

## Community Forest Scheme: Measuring Impact in Livelihood Case Study Lombok Tengah Regency, West Nusa Tenggara Province

Eny Widiya Astuti<sup>1</sup>, Aceng Hidayat<sup>1</sup>, Dodik Ridho Nurrochmat<sup>2\*</sup>

<sup>1</sup>Department of Resources and Environmental Economics, Faculty of Economic and Management, IPB University, Campus IPB Dramaga, Bogor, Indonesia 16680

<sup>2</sup>Department of Forest Management, Faculty of Forestry, IPB University, Campus IPB Dramaga, Bogor, Indonesia 16680

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### Abstract

Community forest (*Hutan Kemasyarakatan/HKm*) is one of the social forestry scheme policies stipulated by the Indonesian government to give partial rights to the community to be able to manage the state forest area. This scheme has implemented for more than ten years, and that includes areas in Lombok Tengah Regency. This research aims to analyze the impact of social forestry scheme policies on the economy of communities around forests and conducted in May–August 2019. By the HKm scheme, the community can manage up to 0.5 ha forest area per person and expected to increase livelihood benefits as well as improve conservation outcomes such as decreasing illegal logging and planting more trees. Based on the study conducted, the community has experienced an increase in livelihoods as well as improvements in environmental conditions. Indicator used in measuring community welfare is per capita income, which noted in the study area is IDR3,609,603 annually and inequality (Gini coefficient), which noted less than 0.4 or in the 'low' category. This study shows that the Gini coefficient in the research location is high (0.530). When compared, the income gap in the group of respondents who got the HKm program was better than the group of respondents who did not. The Gini coefficient data shows that the HKm program quite succeeds in target to increase livelihood benefits. The HKm program expected to improve the level of income inequality (Gini coefficient) from 0.483 (HKm) compared to 0.566 (non-HKm). These findings are important messages to further the HKm scheme policies.

*Keywords:* community forest, Gini coefficient, livelihood, policy, social forestry

\*Correspondence author; email: dnurrochmat@apps.ipb.ac.id, phone +62-2518622637

### Introduction

The Indonesian Ministry of Environment and Forestry (KLHK), through its 2011–2030 National Forestry Plan (Revision 1, 2019), reports that the total area of Indonesia's forest area is currently at 125.92 million ha (KLHK, 2019a). KLHK, in its report, also said that from that number, most (55%) were production forests, and the rest were protected forests (24%) and conservation forests (22%) (KLHK, 2019b). The number of forest areas make forestry sector policy becomes important in the perspective of national development and also because of its large role in the national development sectors, both forward and backward linkages. In Indonesia, the forestry sector has real benefits for the life and livelihood of the nation for ecological, socio-cultural and economic benefit. Further, the forestry sector has a very high forward linkage effect compared to other sectors. This linkage effect means that the forestry sector is also affecting the national economic performance as well as other sectors (Nurrochmat, 2005; Nurrochmat et al., 2010; 2012; Iskandar, 2015).

One policy in the forestry sector is the social forestry program, which first mandated in Law Number 41/1999 on Forestry. This law stated that the implementation of forestry aims at just people's prosperity (optimal benefits) and sustainability. Furthermore, in the explanation of Article 23 stated that forests as a national resource must be utilized as much as possible for the community so that one person or one group should not monopolize the forest. Therefore, forest utilization must be distributed equitably through community participation activities to make them more empowered and develops their potential. Optimal benefits can be achieved if forest management activities can produce high-quality and sustainable forests (DPKPS, 2019). Social forestry should provide common ground between state interests and communities interacting with Forest Estate boundaries, whereby access to land rights provided amidst a reluctance to devolve full management authority. Another notion about social forestry in Indonesia is the idea that formalizing terms of access could incentivize community empowerment

programs as well as provide economic development opportunities, and support rural livelihood initiatives and economic growth. Also, it believed that communities could act as more effective managers of forest resources and incentivize better conservation practices (Larson, 2004; Shrestha & McManus, 2007; Maryudi et al., 2012; Porter-Bolland et al., 2012). During the current administration (2014–2019), social forestry has become more viable. The Social Forestry program expected to reduce economic inequality especially in villages located inside or around forest area by optimizing land and provide more business opportunities, as well as improve human resources quality. Besides, this program can also link to efforts to achieve the Sustainable Development Goals (SDGs). In its publication, BPS notes that of Indonesia's medium-term national development priorities (RPJMN 2015–2019), of the 169 targets in the SDGs, around 57 percent (96 SDGs targets) are following national development priorities (BPS, 2016).

West Nusa Tenggara, in the Indicative Map of the Social Forestry Area (*Peta Indikatif Areal Perhutanan Sosial/PIAPS*), has a fairly large area of social forestry that is 396,356 ha (DJPSKL, 2019) and one of its designated areas is in the Lombok Island region. Changes in policy at the regional and national levels have dynamically affected the rate of deforestation, which then also affects the ecological and economic conditions on the Lombok Island region (Nurrochmat et al., 2019). One of the national policies set to reduce the rate of deforestation is a social forestry program by involving communities living around the Mount Rinjani National Park/*Taman Nasional Gunung Rinjani* (TNGR) area, one of which is by utilizing land under the forest trees to grow high-value commodities such as bananas or durian.

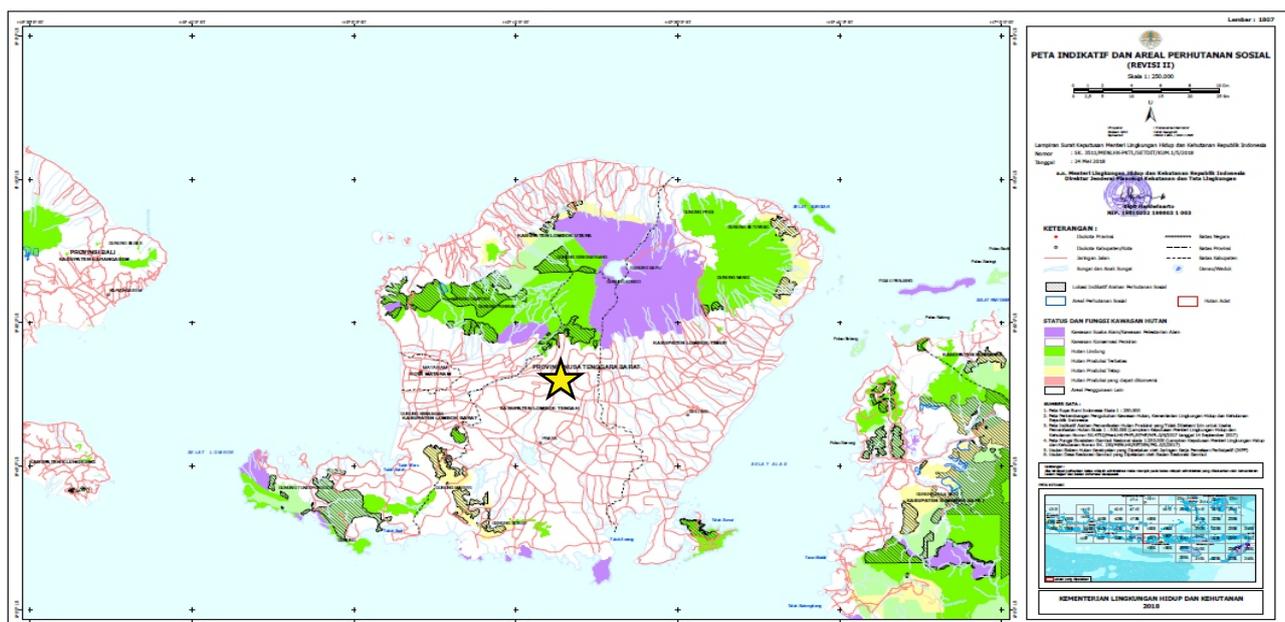
As one of the flagship programs of the government in the forestry sector, it is necessary to look at the impact of the

social forestry program, especially in Lombok Tengah Regency, West Nusa Tenggara. Therefore, this study should be able to answer how the influence of the social forestry program on the economy of communities around forests.

## Methods

This research conducted in the vicinity of the TNGR in Lombok Tengah Regency, West Nusa Tenggara Province (Figure 1). This location is chosen purposively, as one of the locations considered by KLHK with good social forestry implementation (KLHK, 2018; 2019b). Research conducted from May to August 2019. The type of data used in this study is primary and secondary data, both quantitative and qualitative. Primary data is data obtained by do the household survey and stakeholders interviews. The data then used to determine the impact of social forestry activities. Based on these needs, the selection of samples in the form of respondent households conducted purposively. Data and interviews obtained are as follows: a). Household demographic data; b). Data on household economic activities; c). Interview with stakeholders related to their perception on evaluating the social forestry policy. Secondary data obtained from scientific journals, related agency reports, regulations and various previous studies related to this research.

The sampling method used is a simple random sampling, since the characteristics between respondents are quite similar (Azwar, 2016). The selection of research sites for socio-economic survey activities was determined using the purposive sampling method. The selected village is the villages with a social forestry program (HKm). The survey conducted to see the direct and indirect impacts of the HKm scheme on people's livelihood.



Source: DJPSKL (2019)

Figure 1 Study area.

Primary data collection carried out through a survey by using a questionnaire to 219 respondents spread across five villages in Batukliang Utara District, Lombok Tengah Regency, West Nusa Tenggara (Table 1). Respondents were household head respondents, who were selected proportionally between those who participated in the social forestry program and those who did not participate in the social forestry program. The determination of the respondents purposively conducted to see the economic impact on each group-evaluation of the HKm's scheme also done by conducting interviews with key persons.

To analyze the impact of the social forestry program income analysis and Gini coefficient analysis are carried out. Per capita income obtained from the information on the respondent's household income, we can also compare the income gap index (Gini coefficient) between villages. In order to obtain the Gini coefficient, data on the number of households or residents, and the average household income or expenditure then grouped according to class. Then calculate using the Equation [1] (Dephutbun, 2000).

$$KG = 1 - \sum_{i=1}^n (X_{i-1} - X_i)(Y_{1+i}) \quad [1]$$

note:  $KG$  = Gini coefficient;  $X_i$  = the proportion of the number of cumulative households in class- $i$ ;  $Y_i$  = the proportion of total cumulative household income in class- $i$ ;  $n=5$ , if divided into five classes (quintile) then 20% includes, the second 20%, the third 20%, the fourth 20%, and the richest 20%

The calculation of the Gini coefficient will produce a value between 0 and 1. If the value of  $KG < 0.4$  means the level of inequality or the gap between the richest and poorest groups of people in a country or region is quite low if  $0.4 \leq KG \leq 0.5$  means moderate inequality. Whereas if the  $KG$  value  $> 0.5$  means that inequality or disparity in the area is high (Nurrochmat et al., 2016). The Gini coefficient can be used to ascertain the success of the program.

## Results and Discussion

The community forest (HKm) scheme expected to be able to rehabilitate degraded forest areas as well as to encourage the improvement of community welfare. Meanwhile, such improvement expected to lower the poverty rate, (Feurer et al., 2018) in their research argued that initially, poverty alleviation is not the main goal of community forestry, but the hope of side effect of environmental improvement. Another publication, (Saptyuningsih et al., 2019) also pointed that the success rate of environmental management programs is higher if they are implemented based on the interests of local communities who lived in the area affected by the program,

which also applies to HKm, this scheme implemented by considering the farmers need. In their study, (Kay et al., 2019) propose agroforestry practices, as a community does in Lombok Tengah Regency planting high-value commodities in the forest, can be mitigating the environmental pressures. In this study, the impact of the HKm scheme evaluated whether it affects the improvement of people's welfare. The economic impact of social forestry policies in Central Lombok Regency is carried out by identifying the types of products and environmental services of forest resources that are sought by the community, and identifying sources of community income.

**High-value commodities planted by farmers** The HKm scheme allows the community to plant in the forest area, following the given work area. (Wulandari et al., 2018) stated that the community could use the non-timber forest products, and enrichment species by planting the wood trees in this scheme. Commodities planted expected to provide economic benefits for the community while also providing ecological benefits. In the study area, most of the commodities planted and considered to provide the highest economic benefits include banana (*Musa balbisiana*), durian (*Durio zibethinus*), avocado (*Persea americana*), coffee (*Coffea canephora*), and palm trees (*Arenga pinnata*). Other commodities that are also planted by the community on HKm area include bamboo (*Bambusa blumeana* Bl. ex Schul. f.), duku (*Lansium domesticum*), soursop (*Annona muricata*), cocoa (*Theobroma cacao*), jackfruit (*Artocarpus heterophyllus*), rambutan (*Nephelium lappaceum*), clove (*Syzygium aromaticum*), mangosteen (*Garcinia mangostana*), longan (*Dimocarpus longan*), orange (*Citrus nobilis* Lour.), sapodilla (*Manilkara zapota*), betel (*Piper betle*), coconut (*Cocos nucifera*), gnetum (*Gnetum gnemon*), taro (*Colocasia esculenta*), sweet potato (*Ipomoea batatas*), and grass (*Pennisetum purpureum*) for animal feed. Other research also found commodities planted in HKm area are cloves, passion fruit, and coffee (Fisher et al., 2018), rattan, coffee, durians, bananas, jackfruit, medicinal plants, ornamental plants, MPT species, and mushrooms (Kaskoyo et al., 2014), palm sugar, durian, and honey (Wulandari & Kurniasih, 2019). Other economic benefits from the HKm area are beekeeping, collecting bird nests, captive breeding of wildlife, and gathering of livestock forage (Kaskoyo et al., 2014).

One of the high-value commodity cultivated by the community is coffee, which is also widely cultivated by the participants of the HKm scheme. From the interviews, the main problem encountered by farmers was a disease in the

Table 1 Respondents

Village	Respondents (persons)	Hkm (persons)	Non-HKM (persons)
Aik Berik	47	33	14
Aik Bual	42	31	11
Karang Sidemen	43	31	12
Lantan	42	30	12
Setiling	45	31	14

coffee plant that affected crop yields. In HKm area in Lombok Tengah, assistance and introduction of technology are important to improve the productivity, as stated by (Nandini et al., 2016) in their research, they emphasized the application of the intensive silviculture and interference of technology to maximized crop productivity in the HKm. Furthermore, in the end, it will give influence on the income of the HKm farmers.

Another problem is the process of drying coffee, which is still very simple by using sunlight. From the five villages visited, there was 1 (one) female farmer group (*Kelompok Wanita Tani/KWT*) who processed coffee beans in Lantan Village, where coffee beans obtained from the surrounding villages. The community needs more training process, especially regarding marketing. For the time being, the product sold as a ground coffee, but the sorting process should be increasing the value of the coffee itself. They can promote the coffee as a single-origin coffee, which means originates from the North Batukliang region with certain specific characteristics. In addition to commodities with direct economic value, the community in the study area also planted grass as fodder, especially in Aik Bual Village, Kopang District. Characteristics of local breeders there, they have less than five cows, and usually take grass from the HKm land as the main ingredient of animal feed.

**Community income per capita** One way to measure the level of community welfare is to calculate income per capita, which obtained from the average income of the community. Per capita income illustrates the level of welfare in an area. Based on survey data, per capita income in the study area is IDR3,609,603 annually (Table 2). Comparing with research by (Nandini et al., 2016), per capita income for total farmers in four villages is IDR495,179 per capita month<sup>-1</sup>, higher than the current study area (five villages) which is IDR 300,800

per capita month<sup>-1</sup>. Data obtained from (BPS, 2019a) showed that the poverty line in Indonesia is IDR5,103,000 per capita year<sup>-1</sup>, thus per capita income in the study area is still below the line. The local government needs to take some measures to increase people's per capita income.

**Income gap** The income difference then measured by calculating the Gini coefficient. By measuring the income gap within the study area, we can determine the impact of certain policies or programs, in this research is HKm, to the livelihood aspect in the study area. Table 3 illustrates the distribution of income among respondents in the study area. The survey carried at the household level by comparing household income among respondents who received the HKm program and respondents who did not receive the HKm program. This table also shows that the Gini coefficient value for all respondents in five villages is 0.530.

Nurrochmat et al. (2016) state if the value of the Gini coefficient < 0.4 indicates the level of inequality or the gap between the richest and poorest groups of people in a country or region is quite low and if  $0.4 \leq \text{Gini coefficient} \leq 0.5$  means moderate inequality. Meanwhile, if the value of the Gini coefficient > 0.5 means that inequality or disparity in the area is high, the income gap at the study area is more than 0.5 or in the 'high' category. The research finding shows that the income of the people in the research location is not well distributed. When compared, the income gap in the group of respondents who got the HKm program was better than the group of respondents who did not get the HKm program (0.483 compared to 0.566). The high Gini coefficient in the group of respondents who did not get the HKm program shows that there is a high gap of income in the area.

The Gini coefficient data from the study shows that the HKm program is quite on target to improve the livelihood of the community in efforts to alleviate poverty. Datt and Datt and Ravallion (1990) in (Akhmad et al., 2019) emphasize that one way of alleviating poverty in a region is to eliminate inequality that occurs. Bryan and Martinez (2008) study in (Maipita & Wahyudi, 2018) also analyzed the individual income inequality trends in the United States. They argued that focusing on individual income instead of household income allows presenting inequality trends that are not directly affected by changes in household composition.

**Income distribution per capita** The Gini coefficient should

Tabel 2 Per capita income at the study area

Village	Per capita income (IDR)
Aik Berik	3,643,863
Aik Bual	3,592,066
Karangsidemen	3,876,318
Lantan	3,643,895
Setiling	3,606,449
Total	3,609,603

Tabel 3 Gini coefficient at the study area

Community group	Respondent (person)	Gini coefficient
All respondents in five villages	219	0.530
HKm respondents in five villages	156	0.483
Non-HKm respondents in five villages	63	0.566
Lombok Tengah Regency*	-	0.332
Nusa Tenggara Barat Province**	-	0.379

Source: \* (BPS, 2018); \*\* (BPS, 2019b)

complement the Lorenz curve to see income distribution in the study area. The distribution of income can be seen clearly by projecting a percentage of each quintile into the Lorenz curve (Figure 2). In the Lorenz curve, the closer the projection curve to the equality line, the better the distribution.

Figure 2 illustrates the pattern of the income distribution of communities around the forest by processing primary data. Gini coefficient figures in this study showed a moderate level of inequality with Gini coefficient values 0.483 (HKm), as well as high level of inequality with 0.566 (non-HKm) and Gini coefficient values 0.530 (HKm and non-HKm). These detailed numbers then plotted in Figure 2 to see how much the inequality in each group/community quintiles, it described that almost 70% of the highest income controlled by only 40% of the population. Similar depictions also found in the community groups who participated the HKm scheme, although the Gini coefficient number still shows a moderate figure (0.483), more than 50% of the highest income controlled by 20% of the population. If seen from a distance between the lowest income and highest income, the distance

for non-HKm participants is much higher than the distance in HKm participants (Table 4).

### Conclusion

Seeing the considerable attention from the government on the social forestry policy, it needs to be evaluated for its impact on the community's economy, especially in Lombok Tengah Regency. One indicator used in measuring community welfare is per capita income, where per capita income in the study area is IDR3,609,603. Information regarding community welfare then supplemented with information on inequality (Gini coefficient). In the study area, the Gini coefficient obtained is more than 0.5 or in the 'high' category. It shows that the income of the people in the study area is not well distributed. When compared, the income gap in the group of respondents who got the HKm program was better than the group of respondents who did not get the HKm program. The Gini coefficient data shows that the HKm program is quite on target. The HKm program expected to improve the level of income inequality (Gini coefficient) from 0,483 (HKm) compared to 0,566 (non-HKm).

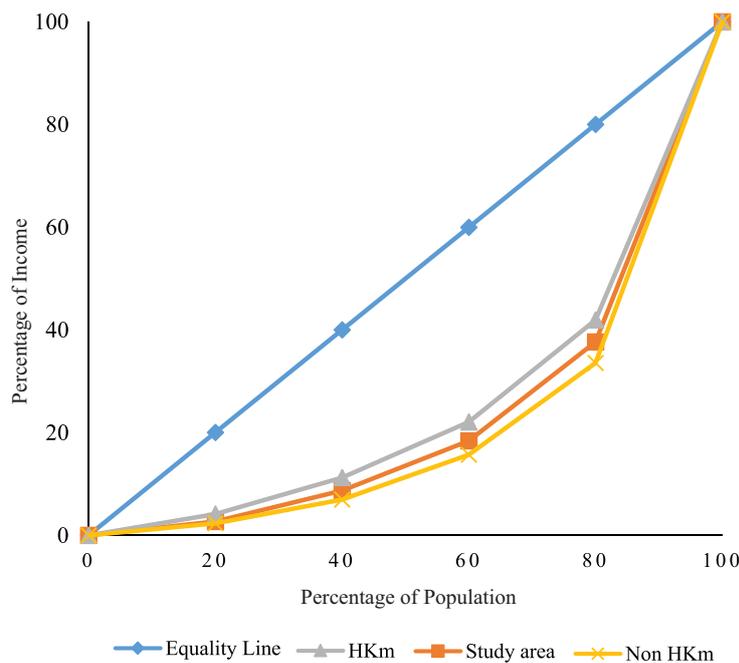


Figure 2 Community distribution pattern.

Tabel 4 Lowest and highest income found in the community

Respondent group	Lowest income (IDR)	Highest income (IDR)	Distance (times)
HKm participants	300,000	30,000,000	100
Non-HKm participants	200,000	54,000,000	270

## Recommendation

The government can implement programs in the study area by increasing the community's income from HKm by planting high-value commodities, expanding the reach of community involvement, strengthening HKm institutions, and building infrastructure for management access and market access.

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