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Competitive Power of Gondorukem Indonesia in International Market

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Abstract

Indonesia is the first number exporting country of gondorukem in 2022 in the world. However, the government and community have not paid much attention to the development of gondorukem thereby affecting the optimum production. This research is intended to analyzing the competitive power and the determining factors of competitive power for gondorukem Indonesia in the framework of *Porter's Diamond Model*. Data analysis in this research was made using the ISP analysis media and approach of *Porter's Diamond Model*. Based on average score of ISP gondorukem Indonesia of 2013-2022, The position of maturation has most firm competitive power. Based on the analysis with *Porter's Diamond Model*, we know that the competitive power of gondorukem Indonesia is affected by the condition factor, demand condition, supporting industry, and competition; structure; and strategy. Condition factor is indicated by the extensive pine land, many and cheap workers, sufficient capital, growth in knowledge, and sufficient infrastructure. Demand condition is indicated by the qualified domestic market demand. Supporting industry is indicated by the lot demand of gondorukem in the paint, ink, and batik industries. Competition, structure, and strategy are indicated by the control of production materials and market by BUMN Perum Perhutani, so it eases the development of gondorukem qualitatively and quantitatively. Information found related to the competitive superiority can be served as the reference of developing the domestic gondorukem.

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INTRODUCTION

Gondorukem is the commodities as the latex distillation products of *Pinus merkusii* in the pure yellow solid form until being light yellow. Gondorukem becomes the mainstay product of Indonesian export as it has important role in the industrial world. Gondorukem in its genuine form functions as the gluten and layer for various kinds of industry. Gondorukem in its derivate form is used as the raw materials in the paper, ink, paint, polyture, varnish, and soap industries (Suranto, 2018). Gondorukem with various roles owned in the industry world is served as the mainstay product of export producing the profit increasing annually. The increased production of gondorukem Indonesia is supported by total sufficiently vast *Pinus merkusii* land. Pines in Indonesia managed by Perhutani include three Regional Divisions namely West Java and Banten, Central Java and East Java to the reach of 894,917 ha (Perhutani, 2022).

Indonesia becomes the first highest exporting country of gondorukem in the world with total export of gondorukem Indonesia to the world in the number of 97,918,696 kg worth US\$137,323,844 in 2022 (Trademap, 2023). Some of gondorukem productions in Indonesia are managed by BUMN Perum Perhutani having eighth plants of gondorukem and terpentin (PGT) with the production capacity of 141,150 tons, spread throughout territories of Central Java, East Java and West Java (Perhutani, 2022). Gondorukem production of Perum Perhutani is divided into the domestics sales and international sales with the most extensive spreading is for the marketing in the international market with the reach of 87%. Export value of gondorukem Indonesia is higher than the import value, showing that Indonesia has potential in the sales of gondorukem in international market.

Various potential owned by gondorukem Indonesia is very attractive to be further reviewed to know if Indonesia actually has the competitive power to retain in international market. Update from this method is to analyze the ISP value of gondorukem for the last ten years namely 2013-2022. The previous research concerning the competitive superiority of gondorukem Indonesia has listed the competitive superiority value in accordance with the analysis tools used (Fahrodji et al., 2009), but there is still limited to the figure and there is no profound analysis on

the actual condition of the domestic commodities, issues, and settlement related to the said issues. The difference of this method from the previous one is to make the profound analysis on the gondorukem commodities in accordance with the framework of *Porter's Diamond Model*, so we get ample information about the competitive superiority factors of domestic gondorukem. Therefore, the goals of this research are to 1) analyze the competitive superiority of gondorukem Indonesia, 2) analyze the determining factors for the competitive superiority of gondorukem Indonesia in accordance with the framework of *Porter's Diamond Model* to get profound information on the determining factor of competitive power of domestic gondorukem, issues encountered, and alternative settlement which can be made.

RESEARCH METHOD

This research focusses on the Indonesia competitive power as the first number exporting country of gondorukem in the world in 2022. Data used focuses on the export and import data of Indonesia during the year of 2013-2022. The method used to this research is the explorative method. The explorative research endeavors to search more profound in the new knowledge to know about any moderate issues or it can occur (Arikunto, 2014). This research uses the secondary data as listed in various bodies or agencies related to the export of gondorukem such as BPS, UN Comtrade, Trademap, Annual Report of Perum Perhutani, and various related literatures.

Goal 1 is analyzed to use the analysis tools of Trading Specialization Index (ISP). ISP can be meant as the comparison between the difference of net trading value and value of total trading from any country (Tupamahu, 2015). ISP can be calculated with the following formulations:

$$ISP = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}}$$

Remarks:

X_{ij} = Export value of commodities i in the country of j (US\$)

M_{ij} = Import value of commodities i in the country of j (US\$)

ISP value at the range of -1 up to -0.5 shows position of any commodities at the introduction stage in the world trade or having low competitive power, value from -0.4 up to 0.0 shows the position of import substitution, 0.1 up to 0.7 shows the expansion of export or having strong competitive power, 0.8 up to 1.0 shows the *maturity* stage in the world trading so that the products has the very strong competitive power (Parmadi et al., 2018).

Goal 2 is analyzed to use the approach of *Porter's Diamond Model*. The approach is made to analyze four main determinant in *Porter's Diamond Model* and connects the same with the commodities of gondorukem Indonesia. *Porter's Diamond Model* analyzes the competitive superiority through four main determinants establishing the model such as bracelet which mutually supports one another (Andini et al., 2016). The four determinants include the condition factor, demand factor, company strategy; structure; and competitor, and related industries. The four factors are also supported by other two factors playing important role namely the role of government and opportunity (Yuniati, 2018). Illustration *Porter's Diamond Model* can be seen in Figure 1.

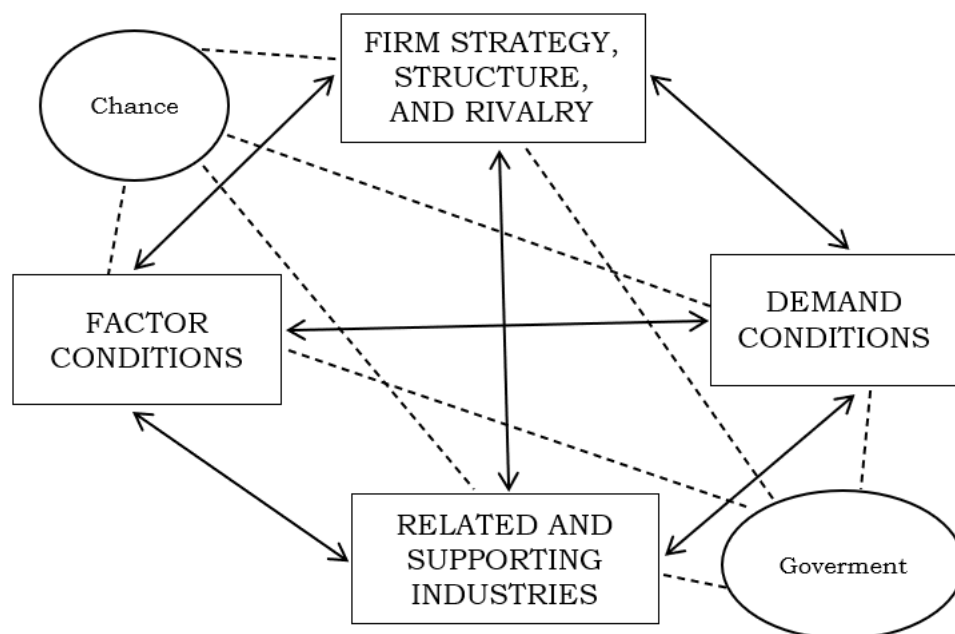


Figure 1. Porter's Diamond Model
Source: Porter (1990)

RESULT AND DISCUSSION

Competitive Superiority Analysis of Gondorukem

Based on the research, the analysis result of ISP Indonesia is found which can be seen in Figure 2.

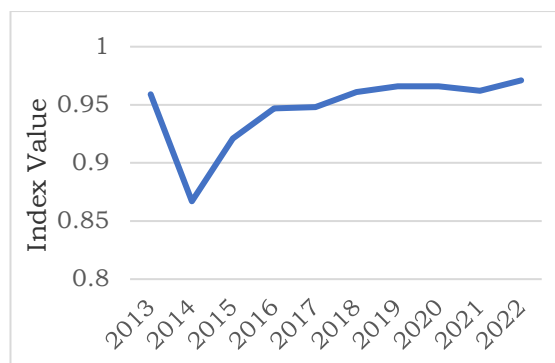


Figure 2. Curve of ISP value of gondorukem Indonesia

Based on Figure 2. The lowest ISP value was available in 2014 with the value of 0.86. The lowering of this ISP value is resulted by the increase of import volume of domestic gondorukem due to the sharp increase of market demand which is not accompanied with the increase of domestic production. Based on the research of Khadafi et al. (2014); Kharismawati et al. (2016), Indonesia is only able to meet the need of gondorukem eighty percent towards total world production, so that the volume of potential and sales market of gondorukem, actually it cannot be fulfilled in Indonesia. In 2014, Indonesia endeavours to improve the foreign sales by increasing the import of gondorukem to be re-sold in the international market. Impact from the increasing import value was ISP value of gondorukem in 2014 down to 0.86.

In 2014, the government through Perhutani built the plant of gondorukem to overcome the import which keeps increasing. Based on Perhutani (2014), Perhutani invented with around Rp190 billion for the construction of the largest processing plant of gondorukem in South-East Asia which can operate starting from 2014. The construction of plant helps produce the added value of 1.5 up to 4 folds from the previous income. In 2015, ISP value of gondorukem Indonesia returned better to be 0.92. In 2016 and 2017 the stagnant ISP value in figure of 0,94. ISP value of gondorukem Indonesia re-increased in 2018. Based on Perhutani (2018), according to information from Marketing Division of Perum Perhutani, in September 2018 total export experienced the growth of 37%. This item was the result from the revision of financial system of Perhutani in 2017 as well as the applicability of investment for the updated production engines.

ISP value of gondorukem Indonesia kept being stagnant in 2021 and experienced a little decline due to the COVID-19 pandemic paralyzing the industry activity and world trading. ISP value of gondorukem Indonesia re-increased and

reached to the highest rate in 2022 of 0.97. The profit of this export is in line with the highest ISP value during the last ten years namely 0.97. The said ISP figure nearly reached to the rate of 1 showing that the product of gondorukem Indonesia and nearly reached the top one to the maturity stage of export. Based on Hanafi and Yuliani (2022), the state which nearly reached to the top of maturity is the specialized state as the exporting of any commodities thereby being very competitive to compete in the international market of international. Gondorukem Indonesia reached the expansion of export or expansion of international market by selling gondorukem more than 38 countries. The state in the top of maturity stage for any commodities is the same stage does not conduct the import towards the commodities. Indonesia is still conducting the import of gondorukem as it does not reach optimum availability of the main standard materials namely latex of *Pinus merkusii*. Indonesia should still pay attention to the latex production level of pine if it is intended to reach the top of export maturity stage. The country at the top of maturity stage still maintains the position that it returns the decline and enters to re-import. Based on Pudjiastuti et al. (2021), the increase of export was also expected by curiosity to the world export competitor of gondorukem so, in its process created the ambition of state to improve the quality and quantity of products compared to the competitor. Based on Trademap (2023); UN Comtrade (2023), five superior exporter countries of gondorukem in 2022 covered Indonesia, Brazil, Vietnam, Amerika, and China. ISP value, each state of superior export of gondorukem can be seen in Table 1.

Table 1. ISP value as the superior world export country of gondorukem

Year	ISP Value				
	Indonesia	Brazil	Vietnam	Amerika	China
2013	0.95	0.98	0.94	-0.03	0.70
2014	0.86	0.98	0.95	-0.29	0.84
2015	0.92	0.99	0.97	-0.10	0.65
2016	0.94	0.99	0.95	-0.09	0.24
2017	0.94	0.99	0.94	0.04	0.18
2018	0.96	0.98	0.94	0.06	-0.01
2019	0.96	0.99	0.95	0.01	-0.22
2020	0.96	0.98	0.94	0.16	-0.49
2021	0.96	0.99	0.95	0.00	-0.48
2022	0.97	0.99	0.96	0.37	-0.40
Average	0.94	0.99	0.94	0.01	0.10

Based on Table 1. Can be seen to the average ISP value of superior exporter world ISP of gondorukem. The five countries during the period of 2013-2022 got average positive average IPS signing the said country in tendency of the exporter of gondorukem than importer. Based on the data, it is known that Brazil keeps the highest average ISP value due to the amount of import of gondorukem Brazil far lower if compared to the four competitor countries. Indonesia and Vietnam follow Brazil with the high ISP value namely 0.94. China follows with the average ISP value of 0.10 then, the United States State follows with the ISP value of 0.013.

The low import value of Brazil is interconnected with the natural resources which have sufficed the production need of gondorukem. Brazil has the natural richness in terms of vast forest. Based on the data as listed in the research of Horst-Heinen et al. (2021), Some of them are from the forest of Brazil being the pine forest with the area reaching more than 1.6 million hectare of land or with around 88% from the entire forestry production of Brazil. The natural condition also allows Brazil to produce two-pine species namely *Pinus Elliottii* and *Pinus Tropical*. The area of land and various species of pine to make Brazil to be more able to produce gondorukem larger than Indonesia only having the area of pine forest by 1.4 million ha. The forest of Brazil state is more productive to produce the latex. Based on the research of Cunningham (2007), the pine forest in Brazil has the *density* level (total average of trees as per hectare) 800, with the latex production of tree per year reached 4.8 tons. *Density* of Indonesia pine forest only reaches the average 350 latex production trees of tree per year of 2.4 kg and production per hectare per year of 0.85 ton.

Based on the average of ISP value of the five countries, the position of state can be known in the world trading. The United States of America is categorized at the substitution stage of import in the world trading and having low competitive power. China is under the category of expanding the export in the world trading. Indonesia, Brazil, and Vietnam exist at the maturity stage in the world trading or having the very strong competitive power.

Analysis on Superior Determinant Factors of Gondorukem Indonesia with the Framework of Porter's Diamond Model

Condition factor

Condition factor as intended by Porter (1990), was an internal factor in support of the production of any commodities including the availability of workers, fertile land, natural resources, knowledge, capital, and infrastructure.

1. Natural Resources

According to *Porter's Diamond Model*, the condition factor affecting the competitive superiority level of any commodities is the natural resources. Based on the research of Imanuddin et al. (2020), it was known that the spread of Indonesia pine forest including the natural pine forest and artificial with total area of ±1,420,950 ha. Indonesia with the tropical climate does support the intensity of illuminating the good sun thereby producing the pine latex can be optimum. In 2022, the production of pine latex in Indonesia reached 109,738.94 tons which was still low if compared to the vast region of forest owned. Based on the statement of Gunawan (2023); Godinho et al. (2016), various factors affecting not only the stand of pine in Indonesia can be tapped including: accessibility towards the low location of tapping, the less facility-infrastructure in the opening of forest area (PWH), and availability and management of tapper is not yet maximum.

2. Human Resources

According to Porter (1990), a state is considered competitively superior if the worker are many, low, and specialized. Total Indonesia people who worked in 2023 was 138,632,511 lives, such as the workers in the agricultural sector of 38,703,996 lives. Based on BPS (2023); Kharismawati et al. (2016), worker's pay in Indonesia if compared to the other countries in Asia tended to be lower and reached only Rp2,772,756. Perhutani in the production process of gondorukem has paid attention to the quality and specialization of workers. Production workers of gondorukem in Indonesia are divided into the farmer of latex, collector, plant's workers, chemist, marketing and sales, management and administration, research power and development, and logistic and distribution workers. Based on the statement from Handayani (2015); Arisena and Oktavia (2020), generally at the skill level of workers in Indonesia tended to be lower if compared to the foreign worker. The improper skill of workers can hamper the productivity level of gondorukem industry in Indonesia.

3. Science Resources

According to Porter (1990), the science resources as intended as a part of the condition factor are the availability of science concerning technical and market knowledge related to any commodities. Factory and workers of operating gondorukem owned by Perhutani shows the availability of technical knowledge concerning the processing of gondorukem in Indonesia. Based on data from Perhutani (2023), Perum Perhutani has Research and Development Center (Puslitbang Perhutani) having various activities of research divided to be the research concerning pines, teak research, industry and marketing industries, FGS (*fast growing spesies*) and other specifies, production, and social process. Even though,

in its application, the research on gondorukem still tends a little and not yet prioritized. Data on gondorukem were summarized concerning the Annual Statement of Perum Perhutani, BPS (Central Bureau of Statistics), and Ministry of Industry. However data on the expansion of pine forest and development of each year has not yet been properly arranged.

4. Capital Resources

The capital resources as intended by Porter is the amount and capital cost available to finance any industry. Based on Perhutani (2022), the capital owned by Perum Perhutani as the mainstay producer of gondorukem Indonesia coming from the source of state. The capital of Perhutani for the maintenance of forest and tapping of pine latex, company, and gondorukem industry and turpentine estimated to the reach of Rp735,836,000,000 in 2022, Rp685,752,000,000 in 2021, and Rp625,270,000,000 in 2020. The availability of the said Perhutani capital increasingly improved every year accompanied with the improvement of gondorukem production.

5. Infrastructure Resources

Infrastructure as intended by Porter (1990) in *Porter's Diamond Model* is the kind and quality of infrastructure affecting the competition, including transportation system, communication system, and so on. Based on Perhutani (2021), access to go in-out PGT (Gondorukem and Turpentine Plants) have been the public access and can be crossed by the truck until the huge item. During the process of distribution in the different province, there have been many accesses to toll road facilitating the process of distributing the production chiefly for the region of Java Island. Generally, the main road in Java Island has been relatively good, even though there have been regions which are still necessary to restore the main road. The less use of main road is much longer than if using the toll road. Access to communication indicated by the availability of various information including the gondorukem industry such as the superiority of product, function and their use can be obtained through various media such as *website* Perhutani or *website* TokoPerhutani.com. Other information about the price, production, and quality of gondorukem are also listed at each Annual Statement of Perhutani.

Demand condition

According to Porter (1990), there were three important attributes of demand namely composition of domestic demand, size and pattern of domestic demand growth, and mechanism in which there have been the domestic preferences in any

country transferred to the foreign market. Based on data on Perhutani (2023), specified gondorukem so demanded by the industry namely including: *Softening Point* : 78°C – 82°C, *Colour* : X-WW-WG, *Impurity* : 0.02%–0.04%, *Acid Value* : 160–190, *Saponification Value* : 170–220, and *Ash Content* : 0.01% – 0.04%. Various specifications so demanded by the market will make Perhutani as the largest producer of gondorukem in Indonesia and will endeavor to develop to meet the same. Perhutani sold gondorukem of top-quality Grade and first Grade for the export product.

Perhutani is only able to sell gondorukem in accordance with the number of production even though in fact, total demand towards gondorukem is larger than the number sold by Perum Perhutani. According to Porter (1990); Nursodik et al. (2022), the quality of selling for any industry more important than the quantity of selling the domestic in performing the level of competitive superiority level from the industry. The quality of gondorukem for the domestic sales has fulfilled the foreign selling standard, so that it has been sufficient to prove that the domestic gondorukem in Indonesia having the competitive superiority.

Related and supporting industry

According to Porter (1990), the related industry is various industries or activities involving the products which mutually complement. The related industry and main support from gondorukem is the raw material industry. The plantation of pines as the raw material of gondorukem is managed by Perhutani, so that it is able to avoid from the deficiency of raw materials due to sales to the other parties. Other supporting industries are the production industry of gondorukem. Some of Gondorukem Indonesia are managed by Perhutani with eight factories on the management with the production capacity of 141,150 tons. Based on the research of Gunawan (2023), if compared with the production of Indonesia pine latex, the processing plant of pine latex in Indonesia is only averagely able to operate 54% only from its production capacity due to the limitation of the domestic latex pine production.

The most important related industry for the survival of gondorukem is the derivate industry or *derivate* plant of gondorukem. Perhutani has derivate two-plant of gondorukem namely PT. Perhutani Anugrah Kimia (PT. PAK). *Derivate* plant of gondorukem available in Indonesia is very little if compared to the production amount of big gondorukem. Based on the research of Gunawan (2023); Tanguy (2016), less having Indonesia in producing the *derivate* of gondorukem to make

Perhutani more sell gondorukem to the international market to obtain the profit. Based on the data of Ministry of Industry of the Republic of Indonesia (2023), some related industries of gondorukem have stood in Indonesia such as paper, glue, batik, ink, paint industries developing well chiefly in some regions of Java Island. The ample related industries in the domestic requiring gondorukem will support the gondorukem industry to keep operating due to the availability of demand.

Competition, structure, and strategy

Domestic competition for the production of gondorukem is controlled by Perhutani as BUMN funded in full by the government. Based on the research of Gunawan (2023), average capacity of plant production from the competitor of Perhutani is 7,000 ton/year, which is the lowest one if compared to the plant of Perhutani to the reach of 17,650 ton/year. Perhutani is prime in the possession of standard materials and financing due to the government aids. Based on Trademap (2023), the competitor of gondorukem Indonesia in the international market such as Brazil, Vietnam, Amerika, China, and Finland.

The control of Perhutani in the domestic production of gondorukem shows that the market structure being the imperfect competition market namely monopoly. The control of market is to make Perhutani more free to develop the quality and quantity of gondorukem. However, it is possible to decline the motivation of Perhutani to improve the quality of gondorukem due to the minimum domestic market competition. The strategy of Perhutani in managing gondorukem is the sustainable forest management in an effort to maintain the pine latex production as the main standard materials of gondorukem. Based on the statement of Perhutani (2022), Perhutani becomes one of the 14 industries of world forestry which has obtained the certification of FSC-FM (*Forest Stewardship Council Forest Management*) improving the bargaining position of Perhutani as the best forest management in the international world. Perum Perhutani also applies the strategy in terms of the strategic plant location and various strategies of marketing.

Government Role

Indonesian government role as the facilitator of domestic gondorukem industry is by establishing BUMN at the aids of processing gondorukem namely Perum Perhutani. Government in running the function as the regulator, to stipulate various regulations in support of gondorukem production. Based on Perhutani (2023), some related regulations with the production of gondorukem Indonesia include Law No. 41, Government Regulation No. 72 Year 2010, Government Regulation No. 73 Year

2014, Policy K3L 2023, Declaration of Policy associated to FSC 2023, Application Declaration of *Controlled Wood* 2023, and Corporate Quality Policy of 2023.

Opportunity role

According to Porter (1990), the opportunity is the event existing outside the very important company authority to affect the competitive superiority. The sustainable opportunity of gondorukem production is situated at the high demand of world and domestic. Based on the statement of Agil et al. (2022), demand of gondorukem comes from the industries such as paint, glue, batik, varnish, and *derivate* which will continue in accordance with the increase of customer towards the industry products.

Based on data Trademap (2023); Perhutani (2016), more than 208 companies of 38 countries to purchase the product of gondorukem Perhutani and dominated by China, India, Japan, Taiwan, and Portugal. The demand of gondorukem is ensured to keep improving given the increasing growth of the related industries. The high profit makes gondorukem to have more opportunity in which the production is maintained and improved to keep on giving the profit for the state.

CONCLUSION

Based on the analysis to use the ISP method, it is known that the competitive power of gondorukem Indonesia is at the maturity stage of export or having the very strong competitive power. Based on the analysis to use the *Porter's Diamond Model*, it is known that the condition factor in support of the Indonesia competitive power supported by the superiority of natural sources, human, knowledge, capital and infrastructure. The demand condition is supported by the more domestic demand having the standard international quality and the availability of gondorukem demand in the increasing international market. The related and supporting industry in support of the competitive superiority of gondorukem Indonesia includes the main standard material industry, production industry of gondorukem, *derivate* industry, and processed product industry of gondorukem. The domestic competition is dominated by Perhutani thereby creating the monopoly market. Strategy applied by Perhutani to overcome the competition includes the management of sustainable forest, marketing strategy, selection strategy of production location, and development strategy of product and innovation.

SUGGESTION

Government is necessary to remedy the facility and infrastructure towards the pine forest in an effort to optimize the raw materials to improve the production of

gondorukem. Government through Perhutani is necessary to conduct the comparison study by visiting to Brazil to learn the technique of managing the good forest. Government can prioritize to invest in the plant of domestic gondorukem in an effort to add the selling value of gondorukem and avoid the dependence on the raw material export. Perhutani as the corporate body owned by the government, it is also necessary to initiate the producer association of gondorukem to facilitate the discussion and the joint research related to the development of gondorukem.

AUTHOR CONTRIBUTIONS

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	Institution	Student S1 Agro-business, Farm and Agriculture Faculty, University of Diponegoro, Jl. Prof. Jacob Rais, Kecamatan Tembalang, Semarang, Central Java.
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	Contributions	Make coordination to the process of data collection process, data collection, remedy on the discussion, until the text publication process.
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	Contributions	Helping in the process of text arrangement, discussion remedy, and process of text publication.
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