Motives for Community Involvement in Agricultural Practice in Forest Production Area: A Case study at Kesatuan Pemangkuan Hutan/Forest Management Unit Kebonharjo, Central Java

Cahyo Wisnu Rubiyanto [1,*], *Fajar* Julian Santosa[2], and *Riskina* Juwita[3]

[1] Department of Agribusiness, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia
[2] Department of Development Extension, Postgraduate Program, Sebelas Maret University, Surakarta, Indonesia
[3] Department of International Food and Agricultural Science, Tokyo University of Agriculture, Japan

Abstract. Development of Kesatuan Pengelolaan Hutan (KPH) is a policy of the Indonesian government to give wider chances for local people in rural area to manage the forest more efficiently and sustainably. However, almost half of the total forest area in the country have not been intensively managed, only few reports have discussed the relationship between development of KPH and local livelihoods. Hence, this study aimed to examine the motives for community involvement, particularly in agricultural practices in forest areas at KPH Kebonharjo, Central Java. This study was conducted through cross-sectional survey and data were analysed using word descriptions and verbatim discussions. The findings of this study indicated that the forest area of KPH Kebonharjo covers about 32.5% of the total area of 42 villages and the community involvement in agricultural activities in forest area was quite high in some villages. Income-generating activities were the main motive and household size, capital, knowledge, and access to credit were investigated as important roles in farmers' decisions to be involved in such activities. The study suggests that future research needs to focus on identifying the socio-economic perspectives and livelihood strategies of local communities.

1 Introduction

Forest areas have long served as a source of livelihood for communities living in the vicinity [1]. In Indonesia, 64 percent of the nation's entire land, or about 120 million hectares, are a forest area, and the largest function of the forest is for production of about 68.8 million hectares. To manage this vast production forest, the states established a forest management unit or *Kesatuan Pemangkuan Hutan* (KPH) which is regulated by Indonesian law; *UU No. 5/1967* about Basic Provisions of Forestry. Furthermore, Government Regulation *No. 3/2008* mandates the establishment of forest management areas at the provincial, district/city, and

* Corresponding author: cahyo.wisnu@umy.ac.id

management unit levels. The forest management unit or KPH is divided into several more management levels from the regional level down to the lower levels in the community, namely *Bagian Kesatuan Pemangkuan Hutan* (BKPH), and *Resort Pemangkuan Hutan* (RPH). Recently, there are 57 KPH, 437 BKPH, and 1592 RPH have been established and all managed together directly by the local community through *Lembaga Masyarakat Desa Hutan or* forest village community organization (LMDH).

LMDH is an organization formed specifically to manage the forest area within the village scope. Local people in the village are doing their part in the area through their involvement in agricultural practices. Agricultural practice in the forest is a key aspect of forest management in Indonesia. Previous studies show that the number of forest farmers joining forest farmer groups has increased since the government started implementing community-based forest management programs [2]. This trend requires a balance between economic gains and conservation goals [3]. In many cases, the local communities play an important role in maintaining this equilibrium by actively participating in the practice to gain their income sources and also the preservation of forests [4, 5, 6, 7]. Furthermore, the involvement of communities in forest management practices has been seen to promote sustainable development as it provides an opportunity for local populations to engage with natural resources.

Community involvement in agricultural practices within forest areas is vital for the sustainable development of forests and their surrounding communities. Through the establishment of forest management units and organizations like LMDH, local communities are empowered to play an active role in managing the forest. Some studies have shown that community involvement increases their economic potential but also creates a sense of ownership and responsibility toward the forests, leading to better preservation practices [8]. In addition, community involvement in agricultural practices promotes a holistic approach to forest management and conservation, with an emphasis on sustainable utilization of resources. The involvement of local communities in forest management and agricultural practices can therefore lead to a win-win situation for both the environment and socioeconomic development.

The success of community involvement in forest management largely depends on various factors such as access to markets for a variety of forest products, tenure security, effective law enforcement, and access to information. Previous studies have shown that communities benefit more from locally owned and managed forests than from large-scale state or company-based plantations as profits are more likely to remain within the local economy [9]. However, there are challenges to community involvement in forest management, such as the lack of technical expertise and resources, and lack of assets, resulting in fewer farmers being involved. The low involvement of farmers in agricultural practice underscores the need to understand their motivations for engagement. Therefore, this study aimed to clarify the process of information transfer in the community to be involved in agricultural practice in forest areas. The study was conducted at KPH Kebonharjo, Central Java, as target area, to explore the motives and describe the characteristics of farmers who involved in forest management practices mixed with agricultural crops.

2 Methodology

2.1 Study Area

The study area was located in KPH Kebonharjo that covers the area of three districts mainly in Central Java, namely Rembang, Blora, and a part of East Java, namely Tuban. The area is characterized as a forest production region located on the northern coast of Java, Indonesia.

KPH Kebonharjo is one of the forest management units under *Perhutani* (Stated-owned enterprises of the Republic of Indonesia) in the region of Central Java. Based on data from Perhutani, the total forest area in KPH Kebonharjo is 17,734.60 ha, 13,392.9 ha (75.5%) for forest production areas and 4,341.7 ha (24.5%) for non-production forest areas. The elevation of the area ranges from 0 to 806 meters above sea level, and the mean annual rainfall is approximately 1,140 mm per year. The topography in the area is mainly ramps, and the soil type is a combination of clay and limestone.

The main trees in the forest area of KPH Kebonharjo are teak, *Kesambi (Schleichera oleosa)*, mahogany, and *Secang* (*Caesalpinia sappan).* In this forest, the local people, with their awareness and ability, mainly engaged in agricultural practices, particularly rice cultivation and various cash crops cultivation. Maize is one of the main cash crops grown in the area, followed by soybean, peanuts, cassava, and vegetables. Livestock such as goats and poultry are also raised by some households for their livelihoods.

2.2 Data Collection and Data Analysis

The survey was started in KPH Kebonharjo from February to March 2023 to collect secondary data. First, we visited the KPH office and interviewed the head of each KPH office to obtain general information regarding characteristics of the area, such as name of villages, total land area of the village, total land area for agriculture in the forest, and number of households who engaged in agriculture practice in the forest. Then we asked about the process of information transfer from KPH to the community regarding forest management and agricultural practices. KPH Kebonharjo consists of a total of 7 BKPH; 6 BKPH are areas of forest production (Table 1) and 1 BKPH is an area of forest protection. In this study, we focus on forest production areas which aimed to determine community involvement in agricultural practice in the forest.

Primary data was then collected through a cross-sectional survey and collected data were analyzed using word descriptions and verbatim discussions [10]. Our analysis aimed to describe the process of information transfer in the study area and understand the motives of the extent of community involvement at KPH Kebonharjo. In our observations, these practices are an important source of livelihood for local communities. We also conducted focus group discussions with community members of LMDH and household surveys in selected villages to gain a deeper understanding of the local livelihoods, farmer characteristics and their perceptions. In this study we focus one's attention on motives of the group farmers that will be explain in the results and discussion section [11].

3 Results and Discussions

3.1 Summary of basic information at KPH Kebonharjo

The summary of conditions at KPH Kebonharjo is shown in Table 1. KPH Kebonharjo consists of 6 BKPH. In the area of 6 BKPH, there are 19 RPH, 42 LMDH, and 42 villages with a total land area of 33,904 hectares. Meanwhile, the forest area of KPH Kebonharjo covers about 32.5% of the total area of 42 villages. The forest area to village area is varied in each village, with some villages having a significant portion of agricultural land in the forest, such as Sale, Wonokerto, Bancang, and Sendangrejo villages which have more than 85% of the forest area in each village. This indicated that community involvement in agricultural practices in the forest is paramount, especially for those living in villages where a significant portion of agricultural land lies within the forest.

Table 1. Basic information of KPH Kebonharjo

BKPH	RPH	LMDH	Village	Village area (Ha)	Forest area to village area (%)	No. HH involved
Karas	Bedog	Wonosari Mulyo	Pamotan	1,777.0	9.6	126
		Peduli Wana	Bangun Rejo	449.5	29.0	76
		Mekar Lestari	Karas	712.3	50.4	256
	Karas	Wono Makmur	Bamban	319.2	39.5	63
		Wana Lestari	Kali Tengah	602.1	20.1	60
		Sobowono	Rendeng	272.1	57.0	45
		Wana Mulya Lestari	Pacing	560.0	23.2	57
Ngandang	Mangseng	Jaya Abadi	Sambiroto	364.2	57.4	286
		Wana Jaya	Mojosari	588.0	57.3	84
		Jati Lestari	Sumbermulyo	894.4	75.9	84
	Bonjor	Sidodadi	Lodan Wetan	954.0	54.7	41
		Dadi Mulyo	Bonjor	1,215.8	54.5	86
	Lodan	Wono Rahayu	Lodan Kulon	807.4	44.6	56
Tuder	Tuder	Jati Mulyo	Jinanten	428.9	62.6	60
	Tengger	Sejahtera	Bitingan	680.1	25.8	32
		Jati Santosa	Tengger	926.0	53.9	76
		Ngudi Lestari	Pakis	290.0	31.2	104
		Giri Wana Lestari	Tegaldowo	1,354.9	0.8	47
		Wonorejo	Dowan	810.1	11.0	30
	Tahunan	Giri Wana Sakti	Tahunan	1,665.7	54.2	329
		Sumber Lestari	Gading	438.7	58.9	66
Sale	Ketodan	Sumber Gedhe	Ketodan	526.0	45.3	36
		Rimba Mulya	Wangi	654.1	35.9	150
	Terongan	Reksa Wana Kumala	Sale	965.2	88.6	242
		Dharma Wana Raharja	Wonokerto	1,570.1	87.7	308
	Ngepon	Bumi Lestari	Tawangrejo	882.4	55.8	104
		Arum Lestari	Ngepon	1,071.5	40.6	359
Tawaran	Karang Tengan	Wana Sejahtera	Tawaran	1,017.0	32.8	72
		Wonomukti	Sidomukti	1,293.8	20.2	77
		Sumber Rejeki	Karang Tengah	445.4	32.1	37
	Gato	Sidomakmur	Jlodro	896.9	56.5	111
		Tani Luhur	Jamprong	1,294.5	31.0	225
	Soko Gunung	Towo Bangau	Soko Gunung	216.3	241.1	241
	Ngajaran	Wana Lestari	Nganjaran	921.0	51.7	135

BKPH	RPH	LMDH	Village	Village area (Ha)	Forest area to village area (%)	No. HH involved
		Harapan Makmur	Bancang	511.6	90.5	136
Gayam	Sb. Wungu	Gunung lestari	Gandu	481.5	76.6	497
		Wana Mutiara	Gayam	503.1	64.6	135
	Nglengklir	Jati Mulyo Langgeng	Tempurejo	326.0	26.4	109
		Jati Purnomo	Nglengkir	847.4	23.4	252
	Merah	Wana Kita Rahayu	Sendangrejo	594.9	86.4	62
	Ngapus	Wanadadi Lestari	Gembol	912.3	11.8	46
		Wana Sejahtera	Ketringan	1,862.6	15.1	60
Total				33,904.0		5,458.0
Average				807.2		130.0

In addition, a large percentage of the population in the area involved in utilizing forest land for their livelihoods also indicates a high degree of community involvement. The average number of households involved in agriculture practice in the forest is 130 households per village. The highest percentage of households to the population involved in agricultural practice in the forest is 58.6% (286 households) in Sambiroto village, while the lowest is 2% (37 households) in Karang Tengah village. Households in all villages were engaged in agricultural practice in the forest, both for subsistence and economic purposes. These agricultural practices include the cultivation of crops such as maize, soybean, peanuts, cassava, and vegetables. Maize was the most cultivated crops and grown in the big area, while other crops were cultivated in small area. Some households also cultivate tree crops such as avocado, durian, and mangosteen. Local people cultivated the crops in the forest two years before harvest time for timber production where the trees do not grow. Additionally, some households also engage in animal husbandry, particularly keeping goats and poultry. The households extensively keep their livestock in the forest along with their agricultural plot. Based on household survey, this study shows that the community's involvement in agricultural practice is motivated by the opportunity and chance on these practices to diversify their livelihoods [12]. The two aspects, forest area used for agriculture and the population involved are interrelated, emphasizing the need for socialization and well-organized system for community involvement.

3.2 Process of information transfer for community involvement at KPH Kebonharjo

Figure 1 shows the process of information transfer for community involvement at KPH Kebonharjo. Community Forest Management (PHBM/Pengelolaan Hutan Bersama Masyarakat) in KPH Kebonharjo refers to government regulations (Perhutani as the stated-owned forest company of the Republic of Indonesia); 1) Perhutani Supervisory Board Decree No. 126 of 2001 on PHBM, 2) Decree of the Board of Directors of Perum Perhutani No. 268 of 2007 about PHBM plus, 3) Decree of the Board of Directors of Perum Perhutani No. 682 of 2009 about Guideline PHBM. These regulations provide the legal framework for community involvement in forest management and create a formal process that allows communities to work with Perhutani.

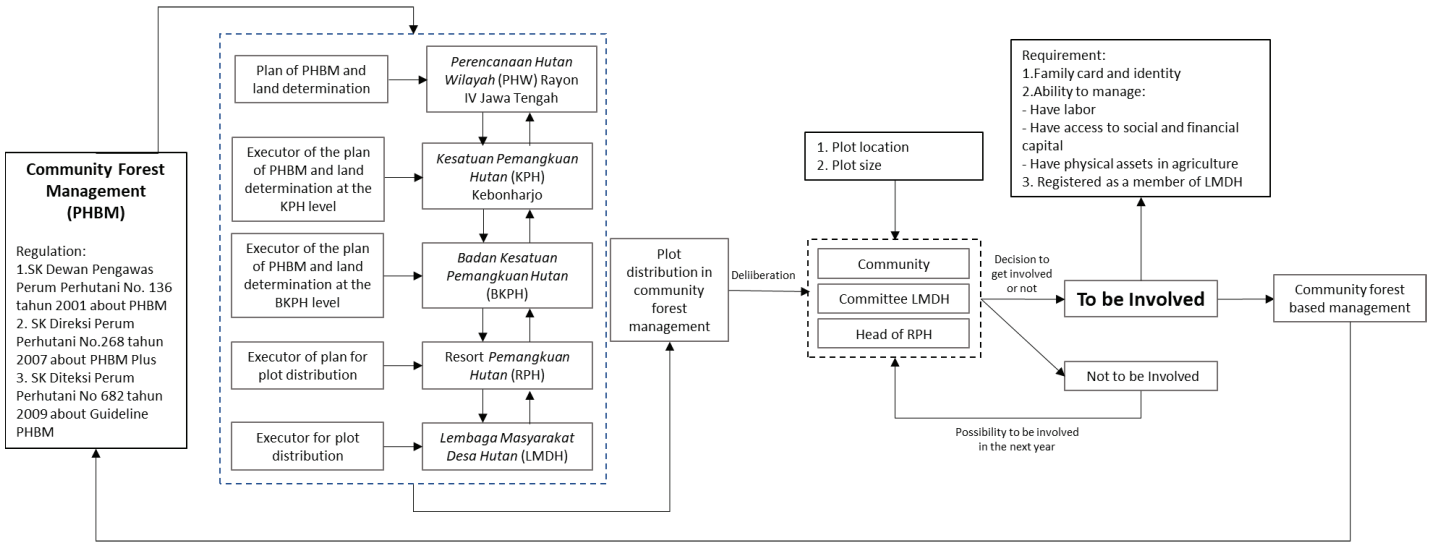

Fig. 1. Information transfer process for community involvement at KPH Kebonharjo

Through this process of information sharing and collaboration between Perhutani and local communities, the community are informed about forest management practices and regulations while also sharing their knowledge and experiences with Perhutani. The information about the plan of PHBM and land determination from KPH Kebonharjo is conveyed to several area levels (BKPH at the high level to execute the plan of PHBM and land determination, RPH at the medium level to execute the plan for plot distribution, and LMDH at the low level to execute plot distribution to the community in the village) that are responsible for PHBM regulations. LMDH is the lowest level, directly interacting with the community to provide them with information about forest management practices, regulations, and plot distribution in PHBM while also gathering feedback from community members. This process of information sharing and collaboration between Perhutani and local communities is crucial to achieve successful community involvement in forest management.

The local community with committee LMDH and the head of RPH makes deliberation about how they want to utilize the forest land with the guidance of Perhutani and establish a profit-sharing agreement between Perhutani and the local community, also about how the resources are used sustainably, and with government regulations in place, community involvement in forest management can provide benefits to both parties. Through this legal framework, local communities are empowered to participate in the management and decision-making process, which also allows them to benefit from these activities in a sustainable way. Furthermore, this process promotes accountability and transparency in the management of forests while also fostering a sense of ownership and responsibility among the local communities towards their forests.There are a few requirements for the local community to be involved in forest management, such as the ability to manage and be a member of LMDH. The ability includes having enough labor, access to social and financial capital, and physical assets. This ability leads the local community to play an active role in the sustainable management of forest resources alongside Perhutani, ensuring the long-term health and vitality of this program while also positively impacting the livelihoods of local communities. Meanwhile, being a member of LMDH is an important responsibility that comes with the opportunity to participate in decision-making and profit-sharing, and to be proactive in saving and loan cooperatives. In conclusion, community involvement in forest management is a critical aspect of sustainable forest management.

3.3 Motives for community involvement in agricultural practice at KPH Kebonharjo

At the village level, few farmers are involved in agricultural practice at KPH Kebonharjo. As mentioned above, only Sambiroto village has the highest percentage of households who are involved in agricultural practices of the population in the village. While in other villages, the households are under 50%. Table 2 shows the farmers' characteristics and their motives for community involvement at KPH Kebonharjo. In this study we classified the farmers into three types of farmers based on their status; farmer-landowners, farmer-capital owners, and farm laborers, to know what their motives of each group to participate in agricultural practices at KPH Kebonharjo.

Table 2. Farmer's characteristics and the motives for community involvement at KPH Kebonharjo

Farmer's Classification	Characteristics	Motives
Farmers - Land Owner	- Member of LMDH - Agricultural practice in the forest is the main income sources	- To get income as their main livelihood

Farmer's Classification	Characteristics	Motives
	- Ease access to ownership of land management in the forest - Prioritized in obtaining information related to the plot distribution - Ease access for joining workshop and socialization held by KPH Kebonharjo - Get the sharing profit from KPH Kebonharjo which mainly from forest timber production - Lack of capital in land management - Some of farmers possible to get access for financial capital to their farm - Get access to get credit from cooperation of LMDH - Land management is usually only done by family members - The cultivation yield is utilized only for subsistence needs	- To get access in land management in the forest - To contribute in forest preservation - To participate in LMDH, to get more relation and also to get access of credit from cooperation of LMDH - To get access to knowledge through regular workshop and training
Farmers – Capital Owner	- Member of LMDH - Agricultural practice in the forest is the side income source - Ease access to ownership of land management in the forest - Prioritized in obtaining information related to the distribution of land in forest - Ease access for joining workshop and socialization held by KPH Kebonharjo - Get the sharing profit from KPH Kebonharjo which mainly from forest timber production - Having access to capital in the management of land in the forest - Get access to get credit from cooperation of LMDH - Land management is not done directly by the family members, usually they have sharecroppers and farm laborers in the management of land - The cultivation yield is utilized only for subsistence needs	- To get more income source as their additional livelihood activities - To get access in land management in the forest - To contribute in forest preservation - To participate in LMDH, to get more relation and also to get access of credit from cooperation of LMDH - To get access to knowledge through regular workshop and training
Farm Laborers	- Not member of LMDH - Agricultural practice in the forest is the daily income source as a farm laborer - Do not have access to ownership of land management in the forest - Not prioritized in obtaining information related to the distribution of land in forest - Do not have access for workshop and socialization held by KPH Kebonharjo - Do not have access to get credit from cooperation of LMDH - Do not have the sharing profit from KPH Kebonharjo which mainly from forest timber production	- To get an additional source of income by becoming farm laborer as a daily livelihood

Farmer's Classification	Characteristics	Motives
	- Income is derived from daily activities from farmer capital owner	

Farmer-landowners participate in agricultural practices at KPH Kebonharjo due to their desire to maintain and improve the productivity of their land. Usually, they have a long-term interest in land management and have enough labor from their family members to ensure its sustainability. The household size plays an important role in the decision of the farmers. These farmers want to participate in community activities such as plot distribution meetings, workshops by extension service and share their knowledge and experience with other farmers and active members of the LMDH, which contributes to the overall development of PHBM. The reason for these farmers to be active in the LMDH, besides social interaction with other members to serve the community and getting more relations [10], is to get access to credit for processing their agricultural land. Additionally, the cultivation yield of these farmers is utilized for their own consumption and as a main source of income for their household, contributing positively to the local economy. This not only improves their own livelihoods but also supports local food security and sustainability [13].

The second group differs from the first group, the farmers-capital owners participate in agricultural practices at KPH Kebonharjo to diversify their income sources for profit maximization by investing some of their capital in agricultural activities. This group of farmers sees agricultural practices to supplement their income and reduce dependency on one source of income. The activities are not done directly by the family members but rather by hired labor or contract farmers. These farmers are motivated to participate in agricultural practices due to their financial interests as well as LMDH member responsibilities. They are willing to invest in agricultural activities such as buying seeds, fertilizer, and assets such as tractors, lawn mowers and grinding machines that can improve productivity and yield. The financial and physical capital of these farmers were taken into consideration in the decision-making by farmers to engage. The investment can be beneficial not only for their own family but also for the larger community [11]. The capital diversification allows their family to be more resilient to economic shocks and increases their overall financial stability [14, 15].

The third group, farm laborers participate in agricultural practices at KPH Kebonharjo because they usually do not have any land to cultivate. These farmers rely on finding work as laborers for the farmers in the farmers-capital owners. Their participation in agricultural practices is motivated by their need to earn a living and support their daily life. They usually migrate from village to village at KPH Kebonharjo, seeking job opportunities in agricultural activities in the forest which have been made available through the participation of the other two groups. The participation of these three groups in agricultural practices at KPH Kebonharjo highlights the importance of community involvement in sustainable forest management practices.

It is clear from the research that factors such as income, household size, land ownership, knowledge and experiences in agricultural economic utilization affect the farmers' motives for community's involvement in agricultural practice at KPH Kebonharjo. Furthermore, social factors such as interactions with other farmers and groups, social norms, and activeness of LMDH members also play a crucial role in pushing farmers to adopt more sustainable practices. Through community involvement in sustainable forest management practices, the three groups at KPH Kebonharjo have found a way to diversify their income sources and achieve economic stability, while also contributing to the livelihoods and food security, preservation of natural resources and a healthier environment.

4 Conclusion

In conclusion, our study found that agricultural practices in forest production areas are an important source of livelihood for local communities at KPH Kebonharjo. The community's involvement in agricultural practices is motivated by their dependence on earning more income for their livelihoods. The study also highlights that household size, capital, knowledge, and access to credit were investigated as important roles in farmers' decisions to be involved in agricultural-forest management practices. In addition, community involvement in both agricultural practices and forest management can help promote sustainable agriculture and ensure the protection of forest ecosystems. In the future, the motivation is not only for income, increased public awareness for community involvement in the forest may also continue to support sustainable farmland management with more diverse motivations such as concern for the global environment, for example reducing greenhouse gas emissions and protecting ecosystem services. Overall, the study emphasizes the importance of understanding the different factors that motivate community involvement in agricultural practice and how it can bring impact to sustainable forest management. The study suggests that future research needs to focus on identifying the socio-economic perspectives and livelihood strategies of local communities. This will help develop effective strategies for promoting sustainable forest management practices that align with the community's needs and motivations.

References

1. W. D. Sunderlin, A. Angelsen, B. Belcher, P. Burgers, R. Nasi, L. Santoso, S. Wunder. Livelihoods, forests, and conservation in developing countries: An Overview. World. Devc, **33**, 9 (2005)d
2. S. B. Parhusip, S. Suharti, T. Sukandi, M. Amano, N. Matsumura. Economic Analysis of Local People's Involvement in Community-based Forest Management in Desa Ciomas, Indonesia. J. Soc. For. Plan. **25**, 1 (2019)
3. W. Widiatmaka, W. Ambarwulan, Y. Setiawan, C. Walter. Assessing the Suitability and Availability of Land for Agriculture in Tuban Regency, East Java, Indonesia. App. Env. Soil Sci, (2016)
4. B. Permadi. Community Empowerment and Farmer Poverty Reduction in Developing Countries. J. Pub. Adm. Stud, **4**, 1 (2019)
5. P. D. Pramanik, R. Ingkadijaya, M. Achmadi. The Role of Social Capital in Community Based Tourism. J. Indonesian Tour. Dev. Stud, 7, 2 (2019)
6. J. P. Robson, S. J. Wilson, C. M. Sanchez, A. Bhatt. Youth and the Future of Community Forestry. Land, **9,** 11, (2020)
7. L. A. Tampubolon. The Concepts of Forest Governance Practices at Site Level in Indonesia. J. Pub. Adm. Stud. **3**, 1 (2018)
8. S. Lele. Understanding Current Forest Policy Debates through Multiple Lenses: The case of India. Ecol. Econ, and Soc–the Insee J, **2**, 2 (2019)
9. E. Iswandono, E. A. M. Zuhud, A. Hikmat, N. Kosmaryandi. Integrating Local Culture into Forest Conservation: A Case Study of The Manggarai Tribe in Ruteng Mountains, Indonesia. J. Man. Hut. Trop, **21**, 2 (2015)
10. T. A. Malketo, E. Geta, S. Sieber. Understanding Livelihood Diversification Patterns among Smallholder Farm Households in Southern Ethiopia. Sust. Agri. Res, **9**, 1 (2019)

11. C. D. Batson, N. Ahmad, J-A. Tsang. Four Motives for Community Involvement. J. Soc. Iss, **58**, 3 (2002)
12. C. W. Rubiyanto, I. Hirota. The Livelihood Transition and Diversification Strategies of Mountain Villages after Road Development: A Case Study in Sone District, Houaphan Province, Northern Laos. Trop. Agr. Dev, **66,** 4 (2021)
13. Z. Rozaki. COVID-19, Agriculture, and Food Security in Indonesia. Rev. Agri. Sci, **8** (2020)
14. H. Hansson, R. Ferguson, C. Olofsson, L. R. Lahtinen. Farmers' motives for diversifying their farm busniness – The influence of family. J. Rural. Stud, **32** (2013)
15. C. W. Rubiyanto, I. Hirota. A Review on Livelihood Diversification: Dynamics, Measurements and Case Studies in Montane Mainland Southeast Asia. Rev. Agri. Sci, **9**, (2021)