ISSN:2656-4270 (Online) 1410-4466 (Print)
Accredited by Ministry of Education, Culture, Research, and Technology with the ranking of Sinta (S3) SK NO.164/E/KPT/2021, 27th December 2021

Buletin Penelitian Sosial Ekonomi Pertanian Fakultas Pertanian Universitas Haluoleo
2022:24(2):134-141
https://ejournal.agribisnis.uho.ac.id/index.php/sosek
doi: https://doi.org/10.37149/sosek.v24i2.419

THE LOCAL WISDOM EXISTENCE OF SWIDDEN AGRICULTURE ON WAWONII ISLAND

Sitti Rosmalah[1*)], Ahmad Muhlis Nuryadi[1)], Samsul Alam Fyka[2)]

[1]Department of Agribusiness Universitas Muhammadiyah Kendari
[2]Department of Agribusiness Halu Oleo University Kendari

**Corresponding author:* rosmalah@umkendari.ac.id

To cite this article:
Rosmalah, S., Nuryadi, A. M., & Fyka, S. A. (2023). The Local Wisdom Existence of Swidden Agriculture on Wawonii Island . *Buletin Penelitian Sosial Ekonomi Pertanian Fakultas Pertanian Universitas Haluoleo*, *24*(2), 134–141. https://doi.org/10.37149/bpsosek.v24i2.419

Received: February 03, 2023**; Accepted:** March 26, 2023**; Published:** March 28, 2023

ABSTRACT

The study assessed the existence of the local wisdom of swidden agriculture on Wawonii Island. Specifically, it identified the farming patterns in Wawonii Island and analyzed the local wisdom of swidden agriculture in Wawonii Island. Purposive sampling procedures were used to get an informant sample, and proportionate random sampling was used to get a farmers' sample. Informants in this study came from community leaders, village staff, and the agriculture and forestry service district. Konawe Islands and extension workers, while the sample of farmers totalling 30 people was taken proportionally from each sub-district on Wawonii Island. Data were collected using a structured interview schedule and summarized with percentages and means. The analytical method used is descriptive qualitative analysis. Results showed the local wisdom of the farmers who used to be slowly fading away. Farmers no longer carry out the tradition of land clearing as before due to limited land. The addition of chemical inputs also slowly began to be carried out because of the short period of resting land. The people of Wawonii Island manage their fields using two agricultural patterns carried out for generations: mixed cropping and monoculture. The existence of local wisdom of field farmers has decreased. The study recommended that the government provides policies that support the preservation of the local wisdom of the people that contribute positively to the balance of forest and land resources therein.

Keywords : existence; local wisdom; swidden agriculture; Wawonii Island

INTRODUCTION

The farming system/field farming is a traditional farming system still widely encountered and practised by the community in Indonesia and throughout the world. Although the Food and Agricultural Organization (FAO) said that shifting agriculture was the main barrier to expanding agricultural productivity in 1957, in reality, this farming system persisted and even began to be widely practised in 2012 (Mertz et al., 2009); (van Vliet et al., 2012);(Mukul & Herbohn, 2016);(Yusran et al., 2020) One of the most significant land-use systems in tropical climates is this traditional farming method (Pascual, 2005). In highland locations with low population density, shifting cultivation is considered a very effective agricultural strategy since the fallow seasons there are long enough to promote the regeneration of soil nutrients and vegetation (Fox et al., 2012).

In Indonesia, swidden agriculture is a traditional community culture on almost every island, including Sumatra, Kalimantan, Sulawesi, Maluku and Irian (Silvi et al., 2017). Wawonii Island is one of the islands where people still live in the fields and utilize forest resources. On the island of Wawonii, there is even a perception that some people are expanding and that the fields are more guaranteeing family life in the future than education. Not surprisingly, one farmer has a field in several places far from the house where he lives. Food plants cultivated in the field consist of five main types of plants: paddy rice, corn, soybeans, green beans, and cassava. Of the five types of food crops, paddy fields dominate the harvested area in Konawe Kepulauan Regency, 121 hectares or 33 per cent of the total harvested area. Field farming is significant for the people of Wawonii Island because

it is the livelihood of most people. Besides the geographical conditions of Wawonii Island, which support field farming because it is generally in the form of mountains and forests, the people of Wawonii Island have also made this farming a culture and habit maintained for generations from generation to generation. In the Wawonii tribe, each family head has inherited a field to manage as capital to meet family needs so that the results are oriented towards meeting the family's food needs.

The Wawonii tribe is said to have come from the plains of Southeast Sulawesi or, more precisely, to be located in the villages of Lasolo and Soropia (*Torete*) and the North Buton mainland in the Kulisusu village. Not many sources say since when the Wawonii tribe people began to occupy the island. What is clear is that they are indigenous people on Wawonii Island and are a distinct ethnic group which has customs and culture that are different from other ethnic groups in the archipelago. The Wawonii tribe has a custom symbol called *Kolungku*. *Kolungku* is a place for surrendering a formal event that shows a form of respect, appreciation and glorification of cultural values, traditions, and civilization that is normative or binding.

Field farming is still the leading choice for farmers who live on small islands, although its management pays little attention to the principles of ideal field management (Ostrom, 2007). The pattern of shifting cultivation still exists in the Arfak tribe, but the garden rotation time is getting shorter because the Distance between moving land is getting closer (Ataribaba Yuliana et al., 2020). The prospects for engaging in field farming in Southeast Asia are covered in research that looks at A Review of Swidden Agriculture in that region (Li et al., 2014). In addition, research related to field agriculture also discusses a lot of the negative impacts of swidden agriculture (Zenda Za Begani Arthur-Josué et al., 2020); (Tanzito et al., 2020); (Yandi et al., 2019) described that shifting cultivation In West Kalimantan, there are several districts, including Kapuas Hulu, Sanggau, Ketapang, and Porcupine explain that agricultural method for the local custom. An agricultural method known as shifting cultivation has been used by shifting farmers for generations. (Asysyifa, 2009) previous research on the Meratus Dayak tribe community revealed activity stages farming and the customary rituals accompanying it: a. Location Determination (*Bamimpi/Batanung*) b. It was clearing Land from Shrubs (*Manabas*) c. Logging of trees (*Batabang*) d. Burning (*Manyalukut*) e. Rice Seed Planting (*Manugal*) f. Maintenance of Plants from Grass (*Magrass*) g. Ritual when rice bears fruit (*Basambu*) h. Harvest (*Magatam*).

What is unique about the people of Wawonii Island is the tendency to become farmer farmers rather than fishermen, even though they generally live in coastal areas. Data from the Office of Agriculture and Forestry of Konawe Kepulauan Regency, 2020, showed that the island of Wawonii 2018 was 33,212 people. 33.21% of the population are farmers, 12.3% are fishermen, and the rest work in other sectors. The number of farmer fields is 800 households scattered throughout six sub-districts in Konawe Kepulauan Regency. The Wawonii tribe, in farming their farms, possesses indigenous knowledge. The phenomenon is interesting to study, primarily related to the local wisdom of the wawonii tribe in farming, which is still the choice of farming in this island community. The primary purpose of the research was to analyze the indigenous knowledge of swidden agriculture on Wawonii Island.

Specific objectives in a study are essential to determine the scope and objectives of the research. The purpose of this study is to find out a thorough understanding of the agricultural pattern practised by the Wawonii community, which focuses on local wisdom and to find out the existence of the application of local wisdom from the pattern of shifting cultivation practised by the Wawonii community. Overall, the specific objectives of the research provide a clear direction for the research, helping to ensure that the findings are relevant and valuable to policymakers and stakeholders.

MATERIALS AND METHODS

Between April and September 2020, the research was conducted in Wawonii Island Konawe Kepulauan Regency Province South East Sulawesi, Indonesia. A purposive sampling procedure was used to select respondents or informants. Purposive sampling is intended so that all respondents and research informants are believed to be genuinely residents so that the validity of the data can be achieved. From the first informant (base informant), the next respondent and informant are also obtained, and so on. The criteria for informants is to have extensive knowledge about various sectors in the community, especially related to field farming activities. The subjects who became the primary informants in this study were community leaders, village staff, agriculture and forestry service district. At the same time, the sample of farmers totalling 30 people was taken proportionally from each sub-district on Wawonii Island Konawe Islands and extension workers. The number of informants follows the thoughts of Koentjaraningrat (1994) and Moleong (1994), who suggest that in qualitative research, the determination of the size of sample size is not an absolute measure but is always based on needs

and developments in the field ". A planned interview schedule was used to gather the data, which was then condensed into percentages and means. Descriptive qualitative analysis is the analytical technique used.

RESULTS AND DISCUSSION

Characteristics of respondents

Based on the respondents' ages, levels of formal education, experiences, and the number of family dependents, the characteristics of the respondents to this research were identified. Briefly presented in Figure 1.

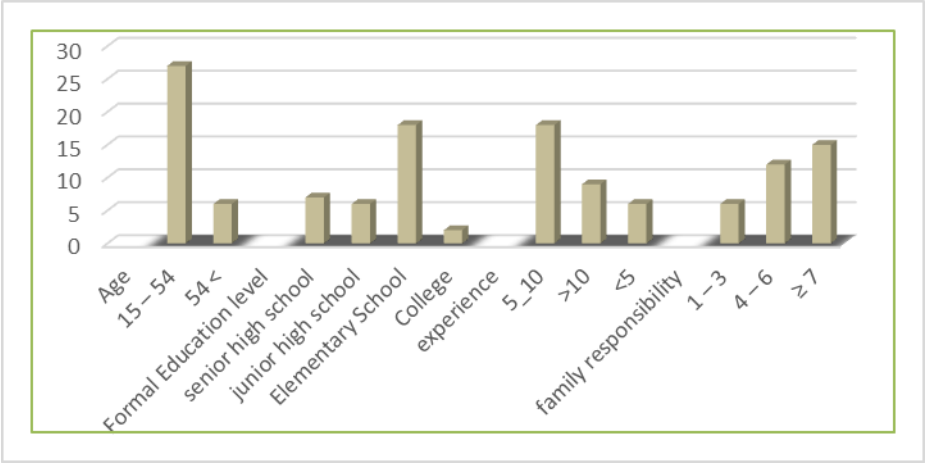

Figure 1. Characteristics of Respondents

Age is one of the factors that can affect physical activity and a person's thinking ability. Based on the data in graph 1, most responders fall under the productive age group. Productive age will affect the ability to think and develop insight and skills. Age level is also often associated with creativity and experience in solving existing problems, so there is a tendency to favour a younger age, primarily regarding the ability to carry out activities in the field.

Education is one of the essential factors for human life. Through education, a person can obtain various knowledge and skills that are very useful for himself and his life and in carrying out his daily duties. The respondents' formal education level in the research area is diverse. However, it is dominated by the level of elementary school education. Extension officers and the village head are only on the higher education level. This shows the need for a serious role from the government to increase the motivation of the people of Wawonii Island to get the highest education possible. Moreover, the local government has provided many facilities, such as scholarships for those who wish to continue their education.

Experience is a good teacher for someone. It can be said that someone who is experienced tends to pay attention when taking action so that the technology that will be recommended is not accepted spontaneously because of the trauma of failure that has occurred. Based on the data, the respondents' experience is in the reasonably experienced category.

The number of dependents in the respondent's family is essential in carrying out their duties. The number of dependents within a family determines how much effort is put towards providing for those dependents' needs. Most of the respondents are in the category of many dependents. This may impact one's willingness to attempt and serve as a labour supply for the family company. The demands of the family will be impacted by extension agents' failure in agricultural extension.

Overview of Farm Agriculture On Wawonii Island

The ancient agricultural method is essential to the everyday life of the residents of Wawonii Island. In Wawonii Island, the farming system is done by cultivating one farm and another on a rotating farm. Usually, the farm can only be used 2 to 3 times. For two to three years, the property is left in ruins. Indigenous peoples use indirect rotation farming methods as part of their traditional conservation efforts, which they inherited from their ancestors. By using this method, the community may stop opening additional fields for the plantation regularly. The season significantly impacts the agricultural process since the farm only produces an annual crop. Open fields were dried up and burnt

during the dry season. However, rice and other crops like corn were grown in the fields during the rainy season. Even though the agricultural system has a lengthy harvest, no pesticides or fertilisers are necessary.

Field rice is planted on the initial use of the land after clearing and processing, and a range of secondary crops and annual crops are planted on the following uses of the land, depending on the kind of annual plant or dominating plantation on the land. If the land is planted with coconut trees, the activity is known as laro ni'i; if the land is planted with cocoa trees, laro sokolati; or if the land is planted with cashew trees, *Laro Dambola*. After planting these long-term crops, the field activities of planting crops or vegetables are no longer carried out, making the second pattern of agriculture the ultimate activity of cultivating fields held by farmers. Yearly crop planting in the form of estate crops also serves as proof of ownership of the field it has seized control of and, if it is subsequently reopened, a land ownership border.

Wawonii Island has seen a lot of cultivation because the soil fertility has declined, and the land can no longer provide enough food to suit the demands of the neighbourhood. Traditional Wawonii farmers often lack knowledge of agricultural technology. Therefore plants still depend on natural soil fertility that may be attained via cultivation activities to meet their nutritional demands. The fallow season, also known as the land's resting phase, may assist in restoring the nutrients that plants lose due to prior crop cultivation operations. Since the field is a food source for farmers, the choice of land to be turned into fields is determined after careful consideration. According to the findings that fewer field farmers are now in existence (Rosmalah et al., 2019)

Local Wisdom of Swidden Agriculture

In Wawonii IslandIn the Wawonii Island community, the term "*Larongkeu Pomalia*" (forbidden forest) is known. In many interior points of Wawonii Island, particular forests are prohibited from entering or clearing as agricultural land. The existence of these forests is very sacred, and those who violate them are believed to have bad luck. Even though most of the population's activities are centred on agriculture, armed with local knowledge, the forests are maintained. In addition, there is the term "*Metabea"* or "*Metompari Tumpu Inia*". It means asking permission. When a farmer opens a new agricultural land outside of the "*Larongkeu Pomalia*", the farmer continues to perform a specific ritual as if asking permission from the forest and the "owner" of the forest before opening the land through "smart people" in the village. So clearly, there are restrictions between land for agriculture/plantations with forest areas.

The opening of the land in the first place had the conditions and procedure for the first openings of the land by the tribal chiefs (indigenous leaders) and their descendants. Conditions In the opening of a new land, it is not possible for anyone who does it must be a person of descent and still recognized. When they were about to open the land and start planting (Fire), the customary *(Puutobu*) leader would announce it at the Mosque to the public. And it has become the custom of the Dimba Village community. In the opening of the new land to enter the forest (*Mesopi Larongkeu*), there are two excellent and bad signs.

a. Good sign

People believe that a good sign is an excellent start to farming. When entering the forest (*Larvae of Larongkeu*) for the first time, the leaves of the young green tree are a good sign. Besides, cutting wood and reciting the Prophet's Prayer is a good sign when the wood is cut through and out of the water. And here is the piece of wood that is cut into pieces. And not just any wood. The wood that is cut is the wrong tree.

b. Bad sign

A bad sign means clearing a field and farming activities will not yield good results. When entering the forest (*Larvae of Larongkeu*) for the first time, the tree's root that extends downward (rope barge) is a bad sign. This means that the crop does not produce good results when it comes to cultivation, and when the wood is cut or pitted, it's a bad sign.

It is similar to the ways that the Dusun Laek community practises local knowledge while engaging in shifting agriculture (Silvi et al., 2017) is Prohibitions and prohibitions in Shifting Cultivation, especially for cultivators whose fields are adjacent to land that is being abstained after customary rituals are carried out, may not carry out activities in the fields for three days while the taboo is in progress. The community is not permitted to harm the environment around the fields while the cultivation process is underway, from the beginning until the final rice harvest is transported back to the village or cultivator's residence. The customary law in shifting cultivation, namely in the form of one crock/*Penungkal*, a free-range chicken weighing over one and a half kilograms, and one kilo of

yellow rice (*Tanung Perbanyu* in the Dayak Bekati language) must be paid to the spirit of the rice/*Nok Naya.*

Previously, some local and local community leaders did land clearing, but a community descendant led the forest by reciting prayers and vows. After the opening of the land, there was a prohibition that one day, the opening of the land, the next day, shall not do any work, such as felling timber or wood-related work, shall not be done in one day. If someone violates it, he will get the disease until after the rice harvest. This happened because there was an oath from an older man who opened the land.

This tradition has been passed down through the ages and is still believed by the local community. But now, no one else enters the forest to open new land because the people already have their own inherited land. At the time of clearing the land, there are stages; 1) Treating trees, 2) After drying cleaning the branches (tree), 3) After cleaning the branches (for a few months) it is left to do the rubbing of the twigs (*Montunu Tinunu*), 4) Then finish planting (fighting).

Also found that the stages of shifting cultivation in Laek Hamlet are: Clearing the undergrowth by cutting down the undergrowth (*Nguma)*, Logging large trees using a machete (*Nahut*), Chopping the crowns of trees *(Najak*), Letting the land dry within 4-5 weeks, After drying, burning wood *(Nyahu*), cleaning up the remaining wood that has not been burnt down (*Ngakas/Nyahu Kubu*), cutting/making planting holes (*Nuruk*), planting rice into holes in the ground (*Ngumpan)*, weeding the fields using a plough (*Ngudu*), waiting for rice bearing fruit (*Ngantik Pade Batahi*), harvesting rice using traditional *Katam* tools made of iron (*Ngutum Pade*), cleaning rice from stalks (*Ngehel Pade*), winnowing rice (*Meo Pade*), transporting rice yields to the house (*Nyingsang Pade Ka'ramin*) (Silvi et al., 2017)

Existence Local wisdom of smallholder farmers in Wawonii Islands

Local wisdom means that society's social structure still contains wisdom developed for the common good. For farmer farmers on Wawonii Island, local wisdom contains social values that serve as the norm for preserving forest resources. As a result of multi-factor interventions, particularly the reduction in forest land due to mining, the higher population pressure causes vulnerable farms to be threatened and fade. In the field farmers on Wawonii Island, local wisdom in managing the fields has faded. This can be seen from several factors, such as the period of resting land that is experiencing shortening, the use of chemical inputs that farmer farmers have never used, and the Distance of fields getting closer to settlements and public facilities. Local wisdom in managing the fields that are still maintained is planting various commodities in the field to overcome the possibility of the risk of crop failure. According to Hujairin et al., (2017), it was emphasized that shifting cultivation for the people of the interior of the Arfak tribe is a farming system that has been carried out for generations. However, the existence of this field farming has experienced a shift/fading in local wisdom values occur due to: (1) population pressure, (2) reduced workforce; (3) the development of mechanisms (swimming regulations), and (4) the presence of disturbances from the cycle of nutrients in nature, such as due to damaged forests or soil erosion and others.

a. Giving period

The ground rests during the giving time before being cultivated and planted once again. Farmers use a long-term fallow farming strategy to cultivate the food crops they require daily (subsistence). In circumstances of low population density, this system is regarded as environmentally stable. Yet, farming practices have become more intensive due to fast population expansion, rising market demand for agricultural goods, and changes in government policy about land use and habitation (Pauw, 1995). Based on the outcomes of data analysis in the field, it is evident that from 2013 to 2018, there was a drop in the time needed for the land to rest before being planted, or, to put it another way, from 2013 to 2018 there was a gradually shortened fallow period. The system that rotates land use cycling) generally, with increasing (following) so that the vegetation naturally covers land and natural success of bush into the secondary forest and ready reopened or semi-annual (semi-fallowing) by cultivating crops complex plantations such as rubber in Jambi without intensive care, it becomes a rubber forest (Evizal, 2015). Farming system community turnaround the Meratus Loksado Dayak tribe is known with 6 M: Slashing, Cutting, Burning, Burning, Grazing and Reaping. Farmland, which was already infertile after being planted for 1-2 years, rested. While waiting for natural succession with the formation of secondary forests in grasslands and wild trees, the cultivators will open up new land. They will return to the initial land if that land being left behind is enough fallow period of 5-10 years (Asysyifa, 2009).

b. Commodity Diversity

The method of clearing land in a specific location, chopping and burning, and then planting various food crops like rice, maize, or cassava is known as shifting agriculture. Climate significantly impacts the burning season and planting fields, making shifting agriculture a highly reliant practice on climate. As the rainy season arrives, the community plants seeds in the fields instead of clearing the ground and burning it during the dry season. Shifting cultivation has been used on land for a very long period. Since the land is unproductive, fields will be abandoned in two to three years. The second land will be abandoned when the first abandoned piece of land becomes fruitful again and is reopened for farming. As the process continues, a map of the agricultural land has been created indirectly. The danger of releasing additional land from central forests may be decreased by mapping farming areas for traditional communities (Thrupp et al., 1997). According to data gathered from the survey's conclusions, the number of commodities planted on farmer-owned farms decreased. After developing paddy fields when they first launched their farms in 2013, 2014, and 2015, farmers continued cultivating three different crop types. Maize, cassava, and sweet potato are cultivated after field rice. However, the commodity was only grown into one commodity in 2018—notably cassava, corn, or sweet potato. Cassava is the most popular crop since it does not require special maintenance, which is challenging for farmers. However, because maize is easier to grow regarding water availability, it only grows during the rainy season. It is common practice to intercrop different food crops in one land area (Mulyoutami et al., 2010).

c. Application of Chemicals

Overuse of pesticides harms soil fertility, kills creatures, damages plants, and has a detrimental influence on surface and groundwater. Indonesia's agricultural system is a typical example of a current agricultural system. Using pesticides like insecticides, herbicides, and other sorts that are not ecologically friendly is the traditional method used in contemporary agriculture. Large amounts of ingredients, such as pesticides, may contaminate the environment, including rivers, lakes, and reservoirs. Pesticides are substances that are challenging to break down. Pesticide waste that gets into the environment will build up in the organism's body. Environmentally friendly agricultural method: the field system. To practise shifting agriculture, rich forest land is first cleared and burned to ash in certain places. Combustion ash will play a crucial role in soil enrichment. This method is appropriate for locations with acidic soil since combustion ashes may raise the pH of the soil. In addition, before the land is fully farmed and used for agricultural activities again, the fallow method, used in farming, is one of the efficient ways to restore fertility. While shifting cultivation has a relatively lengthy harvest, farming does not need pesticides or fertilisers on private property (Rifki, 2017). According to the study, farmers increasingly use chemical inputs in their fields. Initially, farmers only used herbicides to remove grass from the land they would buy. Still, over time, they developed an interest in using other chemical inputs like fertiliser to maintain soil fertility. Since the cultivated land no longer respects the fallow time before the land is utilised again, the decreasing fertility of the ground prevents it from producing the desired outcomes. The research conducted by (Asysyifa, 2009) highlighted how the farming method used for the study had changed. These social changes are brought about by establishing demands that must be met to satisfy societal requirements. It seems that civilization is attempting to hasten the recovery of soil fertility by reducing the fallow time and using fertilisers and pesticides. These changes in society take the form of an endeavour by society to hasten the restoration of soil fertility by shortening the fallow season and using fertilisers and pesticides. These changes are brought about by the creation of demands to be able to meet them social requirements.

d. Distance between fields and settlements or public facilities

The fields were first made in the forest, distant from homes or public buildings. Yet, throughout time and due to rising population density, there is now less space between fields and towns or public buildings. According to the study's findings, it can be said that the Distance between fields and towns or public services is decreasing with time. Up to 2018, there was a gap of only 1 kilometre between the fields and any populated areas, down from the previous year's Distance of over 4 km.

CONCLUSIONS AND SUGGESTION

The residents of Wawonii Island manage their fields utilising two hereditary farming practices, namely mixed farming and one kind of farming (monoculture). Farmers using diverse fields known as laro with perennial crops such as sweet potatoes, rice, cassava, and maize, use this agricultural

style—the local wisdom of the farmers who used to slowly faded away. Farmers no longer carry out the tradition of land clearing as before due to limited land. The addition of chemical inputs also slowly began to be carried out because of the short period of resting land. Farmers that use diverse fields, referred to as Laro Wita by locals, and planted with perennial crops, including rice, cassava, maize, and sweet potatoes, use this agricultural style. To maintain soil fertility, mixed gardens are typically farmed for around three years before being supplied (rested) for many years. Since after planting these long-term crops, the field activities by planting crops or vegetables are no longer carried out, the second pattern of agriculture is the ultimate activity of cultivating fields held by farmers. Yearly crop planting in the form of estate crops also serves as proof of ownership of the field it has seized control of and, if it is subsequently reopened, a land ownership border. To maintain the sustainability of local wisdom following the prevailing culture, relevant stakeholders such as the agriculture department and the agriculture instructor must ensure the existence of farmer fields by providing facilities that facilitate the sustainable management of fields and guarantee the existence of farmer fields. The existence of farmer fields is experiencing breeding. This is evident from the shorter fallow season, the decreasing variety of produced commodities, the use of chemical inputs that farmers shouldn't be using, and the proximity of fields to towns or public services, which should be far away. Suggestions for research are policies to maintain upland farming need to be considered for the sustainability of the environmental ecosystem, which is the main characteristic of upland farming. The local wisdom of the community that is aligned with the environmental sustainability objectives of the forest as a place for field farming activities needs to be maintained

ACKNOWLEDGMENTS

Thank you to the University of Muhammadiyah Kendari for supporting this research by providing internal research funds until the completion of this research article.

REFERENCES

Asysyifa. (2009). Karakteristik Sistem Perladangan Suku Dayak Meratus Kecamatan Loksado Kalimantan Selatan. *Hutan Tropis Borneo*, *25*(25), 98–109. https://ppjp.ulm.ac.id/journal/index.php/jht

Ataribaba Yuliana, Setiawan Iwan, & Noor Trisna Insan. (2020). Pola Pergeseran Nilai Kearifan Lokal Sistem Ladang Berpindah pada Masyarakat Arfak. *Mimbar Agribisnis Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis.*, *6*(2), 812–832. http://dx.doi.org/10.25157/ma.v6i2.3570

Evizal, R. (2015). Etno-agronomi Pengelolaan Perkebunan Kopi di Sumberjaya Kabupaten Lampung Barat. *Agrotrop: Journal on Agriculture Science*, *3*(2), 1–12. https://ojs.unud.ac.id/index.php/agrotrop/article/view/15195

Fox, J., Vogler, J. B., Sen, O. L., Giambelluca, T. W., & Ziegler, A. D. (2012). Simulating land-cover change in Montane mainland southeast Asia. *Environmental Management*, *49*(5), 968–979. https://doi.org/10.1007/s00267-012-9828-3

Hujairin Muhammad, Ahwan Ismadi, & Tatan Kustana. (2017). Revitalisasi Kearifan Lokal Suku Arfak di Papua Barat Dalam Rangka Mendukung Ketahanan Pangan Wilayah - Penelusuran Google. *Jurnal Pemikiran Dan Penelitian Manajemen Pertahanan*, *3*(1), 53–77. https://jurnalprodi.idu.ac.id/index.php/MP/article/view/59

Li, P., Feng, Z., Jiang, L., Liao, C., & Zhang, J. (2014). A review of swidden agriculture in Southeast Asia. *Remote Sensing*, *6*(2), 1654–1683. https://doi.org/10.3390/rs6021654

Mertz, O., Leisz, S. J., Heinimann, A., Rerkasem, K., Thiha, Dressler, W., Pham, V. C., Vu, K. C., Schmidt-Vogt, D., Colfer, C. J. P., Epprecht, M., Padoch, C., & Potter, L. (2009). Who counts? Demography of swidden cultivators in Southeast Asia. *Human Ecology*, *37*(3), 281–289. https://doi.org/10.1007/s10745-009-9249-y

Mukul, S. A., & Herbohn, J. (2016). The impacts of shifting cultivation on secondary forests dynamics in tropics: A synthesis of the key findings and spatiotemporal distribution of research. *Environmental Science and Policy*, *55*(March 2020), 167–177. https://doi.org/10.1016/j.envsci.2015.10.005

Mulyoutami, E., Noordwijk, M. van, Sakuntaladewi, N., & Agus, F. (2010). *Perubahan Pola Perladangan*. website: http://worldagroforestry.org/sea

Ostrom, E. (2007). A diagnostic approach for going beyond panaceas. *Proceedings of the National Academy of Sciences of the United States of America*, *104*(39), 15181–15187. https://doi.org/10.1073/pnas.0702288104

Pascual, U. (2005). Land use intensification potential in slash-and-burn farming through improvements in technical efficiency. *Ecological Economics*, *52*(4), 497–511. https://doi.org/10.1016/j.ecolecon.2004.09.012

Pauw, E. De. (1995). Plant-Soil Interactions at Low pH: Principles and Management. *Plant-Soil Interactions at Low PH: Principles and Management*, *June*. https://doi.org/10.1007/978-94-011-0221-6

Rifki, M. (2017). Ladang Berpindah dan Model Pengembangan Pangan Indonesia. *Seminar Nasional Inovasi Dan Aplikasi Teknologi 2017*, *February*, E22.1-E22.7.

Rosmalah, S., Widayati, W., & Sidu, D. (2019). Existence of Swidden Agriculture on a Small Island. *The Ijes*, 68–75. https://doi.org/10.9790/1813-0803016875

Silvi, Lumangkun, A., & Wardenaar, E. (2017). Kearifan Lokal Masyarakat Dalam Kegiatan Ladang Berpindah Di Dusun Laek Desa Bengkilu Kecamatan Tujuh Belas Kabupaten Bengkayang. *Jurnal Hutan Lestari*. http://dx.doi.org/10.26418/jhl.v5i4.23017

Tanzito, G., Ibanda, P. A., Talaguma, R., & Lusanga, N. M. (2020). Slash-and-burn agriculture, the major cropping system in the region of Faradje in the Democratic Republic of Congo: Ecological and socio-economic consequences. *Journal of Development and Agricultural Economics*, *12*(1), 25–36. https://doi.org/10.5897/jdae2019.1140

Thrupp, L. A., Hecht, S., Browder, J. O., & World Resources Institute. (1997). *The diversity and dynamics of shifting cultivation : myths, realities, and policy implications* (Issue September).

van Vliet, N., Mertz, O., Heinimann, A., Langanke, T., Pascual, U., Schmook, B., Adams, C., Schmidt-Vogt, D., Messerli, P., Leisz, S., Castella, J. C., Jørgensen, L., Birch-Thomsen, T., Hett, C., Bruun, T. B., Ickowitz, A., Vu, K. C., Yasuyuki, K., Fox, J., … Ziegler, A. D. (2012). Trends, drivers and impacts of changes in swidden cultivation in tropical forest-agriculture frontiers: A global assessment. *Global Environmental Change*, *22*(2), 418–429. https://doi.org/10.1016/j.gloenvcha.2011.10.009

Yandi, J., M, I. A., & Idham, M. (2019). Permasalahan Sosial Pada Masyarakat Ladang Berpindah Akibat Perkebunan Kelapa Sawit Di Desa Sempurna Kecamatan Sungai Laur Kabupaten Ketapang. *Jurnal Hutan Lestari*, *7*(1), 256–264. https://doi.org/10.26418/jhl.v7i1.31663

Yusran, J., Yonariza, Y., Elfindri, E., & Mahdi, M. (2020). Kebangkitan Ladang Berpindah Di Nagari Silayang Kecamatan Mapattunggul Selatan Kabupaten Pasaman Provinsi Sumatera Barat. *SOCA: Jurnal Sosial, Ekonomi Pertanian*, *14*(1), 1. https://doi.org/10.24843/soca.2020.v14.i01.p01

Zenda Za Begani Arthur-Josué, N., Faustino, O.-M., & Godfrey, M. (2020). Subsistence Agriculture and its Effect on Smallholder Farmers' Socioeconomic Status in South Kivu Province, Democratic Republic of Congo. *Journal of Environmental Science and Public Health*, *04*(04), 380–389. https://doi.org/10.26502/jesph.96120108