



Article

Local Wisdom for Ensuring Agriculture Sustainability: A Case from Indonesia

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Abstract: Land transformation issues have been threatening the future of agriculture within the past decades. However, there are some areas that show their ability in maintaining their agricultural land. This paper aims to explore the farm management system resulted from the presence of legal pluralism that might contribute to future agricultural development. Data were gained through focus group discussions, observations, and in-depth interviews with various key informants. Systems thinking approach was used in this study, and data were iterated and modeled by using Causal Loop Diagram to give a better illustration of the phenomenon. We found that the integration between customary and legal law, which is manifested in the people's farming praxis, is the main factor in sustaining the agricultural sector. The customary laws were reinforced by the local government, which made the government's role crucial in allowing its citizen to continuously practice their beliefs in maintaining their agricultural lands. These conclusions are helpful in understanding the complexities underlying land transformation issues, which contributes to the literatures in related fields and improves the policy on agricultural land preservation in Indonesia and other developing countries.

Keywords: land fragmentation; land transformation; local wisdom; system thinking; sustainability



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1. Introduction

Attaining widespread food security has been made possible by increasing food production, which can be done through agricultural intensification and farmland expansion. Both ways are putting pressures on the land as one of the main resources for food production activities. As Rockström et al. [1] stated that food production is one of the main drivers that limits the current use of natural resources for human consumption. This explains the relationship between nature as the medium of food production and exploitative food production practices, which negatively affect nature's ability to support food production, and ultimately created an unsustainable spiral.

In food production, land is the most important element as land resources and rights to them are fundamental to the livelihood of rural people [2]. Land degradation, then, is threatening the farmers as a main actor of food production, which in the long-term will negatively impact the food security in a larger scale. The causes of land degradation include not only biophysical factors, but also socioeconomic and political factors (e.g., land-use change, resource demands, population pressure, and land tenure) [2]. One of land degradation issues covers land-use change including land fragmentation, which is happening around the globe and has many important implications in terms of food security, agricultural development and the governance of the rural [3,4].

Land fragmentation can be caused by different drivers such as traditions relating to inheritance or economic processes (King and Burton, 1982 in [5]). As in other countries around the globe, land fragmentation is mainly caused by inheritance systems which are adopted by the society and even in some cases are regulated by national-level laws. In

Turkey, agricultural lands have been consistently divided by inheritance (Zevkliler et al., 1970 in [6]). This situation is also relevant in Indonesia, where the inheritance system caused land, especially farmland, to become more fragmented and further transformed to non-agricultural land.

The negative impacts of land fragmentation have been shown in many previous studies. It negatively impacts agricultural production [7–10], directly and indirectly. In land fragmentation case, the farmland is divided into numerous parcels, which are usually small and unevenly shaped [11]. Smaller plots are usually scattered and harder to maintain and to control. This will lead to higher production costs [12], especially the costs of reconnecting separated habitats [13]; therefore, the potential income may be lower than the costs of cultivation [14]. Higher production cost will hamper the available capital, thus making it harder to maintain efficiency of the farm, which, in the end, contributes to the loss of agricultural productivity [15] and the decrease in agricultural products' quality [16]. Smaller plots can also lead to the loss of natural land and wildlife populations, modifications on local climate, flora, and fauna [17,18]. Inclusively, farmland fragmentation directly and indirectly influences the input, output, production efficiency, and resource allocation in agriculture production [16,19–25]. Thus, on a larger scale, it will threaten the sustainability of agriculture and food security [26].

One of the most successful attempts in tackling land fragmentation might be land consolidation which was able to increase agriculture production in some European countries [27], where the customary rules did not dominate land related regulations. Land fragmentation can be diminished through land management tools including land consolidation [10,28,29]. Hiironen and Riekkinen [30] explained that land consolidation improves the property structure and can reduce average production costs by as much as 15%. Land consolidation efforts were also present in Indonesia through the ministry of agriculture's programs, which were initiated from 2009 to 2011 [31]. Although in some areas in Indonesia the program was reported to be able to increase food productivity [32], in general, such efforts could not penetrate the thick socio-cultural barriers that often limit progress.

The issue of land fragmentation is even more dire in relation to agricultural land transformation. As described before, problems are created by decreasing land size to suit the economic performance of agricultural activities. In other words, the more fragmented the land, the less attractive farming is. Thus, many Indonesian farmers decided to quit, ending up selling their farmland or transforming it to non-agricultural land. That is why many cases of land transformation in rural areas in Indonesia were initiated by land fragmentation.

Amidst the waves of land fragmentation issues in Indonesia, there are several rural areas that seems to be surviving these waves. One of them is Ciamis Regency, West Java, Indonesia. There are signs suggesting that this phenomenon is possible due to the strong influence of existing customary law in the area. Areas in Indonesia are known to have at least three different sets of law consisting of customary, religious, and state laws. This kind of condition is known as legal pluralism [33].

Institutionalizing different sets of law is not an easy task, especially in developing countries where most of them have experienced colonization by Western countries. Rauterbach [34] showed the case where the existence of multiple regulations in South Africa is far from being harmonious. Nwauche [35] found similar evidence in the cases of Nigeria and Ghana. Nevertheless, there are also success stories from the effort of integrating customary into the state legal system. Holzinger et al. [36] concluded that institutionalizing customary laws tend to be more successful in countries with more fractionalized cultures, while provisions are more common in more developed/modernized countries.

This situation is also relevant in Indonesia, where most of the areas are experiencing complexities of legal pluralism, which has the potential to lead to social conflict [37]. However, there are also other cases that show different results. Roth [38] depicted how the integration of these sets of law have managed to contribute to the environmental sustainability of farming in Bali. Thus, the aim of this study is to find out how does the

inter-relation between its customary and legal laws support Ciamis's capacity to maintain their agricultural land while other areas cannot. We hope that our findings can contribute to the theoretical debate of the integration between customary and legal laws. Furthermore, it can help the policy makers in formulating suitable agricultural development policies in a specific area which has thick socio-cultural characteristics.

2. Materials and Methods

The study was conducted in Ciamis Regency, West Java, Indonesia. Ciamis is one of the main rice producing regencies in the eastern part of West Java (Figure 1) that contributes to the fulfilment of West Java's rice demand.

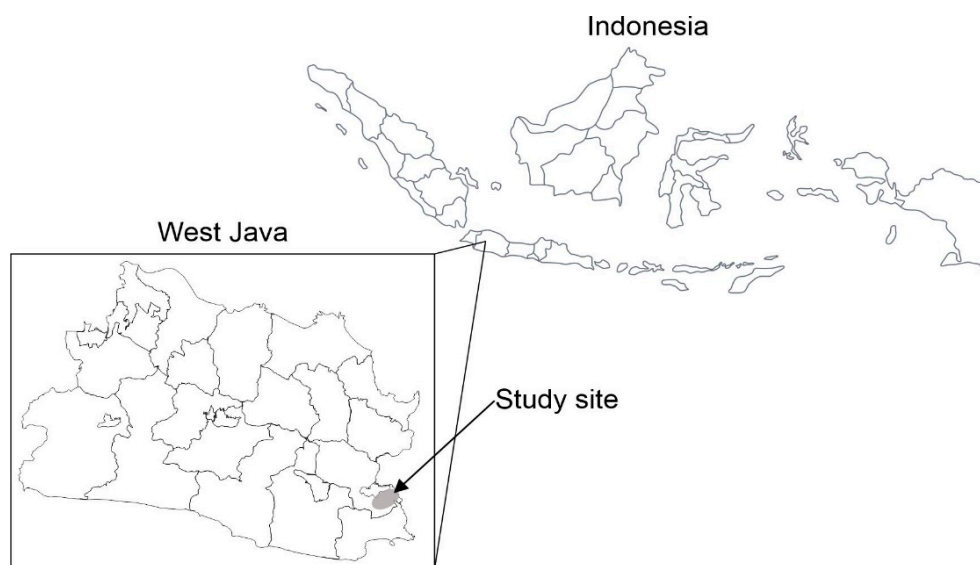


Figure 1. Map of the study site.

The study was a qualitative study, aiming to explore deeper to the reasonings of the select key informants in perceiving their realities [39]. We combined primary and secondary data in our analysis. Primary data is important to explain the phenomenon from the actors' perspectives, which can be used to enrich the macro information that are shown by the secondary data. Primary data were gained through FGD (Focus Group Discussion), field observation, and in-depth interviews with key informants including village elders, government agents, heads of villages and farmer's groups (Appendix A). Secondary data were gained through the literature study including previous studies, document analysis and statistical data from government.

In-depth interviews were conducted to gain the information regarding their perceptions toward the issues. More general point-of-view data was gained through focused group discussions which involves participants from various backgrounds. The second in-depth interviews were done to reaffirm the information they gave during the FGD and the first interview through triangulation. Flick [40,41] stated that "in social research, the term of triangulation is used to refer to the observation of a research issue from at least two different points", which was done to validate the information gained from the informants.

Interviews were recorded individually and then transformed to the form of writings through transcription. Kvale [42] described transcription as a process of data transformation from audio to text so that it can be further analysed. We conducted transcription with 'Listen and Write' software. The transcripts were then coded and analysed by using 'MaxQDA 2018' qualitative data analysis software.

The data were also modeled by using system thinking methodology. Iterations of learning loops, which are based on primary and secondary data, were carried out in the Causal Loop Diagram building process. The Causal Loop Diagram was created by using Vensim software. The aim was to give a better illustration of the complexity that lies

beneath the societal system of Ciamis's population, which allowed them to maintain their agricultural land and farming activities in general. The Causal Loop Diagrams were used to illustrate the land fragmentation issues in West Java, Indonesia and compare it to the situation in Ciamis to find the difference which will help answer to the research questions. The next steps were to generate a synthesis and write the results based on the obtained and processed information.

3. Results

3.1. Land Fragmentation: A Broader Situation

In Indonesia, the rate of agricultural land transformation reached an average of 150,000–200,000 hectares per year [43]. This situation threatens the country where most of its population relies on agriculture. This issue is even acknowledged by the law, in the Constitution Number 41/2009, which stated that agricultural land transformation including land fragmentation poses threats to the national food security and food sovereignty. This law was established to protect the agricultural land from being transformed to non-agricultural lands. The law also gives more authority to the district level so that local government able to autonomously control their agricultural land. The central government further strengthened the law by adding Presidential Laws (PL): PL No. 1/2011, which regulates the establishment and rules of agricultural land transformation; PL No. 12/2012, which gives incentives to those who protect agricultural land; PL No. 25/2012, which regulates the flow of information regarding sustainable agricultural land; and PL No. 30/2012, which regulates the funding of agricultural land protection. However, these laws have not been able to lower the rate of agricultural land transformation in Indonesia. Various factors were responsible for the inability of this law to achieve its goal, which relies heavily on failures at the local level. Similar to many other countries, in Indonesia, land fragmentation is mainly driven by the inheritance system, which determines the farm succession processes. The necessity of using land for other purposes (industrial, commercial and residential) also limits the availability of agricultural land and threatening the sustainability of agriculture in the future.

Traditions and cultures highly influence land tenure and land management system in each tribe which populate various areas in Indonesia. The highly pluralistic land tenure system in Indonesia reflects the diverse social and political cultures found amongst the country's 6000–7000 inhabited islands [44].

West Java is one of the main rice producing provinces in Indonesia. Most of its population are highly dependent on agricultural fields especially in food crops and horticulture. However, similar to many other areas in Indonesia, West Java is also facing land transformation and land fragmentation issues. Within the last decade, rice field's area has decreased by 146,693 hectares, while the area for housings and other buildings has increased [45]. On one hand, this shows that the area is having more population which demands more housings and further increases the demand for foods. On the other hand, agricultural lands, which are the main element in food production, are decreasing, further limiting its capacity to meet the rising demands.

As in other parts of Indonesia, the common inheritance system played a role in land fragmentation and land transformation in West Java. The farm succession is based on the inheritance system, which is not only based on the customary laws but also had religious influence on it. The common way to pass on the rights of land tenure to the successors is to divide the land based on the number of successors, prioritizing the males in the family. For example, a one-hectare farmland owned by household with four children will be divided to four small plots along with the ownerships. This means that the four successors have their full access to the land and can utilize them as they wish. This system made the farmland to be more parceled.

For a commodity that requires a large farm landscape, such as rice, parceled lands will hamper its economic efficiency. Although previous studies shown that smaller plots of land can lead to efficient farming, bringing more income to farmers such as the case of

Rwanda [46], in most of Indonesian cases, smaller plots do lead to more income, but the income comes from non-agricultural activities [47]. A smaller plot means less time and resources needed for farming, thus giving the farmers more flexibility in doing off-farm jobs such as maintaining other farmers' farms, working in a construction site, being a motorcycle taxi driver (*ojek*), or other trading activities [48]. This often led to decreasing interests in agricultural field and increasing the rate of job transition for farmers to become nonfarmers. The less time farmers spent on their field, the less connection they have to their owned land. Considering the limited income that they can earn from a small plot, it is just normal if they decide to sell their land or turn it into a more profitable or suitable land such as businesses or housing.

In general, the process of land fragmentation and land transformation in relation to a broader agrarian perspective in West Java is influenced by the inheritance system and the ever-growing needs of non-agricultural areas (housings, commercial), which is directly determined by the population growth. Seeing those situations, it is fair to expect the rate of agricultural land transformation to continue to increase in West Java. However, in one part of the province, there is an area which can maintain its agricultural land from being fragmented and later transformed. This area is called Ciamis, one of the top rice producing areas in West Java, which only suffers a small number of agricultural land transformation (Table 1).

Table 1. Rice field size in Eastern cluster of West Java 2015–2021 (Hectares).

	2015	2018	2019	2020	2021
Tasikmalaya	140,335	87,205	83,365	72,941	82,935
Cianjur	244,805	236,054	117,909	113,856	113,539
Sumedang	60,427	54,300	56,439	55,892	53,341
Ciamis	69,431	53,557	51,209	52,925	55,013
Pangandaran	35,276	36,246	29,859	29,313	27,730

Source: Badan Pusat Statistik Provinsi Jawa Barat, 2022 [49].

3.2. Land Fragmentation in Ciamis

Ciamis is one of the main rice producing regencies in West Java, which are located along the river, and some of them are covered by peatlands. Like other areas in Indonesia, laws exist at national, regional and local levels, and numerous regulations impact the control and allocation of land and natural resources [50]. Thus, legal pluralism [33] in this area was present, though not as vivid as in some other parts of Indonesia such as Bali (see [38]). More recently, the Indonesian land tenure system was established. It is based on the Basic Agrarian Law (BAL) of 1960 and the Basic Forestry Law (BFL) of 1967, which is then replaced in 1999 by the Forestry Law (No. 41/1999). The BAL was established to create a framework for managing land and natural resources in Indonesia that included both modern law and customary tenure systems [51]. However, this law is not strongly appreciated by most of the people, especially those who live in secluded areas such as Lakbok, Padaherang, and Banjarsari districts.

Ciamis has the lowest rate of land transformation compared to other regencies in West Java. This was due to Ciamis's unique inheritance system, which prevented the farmland from becoming fragmented. People are not allowed to divide their agricultural lands to their successors; instead, those who are willing are encouraged to stay in the area and become farmers to inherit their family land. Located far away from the capital, Ciamis is considered as a place where traditions and local wisdoms are still embedded in its population's daily life, even in their way of farming until this present day.

There are customary leaders called *pupuhu*, each representing one village covered by the study sites. The *adat* (customary law) regulates agricultural activities starting from seed production, inputs production and procurement, resource management, planting pattern and schedule, irrigation schedule, to varieties selection. It is uncommon to see a strong presence of traditional sets of rules that govern agricultural activities as whole such as in Ciamis. According to the *pupuhu*, this was due to the relationship between human and nature, which is still based on their beliefs on how they value and perceive their nature. To them, farming is not just the mean to produce food and generate income, but also as the way to preserve and maintain the nature, which also has historical cultural elements that are embedded into their beliefs.

Aside from the regulations regarding the ways of farming, there is also a unique system which regulates the farmland management, especially in its inheritance system. This system is heavily influenced by the concern of agriculture sustainability. Although the family succession system can be categorized as a patriarchy, the rule of inheritance and decision making in terms of farmland management is matriarchal. Land succession is decided by the eldest woman in the family, who in most cases gave the land to the youngest woman in the family. According to MS, one of our key informants, the woman in the family is wiser and has more values to their tradition and culture, because they usually stay in the village for their whole life absorbing knowledge and experience from their elders, their environment, and their peers, which is why they make the decision of land succession. MM said, “Men usually go out of the village and search their fortune outside, if we had given the lands to them, there would be no farmland anymore now”. This statement does not suggest that men cannot be trusted, but rather it shows that men will spend most of their life outside, which will diminish their connection to the village. SM added that people who have experienced the life outside the village will have different perspectives regarding the value of lands to the people. FS, a man originated from one of the villages who spent his time in the cities for study and work, confirmed that the statement is true to some extent. However, despite the common practices of men leaving the villages, most of the men have the intention to return to the village at some point of their life, when they consider that they have enough experience or became old. NM, an old farmer who was also spending most of his life when he was young living outside of the village, also confirms the statement, “we left our village to gain more knowledge, experience, and fortune, so that we can contribute more to the society once we are back home. We trust the women to preserve our homeland and localities, which I believe are also important to our society”.

The last female offspring must stay in the village and continue the family’s farm business, which means that she also has to marry a man who is willing to become a farmer, usually from outside the village because the men are usually leaving the village when they become adults. Interestingly, the diverse origins of men who are married to youngest women in the village bring diverse farming style from their own home village. Their ways of farming are then inter-related with their tradition, shaping, and reshaping each other, continuously developing and generating new farming styles.

Figure 2 depicts how the general interrelations between elements that are shaping Ciamis’s agricultural system. There are two types of loops: reinforcing loop (R), which illustrates the elements that bring positive feedbacks to the agricultural system; and balancing loop (B), which illustrates the elements with negative feedback. These balancing loops are common to see in any agricultural system in Indonesia—for example, how the production costs reduce the household’s income (B1). B2 shows how the normal loop would be without a different inheritance system, where the number of children who became adults in time inherit the land and tend to sell it as it became more fragmented. These fragmentations will then lead to land transformation (B3).

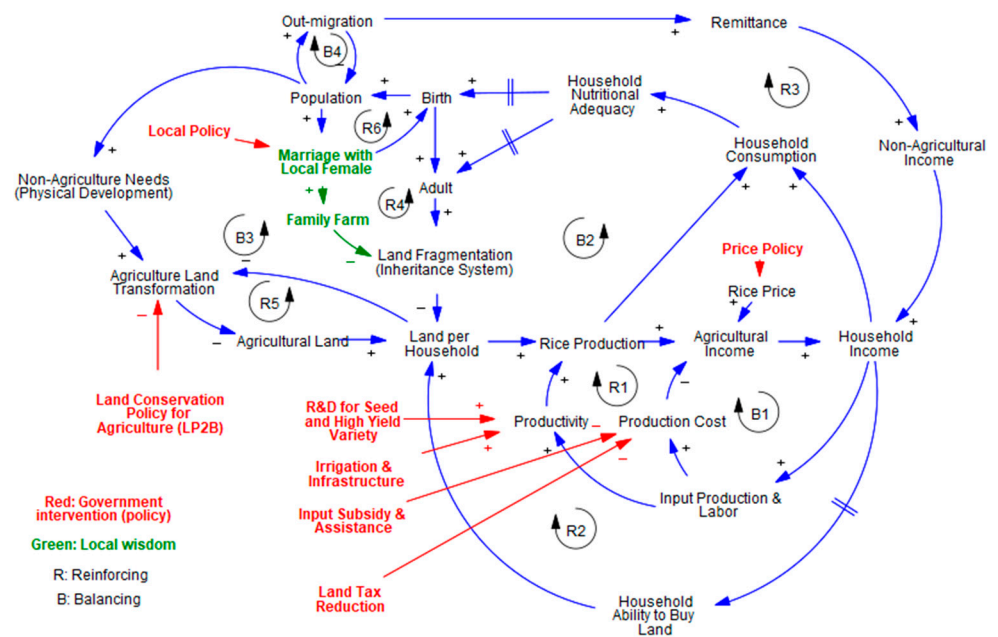


Figure 2. Causal Loop Diagram of Land Fragmentation in Ciamis.

The diagram also shows how a socio-culture system provides a protective effect to Ciamis's agricultural land specifically, and to its agriculture sustainability in general (R2, R4, R6). The process of leaving the area for males when they reach adult age is balanced by the process of males arriving from outside the area (B4). With their local inheritance system, they can maintain the farmland unfragmented. The unparceled agricultural land maintained the economic feasibility of rice farming as their mean of livelihood, combined with the remittance provided by those who migrated and have given significant support to the household's income so that farmers are more focused to their farm (R1, R3, R5). This has further lowered the needs to sell their agricultural land and/or to transform it to non-agricultural land.

Ciamis's government started to acknowledge the phenomena, which they followed up through innovation, which was based on the farmers' request to encourage other farmers to buy back the land from outsiders. IS, who is a representative of local government, said that "during training program, the trainee (farmers) often complained about how they are losing their lands, bits by bits each year. Since 2015, we always included the importance of our local culture into the training topics in every training program we carried out. I don't know if it's successful, but since then, we are seeing more and more farmers decided to make some savings to buy back some lands". The results of these efforts could not be seen instantly. It took several years for the people of Ciamis to put it into practice. As a result, the people started to invest more in buying the lands for their agriculture, as we can see that the ricefield area in Ciamis has been increasing since 2019 (Table 1).

4. Discussion

Some of the literature showed solution to tackle the land fragmentation problem through land consolidation, which is working for some areas, especially in developed countries [8,29,30,52]. However, in underdeveloped and/or developing countries such as Ghana and China, the impacts of land consolidation to the efficiency of farming were less significant [27,53]. As we can see from the results of this study, there are ways to tackle land transformation resulting from land fragmentation brought by the common inheritance system. However, it requires a strong commitment of the state and the people that it governs. This is due to the fact that Indonesia is very rich in local cultures brought

by various tribes in each area. This brings us to the discussion of the integration between customary and legal laws.

The socio-cultural role in maintaining agricultural sustainability in other parts of Indonesia has been documented in the literature (see [38,54–57]). These studies have shown that the government plays a significant role in promoting the culture so that the society will be more likely to apply it into their daily farming praxis. Furthermore, those studies also suggest that there are magnitudes of the inter-relations between the role of government and customary leaders involved. These inter-relations often resulted in a combination between customary and legal laws. Nevertheless, the effort of institutionalizing the customary and the legal laws in solving some agricultural land related issues in Indonesia, often leads to negative outcome such as the loss of farmlands and even social conflicts [49,58–61].

In Indonesia, the range of combination between legal and customary laws highly depend on the localities in which the farming praxis is being practiced. Roth [38] explained how the official government and customary leaders coordinated in the integration of customary and legal laws in Bali have helped the Balinese in maintaining their sustainable agricultural practices. However, this was highly influenced by the touristic characteristics of Bali, which enable both the officials and the citizen to be more open minded toward each other, with the help of high exposure to global society (tourists and expatriates). Nugraha [62] showed how the integration between these laws in South Sulawesi helped cacao farmers in maintaining their lands. Nevertheless, this was also influenced by the fact that cacao is an industrial commodity with higher economic value than rice, which is also supported by the presence of various multinational companies.

While this study shows that it is also possible to be done in a staple food commodity, with low value, and it does not have to be in a touristic area. In the case of Ciamis, the local government carried out various interventions in supporting their agriculture. These interventions came both from central and local government. The central government's programs are more focused on increasing agricultural productivity and farmland conservation at a higher level. The local government's role is not only to carry out the programs from the central, but also to innovate based on their localities. However, in this case, the government has just started to recognize this cultural trend, which can be seen as an opportunity for them to strengthen their culture by institutionalizing it to ensure its agricultural sustainability in the future. The role of the government in formulating a robust regulation in protecting the agricultural land, especially for staple food crops, is unquestionably important. Nonetheless, we think that the process must be done in a certain way which includes environmental and cultural aspects of a society.

5. Conclusions

Ruttan and Hayami [63] affirmed in their theory of induced innovation that a certain limited condition of resources will lead the society to generate new forms of institution to cope with their situation. In relation to farmland management, almost every area which is managed by a tribe in Indonesia has their own forms of institution. In this case, aside of government institutions, the society came up with the customary regulations, which, although they are not formally institutionalized, govern their daily life including farming related activities and farmland management.

The farming styles in Ciamis are determined by customary institution that regulates the praxis of farming ranging from on farm activities to the management of resources (water, land, agricultural inputs), which is based on their local wisdom. The local wisdom and traditions are not only concerned about the sustainability of agriculture as a mean of food production and income generating activities for the future generation, but they are also concerned about the sustainability of agricultural resources including lands. Its inheritance tradition prevents the land from becoming either fragmented and/or transformed, thus ensuring the future generation's farming.

We conclude that integrating customary laws with the legal law is very important. However, it is not an easy task, and it takes a lot of time. It can be started by the identification

and recognition of these customary laws that govern a community in certain areas by the local government. As without the right recognition, customary laws tend to become a hindrance of a more macro legal laws, which then often lead to social conflicts. Thus, we would suggest that the policymakers in the central government must give more room to local governments so that the latter have more flexibility in formulating agricultural development policies that best suit their local context. The local governments also should be more proactive in identifying and recognizing the customary laws in their area. This will allow the local government to include customary laws in their policy-making process to minimize the risks of rejection or other unintended outcomes.

This finding is important to be taken into consideration during policy-making processes regarding farmland management in Indonesia and other developing countries which have similar characteristics. With its multicultural settings, we encourage others to carry out more research to identify the underlying inheritance system for each culture in the country. Then, the research should be included in the regional level policies that regulate farmland management systems in a specific region. This way, we hope that it can further slower or even negate the rate of farmland transformation, solidifying the country's future food security.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. List of Informant for Primary Data Collection.

Interview No.	Name	Date of Interview	Type of Data Collection	Type of Informants	Gender
1	TN	12 January 2018 17 February 2018 13 March 2018	FGD In-depth Interview In-depth Interview	Elder	m
2	DR	12 January 2018 18 February 2018 14 March 2018	FGD In-depth Interview In-depth Interview	Elder	m
3	NM	12 January 2018 19 February 2018 15 March 2018	FGD In-depth Interview In-depth Interview	Elder	m
4	PK	12 January 2018 24 February 2018 16 March 2018	FGD In-depth Interview In-depth Interview	Farmers Group Leader	m
5	MS	12 January 2018 24 February 2018 17 March 2018	FGD In-depth Interview In-depth Interview	Female Elder	f

Table A1. Cont.

Interview No.	Name	Date of Interview	Type of Data Collection	Type of Informants	Gender
6	SJ	12 January 2018 25 February 2018 18 March 2018	FGD In-depth Interview In-depth Interview	Female Elder	f
7	MM	12 January 2018 25 February 2018 19 March 2018	FGD In-depth Interview In-depth Interview	Female Elder	f
8	FS	12 January 2018 26 February 2018 2 April 2018	FGD In-depth Interview In-depth Interview	Successor	m
9	RSN	12 January 2018 26 February 2018 2 April 2018	FGD In-depth Interview In-depth Interview	Successor	m
10	NK	12 January 2018 26 February 2018 2 April 2018	FGD In-depth Interview In-depth Interview	Successor	f
11	NLK	12 January 2018 27 February 2018 3 April 2018	FGD In-depth Interview In-depth Interview	Successor	f
12	SM	12 January 2018 27 February 2018 N/A	FGD In-depth Interview N/A	Successor	f
13	RSA	12 January 2018 27 February 2018 3 April 2018	FGD In-depth Interview In-depth Interview	Successor	f
14	RK	12 January 2018 28 February 2018 3 April 2018	FGD In-depth Interview In-depth Interview	Successor	f
15	SDA	12 January 2018 28 February 2018 4 April 2018	FGD In-depth Interview In-depth Interview	Successor	f
16	YR	12 January 2018 28 February 2018 4 April 2018	FGD In-depth Interview In-depth Interview	Successor	f
17	FR	12 January 2018 1 March 2018 5 April 2018	FGD In-depth Interview In-depth Interview	Extension Agent	f
18	DH	12 January 2018 1 March 2018 5 April 2018	FGD In-depth Interview In-depth Interview	Extension Agent	m
19	DN	12 January 2018 2 March 2018 6 April 2018	FGD In-depth Interview In-depth Interview	Extension Agent	m
20	EK	12 January 2018 2 March 2018 6 April 2018	FGD In-depth Interview In-depth Interview	Extension Agent	m
21	IS	12 January 2018 3 March 2018 7 April 2018	FGD In-depth Interview In-depth Interview	Local Government	m
22	SJ	12 January 2018 3 March 2018 7 April 2018	FGD In-depth Interview In-depth Interview	Local Government	m
23	AS	12 January 2018 3 March 2018 7 April 2018	FGD In-depth Interview In-depth Interview	Local Government	m

Source: fieldwork (summarized).

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