



Direct Payment System in Sugarcane Industry: Beneficial or Unfavourable Solution?

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Article Information Abstract

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Smallholder Farmer (PR) dominate the sugarcane supply for national sugar production. That indicates sugar production depends on the sustainability of sugarcane's supply from smallholder sugarcane farming. 34.4 percent of sugarcane farmers in Indonesia partner with sugarcane factories, while others decide to manage independent farming. So far, the partnership is defined by the Profit-sharing system (SBH). The number of independent farmers raises why farmers decide independent farming rather than partnership. Otherwise, government through 593/TI.050/E/7/2019 propose a policy for sugarcane factories to obtain sugarcane with Direct System. This situation raises the pros and cons at the farmer's level to decide it. A direct Payment System (SPT) is a buy-sell transaction within farmers without sustainability. One of the sugar factories performing SBH partnership is PG Kebon Agung, located in Malang with a vast production capacity. This study aimed to describe the partnership and transaction mechanism, determine the decision-making factors of farmers participating in SBH partnerships, and compare the incomes. The analytical method is descriptive-qualitative, logistic regression analysis, and comparative income analysis. The results showed that SBH has advantages in assisting farmers but has weaknesses in payment times. This is the opposite of SPT, which provides faster payment times. The amount of SBH farming income is also more significant than SPT. So this study suggests that SBH farmers are suitable for farmers who have a shortage of capital. At the same time, SPT is suitable for farmers with more capital who need a faster cash flow.

INTRODUCTION

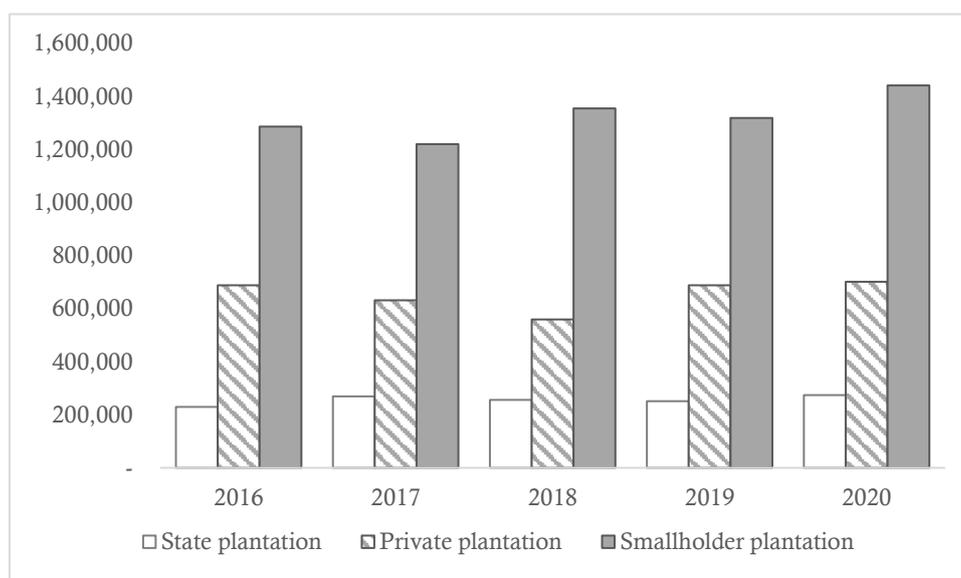
There are three forms of agricultural transfer products from producer to the following processor: the spot market, contracts farming, and vertical integration (MacDonald et al., 2004). The spot market is a product transfer process performed without any contract. In contrast, Contract Farming (CF) is a product transfer with several agreements upon the parties previously; vertical integration is the process of a product by transfer within one company operation.

Contract farming is a suitable mechanism to unite farmers and companies (Bellemare & Lim, 2018). Contract farming provides farmers access to production facilities, technology, and

market information (Mishra et al., 2018). On the other hand, processors also use CF to ensure raw material capacity, including quality (Lee et al., 2012). This is a reinforcement that CF is beneficial for increasing farm efficiency.

The participation of farmers in CF varies considerably depending on the commodity type. Contracts on broiler chicken have the most significant percentage, 55.69% (BPS, 2014). The percentage of other commodities is 8.03%, 7.6%, and 2.9% for small chilies, large chilies, and plantation commodities. The sugarcane partnership is unique because a sequence of processes determines the partnership's result both on the farm and in the factory. The final product is sugar for household consumption.

Figure 1. The proportion of Sugarcane Production in Indonesia by Business Status (Tons)



Source: Central Bureau Statistics, 2021 (Processed)

It is a fact that smallholder plantations dominate the national sugarcane production. Figure 1 indicates the proportion of TR sugarcane production, private and Government Plantation (PBN), and Private Plantation (TS), which sugar factories integrate. Therefore, national sugar production by sugar factories depends on the sustainability of sugarcane farmers (Respati, 2020).

Therefore, the relationship built between farmers and sugar factories will define the company's efficiency. Companies can implement

various strategies, one of which is to guarantee nearby farmers with partnership contracts for sustainability.

The sugarcane partnership has provided many benefits for both farmers and factories. The benefits of sugarcane farmers in contract farming are have higher incomes than non-contract (Cahyarubin, 2016; Rahma & Mayangsari, 2018; Sixmala et al., 2019). However, some criticisms of the implementation of the partnership include the transparency in the yield calculation and inappropriate profit-sharing (Dianpratiwi et al.,

2016; Mohammad Rondhi et al., 2020). In addition, the length of payment time makes farmers still avoid participating in contract farming partnerships.

Recently, the government, through the circular letter of the minister of agriculture no. 593/TT.050/E/7/2019 proposes regulation for the Direct Payment System (SPT). This mechanism is directed to guarantee farmers receive cash from sugarcane harvests. This policy leads the factory to provide a significant amount of cash to buy raw materials for smallholder sugarcane.

Previous studies on the Direct Payment System for sugarcane topics are not available. However, many related studies have compared partnerships and non-partnerships (have some common characteristics with SPT). The topic of partnerships in sugarcane commodities has been widely conducted, particularly the mechanism of sugarcane partnerships for farmers, the realization of partnerships, the benefits of partnerships by comparing partners and non-partners. Several studies, such as Cahyarubin (2016), Rahma dan Mayangsari (2018), Sixmala et al. (2019), stated that partner relations (SBH partnerships) in different sugar factories are beneficial for farmers in terms of income levels.

In another report, research by Anam dan Qibtiyah (2018) states that SPT has a weakness: the imposition of a value-added tax charged to farmers. Another weakness is the relationship between farmers and sugar factories are limited to only buy-sell. Those transactional relations can eliminate the longstanding principles of partnership. As a result, disintegration can also impact the quality of sugarcane farmers and a decrease in sugar production in the factory.

The results of previous research seem to be different from the government's point of view as policymakers. The agricultural policy describes the SPT mechanism, which will replace SBH. The government seems to have a special assessment and concludes that SPT is better than SBH partnership. The research gap attempts to further explain the SBH partnership in the middle of sugar industry policy issues. The is examines

several factors in farmers' decision-making and looks at nearby farmers' incomes.

Based on these studies and facts, the study aims to (1) find out this description model specifically on profit-sharing partnership (SBH) and Direct Payment System (SPT), (2) factors that determine farmers' decisions in selling, (3) identify the difference in farmers income between SBH and SPT models. This is important as one of the considerations for implementing government's policy about direct payment system.

RESEARCH METHODS

The research was conducted in the Kebon Agung Sugar Factory (PGKA) operation area in Malang Regency/City. PGKA is one of the sugar factories established in Pakisaji District, but to fulfilling sugarcane supply, it arranges partnerships with smallholder sugarcane farms scattered across 19 districts. Determination of research area using the purposive method. Attention for deciding the operation area of PGKA because the daily sugar production capacity (TCD) is most significant compared to another sugar factory in Malang Regency/city, the region with the most significant sugarcane production in Indonesia.

The sample was defined from the population of each group using disproportionate random technique sampling. There are 60 samples from SBH and 60 samples from farmers who performed Direct-system (SPT). Gay dan Diehl (1992) argue that the adequate sample size in a study is depended on the type of research. Comparative research has a minimum requirement of 30 in each population group. In addition, the determination of samples size is based on the analytical method used, particularly logistic regression analysis with a minimum size of 100 samples (Long, 1997, p. 54).

This study implied descriptive-qualitative analysis, logistic regression analysis, and independent t-test. The methods were selected according to the type of data being analyzed and the aim of this research. There is a replication of data analysis methods from previous research, with the novelty on research location, condition

of the sample farmers, and the possibility of farmers to decide between two forms of mechanism. Active replication is an attempt to imitate several methods that have been used previously, of course with some novelties to acquire scientific principles (Morissan, 2017).

Qualitative descriptive analysis was used to explore the mechanism for implementing SBH and SPT. In each form, a description of the implementation mechanism that has been performed among sugarcane farmers in the PGKA operation area will be collected.

Logistic regression analysis is applied to determine the factors in farmers' decision-making in SPT or SBH. The dependent variable of farmers' decisions is represented by 1 for SBH partnerships and 0 for SPT. 9 variables that hypothetically affect the decision and are included in the regression model. We describe the logistic regression equation models as follows:

$$\log \frac{p(Y=1)}{1-p(Y=1)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 D_1 + \beta_7 D_2 + \beta_8 D_3 + \beta_4 D_4 \dots\dots\dots(1)$$

Equation 1 presents the logistic regression model with binary variable (Y) that proxied as farmer decision, 1 for SBH partnership and 0 for SPT. *p* is the proportion of values in population, β_0 is the Constant, and $\beta_1 - \beta_8$ presented as regression coefficient. The 9 variables that used in this paper proxied as: X_1 is age (years); X_2 is education (years); X_3 is experience (years); X_4 is distance from land to PGKA (km); X_5 is land size (ha); D_1 is main source of capital (1= ext. parties, 0= independent); D_2 presented as farmer group (1= member, 0= non member); D_3 presented as Village Unit Cooperative (KUD) (1= member, 0= non-member); and D_4 presented as Perception of payment time (1= immediately, 0= not immediately).

The fitted model is tested sequentially by the Omnibus Test, Classification Table, Model

Summary (-2 log-likelihood and Nagelkerke R Square value), and Hosmer and Lemeshow's test. Then the Wald test is used to test the regression coefficient of each variable.

RESULTS AND DISCUSSION

Sugarcane farmers in Kedungkandang District currently have two alternatives in selling their sugarcane. The first option is farmers sell to PG Kebon Agung by contract farming based on a contract arrangement called Profit-Sharing (SBH). Another option is to sell to buyers with an SPT transaction. The characteristics of farmers and respondents' farms are presented in table 1. The average age of SPT farmers is 43 years, younger than the age of SBH farmers. This reveals a tendency for SPT farmers whose young lead is aggressive towards change. In addition, SPT farmers also tend to have less experience than SBH farmers.

Furthermore, SPT farmers have broader land than SBH farmers. This leads the farmer to need capital with a faster cash flow. Most of the sources of capital for SBH farmers come from external parties. This is not similar to the source of capital for SPT farmers, whose sources of capital come from their own.

All SBH farmers are members of the KUD, and only a small number are not members of the KUD. This is a bit different from SPT farmers, who are only a small percentage, 25 percent members of the KUD. KUD membership is used for farming credit access and other loans when the harvested payment has not been received yet.

The farmer's perception of the length of payment time is vital in determining the sales mechanism. Most SBH farmers perceive that payment time is not the main factor, which is in contrast to SPT farmers, where payment time is vital point.

Table 1. Characteristics of Farmers in SBH and SPT Mechanism

Characteristics	SBH (n=60)				SPT (n=60)			
	Min	Max	Ave	Std Deviation	Min	Max	Ave	Std Deviation
Age	32	69	52,45	8,081	28	70	43,57	9,610
Education	2	18	8,57	3,422	3	16	10,38	2,464
Experience	5	50	24,13	10,460	2	40	14,12	8,956
Land distance	3,1	15,4	7,55	3,079	3	14,7	8,10	3,203
Land area	0,10	15,00	1,23	2,096	0,4	10	1,91	1,562
Capital sources								
0: independent	-	-	17(28,33%)		-	-	53(88,33%)	
1: external Parties	-	-	43(71,67%)		-	-	7(11,67%)	
Farmers group								
0: non-member	-	-	0(0%)		-	-	41(68,33%)	
1: member	-	-	60(100%)		-	-	19(31,67%)	
KUD								
0: non-member	-	-	0(0%)		-	-	45(75%)	
1: member	-	-	60(100%)		-	-	15(25%)	
Perception of Payment Time								
0: not immediately	-	-	42(70%)		-	-	2(3,33%)	
1: immediately	-	-	18(30%)		-	-	58(96,67%)	

Source: Primary Data, 2021 (Processed)

The principle concept that distinguishes SBH and SPT is a contractual arrangement between farmers and the sugar factory. SBH model emphasizes the farmer and factory relationship from field to post-harvest. Sugar factory roles as a company that provides field personnel to assist farming, provide counseling, and as a guarantor (avalist) in capital. On the other hand, SPT mechanism emphasizes the buy-sell system without previous agreement.

The forms of assistance that benefit farmers include technical guidance, fertilizer subsidies, cutting-loading subsidies (TMA), and access to Smallholder Credit (KUR). In addition, farmers also receive benefits in the kind of molasses and sugar. The contract also arranges the amount of sugarcane that must be fulfilled along with the rights and incentives for both parties.

SBH arranges the output sharing received between farmers and factories with a variation of 66-80%. The profit-sharing is calculated from the amount of sugar produced. For example, 66 percent profit sharing means 66% of the results belong to farmers, and 34% to the factory. The profit-sharing is calculated based on the resulting yield, which also ranges between 5-8%. This

means that the yield of sugar produced from raw sugarcane to become sugar is 5 percent.

Realization of SBH at PG Kebon Agung can provide various profit-sharing proportions determined by the level of cumulative yield for one period. The 2020 milling season runs from 4 June to 8 November. One milling season is divided into various periods.

Furthermore, the selling of sugar is conducted by auction procedure representatives of farmers-the Indonesian Sugarcane Farmers Association (APTRI) Malang area, sugar factory, and traders (auctioneers). The government has determined the initial price of the auction by taking into account the production cost (BPP). The final price is determined based on the highest bidder in the auction.

Process of payment after harvesting takes a minimum of 10 days and a maximum of 5 months. The steps of SBH partnership in one period include 1-2 days for TMA, 5-8 days for sugar production by the factory, 2-4 days for sugar auction procedures by APTRI, and the next day is payment process for farmers who also involving the Bank and KUD. The length of time is because the cash payment depends on the flowing of sugar auction process.

SPT, name implies is restricted to buy-sell transactions between the two parties. The relationship of the two parties is generally only formed during the harvest season and shortly before harvesting. This condition prompted farmers to operate independently during the farming on land without intervention from sugar factory, including in terms of providing capital. In providing capital, farmers associate independently with the financial providers by using the guarantee they have. During farming operations, farmers inquire about information from near farmers and extension labor. This is different from SBH farmers who get farming information from PG agricultural instructors.

Furthermore, during harvesting, farmers conducted the process of loading and unloading at their own expense. After arriving at the factories, the harvested cane is being measured to determine its weight and assessed based on its quality (yield) to determine the price of sugarcane per quintal. The prevailing price at the time of the study was Rp.60.000-70.000/quintal for low-high quality. However, SPT farmers do not receive other revenue in the form of molasses and sugar. In this case, farmers do not have to wait a long time to get the money from the sale. Graphically, the sales process for SPT system can be seen in Figure 3. This process is slightly

different from the mechanism stated in 593/TI.050/E/7/2019 where the price is set at Rp.50.000 for sugarcane with an individual yield of 7 percent. The price can be lower if the yield is lower, and conversely, the price can be higher if the individual yield is higher.

SBH has several advantages, particularly facilities for smooth credit guarantees, a detailed quality process, and profit-sharing within natura (sugar). However, there is a weakness in SBH, namely the payment time, which tends to be lengthy. This is in line with Rondhi dan Khasan (2021) statement, which states that several characteristics of sugarcane farming cause complexity in sugarcane partnership. Figure 2 illustrates the complex steps of SBH partnership. This and the length of time for payment are considered by farmers who want cash immediately. Realizing SPT mechanism at the research site is simpler than SBH, only involving sugarcane farmers and buyers who want to buy sugarcane owned by farmers (Figure 3).

SPT farmers have the authority to trade their sugarcane through any sugar factories, brown sugar factories, other farmers, slashers (known as pok-pokan). This rapid payment is an advantage of SPT system, even though it has the disadvantage of limited facilities.



Figure 2. Step of Sugarcane sell within SBH Partnership



Figure 3. Step of Sugarcane sell within SPT

Source: Primary Data, 2021 (Processed)

Various factors influence farmers' decision-making to determine SBH partnership and SPT. In this study, researchers concentrated on 9 variables that were assumed to be decision-making factors. The model criteria test was led on all variables in logistic regression analysis. So it can be accomplished a regression model that is fit to be analyzed (Herlina, 2019).

The results of the Omnibus Test with a calculated chi-square value of 129,496 and a significance of 0,000 is less than the error level of 0,05; explains that there is at least one independent variable that affects the dependent variable. So that the equation model and its variables can be used for further analysis. The output of the Classification Table consists a value

of 95 percent. The percentage shows that all independent variables can increase the accuracy of the logistic equation model up to 95 percent. So the equation model and its variables can be used for analysis. The model summary consists of -2LL value to determine the impact of the independent variable addition, and the value of Nagelkerke R Square to determine the percentage of the independent variable's ability to explain the dependent variable. The value of -2LL at step 0 is 166,355 and at step 1 is 36,859. This decreasing value indicates that an addition of 9 independent variables can significantly improve the model.

The Nagelkerke R Square value of 0,880 indicates that the independent variable in the equation model can explain the dependent variable by 88 percent. The value of 12 percent is explained by other independent variables that are not added to the model. Hosmer and Lemeshow's test presents the results. So it is recognized, there is no significant difference between the predicted equation model and the research data. The equation model and variables are suitable for further analysis.

Table 2. Results of Logistic Regression Analysis on Sugarcane Farmers' Decision Making

Independent Var.	β	Wald	Sig.
Age	0,187	3,721	0,054
Education	0,207	1,479	0,224
Experience	0,009	0,018	0,893
Land distance	-0,385	4,160	0,041
Land area	0,066	0,131	0,718
Capital sources	2,694	5,886	0,015
Farmers group	-0,142	0,000	1,000
KUD	19,863	0,000	0,999
Perception	-4,857	6,871	0,009
Constant	-24,949	0,000	0,996
Output	Value	Sig.	
Omnibus Test	129,496	0,000	
Classification Table (step 0)	50,0 %	-	
Classification Table (step 1)	95,0 %	-	
-2 log likelihood (step 0)	166,355	-	
-2 log likelihood (step 1)	36,859	-	
Negelkerke R Square	0,880	-	
Hosmer and Lemeshow's	5,770	0,673	

Source: Primary Data, 2021 (Porocessed)

The research data that has accomplished the regression model criteria test, then each variable is analyzed partially using the Wald test. Wald test along with the logistic regression analysis at the 95 percent confidence level are presented in the resulting table 2. Based on the full results of the logistic regression analysis, three variables that determine decision-making according to the research hypothesis are clarify: the variable distance of land, the main source of capital, and the perception of payment time. In contrast, the other six variables, including farmer's age, education, experience, land size, farmer group, and KUD, have no significant effect on farmers' decision-making to partner within SBH.

Land distance as part of farming characteristics has a significant effect on farmers' decision-making with a significance value of 0.041; smaller than the error level of 0,05. Furthermore, the regression coefficient value - 0.385 also represents if there is an additional 1 km distance (farther from PGKA location), the tendency of farmers to participate in SBH decreases by 38,5 percent. Farmers who have a sugarcane farming location closer to PGKA tend to sell their sugarcane with PGKA Agiesta et al., (2017) This relates to the number of transporting costs by farmers. The cost of trucks increases with the distance from the land. The cost of trucks is also a consideration among other potential benefits of a partnership.

Main capital source variable have a significant effect significance value 0,015; smaller than the error level of 0,05. Moreover, the regression coefficient value of +2,694 additionally confirms that if the main farmers' capital depends on external parties, it will increase the tendency to participate in SBH partnership by 269,4 percent. Farmers that do not have enough capital for farming certainly depend on external parties. External parties, funds providers, that have remained farmer's trust are banks, other farmers, and cooperatives (KUD).

Farmers can access credit at KUD with particular term and conditions as part of SBH partnering benefits. Farmers will be registered with one registration number after completing

the verification process by PGKA. Using this registration number, farmers can access credit and other benefits within the KUD. Farmers who use the primary source of independent capital can fulfill all the resources of sugarcane farming.

Moreover, it is known that the variables that have a significant effect on the decisions of sugarcane farmers is perception of payment time. This variable is also included in institutional variables representing farmers' perceptions of the length of time for a cash payment from sugarcane sales. Payment time is calculated from the harvesting time. The significance value of 0,009 is smaller than the error level of 0,05, and also the coefficient value of -4,857 emphasizes if farmers have a perception of fast cash payment, the possibility of determining to participate in SBH decreases by 485,7 percent.

The length of time for cash payment in SBH partnerships is one of the considerations for farmers to decide. Respondent farmers learn from their own experiences as partners and more from the realization of other farmers. This is confirmed by the condition of other sugar factory partner farmers, who are also known through research that cash payment requires a long time. One of them is a partner farmer in PG Gempolkrep. (Azmie et al., 2019).

Farmers who decide payment time not as the main thing, surely, they have sufficient independent capital to use for sugarcane farming the following season. On the other side, SPT has advantages in the speed of cash payment.

Six other variables have no significant effect on decision making, viz age, education, experience, land area, farmer groups, and KUD. The age inquiry is the age level of farmer at the time this research was conducted. Education defines the level of formal education taken by the respondent. Knowledge about sugarcane is received by farmers, not from formal education but parents, the environment, and guidance from factory. This knowledge also includes information about the mechanism of SBH partnership and SPT. In line with research from Rokhani, et al. (2020) which states the factors of age, education level, and land type do not

significantly affect the decision-making of sugarcane farmers' partnerships in Indonesia.

The experience variable shows how long the farmers have been handling out their sugarcane farming. The results of the analysis show that the experience variable has no significant effect on decision-making. This is indicated by a significance value 0,893 which is greater than the error level of 0,05. Experience does not affect because sugarcane farmers have sufficient insight and authority not to participate in SBH contracts in following season. The terms of contract also not require farmers to have farming experience to join as SBH partner farmers, same if they want to decide the form of SPT.

Total area of sugarcane farming land does not hold the farmers' decision to decide. SBH partnership and SPT do not have a minimum land area requirement. So farmers still in authority to decide between the two mechanism. Participation of farmers in the organization, especially farmer group and KUD, also has no significant effect. Farmer groups are formed in a small village area based on collective goals. Most of the sugarcane farmers in Kedungkandang District have participated in local farmer groups since a long time ago. In fact, it is a legacy from the past generation. Farmer groups are known to have a major impact on the sustainability of sugarcane farmers in PGKA's operation areas. Various benefits are received by farmers so that participation in farmer groups continues until now. The benefits including a discussion for aspirations and source of information.

Another organization including is KUD. Participation in KUD does not show to have a significant effect on decision-making. However, it is known that the existence of KUD has a vital role for sugarcane farmers in PGKA's operation area. The sugarcane farmers of Kedungkandang District can access KUD "Subur" which has a sugarcane business unit. Sugarcane farmers as long as they have administrative requirements, such as ID, family card, and sugarcane farming land, can register as members of KUD.

The results of this study concluded that the sugarcane farmers condition with close land distance from PGKA, main source of capital depends from external parties, and do not expect a fast cash payment time, tend to participate in SBH partnership. These are related to research by Susilowati et al., (2020), which states that contract farming provides many benefits for farmers and PG Kebon Agung. Both parties have been established on long-term commitments as a form of partnership.

Farming income consists of cost and revenue components which are then calculated in mathematic equations. The cost components acquired by farmers in SBH and SPT mechanisms are not different. Sugarcane farming according to Fatah (2016) remains for 8-12 months until ready to harvest. The characteristics of these plants generate many things that are needed in cultivation. The cost components to fulfilled general cultivation needs including land costs, fertilizer costs, labor costs, and cutting-transport costs (TMA).

Details of the costs required for farming in the PG Kebon Agung operation area are presented in the following table.

Table 3. Sugarcane Farming Costs in PGKA Operation Area

Cost	SBH Farming (Rp/Ha)	SPT Farming (Rp/Ha)
Land	15.464.488	15.580.688
Fertilizer	2.271.426	3.655.381
Labor	14.359.886	13.644.556
Harvesting	7.216.350	8.326.935
TC	39.312.151	41.207.559

Source: Primary Data, 2021 (Processed)

Table 3 shows the cost component on one season of sugarcane farming for both those who have participated in SBH with PG Kebon Agung and those who practice SPT. After calculating, it can be perceived that the average total cost required by farming with SBH partnerships is Rp.39.312.151/Ha. While the average total cost required for farming in the form of SPT is Rp.41.207.559/Ha. Cost components included in the calculation such as land costs, fertilizer costs, labor costs, and TMA costs.

The average cost of land in 2020 for SBH is Rp. 15.464.488/Ha and SPT farming is Rp.15.580.688/Ha. Differences in land costs are not only prompted by the sugarcane selling mechanism but also affected by other factors such as land type, soil fertility, land location, access to main roads, and conditions around the land. wetland tends to be more valuable than dry land. This is because including clear access to water irrigation. Land that is closer to the main road also tends to be more valuable than the further inland due to accessibility for trucks during the harvesting (TMA) process.

The average cost of fertilizer in the 2020 farming season for SBH is Rp. 2.271.426/Ha and SPT farming is Rp. 3.655.381/Ha. Teger Basuki (2016) the general dose of ZA fertilizer is 5 quintals per hectare and phonska 6 quintals per hectare. Organic fertilizers do not have a specific dose limit because their features could improve soil composition. Farmers who participate in SBH can afford three types of fertilizers at subsidized prices through KUD as one of the partnership benefits with PG Kebon Agung. The quantity of subsidized fertilizer is limited to one package of 12 quintals/ha per farmer, consisting of 6 quintals of ZA fertilizer, 4 quintals of Phonska fertilizer, and 2 quintals of Petroganik.

SBH farmers will be subjected to subsidized prices, can be paid in cash or cut from receipts during the production season with 10,5 percent interest rate. The price of subsidized fertilizer that practices in 2020 is Rp.85.000/50kg for ZA fertilizer, Rp.115.000/50kg for Phonska fertilizer, and Rp.32.000/50kg for Petroganik fertilizer.

Farmers also accessing non-subsidized fertilizers at farm shops or agents to get sufficient quantity. Meanwhile, farmers who apply SPT mechanism are not attached by a partnership with PG Kebon Agung, so the fertilizer needs are fully acquired through farm shops or agents. The unit price for non-subsidized fertilizers is Rp.140.000/50 kg for ZA fertilizer, Rp.230.000/50 kg for Phonska fertilizer, and Rp.50.000/50 kg petroganik.

The average total labor cost required for SBH farming is Rp. 14.359.886/Ha, and SPT is

Rp. 13.644.556/Ha. The need for farm laborers is adjusted to the number of varieties of work in the technical cultivation that will be operated. Some types of work use farm laborers with a daily payment system, and other types use a grouping system. This type of work requires that SBH farms and SPT provide labor costs that are not so different.

Overall, the average cost of TMA required for SBH farming is Rp.7.613.854/ha, and after subsidy addition, it is Rp.7.216.350/ha. While for SPT farming as total Rp.8.326.935/Ha. The cost of harvesting labor in Kedungkandang District ranges from Rp.4.500 - Rp.15.000 per quintal of sugarcane, and for trucking labor it ranges from Rp.3.500 - Rp.5.000 per quintal of sugarcane.

With this price range, the imposition of costs for SBH and SPT farmers is considerably different. SBH partner farmers are helped by the presence of subsidies as part of the partnership benefits. The amount of subsidy is Rp.200/quintal of sugarcane for transportation and Rp.300/quintal of sugarcane for cutting quality improvement. The average subsidy received by partner farmers is Rp.401.986/Ha.

Table 4. Sugarcane Farming Revenues in PGKA Operation Area

Revenue	SBH Farming (Rp/Ha)	SPT Farming (Rp/Ha)
Sugar Auction	50.133.721	53.807.071
Molasses	5.247.049	-
Sugar (Natura)	6.012.457	-
TR	61.393.227	53.807.071

Source: Primary Data, 2021 (Processed)

Table 4 shows the details of sugarcane farming revenues for both participating in SBH with PG Kebon Agung and those who practice SPT. The revenue components included in the calculation are sugarcane sales, molasses revenue, and sugar sales (natura). After calculating, it is known that the average total revenue obtained by SBH partnership farming with additional revenue is Rp.61.393.227/Ha. While the average total income of SPT from sugarcane sales is Rp. 53.807.071/Ha.

Revenue, in general, proceeds from the trade of sugarcane which is measured by its weight. Greater the weight, then greater the revenue for farmers. Income calculation for SBH farmers is also determined by the amount of yield. The weight of sugarcane that has been measured will be calculated with the yield percentage of the farmer's share. The yield that applies at PG Kebon Agung is calculated cumulatively per period. Furthermore, the calculation of the weight of sugar is obtained to be calculated by the highest sugar price from the auction which is received by farmers. The auction of sugar prices in the 2020 season is not different, range Rp.10.700 - Rp.11.200/kg sugar.

In addition to revenues from the sale of sugarcane, SBH farmers also receive revenues in the form of molasses and sugar sales. Molasses prices at PG Kebon Agung in the 2020 production season are around Rp.6.600/quintal of sugarcane. For sugar revenue, SBH partner farmer is authorized 10 percent of the total sugar production. Sugar (natura) can be trade at the price per kilo of sugar prevailing in the consumer market.

SPT revenue only calculated by its weight. The weight of the sugarcane is generated by the selling price proposed by the buyer. Farmers without partnership relations with sugar factory can decide the buyers with the best prices. The buyes, also the funder, will propose a number of prices regarding a price account of sugarcane in the market. The farmers will trade at the best price with the consideration that they will not receive other revenue. The sugarcane prices in the 2020 production season are within Rp.49.000 - Rp.84.000/quintal. Farmers with SPT do not receive any revenue from molasses and sugar.

Based on research in the site and being collected and calculated. From that, it is identified the average income per hectare of sugarcane farming with SBH and SPT. The income for SBH farming is Rp.22.081.076/Ha, and for SPT is Rp.12.599.513/Ha. The amount of these two incomes are affected by the revenue and cost components that have been defined in previous results. So it is known that the incomes of both SBH and SPT at profitable level.

The results of this study and calculations are conformed with Dini (2019) which states that the income of SBH farming with PG Kebon Agung is not only received from sugarcane sales. Components of net farm income (NFI) SBH's sugarcane are presented on the farmers' sugar receipt including revenue from the sugarcane sales as well as molasses and white sugar.

In terms of selling the sugar (natura), PG Kebon Agung does not prohibit farmers from selling sugar to other parties at the current market price. These revenue components also increase farm income. Revenue as an additional factor has a positive impact on income levels. If the revenue is greater, it will increase farm income.

Farmers have two alternatives in trading their sugarcane products, namely SBH partnership and SPT. The researcher wants to study the comparison of the two forms, especially in terms of their benefits for farmers. One feature that can be used as an indicator of the comparison is farm income. Based on the results in the previous analysis, the income value of SBH partner farms and SPT farming partners is collected. The following are the results of the income comparison using independent t-test analysis at the 95 percent confidence level:

Table 5. Results of Comparative Analysis on Farming Income.

Details	Result
SBH Averages income	22.081.075,97
SPT Averages income	12.599.512,57
Average difference	9.481.563,40
Sig. of variance test	0,312
t-test	10,388
df (N-2)	118
Sig. t-test (2-tailed)	0,000

Source: Primary Data, 2021 (Processed)

Based on table 5, it is known that the difference in the average income between the two forms is Rp.9.481.563,40/Ha. Results of the analysis calculation of the average income, the variance significance value of the Levene Test output is 0,312, which is greater than the error level 0,05. So the data requires assumption for t-test, the similarity of variances is achieved (Santoso, 2017).

Furthermore, it can be seen that the t-value of 10,388 is greater than the t-table value of 1,980 at df 118. The significance value of the t-test (2-tailed) with a number of 0,000 is less than the error level of 0,05. So it is identified, there is a significant difference between SBH partnership and SPT farming income in the operation area of PG Kebon Agung. This is in line with the research from Dyah, et al. (2019) which concludes that there is a difference in the average income of partner sugarcane farmers with non-partners in PG Rendeng. The income difference of partner farmers is Rp. 4.321.965/Ha compared to independent farmers.

Partner sugarcane farmers in several past studies are representatives of SBH partners in this study. Farmers register a partnership with a sugar factory that is arranged a production contract. The contract letter contains an arrangement that must be performed by the farmer, particularly the amount of sugarcane and a certain yield to get incentives. Incentives received by partner farmers include the sale of sugarcane, molasses, and sugar, also accessibility to subsidies and loan credit. On the other side, sugar factories get incentives to ensure the amount of sugarcane supply for sugar production.

Meanwhile, in past studies, farmers who are not registered as partner farmers are frequently represented as non-partner farmers. Farmers have authority to trade their sugarcane products, not being restricted by a contract with any sugar factory. The decision to trade is owned by non-partner farmers any available buyer, sugar factories, sugarcane traders, and brown sugar factories through buy-sell transactions. In this study, SPT farming is a term represents non-partner farmers in selling their sugarcane products.

The difference in income levels is moreover due to the different mechanisms between SBH partnership and SPT. The form of SPT has a revenue with the weight of sugarcane calculated by price per quintal of sugarcane. The amount of sugarcane weight and selling price are the only component of the farming income level in SPT mevhanisme. While the form of SBH partnership has a more complex revenue

calculation. The weight of sugarcane calculated by the cumulative yield to get the weight of sugar. Furthermore, the weight of sugar is calculated by the selling price per kilogram of sugar from the auction process for farmers' revenue.

The form of SBH partnership, apart from the revenue from sugarcane sales, also receive additional revenue from the sale of molasses and sugar. The amount of revenue from the sale of molasses is calculated using the cane weight component and selling price per quintal of cane. The sugar reception is received from 10 percent of the sugar weight in the previous calculation. Farmers generally sell sugar (*natura*) at market prices which tend to be more valuable than the auction price. So that sales become additional income for farming in the form of SBH partners.

In this study, it is known that the average farming costs of SBH and SPT are not so different, just the cost of fertilizer. The difference in fertilizer costs is due to SBH partner farms being able to access subsidized fertilizers at the KUD as part of the partnership advantages. In 2020 season, the unit price of subsidized fertilizer is less when compared to the non-subsidized price. Farmers in the form of SPT fulfill the fertilizer need from kiosks and agricultural agents with various unit prices.

The income level of SBH partnership farming is identified in Rp.9.481.563,40/Ha higher than SPT farming. The results of this study are in line with previous research. Cahyarubin (2016) states that the income level of partner farms is greater than that of non-partner farmers in PG Rejoagung Baru. Related conclusions were also received from the research of Rahma dan Mayangsari (2018) that farmers with PG Olean credit partners have a higher income level of Rp.12.212.194 from independent farmers.

Furthermore, Sixmala et al., (2019) also strengthened the results of the study which stated that the income level of the farmers of PG Rejoagung Baru partners, was greater than the income of non-partner farmers, with a difference of Rp.5.060.935.

CONCLUSION

SPT is the new policy from central government to provide farmer a cash after harvesting time. In contrast, SBH provide risk-sharing from farmer and sugar factory. This study confirms the significant factors on sugarcane farming decisions to participate in SBH and SPT. This study confirm that farmer participation in selecting factors include land distance, main source of capital, and perception of payment time. Farms with land distances that are farther from sugar factory, the main source of capital depend from external, and the perception of payment time that not have necessary to be fast, they are tend to participate SBH partnerships.

The average income level of SBH farming is Rp.20.802.062/Ha; and SPT farming of Rp.14.029.906/Ha. There is a significant difference between the mean income of SBH and SPT. This reserach recommends can be made for to develop the national sugarcane industry. First, SBH Partnership has long-term advantages, such as guaranteed sugarcane supply for factories that also help ensure the national sugar supply, and for farmers its guarantees the market prices and sugarcane sales. The government is supposed to improve the realization of SBH partnership as a mechanism for selling sugarcane. SPT mechanism which is being discussed by the government is worried to disrupt the sustainability of sugar supply. A critical possibility is competition for sugarcane demand between factories which leads to production inefficiency. Then the government and sugar factories are suggested to optimize the sugar auction procedure in SBH mechanism. So the cash payments can be agile and profitable for all parties.

This paper has limitations that may be enhanced in further research. The limitation is that the research takes a sample of farmers located on the island of Java, where most of the sugar factories are inherited from colonialism. Unlike factories outside Java, such as Lampung, Bombana, and Nusa Tenggara, they manage their Private Plantation (TS). Future research is also expected to describe the urgency of Direct Payment policy on a national scale, with samples not only in Java.

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