Analysis of Factors Influencing the Production of Dried *Gambier* Sap in *Pakpak Bharat* District

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Abstract: *Gambier* has high economic value, but it has not been cultivated intensively in Indonesia. Plant area and production of *gambier* still fluctuate from year to year. Pakpak Bharat is the largest *gambier*-producing region in North Sumatra. The factors that directly and indirectly influence the production of dried *gambier* sap in Pakpak Bharat District were analyzed using the linear regression model with the intermediate or intervening variable. The results showed that the area of productive plants, the use of fertilizers, and the experience in farming had a positive and significant influence on the amount of harvested *gambier* leaf, the types of seeds, and the use of pesticides. However, the age of productive plants have a negative and significant influence. Meanwhile, the number of productive plants has a positive influence and the number of cultivation labors has a negative influence, although it is not significant. The number of processing labors has a positive and significant influence on the production of dried *gambier* sap; while the amount of harvested *gambier* leaf has a positive but not significant influence. Variables influencing the amount of harvested *gambier* leaf cannot influence the production of dried *gambier* sap indirectly through the mediation of the amount of harvested *gambier* leaf.

1 INTRODUCTION

Dried *gambier* sap is the dried extract of boiled leaf and twig of *gambier* plant (Uncaria gambier Roxb). *Gambier* sap has many benefits and can be used both in the traditional and modern industry, so the need for *gambier* continues to increase. Consequently, it has high economic value. Although Indonesia is a large exporting country in the world *gambier* market, *gambier* plantation is a smallholder plantation and has not been cultivated intensively. According to Manan (Manan, 2008), all *gambier* plantations in Sumatera are smallholder plantations, and no investors are trying to manage them. According to Ermiati (Ermiati, 2004), the prospect of high *gambier* demand has not been accompanied by increased productivity, quality, and income of farmers. *Gambier* industry is still classified as the home industry, so the productivity, quality, and income of farmers are still low.

Many problems must be faced in *gambier* plantation development, ranging from cultivation techniques, post-harvest processing, business planning, marketing, to the socio-economic and cultural aspects. According to Fauza et al. (Fauza et al. 2007), the main problem in *gambier* plantation development is low productivity. The low productivity of *gambier* occurs due to the traditional cultivation techniques, the use of non-optimal production inputs, the unavailability of superior varieties, inadequate maintenance, as well as the methods and tools of harvesting and processing that have not been effective and efficient.

The production centers of *gambier* in Indonesia are still limited. Based on BPS-Statistics Indonesia (BPS-Statistics Indonesia, 2014), the three largest *gambier* producing regions in Sumatra are Lima Puluh Kota District in West Sumatra Province and followed by Pakpak Bharat District and Dairi District in North Sumatra Province. The largest *gambier*-producing region in Indonesia is Kabupaten Lima Puluh Kota in West Sumatera Province. Meanwhile, the area of plants and production of *gambier* in North Sumatra, which is the second largest *gambier*-producing region in Indonesia, still fluctuates from year to year. It shows that *gambier* farming in North Sumatra is potential to be developed intensively. The largest *gambier*-

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producing region in North Sumatra is Pakpak Bharat.

It is slow and fluctuating increase in production and the demand in the domestic and world markets continue to increase along with new studies about the benefits of *gambier*. This situation leads to increases *gambier* demand for industries. It makes *gambier* farming potential to be developed intensively. Based on this, this study aims to analyze the factors that directly and indirectly influence the production of dried *gambier* sap in Pakpak Bharat District. Mediawati (2010) in Pakpak Bharat District, North Sumatera Province, showed that the factors influencing *gambier* production were the number of cultivation labors, the use of fertilizers, and the number of productive plants. Afrizal (2009) in Lima Puluh Kota District, West Sumatera Province, showed that the factors influencing *gambier* production were the number of cultivation labors, the area of productive plants, the use of pesticides, the number of productive plants, the age of productive plants, cultivation methods, farming experience. Ermiati and Rosmeilisa (2001) in Harau Sub-district, Lima Puluh Kota District, West Sumatera Province, showed that the types of seeds, the use of fertilizers, and the technology of processing influence *gambier* production.

2 METHODS

The study was conducted in Pakpak Bharat District because it was the largest gambier plant area and production in North Sumatra Province. The population of this study was the *gambier* farmers in Pakpak Bharat District, who planted gambier started from the cultivation to the processing into dried gambier sap. The sampling was carried out using a simple random sampling method. The samples obtained from Sitellu Tali Urang Jehe, Pergetteng Getteng Sengkut, Kerajaan, and Tinada Sub-districts because they had the largest *gambier* farmer population in Pakpak Bharat District with more than 100 *gambier* farmers. The data used were the primary data obtained through interviews with 100 gambier farmers in 2013.

The collected data were then tabulated and analyzed using the linear regression model with intermediate or intervening variables. Model estimation used Ordinary Least Square (OLS) method. The data processing used the SPSS 24 Program. The production of dried *gambier* sap was influenced by the amount of harvested *gambier* leaf and the number of processing labors. While the amount of harvested *gambier* leaf was influenced by the cultivation labors, the area of productive plants, the types of seeds, the use of fertilizers, the use of pesticides, the number of productive plants, the age of productive plants, and the experience in farming. Therefore, through the amount of harvested *gambier* leaf, the number of cultivation labors, the area of productive plants, the types of seeds, the use of fertilizers, the use of pesticides, the number of productive plants, the age of productive plants, and the experience in farming were expected to influence the production of dried *gambier* sap. The path of analysis of the influencing factors of the production of dried *gambier* sap in Pakpak Bharat District was presented in Figure 1.

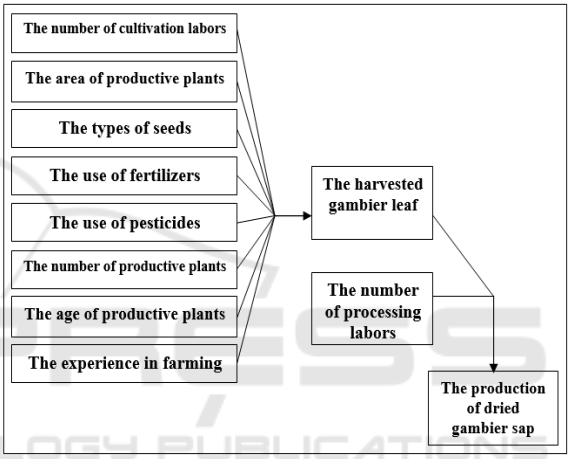

Figure 1: Path of Analysis.

Model of the production of dried *gambier* sap in this study is mathematically expressed in a multiple linear regression equation as follow.

$$HPDG = c_0 + c_1\,TKB + c_2\,LLTM + c_3\,JB + c_4\,PPu + c_5\,PPe + c_6\,JTM + c_7\,UTM + c_8\,PB + \mu_1 \quad (1)$$

$$PGGK = b_0 + b_1\,HPDG + b_2\,TKP + \mu_2 \quad (2)$$

Descriptions:

HPDG = the amount of harvested *gambier* leaf (kg/ha/year);

TKB = the number of cultivation labors (HKO/ha/year);

LLTM = the area of productive plants (ha);

JB = the types of seeds (*dummy*),
where: 1: if used the seeds varieties that was recommended by government; 0: if used the local seeds varieties;

PPu = the use of fertilizers (*dummy*),

where: 1: if used fertilizers; 0: if did not use fertilizers;

PPe = the use of pesticides (*dummy*), where: 1: if used pesticides; 0: if did not used pesticides;

JTM = the number of productive plants (tree/ha);

UTM = the age of productive plants (year);

PB = the experience in farming (year);

PGGK = the production of dried gambier sap (kg/ha/year);

TKP = the number of processing labors (HKO/ha/year);

$b_1, ..., b_n$ = the regression coefficients or parameters of the production of dried gambier sap equation;

$c_1, ..., c_n$ = the regression coefficients or parameters of the amount of harvested gambier leaf equation;

b_0, c_0 = the intercept coefficient or constant of the model;

μ_i = the error or residual or disturbance.

Variables influencing the amount of harvested *gambier* leaf influence the production of dried *gambier* sap indirectly through the amount of harvested *gambier* leaf mediation. OLS assumption test was carried out before the model estimation to see whether there was a disturbing element in the regression model (Gujarati, 2004). Normality assumption test was conducted by the Kolmogorov-Smirnov test. The multicollinearity assumption test was conducted by looking at the Tolerance and VIF values. Moreover, the heteroscedasticity assumption test was conducted by the Glejser test (Ghozali, 2014).

Furthermore, results of the goodness of fit test, which included the F-test, and the determination coefficient value (R^2) test were evaluated. The t-test was carried out to see the independent variables influencing the amount of harvested gambier leaf and the production of dried gambier sap. In addition, the Sobel test was carried out to see the indirect influence of variables influencing the amount of harvested gambier leaf on the production of dried gambier sap through the mediation of the amount of harvested gambier leaf (Ghozali, 2013).

3 RESULTS AND DISCUSSION

The normality assumption test with Kolmogorov-Smirnov test on both models showed a significance value of 0.200 (> 0.05) which means that the residual data were normally distributed. The multicollinearity assumption test showed the Tolerance value of all independent variables > 0.1 and VIF of all independent variables < 10 which means that there was no multicollinearity in the models. The assumption of heteroscedasticity test with Glejser test showed the significance value of all independent variables > 0.05, which means that heteroscedasticity did not occur in the models (Table 4).

Table 1 shows the statistical test result of factors influencing the amount of harvested gambier leaf. The model of the factors influencing the amount of harvested *gambier* leaf is 0.528 (R-Squared). It means that 52.8% of the variations of the independent variables of the number of cultivation labors and the area of productive plants explain the variation of the dependent variable. The types of seeds, the use of fertilizers, the use of pesticides, the number of productive plants, the age of productive plants, and the experience in farming, have been able to explain the variation of the dependent variable of the amount of harvested *gambier* leaf. The remaining 47.2% is explained by the variations in other variables that are not included in the model. The F-statistical probability value of 0.000 (< 0.05) also has significant influence on the dependent variable of the amount of harvested gambier leaf.

Table 1: The statistical test result of factors influences the amount of harvested gambier leaf.

Variables	Statistics Test			
	C	Std. Error	t	Sig.
Constant	1554.665	1303.305	1.193	0.240
The number of cultivation labors (HKO/ha/year)	-0.006	0.982	-0.006	0.995
The area of productive plants (ha)	2143.232	921.615	2.326	0.025
The types of seeds (dummy)	-1649.479	536.772	-3.073	0.004
The use of fertilizers (dummy)	1774.538	602.476	2.945	0.005
The use of pesticides (dummy)	-1061.868	572.449	-1.855	0.071
The number of productive plants (plants/ha)	0.571	0.356	1.601	0.117
The age of productive plants (year)	-132.575	77.979	-1.700	0.097
The experience in farming (year)	110.278	45.468	2.425	0.020
		R^2	0.528	
		F	5.724	0.000
		Normality Test (Z)	0.089	0.200
Dependent Variable: The amount of harvested gambier leaf (kg/ha/year)				

Table 2 shows the statistical test result of factors influencing the production of dried *gambier* sap. In the model of the factors influencing the production of dried gambier sap, the determination coefficient (R-Squared) is 0.577 which means that 57.7% variations in the independent variables of the amount of harvested *gambier* leaf and the number of processing labors have been able to explain the variation of the dependent variable of the production of dried gambier sap. On the other hand, the remaining 42.3% is explained by the variations in other variables that are not included in the model. The f-statistical probability value of 0.000 (<0.05) shows that the independent variables of the amount of harvested *gambier* leaf and the number of processing labors included into the model, simultaneously has a significant influence on the dependent variable of the production of dried gambier sap.

Table 2: The statistical test result of factors influences the production of dried *gambier* sap.

Variables	Statistics Test			
	B	Std. Error	t	Sig.
Constant	57.111	48.202	1.185	0.242
The number of processing labors (HKO/ha/year)	0.020	0.017	1.141	0.260
The amount of harvested gambier leaf (kg/ha/year)	1.625	0.451	3.602	0.001
R^2			0.577	
F			32.024	0.000
Normality Test (Z)			0.085	0.200
Dependent Variable: The production of dried gambier sap (kg/ha/year)				

The function of the factors influencing the production of dried gambier sap could be written in the linear equation as follows.

$$HPDG_{LLTM} = 1554.665 - 0.006\,TKB + 2143.232 - 1649.479\,JB + 1774.538\,PPu - 1061.868\,PPe + 0.571\,JTM - 132.575\,UTM + 110.278\,PB \quad (3)$$

$$PGGK = 57.111 + 0.020\,HPDG + 1.625\,TKP \quad (4)$$

The number of cultivation labors has a coefficient value of -0.006, but the significance value is 0.995 so that it is not significant at α 5% and α 10%. It means that the number of cultivation labors has a negative influence but not significant on the amount of harvested gambier leaf. Therefore, if there is an increase in the number of cultivation labors of 1 HKO/ha/year, then the amount of harvested *gambier* leaf will decrease by 0.006 kg/ha/year. The cultivation labors were mostly used in the process of plant maintenance and harvesting. The majority of gambier farming in Pakpak Bharat District used family labor. All this time, the *gambier* farming itself was still a source of side income. In general, *gambier* farmers have other sources of income. Therefore, the allocation of labors for the plant maintenance and harvesting had not been optimal. The plant maintenance was only carried out if it was time available and as minimum as possible. The harvesting also still had to experience constraints on the limited capacity of processing facilities owned by farmers. Consequently, whatever number of labors was allocated for harvesting, the labors would only harvest *gambier* leaves as much as the capacity that could be processed by the processing facilities owned by farmers.

The area of the productive plants has a coefficient value of 2143.232, and the significance value is 0.025 so that it is significant at α 5%. It means that the area of the productive plants has a positive and significant influence on the amount of harvested gambier leaf. Therefore, if there is an increase in the area of the productive plants of 1 ha, then the amount of harvested *gambier* leaf will increase by 2143.232 kg/ha/year. The larger the area of the productive plants, the more the number of plants and the amount of gambier leaf could be harvested.

The types of seeds have a coefficient value of -1649.479, and the significance value is 0.004 so that it is significant at α 5%. It means that the types of seeds have a negative and significant influence on the amount of harvested gambier leaf. Therefore, if the farmers use the superior varieties seeds recommended by the government, then the amount of harvested gambier leaf will be lower by 1649.479 kg/ha/year than if the farmers use the local varieties seeds. The superior varieties recommended by the government succeeded well based on observations in the area of West Sumatra, which was the largest gambier production center in Indonesia, on the other hand, the local variety seeds yielded a higher amount of gambier leaf in Pakpak Bharat District. The local varieties were more suitable to be developed in Pakpak Bharat District due to the location-specific nature of agricultural commodities. Varieties that are suitable to be developed in an area will not necessarily give the same results if developed in other regions. Local varieties from Pakpak Bharat District had better adaptability in Pakpak Bharat District compared to new varieties imported from other regions.

The use of fertilizers has a coefficient value of 1774.538, and the significance value is 0.005 so that it is significant at α 5%. It means that the use of fertilizers has a positive and significant influence on the amount of harvested *gambier* leaf. Therefore, if the farmers use the fertilizers, then the amount of harvested *gambier* leaf will be higher by 1774.538 kg/ha/year than if the farmers do not use the fertilizers. There was no location-specific standard operating procedure (SOP) in carried out the *gambier* farming in Pakpak Bharat District. So that farmers also had not implemented the *gambier* farming based on SOP. The use of fertilizers and pesticides was carried out only modestly. There was no regular schedule or frequency of using fertilizers or spraying pesticides. Farmers would use fertilizers or spray pesticides only if there were excess money or if it was deemed necessary. The amount and types were also just as casual and not based on calculations or specifically recommended dosages. Gambier plants are usually planted on marginal land, so fertilization is essential to improve soil fertility.

The use of pesticides has a coefficient value of -1061.868, and the significance value of 0.071 so that it is significant at α 10%. It means that the use of pesticides has a negative and significant influence on the amount of harvested *gambier* leaf. Therefore, if the farmers use the pesticides, then the amount of harvested *gambier* leaf will be lower by 1061.868 kg/ha/year than if the farmers do not use pesticides. Same as in the use of fertilizers, the farmers had not implemented the gambier farming based on SOP. When using pesticides, the amount and types were just as casual and not based on calculations or specifically recommended dosages. Moreover, the form of *gambier* plants themselves is the shrubs half-propagating, so that an inappropriate pesticides usage and not according to the recommendations or excessive can actually damage the plant, especially the leaves.

The *number* of productive plants has a coefficient value of 0.571, but the significance value is 0.117 so that it is not significant at α 5% and α 10%. It means that the number of productive plants has a positive but not significant influence on the amount of harvested *gambier* leaf. Therefore, if there is an increase in the number of productive plants by 1 tree/ha, then the amount of harvested *gambier* leaf will increase by 0.571 kg/ha/year. The more the number of productive plants, the more the amount of gambier leaf could be harvested. However, paying attention to the plants spacing is still very important. Farmers in Pakpak Bharat District usually plant *gambier* with varies spacing, so that the number of productive plants of each farmer per hectare varies greatly. In fact, spacing that is too narrow, can interfere the plant growth, while too tenuous spacing will be less efficient because the number of plants produce will decrease.

The age of productive plants has a coefficient value of -132.575, and the significance value of 0.097 so that it is significant at α 10%. It means that the age of productive plants has a negative and significant influence on the amount of harvested *gambier* leaf. Therefore, if there is an increase in the age of productive plants by 1 year, then the amount of harvested gambier leaf will decrease by 132.575 kg/ha/year. The gambier plants were not at a productive age so that an increase of age would actually reduce the amount of harvested gambier leaf.

The experience in farming has a coefficient value of 110.278, and the significance value of 0.020 so that it is significant at α 5%. It means that the experience in farming has a positive and significant influence on the amount of harvested gambier leaf. Therefore, if there is an increase in the experience in farming by 1 year, then the amount of harvested *gambier* leaf will increase by 110.278 kg/ha/year. The higher the experience of farmers in farming *gambier*, the higher their knowledge and ability, therefore they will be better and more efficient in farming *gambier*.

The amount of harvested *gambier* leaf has a coefficient value of 0.020, and the significance value of 0.260 so that it is not significant at α 5% and α 10%. It means that the amount of harvested *gambier* leaf has a positive but not significant influence on the production of dried *gambier* sap. Therefore, if there is an increase in the amount of harvested *gambier* leaf by 1 kg/ha/year, then the production of dried *gambier* sap will increase by 0.020 kg/ha/year. The amount of harvested *gambier* leaf has no significant influence on the production of dried *gambier* sap because the capacity of the processing facilities was not optimal. As much as any gambier leaves could harvest by farmers, farmers could only process as much dried *gambier* sap as can be processed by the available processing facilities, while the rest would be the leftover. There used to be a factory that could process *gambier* leaves into dried *gambier* sap in Pakpak Bharat District, so that the farmers could sell their gambier leaves to be processed at the factory. However, the factory was no longer operating, so farmers were forced to process their *gambier* leaves into dried *gambier* sap with traditional and limited processing tools. It caused *gambier* leaves to be processed per day only

as much as the capacity of the boiler for boiling and the available labors. The quality, size, and shape of the dried *gambier* sap produced were also not well standardized, so it would be difficult to export.

The number of processing labors has a coefficient of 1.625, and the significance value of 0.001 so that it is significant at α 5%. It means that the number of processing labors has a positive and significant influence on the production of dried *gambier* sap. Therefore, if there is an increase in the number of processing labors of 1 HKO/ha/year, then the production of dried *gambier* sap will increase by 1.625 kg/ha/year. The more the number of processing labors, the more the capacity of *gambier* leaf that can be processed by farmers to become dried *gambier* sap, so that will increase the production of dried gambier sap.

Table 3: The statistical test result of factors influences the production of dried *gambier* sap indirectly through the mediation of the amount of harvested gambier leaf.

Variables	Statistics Test			
	B x C	Std. Error	t	t_{table}
The number of cultivation labors (HKO/ha/year)	-0.00012	0.02578	-0.00466	2.020
The area of productive plants (ha)	42.86464	43.73470	0.98011	2.020
The types of seeds (dummy)	-32.98958	31.38189	-1.05123	2.020
The use of fertilizers (dummy)	35.49076	34.06095	1.04198	2.020
The use of pesticides (dummy)	-21.23736	23.48722	-0.90421	2.020
The number of productive plants (tree/ha)	0.01142	0.01347	0.84756	2.020
The age of productive plants (year)	-2.65150	3.04452	-0.87091	2.020
The experience in farming (year)	2.20556	2.22238	0.99243	2.020
Dependent Variable: The production of dried gambier sap indirectly through the mediation of the amount of harvested gambier leaf (kg/ha/year)				

Table 3 shows the statistical test result of factors influencing the production of dried *gambier* sap through the mediation of the amount of harvested *gambier* leaf. The Sobel test showed the significance value (p-Value) of all independent variables > 0.05 which means that it was not significant at α 5% or α 10% (Table 5). It means that the variables that influence the amount of harvested *gambier* leaf could not influence the production of dried *gambier* sap indirectly through the mediation of the amount of harvested *gambier* leaf. Variables that influenced the amount of harvested gambier leaf would be able to influence the production of dried *gambier* sap indirectly if the amount of harvested *gambier* leaf itself could influence the production of dried *gambier* sap.

The magnitude of the indirect influence from variables influencing the amount of harvested *gambier* leaf to the production of dried *gambier* sap through the mediation of the amount of harvested gambier leaf could be interpreted as follows.

1. The number of cultivation labors has an indirect coefficient value of -0.00012 which means that if there is an increase in the number of cultivation labors of 1 HKO/ha/year, then the production of dried gambier sap will decrease by 0.00012 kg/ha/year.
2. The area of the productive plants has an indirect coefficient value of 42.86464, which means that if there is an increase in the area of the productive plants of 1 ha, then the production of dried gambier sap will increase by 42.86464 kg/ha/year.
3. The types of seeds have an indirect coefficient value of -32.98958 which means that if the farmers use the superior varieties seeds recommended by the government, then the production of dried gambier sap will be lower by 32.98958 kg/ha/year than if the farmers use the local varieties seeds.
4. The use of fertilizers has an indirect coefficient value of 35.49076, which means that if the farmers use the fertilizers, then the production of dried gambier sap will be higher by 35.49076 kg/ha/year than if the farmers do not use the fertilizers.
5. The use of pesticides has an indirect coefficient value of -21.23736, which means that if the farmers use the pesticides, then the production of dried gambier sap will be lower by 21.23736 kg/ha/year than if the farmers do not use pesticides.
6. The number of productive plants has an indirect coefficient value of 0.01142, which means that if there is an increase in the number of productive plants by 1 tree/ha, then the production of dried *gambier* sap will increase by 0.01142 kg/ha/year.
7. The age of productive plants has an indirect coefficient value of -2.65150, which means that if there is an increase in the age of productive

plants by 1 year, then the production of dried gambier sap will decrease by 2.65150 kg/ha/year.

8. The experience in farming has an indirect coefficient value of 2.20556, which means that if there is an increase in the amount of harvested gambier leaf by 1 kg/ha/year, then the production of dried gambier sap will increase by 2.20556 kg/ha/year.

4 CONCLUSIONS

In the area of the productive plants, the use of fertilizers, and the experience in farming, has a positive and significant influence on the amount of harvested gambier leaf. The types of seeds, the use of pesticides, and the age of productive plants, have a negative and significant influence. The number of productive plants has a positive influence, and the number of cultivation labors, have a negative influence but not significant. The number of processing labors has a positive and significant influence on the production of dried gambier sap; while the amount of harvested *gambier* leaf has a positive but not significant influence. Variables influencing the amount of harvested *gambier* leaf cannot influence the production of dried *gambier* sap indirectly through the mediation of the amount of harvested *gambier* leaf due to the inadequate processing tools capacity and technology. Variables influencing the amount of harvested *gambier* leaf would be able to influence the production of dried *gambier* sap indirectly if the amount of harvested *gambier* leaf themselves could influence the production of dried gambier sap. Government and academics are advised to conduct research and guidance to farmers regarding the *gambier* varieties and the standard operating procedures (SOP) in carrying out the location-specific *gambier* farming in Pakpak Bharat District. The government and investors are also suggested to be able to facilitate farmers related to the efforts to increase the capacity and technology of *gambier* processing facilities.

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APPENDIX

Table 4: The multicollinearity and heteroskedasticity test result of factors influence the amount of harvested gambier leaf model and the production of dried gambier sap model.

Variables	Multicollinearity Test		Heteroskedasticity Test	
	Tolerance	VIF	t	Sig.
Dependent Var.: The amount of harvested gambier leaf				
The number of cultivation labors (HKO/ha/year)	0.728	1.374	0.999	0.324
The area of productive plants (ha)	0.665	1.503	0.636	0.528
The types of seeds (dummy)	0.961	1.041	-1.322	0.193
The use of fertilizers (dummy)	0.746	1.341	-0.271	0.787
The use of pesticides (dummy)	0.790	1.266	1.420	0.163
The number of productive plants (plants/ha)	0.679	1.474	1.141	0.261
The age of productive plants (year)	0.586	1.708	-0.033	0.974
The experience in farming (year)	0.837	1.195	-1.594	0.119
Dependent Var.: The production of dried gambier sap				
The number of processing labors (HKO/ha/year)	0.328	3.048	-0.798	0.429
The amount of harvested gambier leaf (kg/ha/year)	0.328	3.048	0.857	0.396

Table 5: The Sobel test result of factors influences the production of dried gambier sap indirectly through the mediation of the amount of harvested gambier leaf.

Variables	Sobel Test	
	Sobel's Z	Two-tailed p Value
Dependent Variable: The production of dried gambier sap indirectly through the mediation of the amount of harvested gambier leaf		
The number of cultivation labors (HKO/ha/year)	-0.00611	0.99513
The area of productive plants (ha)	1.04978	0.29382
The types of seeds (dummy)	-1.09870	0.27190
The use of fertilizers (dummy)	1.09254	0.27460
The use of pesticides (dummy)	-0.99350	0.32047
The number of productive plants (plants/ha)	0.94864	0.34280
The age of productive plants (year)	-0.96743	0.33333
The experience in farming (year)	1.05852	0.28982