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Local knowledge of the *using tribe* farmers in environmental conservation in Kemiren Village, Banyuwangi, Indonesia

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ABSTRACT

Using Farmers (Banyuwangi ethnic community) in Kemiren Village uses their ancestral knowledge in utilizing natural resources and the environment so that its sustainability is maintained. This study aims to identify the local knowledge of *Using* farmers in Kemiren Village, Banyuwangi Indonesia which plays a role in preserving their natural resources and environment. The study uses a qualitative approach and the data collection using documentation, interview, and field observation techniques. Data analysis uses methods cross-referenced and repeated information. Local knowledge of *Using* farmers that used to manage the environment is in the form of values (togetherness, obedience, consensus, fairness and caring), norms (prohibitions/taboo and suggestions in utilizing natural resources), belief (providing *labuhan*/offerings and *selamatan*/ritual), and practices in utilizing natural resources. The primary key that plays a role in environmental preservation is a harmonious relationship among farmers.

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INTRODUCTION

Local knowledge relates to the pieces of knowledge, beliefs, traditions, practices, institutions or institutions, as well as the views of life held by local communities about the relationship between living things, including fellow humans and their relationship with the environment (Gadgil, Berkes, & Folke, 1993; Vandebroek, Reyes-García, Albuquerque, Bussmann, & Pieroni, 2011). Cultural norms and values possessed by local communities are also part of the local knowledge system (Agatha, 2016). Local knowledge is a cultural heritage, about practices that can be used as a source of information for planning and management of land and natural resources (Eyporsson & Thuestad, 2015). Local knowledge is also dynamic, adaptive, and holistic (Beckford & Barker, 2007).

Ancestors of indigenous peoples in Indonesia conceptualize local knowledge in the form of local wisdom that is used as a guide for behaving and acting towards nature and the environment (Siswadi, 2011). They think it is imperative to maintain and utilize natural resources in a balanced manner or sustainable (Thamrin, 2013). Utilizing natural resources is done using perspectives obtained based on experience and knowledge (Heryanto, Supyandi, & Sukayat, 2018). Therefore, local people can be used as a reference behavior that should be done by humans to preserve nature (Darusman, 2014).

Local communities in Indonesia play a role in conservation through traditional land management (Iswandono, et al., 2016; Tamalene, Hasan & Kartika, 2019). The Baduy community in Banten manages the natural resources of the forest by dividing it into three, namely *larangan* forest, *dudungusan* forest, and *garapan* forest, where *larangan* forest is prohibited and not permitted by anyone. Limited harvesting may be done in the forest *dudungusan*, while *garapan* forests function as fields or *Huma* (Suparmini, Setyawati, & Sumuar, 2013). *Tallasa kamase-mase* (simple life, as it is) is a principle of life owned by the Ammatoa community that has prevented excessive harvesting of forest products (Sukmawati, Utaya, & Susilo, 2015).

Agriculture has close links with indigenous peoples in Indonesia, where indigenous farmers manage their farming using customary provisions (Kurniasari, Cahyono, & Yuliati, 2018). Local knowledge such as rituals, traditional ceremonies, and activities related to local values affect the environmentally friendly behavior of farmers, namely reducing the negative impact on the environment in managing agricultural land (Mulyadi, 2011; Hariyadi, Tamalene, & Hariyono, 2019). The *Using* Community (or also called Osing tribe) is an indigenous community that is considered a native of Banyuwangi Regency, East Java Province, Indonesia. Kemiren Village is one of the villages in the Banyuwangi Regency, where the community still firmly holds the Using tradition. The community interaction with nature is related to agriculture because most of the people are farmers. They have local knowledge to preserve their environment (Herawati, 2004) and has been proven to contribute to the preservation of water resources in Kemiren Village around (Sumarmi, 2015). Rice fields in Kemiren are also known to be fertile and never lack water so that farmers can grow crops throughout the year. They still maintain the culture of rice fields until now, where the culture means learning to respect and care for nature as it is towards their self (Saputro, Purwadi, & Marhaedi, 2015).

Local knowledge is formed informally and is rarely documented because it is inherited verbally. This study aims to identify the local knowledge of *Using* farmers in Kemiren in managing natural resources and the environment so that it plays a role in the preservation of the village environment. Local knowledge needs to be documented because it can be developed as a model for sustainable natural resource management, where at present many local practices have been lost (Kala, 2013). Local knowledge can also be lost gradually due to the introduction of the concept of unsustainable development, where the effect of the loss is not only clearly seen in the local community but also gives other community losses (Ihenacho, Orusha, & Onogu, 2019).

Kemiren Village is a village that is open to technology and globalization. Kemiren farmers have utilized new technology products such as hand tractors to plow fields (although there are individual farmers who use cows) and rice thresher machines. They also use chemical fertilizers and get assistance from agricultural extension workers. Therefore, it is essential to document the local knowledge of *Using* farmers in Kemiren so that this knowledge is not lost and can be passed on to the next generation.

Methods

Research design

The research approach used was qualitative and data was collected through observation and interviews (Albuquerque, Ramos, Paiva de Lucena, & Alencar, 2014). Observations were made through participant observation and unstructured observation based on Bungin (2007). Participant observation is done by observing and directly involved in the activities of the informant who is a local expert, while unstructured observation by observing the activities of farmers and the condition of rice fields in Kemiren Village. Interviews were conducted by establishing direct communication with selected informants. Interviews conducted included semi-structured interviews and informal interviews based on Albuquerque, Ramos, Lucena, & Alencar (2014).

Participants

This research was carried out in Kemiren Village, Glagah Subdistrict, Banyuwangi Regency, East Java, from February to May 2019. The selection of informants was carried out through purposive and snowball sampling techniques. The purposive sampling technique was used to select critical informants, namely 2 elders of Kemiren Village. In contrast, the snowball sampling technique is used to select recommendation informants based on information from key informants. The recommendation informants consisted of 10 farmers as local experts in the agriculture of Kemiren Village, 1 *Modin Banyu,* and 3 Irrigation Service Officers. *Modin Banyu* is appointed as a regulator of the distribution and utilization of Kemiren village irrigation based on the farmers' deliberations and agreements.

Data analysis

Data was analyzed with cross-referenced and repeated information methods (Albuquerque, Lucena, & Lins, 2014). The results of the analysis were descriptive data of local knowledge of *Using* farmer that plays a role in the environmental preservation of Kemiren Village.

Results and Discussion

Kemiren Village is at an altitude of 187 m asl. The percentage of farmers and farm laborers in Kemiren Village is 38.5% of the entire village population. In comparison, the rice paddy and dry fields area is 78% of the total area of Kemiren Village. The agricultural system of the community is settled agriculture and uses a technical irrigation system. Irrigation water utilizes the Gulung River flowing from upstream in the Kali Bendo plantation area with the arrangement of officers from the Irrigation Services Department in synergy with *modin banyu*. Gulung River never recedes its water even though during the dry season so that it can fulfill irrigation needs for the rice fields of Kemiren Village throughout the year. Therefore, the fields of Kemiren Village can be planted with paddy throughout the year.

Local knowledge used by *Using* farmers of Kemiren Village in the utilization and management of natural resources is sourced from *weluri,* which was passed down by their ancestors. *Weluri* is a testament, advice, knowledge, procedure/technique, and traditions of the ancestors used as guidelines on how to behave towards fellow humans and their environment.

Weluri is still maintained and carried out today as a form of obedience to his ancestors. Based on research data, the local knowledge of *Using* Kemiren farmers who play a role in environmental conservation can be categorized as values, norms, beliefs, and environmental management practices (Table 1). Values in local knowledge are related to togetherness, obedience, consensus, fairness, and caring (Siswadi, 2011). Values are related to life goals, while norms are used to regulate the behavior and actions taken by humans (Kaczocha & Sikora, 2016). These norms are social norms relating to what other people are expected to do (Nordlund, 2009).

Table 1.
Local knowledge of *Using* farmers to manage the natural resources and environment

Categories	Form of local knowledge
Value	Togetherness Obedience Consensus Fairness Caring
Norms	They are maintaining the quality of spring water sources. Providing *labuhan* (offerings) and ritual in rice fields and spring Maintaining irrigation channels Reporting tree felling and planting new plants as a substitute No felling trees in the spring area No trespassing above the spring
Belief	Provides *labuhan*/offering and ritual in rice fields Provides *labuhan*/offering and ritual in spring
Knowledge	Making land near rivers as the dry field (gardens), Using cow dung for manure Planting that is often needed plants Working together to clean dams and irrigation channels Selective logging

Local knowledge in the form of values

Values in managing natural resources and the environment are still firmly held by the Kemiren community and became an advantage of the Kemiren community. Other neighboring villagers also recognize this advantage. The value of togetherness can be seen from the tolerance attitude, mutual respect, and does not interfere or take other people's property developed by the Kemiren farmers. This value is also a guideline for all Kemiren people so that they will not dare to disturb, destroy, and take something in someone else's rice field without the owner's permission, even just grass.

The persistence of Kemiren farmers to maintain the values have raised the respect of other village communities. Therefore, the rice fields belonging to the Kemiren people in another village will not be disturbed by farmers in that village even though the fields are not guarded. No one dares to take their plants, even grass without permission. However, the community has a unique tradition to notify that plants or grass on their land should not be taken, namely by plugging *blarak* (coconut leaf midrib) (Figure 1). Even though there is no *blarak*, people still will not take plants from other people's land as an expression of respect and do not want to interfere or take other people's property. Tolerance among farmers can be seen from the reluctance to ask for grasses that grow in the fields if the farmer has cows and other livestock because he knows the grass will be used for animal feed.

Figure 1. *Blarak* as a marker in a rice field

All matters relating to the necessities of life of all farmers are arranged together through deliberations to get consensus. Consensus can be created because all things are done in a kinship, tolerance, and care so that it will not interfere with other people's property or public facilities that belong together. Consensus has been able to stop existing conflicts in the community and prevent future conflicts in the use of natural resources because of community obedience with the agreements (Bawole, Simbolon, Wiryawan, & Monintja, 2014). The farmers will respect the decisions made and, with personal awareness, will implement them. The obedience to regulations, whether written or not, is reflected in several actions, such as the irrigation water regulation carried out by the *modin banyu*, the tree felling rules, and the farmers' group rules that have been mutually agreed upon. Springs that appear on someone's land will also not be owned privately and allow other communities to use them as a form of togetherness and caring for others. Mutual sharing is also applied to other resources such as plants needed for food, medicine, and *labuhan* (offerings).

Local knowledge in the form of Norms

The norms implemented by the Kemiren farming community contain elements of suggestions and prohibitions in behavior to avoid harming nature and fellow humans. The suggestions and prohibitions are (1) maintaining the quality of spring water, (2) *labuh* (giving offerings) and held ritual in rice fields and spring, (3) maintaining irrigation channels, (4) reporting tree felling and planting plants only as a substitute, (5) no felling trees in the spring area, and (6) no trespassing above the spring

Maintaining the quality of springs water. Kemiren village has water springs with varying discharge. 29 recorded springs are scattered throughout the village (Kemiren Village Profile, 2016). The Springs is generally appeared in gardens and along the river of *Sobo* River and the *Gulung* River flanking Kemiren village. Water from springs will flow into both rivers, thus increasing river water discharge. Water from a spring is usually collected first and then flowed through pipes for later use (Figure 2).

Farmers usually use spring that appears near their fields to clean themselves (take a bath) after their field activities. Kemiren farmers have a habit of paddling all day and go home in the evening so that near the spring is usually built a Muslim simple prayer place. Things that should not be done at water spring are entering the water from the source of the water discharge to the shelter, urinating, or defecating near the source of the water discharge. These prohibitions

are useful for maintaining water quality. In addition to farmers, water springs are also used by the Kemiren community (generally women) to wash clothes.

Figure 2. Springs of Kemiren Village

Maintain irrigation channels. Rice field irrigation water comes from the Gulung River, sourced from the Bendo Kali plantation (about 10 Kilometers from Kemiren Village). Water from the Gulung River has flowed through irrigation channels until it reaches the community's rice fields. All farmers are encouraged and required to maintain irrigation channels and not take actions that can damage the irrigation channels. The farmers also realize that irrigation canals are a necessity for all farmers, so they do not dare to do things that will harm other farmers. The rice field irrigation system in Kemiren village was once regulated only by the *modin banyu*. However, agricultural irrigation is now under the supervision of the Irrigation Service that synergizes with the *modin banyu.* The synergy between the Irrigation Service, *Modin Banyu,* and farmers have kept the irrigation channel well maintained. Watersheds (area along the river) are still well preserved because people obey the prohibition against cutting down trees along the watershed.

Reporting tree felling and planting new trees. Farmers and other communities will report to the village government if they cut down trees even though the tree is their own, planted in their gardens. This is a rule set by the village government, and the community obeys it with self-awareness. They also plant new trees as a substitute before logging is done.

There are no falling trees in the spring area. People do not dare to cut down trees that have the springs under, although there are no myths about the tree. The community does it because they know the vital role of trees for the sustainability of springs. If the spring comes out of the bamboo clump, then the bamboo cut down use selective feeling that it does not interfere with the survival of the bamboo population and the spring.

No trespassing above the spring. Another prohibition norm is no to trespassing area above the spring. The teachings of ancestors are interpreted with the aim that the land above the spring does not constitute landslide. The community also means that the land above the spring is forest, so the prohibition is interpreted as ancestral advice so that their descendants do not disturb the forest.

Values and norms that are obeyed and applied by farmers are one of the primary keys to the success of environmental management in Kemiren Village. The community is always live in harmony, mutual respect, and help each other. There is no conflict between them. These norms and values are characteristic of rural communities that consider more social-culture and nature conservation than economic interests (Chalim, 2012). Social norms will strengthen social ties and a sense of social responsibility in the use of environmental resources (Agatha, 2016).

Local knowledge in the form of belief

Provides *labuhan*/offering and ritual in rice fields and spring. *Labuh* (give an offering, as shown in Figure 3a), *is* done as part of society's universal belief. The purpose of ritual and *labuhan is* generally to ask for safety, avoid catastrophe or disease, and the water used to irrigate rice fields will make paddies flourish and produce abundant yield. Based on Koentjaraningrat (2015), ritual and offerings such as those conducted by *Using* farmers are a form of religious ceremonies, a form of surrender to the God who has powered higher than them. Religious activities cause people to feel religious emotions that will encourage them to have an attitude and take religious actions.

(a) (b)

Figure 3. (a) *Labuhan* and (b) *adeg-adeg*

Labuhan done by each farmer is different because each paddy field depends on each family's ancestor's testament. Some *labuhan* used are *getihan cengkaruk, kinangan, incense, jenang lemu, jenang abang,* and *cekeker*, as shown in Table 2. *Labuhan* can be only one type or several types of those materials depending on the testament of the ancestors. *Labuhan*, which is carried out by farmers related to environmental management (water conservation), namely when *dying al* or plowing the fields, *tandur* (planting paddy), *dauhan* (ritual clean dam), and *rebo wekasan* (ritual on last Wednesday in the month of *Sapar* the Javanese calendar).

Labuhan nyingkal (plows the paddy field) *is* placed near the *wangan* (water entry hole into the field) when the water starts to flow into the paddy field. If the plants planted by farmers do not need water flow when plowing the paddy field like *palawija* crop, the farmer does not putting *labuhan.* The farmers putting the *labuhan* and also plugged in *adeg-adeg* in the *wangan* when *tandur*/planting paddy (Figure 3b). *Adeg-adeg* is several plant stems (Table 3), that plugged into the ground. Each family has his *adeg-adeg* depending *weluri* each ancestor, and it can be only one kind of plant or several plants. *Adeg-adeg* is believed to be able to ward off diseases or pests that attack rice. *Labuh* lying is accompanied by a prayer that is usually done by the farmers themselves.

Table 2.
Labuhan and its materials used

Labuhan	Material
Getihan cengkaruk	sun drying rice and then given a palm sugar thawed
Kinangan	materials for *nginang,*
Jenang Lemu	rice cooked with coconut milk was given red sugar water
Jenang abang	porridge of rice cooked with brown sugar

Cekeker	head, legs, and wings of *chicken* with seasoning *pecel* typical *Using*
Asepan	incense

Ritual *dauhan* happens in October, with the drying of the dam carried out by the Irrigation Service. The drying process aims to check the condition of dams and irrigation channels, carry out maintenance, and repair damaged installations. This ritual was led by *modin banyu* after the community cleaning up the river in the area around the dam, and water began to flow again through the dam. *Labuhan* given is a *cekeker, a pitung tawar* flower (flowers mixed with raw rice given turmeric juice, so it is yellow)*, jenang abang, and asepan* (incense). The salvation by eating dishes *pecel pithik* together is done at the end of the ritual. *Modin banyu* will advise so people in harmony, mutual respect, not fighting over irrigation water, and if there are problems between people in the community, then report to him immediately.

Table 3. The plants of *Adeg-adeg* and used organ

Plants	Used organ
Castor (*Ricinus communis*)	stalks with leaves
Galangal (*Alpinia galanga*)	stalk with leaves
Dringo (*Acorus calamus)*	leaves
Kluwih (*Artocarpus camansi*)	stalk and leaves
Jambe (*Areca catechu)*	leaves

The *rebo wekasan* ritual is carried out because the community believes that on the last Wednesday in *Sapar* (Javanese calendar), the disease is transmitted through water. Therefore, on this day, the community must not take water from any water sources for drinking and cooking needs because they are afraid of contracting the disease. A ritual performed in water sources such as rivers and springs by providing *labuhan* and recite prayers together, and then eat a dish of *jenang abang* and *sego golong* (white rice with boiled chicken egg dishes and *pecel* sauce typical *Using*). *Sego golong* has philosophy as a piece of advice that as humans must have clean and soft white hearts (parables of egg whites) so that they are as valuable as gold (parables of egg yolks)—putting *Labuhan* at the spring also done at harvest time.

Labuhan, adeg-adeg, selametan, and prayers that they say in every paddy activity is a form of belief in cosmic forces that can affect their life. Matters relating to belief are very susceptible to outside culture, and some consider it superstition (Yuan, Lun, He, Cao, Min, Bai, Liu, Cheng, Li, & Fuller, 2014). However, the Kemiren farmers still hold unwavering those things and not dare to leave them. Farmers do not dare to violate them because they want to obtain safety, avoid catastrophe or disease, and expect abundant harvests. Besides, the ritual is an ancestral *weluri*, and it is carried out as a form of respect for the ancestors.

Spiritual and cosmological beliefs have an essential meaning in the use and management of biodiversity (Rankoana, 2015). The use of individual plants that are used for *labuhan* makes these plants have an essential meaning for the people of Kemiren. The community will protect plants beneficial for their lives (Tamalene, Al Muhdhar, Suarsini, Rochman, & Hasan, 2016), affecting the preservation of these plant species. Belief can also influence local communities' behavior to support the implementation of local wisdom in environmental preservation (Limba, Lio, & Husain, 2017).

Local knowledge in the form of practices

Local practices by Kemiren farmers that have an impact on environmental preservation are, making the land near the river as dry fields (garden), using cow dung for manure, cultivate plants that are often needed, cooperate to clean dams and irrigation channels, selective logging.

Local practices related to the management of biological diversity and ecosystems to ensure the continuity of the natural resources and ecological functions flow that support the community (Berkes, Colding, & Folke, 2000).

They were making land near the river, a dry field (garden). Farmers who have land near the watershed will make it a garden or dry field (Figure 4), even though the land can also be used as rice fields (planted with rice and *palawija* crops). They have an understanding that trees can prevent soil erosion so that land will be turned into gardens and planted with trees. They are worried that if the land is turned into a rice field, it will cause soil erosion, which will harm the environment. Another reason is the spring that comes out of the roots of trees that exist along the watershed. The community also planted trees along the river together with the Irrigation Service.

Figure 4. Land near the river used as a dry field

Utilize cow dung for manure. Farmers usually also become cattle ranchers. Cow dung will be used as manure and will usually be spread before the process *singkal* is carried out. Making manure is done simply, which is cow dung placed on the ground and left alone without any treatment. The community indicated that dung could be used as manure when its color was black as the color of the soil.

Cultivate crops that are often needed. Farmers generally grow their crops that are used for daily needs such as vegetables and cooking spices, even though there has been a shift in buying the plants needed. The purpose of planting plants is to be easy to get these plants in a short time and the amount as needed. Place of planting is carried out in rice fields, gardens, and house yards (home garden) adapted to the plant's character. Vegetables are usually planted in paddy fields, or they leave a small portion of their fields for their daily vegetable needs while cooking spices are usually planted in the house yard. Farmers who have cows usually let their rice fields overgrow with grass (especially reed), so they can be used to feed their cows.

They usually also cultivate the plant needed for rituals or *labuhan*. Betel plant as a material *kinangan* is a plant that is often cultivated in the yard of the house. They also plant *dringo*, commonly used for *sawan* (an herb that is anointed to rice seeds evenly before the seeds are sown), which aims to avoid contracting the disease. *Sawan* consists of leaves *dringo*, shallots (*Allium cepa.*), and turmeric (*Curcuma longa*), which is mashed with a little water added. *Dringo is* usually planted near the irrigation channel in rice fields.

Indigenous peoples use the home garden as a planting area of needed plants in their lives (Bamin & Gajurel, 2015) for their economic and socio-cultural needs (Hazarika, Biswas, & Kalita, 2014). Farmers also invited other farmers to take their crops so that a tradition of sharing was formed among the community. The tradition is *weluri* from the ancestors in order to maintain harmony and care for fellow humans who are still guarded by farmers today. Planting areas around the house (home garden) can help maintain harmonious social relations in the community because it becomes a medium for sharing plants needed in daily life (Peroni, Hanazaki, Begossi, Zuchiwschi, Lacerda, & Miranda, 2016). Such behavior has fostered an attitude of togetherness, kinship, and caring to create harmony among fellow Kemiren farmers. The practice of domestication has played a role in the preservation of biodiversity because the Kemiren people do not need to take these plants from the wild so that they do not interfere with the preservation of the ecosystem.

They are working together to clean dams and irrigation channels. The tradition of cleaning dams and irrigation channels is carried out every October in conjunction with the ritual *dauhan*. Farmers, both young and old, work together to clean the river area around the dam from rubbish and tree trunks and to hoe soil and sand to prevent silting of the river. Irrigation channels are also cleaned, grass grows, and has the potential to inhibit the flow of water is also cut. This tradition strengthens the togetherness of the farmers.

They are planting a tree and selective felling. Ancestors of Kemiren community plant trees in their gardens so their descendants will use them in the future. They have an understanding that old wood is more substantial and durable from wood-destroying pests. The hope is that when his children need wood to build a house, the tree will be old enough to get quality wood. At present, only a few are still doing that and choosing to buy wood when they need it.

The tree felling is done with selective felling that is only cutting down trees or bamboo that have met the criteria in terms of age or adjusted as needed. For example, to produce angklung paglak, the bamboo (*Bambusa sp.)* that is cut down is only 3 years old, and the trunk is straight (Utomo, Al Muhdar, Syamsuri, & Indriwati, 2018). Farmers also have the belief that logging is done on *pasaran pahing* (particular day in Javanese calendar).

The farmers of Kemiren Village have received assistance from the agriculture and Irrigation Service Departement. The officer still gives space for farmers to carry out the local knowledge they have, including the rituals and agricultural techniques that they get from their ancestors. Thus the synergy between farmers and institutions does harmoniously. The traditional community will be easier to collaborate with (modern) foreign technology if their social components are not considered wrong or ignored (Behailu, Pietilä, & Katko, 2016).

The local knowledge of *Using* farmers still being applied today has proven to have a role in maintaining the preservation of natural resources, especially water sources in Kemiren Village. However, rapid urbanization can cause an ethnic community to lose its local knowledge and conservative attitudes (Majumder, Deka, Pujari & Das, 2013). Globalization has changed the lives of *Using* farmers in Kemiren. For example, farmers choose to use a tractor because they feel more efficient than cows, and they do not need to care for cows anymore. Harvesting is also faster because it uses a manual or machine rice thresher, unlike when it used *ani-ani*. *Ani-ani* is a traditional tool for cutting rice stalks in harvesting time. There was a tradition of cooperation when farmers are planting or harvesting rice that they have rarely done it now. The community feels that the necessities of life are increasing, so they are looking for additional work, and there is no time for cooperation.

At present, this has not diminished the value of togetherness that they have held fast. Nevertheless, with the decreasing intensity of the interaction is feared that it will erode the kinship values that they have. The research of Iswandono, Zuhud, Hikmat, Kosmaryandi, & Wibowo (2016) on the Maggarai tribe in the Ruteng Forest of East Nusa Tenggara Province get

the result that kinship, communal social ties, and religious rituals still adhered to play a role in preserving traditional land management carried out by the tribe.

The beliefs, knowledge, values, norms, and practices of local wisdom that are used by *Using* community in Kemiren Village when interacting with the environment have created harmony between the community and nature. Their harmony has proven to have a positive impact on natural resource management and environmental preservation. Thus the use of natural resources is done wisely. They do not dare to take actions that will damage public facilities that shelter and sustain the needs of the whole community, such as irrigation channels, rivers, and springs. The water of springs that never dry out even in the dry season is clear preservation evidence of farmers' determination in maintaining their values, norms, and ethics.

Conclusion

Using farmers in Kemiren have local knowledge that is used to interact with nature and fellow humans. Local knowledge possessed is always maintained and implemented so that it can regulate the use of natural resources and maintain its sustainability. The local knowledge is in the form of values (togetherness, obedience, consensus, fairness, and care), norms (prohibitions and suggestions in utilizing natural resources), belief (providing labuhan/ offerings and ritual), and practices in utilizing natural resources and the environment (making land near the river as a dry field/garden, using cow dung for manure, growing plants that are often needed, working together to clean dams and irrigation channels, and selective logging). Farmers have strong social ties, use natural resources as needed, and behave wisely. Their local knowledge has been able to create a harmonious life to reduce conflicts that can arise related to the use of natural resources.

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