male and female is about 68% : 22%. Men have greater roles in overall cultivating practices starting from species selection to harvesting. Meanwhile, women have greater role in marketing the commodities and some roles in activities of planting and harvesting. Based on Mulyoutami et al [17], women in Gorontalo are also more responsible for selling products with high subsistence values and are important for household consumption, such as rice, chili, tomatoes, pepper and coffee; and they play a role in determining the number of products to be stored or sold. Sometimes, if a lot of works have to do in farmland, the farmers bring all their family members to work together. If the farmers could pay some workers then the farmer could take some other farmers as their labour workers. A labour worker will get for about IDR 75,000/day and this is the easiest way for farmers to get quick money for family.

Figure 3. Extensive land farming using burning system for growing corn in Boalemo District

Trees have not yet been counted as a worthy commodity since the trees cannot provide immediate returns. Farmers still focuse on how they could get money quickly to fulfil their daily needs. Once, in 2014, the farmers got 8,000 seedlings of *jabon* which are intended to be planted in their HTR areas. The seedlings, without transportation cost given, were placed in the village office that time. Many seedlings were not been able to be distributed and the seedlings that time was only planted on farmers' land that was relatively close to their location. Due to the long dry season, the planted seedlings were not able to survive that time.

Farmers in Rumbia just few years ago was surprised that one of the farmers was succeeded to sell 70 trees of planted *jabon* for IDR 25 million plus a motorcycle. Previously, they do not think that if they are growing trees they will have added value. They are still have imaged that they still can take the trees easily from the existing forest. Key persons informs that only few farmers in Boalemo grow trees by their own will and efforts. In general, it is also applied in other areas of Gorontalo Province as it is informed by the Secretary of Environment & Forestry Office of Gorontalo Province. So far, the favourite species to grow by farmers are teak and *jabon*. The success of selling *jabon* have been increasing farmers' awareness that growing trees is valuable. Moreover, the head of FFG and the village leaders have thought that the HTR areas so far left unmanaged and it could become an appropriate location to grow *jabon* for long term income for the FFG members. This idea grows stronger after they join in *Master TreeGrower* training course and presentation offered by business actor in a training course.

3.4. Sources of Income

Results from household survey conducted in research location shows that land-based income is the main household income (Figure 4). The research reveals that 72% of household income of the farmers comes from land, while income from non-land provided 27% and others (including government subsidies) contributes only 1% from the total household income. Probably it is because less alternatives available for working off-farm or less entrepreneur ability. Therefore, they maximize income from land by cultivating agriculture and estate crops. This condition reflects high farmers' dependency on land to sustain their livelihood. Furthermore, as farmers are really dependent on income from land, the research also reveals that different lands serve different contribution to household's income. Farmers in Boalemo mostly manage their private land rather than the HTR land. Therefore, the private land provides substantial contribution for all households, comprising an average of 47% to household income, while the HTR land contributes low, for about 25%.

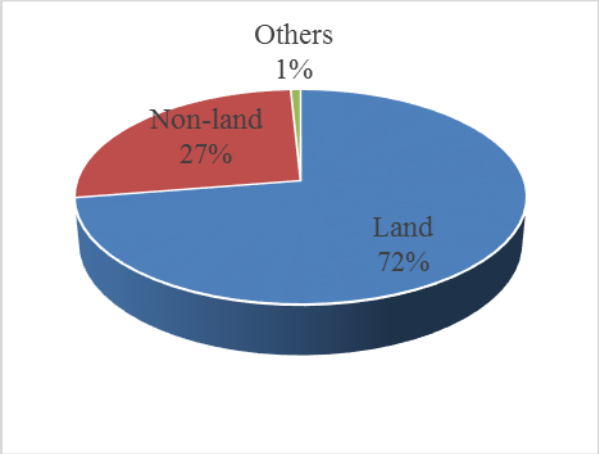

Figure 4. Contribution of different source to household income

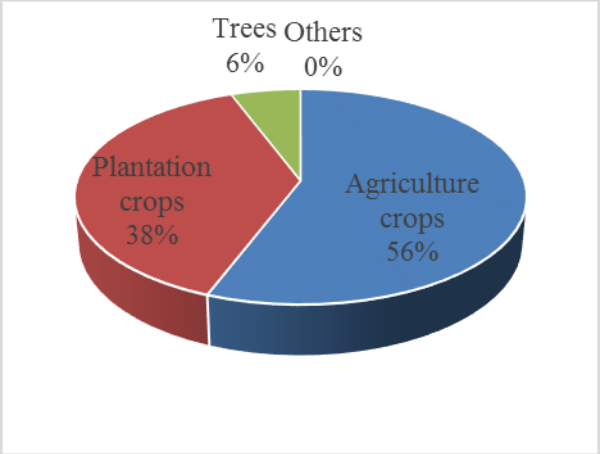

Figure 5. Contribution of commodities to land-based income

The farmland produces wide range of commodities classified into agriculture crops, estate crops, trees and others. As it is presented in Figure 5, the research reveals that agriculture crops provides contribution to household income ranging between 15-95.7% with the average contribution of 56%. While estate crops provides contribution ranging between 4.3-77.4% with the average contribution is 38%. Meanwhile, tree production is considered as a small contributor to household income. Matrix ranking developed in FGD sessions in Boalemo reveals corn, chili, coconut, cocoa, clove and palm sugar as the main commodities contributing into household income. The farmers also raise livestock such as chicken, sheep and cow. However, the livestock does not provide substantial contribution to households' income.

Almost all commodities produced in Boalemo are sold and only very small parts are used directly by the farmer households. It happens because the farmers has already choosen commercial agriculture and estate commodities. Money obtained from selling of the harvest is used to buy rice and fulfil other daily needs and some parts. The money is also used to pay costs for the next planting period or to pay back costs of the current planting period that they have obtained from debt. Generally in Boalemo as well as in other Gorontalo areas are found farmers, sometimes, who need to borrow money to pay costs of their activities of preparing land, making seedlings and buying fertilizer, and planting activities to grow corn.

This research also reveals that majority or 70% of the community are low-wealth, 27% are medium-wealth and only 3% are high-wealth households. The community members share their understanding of welfare based on land, vehicle, occupation and number of trees owned by the household. This is different in wealth status of the households that is already considered in selecting respondents proportionally for this research. Yearly income of the household is counted as IDR 40,089,000 or IDR 4,007,000 per month. Even it seems a high amount, but it is not for the household because they still need to pay their farming costs.

3.5. Climate Condition

Boalemo has tropical monsoon climate. In normal years, the rainy season lasts from November to April, while the dry season lasts from May to October. Daily temperature varies between 24^0C-34^0C, while the humidity varies between 54%-93% [9]. Publication of 'Boalemo in Figures' [9] provides information about monthly data on number of rainy days and precipitation. The data accumulated over 2008-2018 period is presented in Figure 6 and 7, with a note that data for 2012 is not available. Over the last decade, number of the rainy days vary from 106 days/year in 2015 and 2016 to 248 days/year in 2008. In the same period, the precipitation vary from 845 mm^3/year in 2015 to 2,289 mm^3/year in 2008. Over 2008-2018, 2015 became the hottest year while 2008 became the wettest year. These

condition is following the global phenomenon of La Nina and El Nino events. Moreover, the data reveals that average precipitation over period of 2008-2011 was higher than the average precipitation over 2013-2018 period as it is recorded as 1,937 mm^3/year and 1,498 mm^3/year respectively.

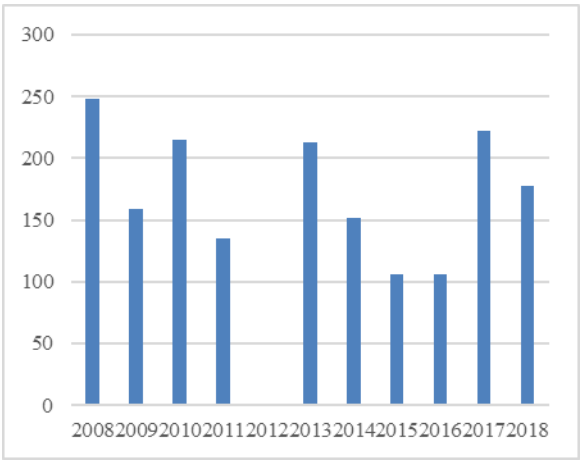

Figure 6. Number of rainy days in Boalemo District in the last 11 years [18]

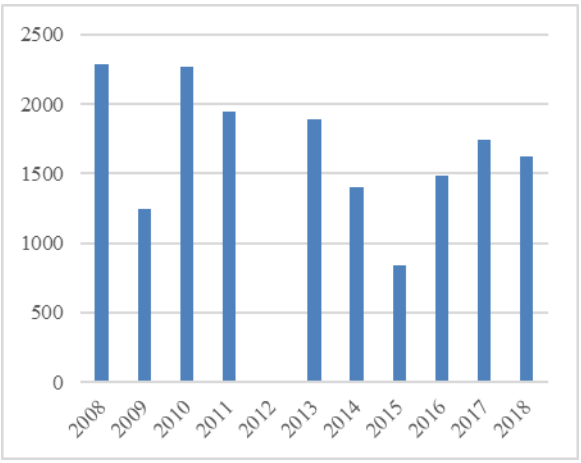

Figure 7. Yearly precipitation in Boalemo District in the last 11 years [18]

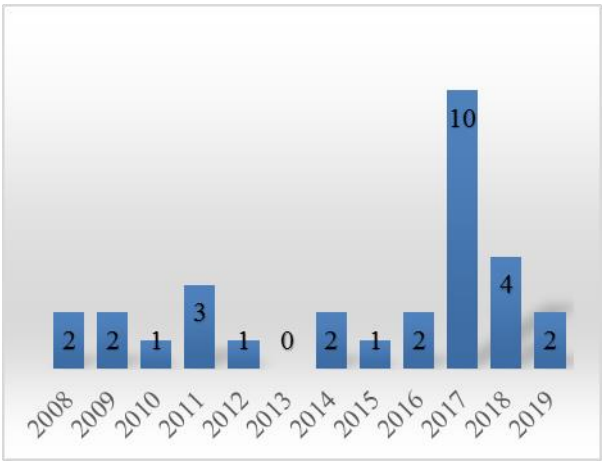

Figure 8. Flood incident in Boalemo District in 2008-2019 (Aug'19) [19]

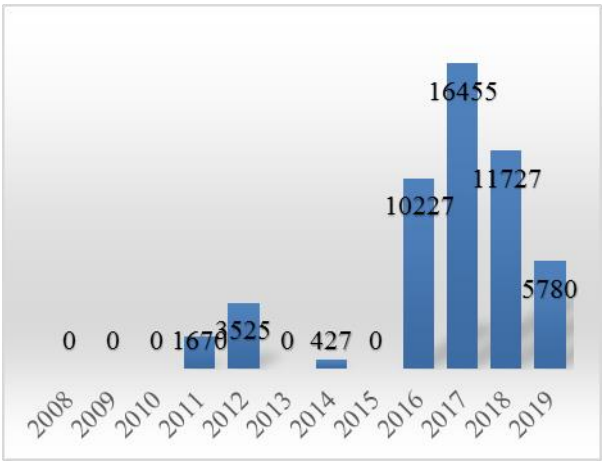

Figure 9. Number of people reported suffering from flood incident in Boalemo District in 2008-2019 (Aug'19) [19]

Flood brought by the rain falls has been hit routine in Boalemo District. Over the period of 2008-2019, one or two floods hit yearly but in 2016 there were 10 flood incidents that occurred in Boalemo. Data on flood incidents and number of people suffering from the floods is presented in Figure 8 and 9 [19]. In the last few years, flood incidents has increased even though the precipitations are lower if it is compared with some previous years as it has been mentioned above. It indicates that the floods are not caused by rain falls only but also by the changes in vegetation and land use as it is mentioned in previous section. Number of people who are reported suffering from the floods also increases. Not only people in low and coastal areas suffer from the floods but also people in higher location around watershed areas experience the impacts of flooding. The latest two floods occurred in January and

March 2019 and hit the sub-districts of Botumoito, Dulupi, Tilamuta and Wonosari with the total of 5,780 people suffering from the floods.

4. Policy for Improving Welfare of the Communities

As it has been mentioned above, farmers really depend on land as their source of income, with 70% of the household who are in low-wealth status. Various effort need to be made to improve their welfare of. As their income from private land could not fulfil all costs of their livelihood, giving access to state-owned land through HTR scheme could help the farmers. National social forestry policy, in which the HTR scheme is part of it, is intended to increase local community to access to the rights of forest resources and may improve welfare of the community. The implementation of the policy aims to transfer right of forest management to local community, build local community knowledge and skill and encourage the commercial use of the designated forest to improve local community's livelihood [2]. This goal could only be realised if there is a policy consistency across different sectors, continuous reform of relevant administration and bureaucracy and integrated related policies of different tiers of government [20]. Some policies from different sectors have been issued and could be used to improve welfare of communities as it follows.

4.1. Forestry sector

Many policies have been issued for forestry sector to enhance forest and land management as well as to improve welfare of the farmers. There are typically many stakeholders involve in the policies. Especially the HTR program, particularly at the local and provincial levels, various stakeholders could be better coordinated. The provincial government agencies could play a major role in coordinating community involvement in the HTR program, such as via the Social Forestry Acceleration Working Group (*Kelompok Kerja Perhutanan Sosial*, Pokja PS), forming group in each province as it is required by the MoEF [2].

Another valuable entity in the implementation of the policies is Forest Development Financing Agency (*Badan Layanan Umum*, BLU). BLU is managed by the MoEF to provide credit or financing on-farm and off-farm forestry business. The credit can be given to holders of all schemes of social forestry including to HTR permit holders.

In addition, for years, MoEF through its regional watershed management unit provides free seedling for all communities including individual, FFG, organisation or institution. The seedling consists of fruit trees and forestry/timber trees. For areas of Gorontalo Province, including Boalemo District, free seedling has been provided by Bone Bolango Watershed Management Unit located in Gorontalo District.

4.2. Agriculture sector

Based on Minister of Agriculture Regulation No. 50/2012, Gorontalo Province is designated as centre for corn production to support national food security. In addition to corn, several of agricultural products are also being prioritised, although the commodities could be differ for each district. Aside from being a corn producing region, Boalemo District is also designated as a producer for rice, chili, chocolate and beef cattle. The policy aims to support national food security and at the same time increases the income and welfare of farmers at local level. The policy is then followed up with various supporting programs including providing production facilities, fertilizers and pesticides as well as seedling assistance given to farmers [21].

Various assistances provided by government could be used by the farmers as capital to utilize their land, in addition to the capital they provide independently. Considering that the land in Boalemo is still widely available, the farmers apply extensive agriculture system, both in their private and HTR lands. Utilization of the lands is generally in form of intercropping of agriculture and estate crops. The policy can be more utilized by introducing trees into the existing intercropping patterns, especially on the HTR land. The trees mainly could protect the soil from erosion and reduce the potential flooding.

The integration of timber crops with agricultural and estate crops on the same piece of land might become source of income for farmers in the short, medium and long term [14 - 15]

4.3. Disaster management sector

The mandate of Law No. 24/2007 concerning Disaster Management iss complemented by Government Regulation No. 21/2008 concerning Implementation of Disaster Management. One point among others from these regulations emphasizes that overcoming disasters could be done through disaster mitigation. Disaster mitigation is a series of efforts to reduce risk of disasters, one of which is through awareness and enhancing ability to face the threats of disaster. Each region should have a disaster management plan. The Regional Disaster Management Agency (BPBD) is then formed as one of manifestations of the regulation. At Boalemo District level, these regulations have been followed up through District Government Regulation No. 5/2012 concerning the Implementation of the Boalemo District Disaster Management as well as the action plan prepared by the BPBD. However, community based disaster mitigation is needed to be developed in order to as early as possible avoid and deal with disaster risks so that the community will not only rely on the BPBD and the government when disaster, including flooding, occur. Community based disaster mitigation can be carried out through various of activities such as preparation of disaster risk maps, risk analysis and disaster management plans, as well as formation of disaster response forum and volunteer in village level [16 - 17].

4.4. Channelling policies

Farmers could not be left alone in developing farming system to enhance their welfare as they have limitation in financial, knowledge and capacity. However, any policy and intervention into their farming activities need to be channelled through right entities or persons. The research reveals varies of entities or persons to whom farmers have to contact and trust for certain aspects of information. For land management and institution arrangement, most farmers rely on the head of FFG and extension officer as their sources of information. Trader is entity to whom farmers could looking and from whom they could receive information related to marketing the commodities. Meanwhile, for financial information and support, farmers make contact with bank institutions and traders. In Boalemo District as well as it is in other areas in Gorontalo Province, farmers could also borrow money from some traders, either for consumption or for their activities related to preparing farmland and they will repay the debt from selling their farming commodities. These entities or persons need to be involved in implementing policies with the aims of improving their community welfare .

Basically, it is needed a policy that is friendly to farmers and in accordance with the facts that occur in the field. Being able to encourage farmers' motivation to plant trees beside annual crops is expected. So farmers can have a bundle of source income target through short, medium and long term income. Shively [26] explaines that pricing policies of preferred perennial crops are important to encourage farmers to plant trees. Market opportunities analyse to provide the economic value of trees for farmers are essential, in order to convince the decision makers to develop an appropriate policy [27]. It is important to link the agricultural-decision making and the environmental outcomes [26]. Stakeholders' support in facilitating smallholder tree farming could be one of the strategies to enhance livelihood security and to protect the remaining forest resources [28]. Establishing market linkages to farmers is one of the essential step to improve smallholders' welfare [29].

5. Conclusion and Recommendation

Opportunities are available to utilize the HTR land for growing trees for future income. Considering the HTR land that is located in hilly & steep contour, the grown trees could absorb rainwater and reduce erosion so it will lessen the potential of floods that happen routine every year in Boalemo. Meanwhile, the farmers can continue their current land use in their private land by cultivating agriculture and estate crops for daily and short-term income. Considering low knowledge and capacity of the farmers both in economy and in technical aspects of growing trees and environmental impacts of their current farming system, some activities on awareness raising for growing trees, aids, training

and assistances are needed to support the farmers for better use of the HTR land as well as their private land. Multisectoral policies including policies on agriculture, forestry and disaster management are also available as efforts to support increasing welfare of the farmers as well as for environmental protection.

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