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Tea smallholder sustainability, a case study in Cisitu Village, West Java, Indonesia

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Abstract. These days tea smallholders are facing droughts due to climate change. The government has several programs that aim at helping tea smallholders to solve their problems. The objective of this paper is to examine the sustainable livelihood approach of the tea smallholders by integrating the government programs and the resources that they have. Data is collected through semi-structured interviews with 15 tea smallholders in Cisitu Village in West Java. This village is about 25 kilometres from Sukabumi City, the capital city of the district of Sukabumi. Our analysis shows that smallholders with small resources tend to become poorer. Besides the limitation of their resources, the government programs do not seem to facilitate them. On the other hand, smallholders with strong and diverse assets gain benefits from the government programs. However, social capital is the main resource that could support poor smallholders to relieve their financial pressure. By joining the farmer group institutions, farmers will be supported to fulfil their farming needs. Besides the group institutions, almost all smallholders support their financial needs by running grocery stalls, planting cash crops, or having other another job in other areas.

1. Introduction

Indonesia is the fifth largest producer and exporter of tea in the world after Sri Lanka, Kenya, China, and India [1]. Tea farms in Indonesia have been established since 1910. In 1958 the Indonesian government took over the tea farms from the Netherlands and the British and naturalized them to become the Indonesian government-owned [2]. Tea farms in Sukabumi have been established since 1880, which was owned by the Dutch government. The Dutch tea farms were in areas of Parakan Salak and Tenjo-Ayu (Ciurug Sub-District), Sinagar-Cirohani (Ciheulang Sub-District), Goalpara (Gunung Parang Sub-District), Perbawatie (Slabintana Sub-District), and Artana (Jampangtengah Sub-District). The commodity is produced by state-owned estates, private estates, and local people’s plantations [4]. Tea as a commodity plays a strategic role in Indonesian economy. The commodity is not only able to absorb a large number of workers, but it is also one of the contributors to the Gross Domestic Product (GDP) and the country’s sources of foreign exchange earnings, as well as helping to support soil and water conservation [5].

The main challenges in the tea agricultural sector are low prices, limited marketing processes, difficult access to financial institutions, and farmer groups [6]. The prices of tea in Indonesia are differentiated based on two types of tea commodities, namely black tea and green tea. In 2013 the commodity price of black tea was IDR 57,400/kg whereas the price for green tea was IDR 77,275/kg. In 2014 the prices were not differentiated based on the two different commodities, which was IDR 60,825/kg, and IDR 64,200/kg in 2015 [7]. Declining prices in the tea sector has ruined its sustainability, which then hugely affected the livelihoods of the tea plantation workers and eventually leading them to poverty [8]. The tea production chain in the people’s tea plantation is producers ➔ collectors ➔ porters ➔ big
traders \(\rightarrow\) tea processing factory [9, 10]. The length of the production chain in the people's tea plantations has caused low price of tea received by farmers, which is 15.8% of consumer prices [10]. One of the main problems faced by farmers in Java is lack of money and arable land [11].

The purpose of this study is to analyze the sustainability of smallholder tea farmers in meeting their needs based on the ownership of farmers’ assets. This study was held in Cisitu Village, Cijulang Subdistrict, Sukabumi District, in West Java Province. The location of the research area is shown in Figure 1. above. This village is about 25 kilometers from Sukabumi City, the district’s capital city.

![Figure 1. Location of the Sukabumi District where the Cisitu Village is located. Source: Data Processing, 2019](image)

2. Research Methods

The data used in this study is the translation of the data from the informant interviews. The informants in the study were the local government staff, namely those from the BP3 (Extension Agency of Agriculture) and the Village Head of the research location, and the tea smallholders who still had their own arable land. The information search is done by using the snowball sampling method. Snowball sampling is a technique for determining the informant in small numbers but representative of the population. The key informant is asked to find another informant, and so on [12]. If the answers given are similar and saturated, then the researcher might terminate the interview.

Data collection is done by conducting interviews with informants using interview guidelines. The results of the interview are translated in writing and encoded to see the assets used by the tea smallholders. The assets data is weighed according to the following table:
| Assets                                | Weighed | Total |
|--------------------------------------|---------|-------|
| **Natural Assets (A)**               |         |       |
| Land ownership (A1)                   | 33.33%  |       |
| Environmental service (A2)            | 33.33%  | 100%  |
| Potential of disaster (A3)            | 33.33%  |       |
| **Human Assets (B)**                  |         |       |
| Ability and Knowledge                 |         |       |
| • Self-taught (B1)                    | 33.33%  | 100%  |
| • Other institutions/training (B2)    | 33.33%  |       |
| Quality of labor (B3)                 | 33.33%  |       |
| **Physical Assets (C)**               |         |       |
| Agricultural mechanisms              |         |       |
| • Switch sectors (C1)                 |         |       |
| • Do not switch sectors (C2)          | 12.5%   |       |
| Agriculture support equipment (C3)    | 12.5%   |       |
| Agricultural technology (C4)          | 12.5%   |       |
| Accessibility                         |         | 100%  |
| • Physical (farm)                     |         |       |
| - Footpath (C5)                       | 12.5%   |       |
| - Not footpath (C6)                   | 12.5%   |       |
| • Social (group/institution)          |         |       |
| - Farmer institution (C7)             | 12.5%   |       |
| - Financial institution (C8)          | 12.5%   |       |
| - Other institutions (C9)             | 12.5%   |       |
| **Financial Assets (D)**              |         |       |
| Agricultural land area                |         |       |
| • Sell (D1)                           |         |       |
| • Do not sell (D2)                    | 20%     |       |
| Capital                               |         |       |
| • Private (D3)                        | 20%     |       |
| • Financial institution (D4)          | 20%     |       |
| Other life assets                     | 100%    |       |
| • Another job                         |         |       |
| - Support fund (D5)                   | 20%     |       |
| - Do not support capital (D6)         | -       |       |
| • Other assets                        |         |       |
| - Support fund (D7)                   | 20%     |       |
| - Do not support capital (D8)         | -       |       |
| **Social Assets (E)**                 |         |       |
| Institutional attachment              |         |       |
| • Financial institution (E1)          | 33.33%  | 100%  |
| • Other institutions (E2)             | 33.33%  |       |
| Farmer group membership (E3)          | 33.33%  |       |
The analysis was carried out using pentagon diagrams. The polygon diagram shows the magnitude of the SLA value for each asset that supports the livelihood of tea smallholders. The next process was checking the validity of the data by triangulating the data. Data triangulation is a technique for checking the validity of data through other sources [13]. Other references in this study were the results of interviews with informants and village officials as well as theories and findings from research in the field of SLA.

2.1 Farmer’s Profile

Table 2. Informants’ Human Assets

| Informant  | Dry Season Activities                                      |
|------------|-----------------------------------------------------------|
| Mr. Aan    | Planting mixed commodities and raising livestock          |
| Mr. Sobari | Managing tea factory                                      |
| Mrs. Tutih | Taking care of the rice field and \ grocery stall        |
| Mrs. Titi  | Taking care of the rice field                             |
| Mr. Barkah | Planting fruit trees                                      |
| Mr. Sudin  | Planting fruit trees and taking care of grocery stall     |
| Mrs. Aah   | Taking care of wood commodities and grocery stall         |
| Mrs. Solihin| Planting vegetables and taking care of the grocery stall  |
| Mr. Parman | Working as a laborer and taking care of the rice field    |
| Mr. Asep   | Taking care of the coffee commodities                     |
| Mrs. Irah  | Taking care of wood commodities                           |

Source: Informants interview, 2019

For the rest of the informants, they do not do anything when the dry season comes. They just taking care of the tea farm with their limited capital or they pay no attention to their farm. So, their land become dry and abandoned. They will plant the new tea plantation when the rainy season comes. Unfortunately, they do not have enough source to cultivate their land in good form.

Table 3. Informants’ Financial Assets and Social Assets

| Informant    | Financial Assets                                                                 | Social Assets                                      |
|--------------|----------------------------------------------------------------------------------|---------------------------------------------------|
| Mr. Aan      | - Another job: village official                                                  | - Membership of farmer group                      |
|              | - Other assets: Goat farm and fishpond                                            |                                                   |
| Mrs. Aah     | - Another job: PLN official                                                       | - Membership of farmer group                      |
|              | - Other assets: Grocery stall                                                     |                                                   |
| Mr. Parman   | - Another job: stone-breaking labor                                               |                                                   |
|              | - Other assets: rice field                                                       |                                                   |
| Mr. Sobari   | - Another job: tea factory manager                                               | - Membership of farmer group                      |
|              | - Other Assets: Tea factory, tea warehouse and fishpond                          | - Has relationship with financial institution      |
| Mrs. Ningsih | - Another job: production of white tea products                                   | - Membership of farmer group                      |
|              | - Another job: tea middleman                                                      |                                                   |
| Mrs. Tutih   | - Other assets: Fertilizer provider stall and rice field                         |                                                   |
| Mr. Asep     | - Another job: tea seeder                                                         | - Membership of farmer group                      |
|              | - Other assets: coffee farm and rice field                                       | - Has relationship with government                 |
Main occupation in tea farm sector

| Name      | Occupation     |
|-----------|----------------|
| Mrs. Titi | Other assets: rice field |
| Mr. Solihin | Other assets: grocery stall |
| Mrs. Irah | Other assets: grocery stall |
| Mr. Epeng | Membership of farmer group |
| Mr. Rodi | Membership of farmer group |

*Source: Informants interview, 2019*

In this village, networking and kinship are very important. This social capital could provide help for farmers in getting financial support in addition to the support that they get from the government. The government provides seed, fertilizer, or training on how to plant and take care of the tea plantation. Farmers with strong financial assets like Mr. Asep and Mr. Sobari, could develop cooperation with other institutions easily. The other institutions can offer financial aid or land for planting other commodities.

3. Result and Discussion

3.1 Sustainable Livelihood

Tea smallholders are divided into two categories: 1) tea smallholders with other jobs 2) tea smallholders without other jobs.

3.1.1 Tea smallholder with Other Jobs. There are seven informants in this group, with 2 models of livelihood sustainability as smallholder tea farmers. The first model is farmers whose main occupation is not in the agriculture sector. There are 3 informants under this category, namely Mrs. Aah, Mr. Aan and Mr. Parman. The use of their SLA assets can be seen in Table 3. From the data in Table 3 the SLA polygon form is as follows:

![Figure 2](SLA_Polygon_1_Mr.Aan_and_Mrs.Aah.png)

*Figure 2. SLA Polygon 1 (Mr. Aan and Mrs. Aah)*

*Source: Interview Data Processing, 2019*

![Figure 3](SLA_Polygon_2_Mr.Parman.png)

*Figure 3. SLA Polygon 2 (Mr. Parman)*

*Source: Interview Data Processing, 2019*

The difference in the use of SLA assets lies in financial assets. Utilization of these financial assets affects the capital on agriculture. The capital used is private capital because there is no social relationship with financial institutions.

The next SLA polygon model is based on farmers who have other jobs but are still in the agriculture sector. In this case, there were 4 informants, namely Mr. Sobari, Mrs. Ningsih, Mr. Asep and Mrs. Tutih. The use of informant's SLA assets can be seen in the following figure:
Mrs. Tutih has similar uses for SLA assets with Mr. Parman. (Fig. 3). The fundamental difference in the SLA assets of these 4 informants is the financial assets. The financial asset is obtained from the relationship between financial assets and social assets.

3.2 Tea Farmer Only
In this tea farmer group, there are two SLA polygon models. The SLA polygon model is divided based on farmer group membership. The use of the SLA model in pure tea farmers is as follows:
The difference in Figures 7-9 lies in the social assets used by farmers. Social assets are one of the supporters of the existence of capital in agriculture. Farmers who are members of farmer groups do not benefit in the form of capital. Farmer groups serve only as a facility for training and providing assistance.

Table 3 shows that not all farmers can take advantage of available social assets. Further look at the sketch of the location of the village of Cisitu (Figure 10) indicates that the location of the housing area is near the village administrative center (village office). Cisitu village, which only covers an area of 12.26 km² and is passed by the main road (district road) has easy access to the village office. The reason the informants are not able to make good use of social capital is not because of the location where they live, but more due to the following reasons: 1) the informant is originally not from Cisitu village, 2) the informant thinks that the farmer groups are not useful. The idea that farmer groups are not useful comes from the decline in government assistance in the form of fertilizers and the fact that the seeds are not distributed at the right time. Aid tends to be distributed during the dry season when seeds planted will not develop well. So, it is fair to say that the location of the informant does not affect the use of social assets by farmers.

Financial assets are the main sources in determining the sustainability of these livelihoods. However, in reality financial assets can also be obtained from the relationship between social assets and financial assets (Fig. 11). Meanwhile financial assets are very dependent on social assets in terms of capital. Capital is not only obtained from personal proceeds but it can also be borrowed from financial institutions and from. The other source of capital is proceeds from tea sales. Tea that is developed to be sold is people's tea with low selling price.
However, the real problems in tea production are rising production costs, mismanagement, the old age of tea trees, poor agricultural practices, low labor productivity, climate change, and damaged infrastructure [14]. In Cisitu Village tea farming, climate change seems to have triggered various problems. The dry season, which starts from the end of March and lasts in October, has deranged the farming system. Tea smallholders will have to shift to other commodities or remain on tea commodities with consequences of losses on capital. Tea smallholders with strong capital will continue tea farming with capital support from other institutions. The main challenges in the tea agriculture sector are low tea prices, limited marketing processes, difficult access to financial institutions and farmer groups [6]. Declining prices in the tea sector have ruined the sustainability of the tea sector, which in turn negatively affects the sustainability of the livelihoods of tea plantation workers and leading them to poverty [8]. This statement is true of the farmers in Cisitu Village. So, it can be said that the main problem in the sustainability of tea in Cisitu Village depends on the use of social assets that support financial assets.

Agricultural sustainability is not only concentrated on the environment and social factors, but also on the innovation and economic sustainability offered for farmers, workers, consumers, policymakers, and other things that are included in the food system. Furthermore, sustainable agriculture is achieved through the adaptation of agricultural technology that has no impact on the environment and can be accessed by farmers and can increase agricultural productivity [15]. This statement cannot be realized in agriculture in the village of Cisitu. Sustainable agriculture there is hindered by the use of minimum technology and inadequate government assistance. Thus, farmers only utilize the capital that they have, which heavily depends on the relationship between farmers and other farmers, farmer groups, or with other institutions.

4. Conclusion
Tea farming in Cisitu village is heavily dependent on social capital. Social capital supports the farmers’ financial capital. The financial capital comes from other jobs or other life assets, such as rice fields, livestock, and ownership of grocery stalls. The dry season highly affects the sustainability of tea farming. Farmers with strong capital will be able to survive in tea farming, while those with weak capital will shift to other agricultural commodities in the dry season. The farm land location and the social position of the informant do not influence the social capital usage.

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### 6. Appendices

**Table 4. Use of SLA Assets by Informants**

| SLA Assets | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|
|            | Score   | Value   | Score   | Value   | Score   | Value   | Score   | Value   | Score   | Value   | Score   | Value   | Score   | Value   | Score   | Value   | Score   | Value   |
| (A)        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| A1         | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    |
| A2         | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    |
| A3         | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    |
| (B)        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| B1         | √       | 100%    | √       | 66.67%  | √       | 100%    | √       | 100%    | √       | 100%    | √       | 66.67%  | √       | 66.67%  | √       | 100%    | √       | 100%    |
| B2         | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    |
| B3         | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    | √       | 100%    |
| (C)        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C1         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C2         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C3         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C4         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C5         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C6         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C7         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C8         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| C9         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| (D)        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D1         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D2         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D3         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D4         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D5         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D6         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D7         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| D8         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| (E)        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| E1         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| E2         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| E3         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
Information:

| Model 1 | Model 1 is for farmers whose main occupation is not in the agricultural sector. Model 1 SLA polygon belongs to Mr. Aan and Mrs. Aah |
|---------|-------------------------------------------------------------------------------------------------------------------|
| Model 2 | Model 2 is for farmers whose main occupation is not in the agricultural sector. Model 2 SLA polygon belongs to Mr. Parman |
| Model 3 | Model 3 is for farmers whose main occupation that is not in the agricultural sector. Model 3 SLA polygon belongs to Mr. Sobari |
| Model 4 | Model 4 is for farmers whose main occupation is not in the agricultural sector. Model 4 SLA polygon belongs to Mrs. Ningsih |
| Model 5 | Model 5 is for farmers whose main occupation is not in the agricultural. Model 5 SLA polygon belongs to Mr. Asep |
| Model 6 | Model 6 is for farmers whose main occupation is as smallholder tea farmers but not joining any farmer group. Model 6 SLA polygon belongs to Mr. Sudin, Mr. Barkah, Mr. Nanang and Mrs. Titi |
| Model 7 | Model 7 is for farmers whose main occupation is as smallholder tea farmers but not joining any farmer group. Model 7 SLA polygon belongs to Mrs. Irah and Mr. Rodi |
| Model 8 | Model 8 is for farmers whose main occupation is as smallholder tea farmers and joining a farmer group. Model 8 SLA polygon belongs to Mr. Epeng and Mr. Solihin |