

STRATEGIES AND POLICIES TO INCREASE COMPETITIVENESS OF CASSAVA IN LAMPUNG PROVINCE, INDONESIA

Teguh Endaryanto^{*)}, Wan Abbas Zakaria^{*)}, Lidya Sari Mas Indah^{*)}, Amanda Putra Seta^{*)}

^{*)}Department of Agribusiness, Faculty of Agriculture, University of Lampung
Jln Soemantri Brojonegoro No. 1, Bandar Lampung 35141, Indonesia

Article history:

Received
13 June 2022

Revised
3 November 2022

Accepted
17 November 2022

Available online
30 November 2022

This is an open access
article under the CC
BY license ([https://
creativecommons.org/
licenses/by/4.0/](https://creativecommons.org/licenses/by/4.0/))



Abstract: Cassava is an important commodity and has a strategic role for the Indonesian economy, especially for Lampung Province as the main producer. However, prices and profits that tend to be low, policies are not in favor of farmers, and weak institutions, so the commodity's is low competitiveness. Government intervention in encouraging the competitiveness of a commodity by providing protection to producing farmers is felt to be very effective, especially for cassava commodities. Therefore, this study aims to analyze appropriate strategies and policies in increasing the competitiveness of cassava commodities in Lampung Province. Therefore, strategies and policies are needed to increase the competitiveness of cassava commodities in Lampung Province. The research was conducted in 2020 in Central Lampung and East Lampung Regencies with a total of 120 farmers as respondents. This research uses policy matrix analysis or PAM analysis and qualitative descriptive. The results showed that cassava has comparative and competitive advantages even though it is low. Therefore, the best policy is needed to increase the competitiveness of cassava commodities. The policy in order to increase the competitiveness of cassava in Lampung Province can be done by increasing output by 20% even though the cost of fertilizer increases by 20%. Some of these policies and strategies can have an impact on production cost efficiency, improve the quality of cassava, increase the quantity of cassava, and increase the income of cassava farmers.

Keywords: cassava, competitiveness, improvement policy, PAM, strategy

Abstrak: Ubi kayu merupakan komoditas yang cukup penting dan strategis peranannya bagi perekonomian Indonesia terkhusus Provinsi Lampung karena merupakan produsen utama. Akan tetapi harga dan profit yang cenderung rendah, kebijakan yang tidak memihak petani, serta kelembagaan yang lemah membuat rendahnya daya saing komoditas ini. Intervensi pemerintah dalam mendorong daya saing suatu komoditas dengan memberikan perlindungan kepada petani produsen dirasa sangat efektif terutama bagi komoditas ubikayu. Oleh karena itu, penelitian ini memiliki tujuan menganalisis strategi dan kebijakan yang tepat dalam peningkatan daya saing bagi komoditas ubikayu di Provinsi Lampung. Penelitian dilakukan pada tahun 2020 di Kabupaten Lampung Tengah dan Lampung Timur dengan jumlah responden sebanyak 120 petani. Penelitian menggunakan analisis matrik kebijakan atau PAM Analisis serta deskriptif kualitatif. Hasil penelitian menunjukkan ubikayu memiliki keunggulan komparatif dan kompetitif walaupun tergolong rendah. Oleh karena itu diperlukan kebijakan terbaik dalam rangka meningkatkan daya saing komoditas ubikayu. Kebijakan dalam rangka peningkatan daya saing ubikayu Provinsi Lampung yang dapat dilakukan yakni dengan meningkatkan output sebesar 20% walaupun biaya pupuk meningkat sebesar 20%. Peningkatan output dapat dilakukan dengan strategi yakni perbaikan teknologi dengan peningkatan kualitas bibit, pemerataan akses pupuk bersubsidi, dan peningkatan akses sarana prasarana irigasi, selain itu kebijakan pengembangan sumberdaya manusia dan kebijakan harga dasar juga menjadi strategi utama dalam peningkatan daya saing ubikayu di Provinsi Lampung. Beberapa kebijakan dan strategi tersebut dapat berimplikasi kepada efisiensi biaya produksi, peningkatan kualitas ubikayu, peningkatan kuantitas ubikayu, serta peningkatan pendapatan petani ubikayu.

Kata kunci: ubikayu, daya saing, kebijakan peningkatan, PAM, strategi

¹ Corresponding author:
Email: teguh.endaryanto@fp.unila.ac.id

INTRODUCTION

As we enter the period of the free market, agricultural commodity trading with other countries is increasingly more competitive. Both industrialized and developing countries are vying for the right to preserve the key commodities of their country. The government action in boosting a commodity's competitiveness by giving protection to producer farmers is considered to be particularly beneficial (Saptana, 2010). In addition, domestic agricultural commodities are able to compete in both local and worldwide markets as a result of government initiatives.

It is unarguable that cassava is a commodity that bears a significant component in the economic sector in Indonesia (Muslim, 2008). Cassava is one of Indonesia's most prominent commodities, owing to the high demand (both industrial and household), a wide variety of derivative products, and last but not least the favorable climatic and the conditions of Indonesian soil. Furthermore, its derivative goods, such as tapioca, are in high demand in the food business, both domestically and internationally. Regarding cassava as a key commodity, it is crucial that the government provides the policy in the attempt to support the cassava farmers in order for them to compete with imported cassava products.

Indonesia is one of the top five cassava producers in the world, with 18,3 million tons expected in 2020. Indonesia's bargaining value as a cassava producer is still high, despite the fact that it is not the largest producer. Indonesia has a wide variety of cassava derivative product industries. After Thailand, Indonesia is Asia's second-largest producer. Thai cassava is famous for its efficiency and competitiveness, allowing it to dominate the Asian market.

The Indonesian Ministry of Agriculture reported 136.000 tons of cassava imports in 2020, which is worth to \$58 million. If this condition continues, cassava farming's long-term viability will be jeopardized. Due to large-scale imports by the industry, the price of cassava at the factory level plummeted to Rp400 per kg in 2017. The price and value of imported tapioca affect the price of cassava in Indonesia, according to Taslim and Rifin (2019). As a result of this condition, government policies must be implemented in the attempt to ensure the long-term viability and competitiveness of Indonesian cassava commodities.

Plantation crops, on the other hand, do not receive the same extent of protection in Indonesia as food crops do. Cassava has been one of the few commodities which receive considerably minimal intervention from the government. Furthermore, there was no active association of farmer groups (*Gapoktan*) or cassava farmer group (*poktan*) discovered. Existing agricultural extension staff did not provide any beneficial aid to *the Gapoktan* or cassava farmer organizations as much as they were required to. This is owing to the food crop priority program of the government. As a result, it is crucial that cassava is designated as a national strategic commodity.

Previous research on the competitiveness of cassava has been carried out by several researchers with different perspectives. Yi et al. (2018) mentioned that the competitiveness of Indonesian processed cassava in the Chinese market is low. Therefore, it is necessary to adopt technology and increase starch production in order to increase the fulfillment of processed cassava export quantity. In addition, based on Asriani (2011), cassava and tapioca commodities actually have strong competitiveness. However, from year to year the trend of development shows negative results. This is due to low productivity and the need for improvement in processing technology. Ariadi et al. (2015) and Anggraini et al. (2016) concluded that management of cassava farming needs to be done so that production efficiency can be achieved.

This research will complement the previous research. This research offer government strategies and policies in increasing the competitiveness of cassava with the latest issues. Therefore, this study does not only focus on the level of competitiveness of cassava but also the relevant strategies and policies for increasing the competitiveness of cassava. At present, not many agribusiness strategies and policies have considered commodity competitiveness. Policy Analysis Matrix (PAM) can identify policy variables that directly affect commodity competitiveness. In addition, an in-depth approach was carried out with farmers and factories (as buyers) so that the policies may provide benefits for both.

Lampung Province is the epicenter of cassava production in Indonesia. They produce approximately 30% of Indonesian cassava (BPS, 2021). The declining competitiveness of cassava will simultaneously give a significant impact on Lampung's residents who the

majority of them are cassava farmers. As a result, it is required to adopt legislative initiatives to boost the competitiveness of cassava in Indonesia, particularly in the Province of Lampung.

METHODS

Previous research on the competitiveness of cassava has been carried out by several researchers with different perspectives. Yi et al. (2018) mention that the competitiveness of Indonesian processed cassava in the Chinese market is low. Therefore, it is necessary to adopt technology and increase starch production in order to increase the fulfillment of processed cassava export quantity. In addition, based on Asriani (2011), cassava and tapioca commodities actually have strong competitiveness. However, from year to year the trend of development shows negative results. This is due to low productivity and the need for improvement in processing technology. Supported by Ariadi et al. (2015) and Anggraini et al. (2016) who concluded that management of cassava farming needs to be done so that production efficiency can be achieved.

This research will try to complement the research that has been done previously, this research tries to offer government strategies and policies in increasing the competitiveness of cassava with the latest issues. Therefore, this study does not only focus on the level of competitiveness of cassava but also the relevant strategies and policies for increasing the competitiveness of cassava. The research method used is a survey using a simulation analysis of the policy matrix or Policy Analysis Matrix (PAM) Monke and Pearson (1989) (Table 1) and qualitative descriptive analysis. The survey was conducted on 120 farmers in the districts of East Lampung and Central Lampung,

Lampung Province. Samples were taken randomly from each selected village.

RESULTS

Before conducting policy simulations, first an analysis of farming, profits, and advantages (competitive and comparative) of cassava commodity in Lampung Province is carried out. The results of the farming analysis are used as the basis for formulating appropriate government policies for cassava commodities. The results of the analysis of farming, profits, and advantages of cassava commodities are as follows.

Analysis of Cassava Farming in Lampung Province

Analysis of cassava farming in Lampung Province was conducted to determine whether cassava is still feasible and profitable to cultivate. Based on the research results, the average productivity per ha of cassava in Lampung Province is 23,017 tons/ha. the average price of cassava is Rp972.54/kg. The revenue from cassava farming is Rp26,862,411/farm and Rp22,385,342/ha.

Table 2. shows the profit of farming over cash costs, which is Rp17,481,734.26 per farm and Rp14,568,111.88 per ha. Meanwhile, the profit from farming over the total cost is Rp8,153,650.78 per farm and Rp6,794,708.98 per ha. Another study conducted by Iqbal et al. (2014) concluded that the average income over total costs in one growing season was Rp20,795,322 per ha with a productivity of 36,115 kg per ha. Based on the results of the 2014 study, it shows that there was a fairly high reduction in productivity between 2014 and 2020 – when this research was conducted – causing a decrease in profits.

Table 1. Table of Policy Analysis Matrix (PAM)

Description	Revenue	Cost		Profit
		Tradeable Input	Domestic Factor	
Private/Financial	A	B	C	D
Social/Economic	E	F	G	H
Divergences	I	J	K	L

Note: Private Profit $D=ABC$; Social Benefits $H=EFG$; Output Transfer $I=AE$; Input Transfer $J=BF$; Transfer Factor $K=CG$; Net Transfer $L=DH$

According to Zakaria et al. (2020), cassava farmers currently have other diverse sources of income, even tending to off-farm activities. This is certainly very helpful in increasing the level of welfare of farmers. Although it shows that cassava farming is profitable, the income at a total cost of Rp6,794,708.98 per ha. The farmers' income has not been able to meet all their household needs. In terms of cultivation, cassava has good competitiveness and is quite competitive when compared to pumpkins with an intercropping pattern (Doubi et al. 2016). Hence, the intercropping pattern can be used as a solution to increase farmers' income. Farmers should add other sources of income, both off farm, non-farm, and other on-farm.

Financial and Economic Benefits, and the advantages of Cassava Commodities

The results showed that the economic benefits were higher than the financial benefits, which were Rp9,231,876 and Rp6,671,874 respectively (Table 3). This difference causes the divergence to have a negative value, which is Rp-2,448,498. Negative divergence is caused by lower financial income compared to economic income. The domestic price of cassava has not received effective protection from the government. Therefore, the profits received by farmers are lower

than they should be. In line with research Rosanti et al. (2013) the divergence value of cassava farming in Lampung Province in 2013 was Rp-2,819,124. This indicates that there has been no change in cassava agribusiness in the last seven years.

In terms of superiority, cassava is considered to have competitive and comparative advantages, although the value is still low, namely PCR of 0,657 and DRCR of 0,603. This advantage is a potential for the development of cassava commodities. The same result is shown by the research of Zulkarnain et al. (2021) that cassava has advantages/ competitiveness and has great potential for export.

Sukpanich and Wang (2022) research shows that Indonesia does not have a significant competitive advantage compared to Thailand and Vietnam. Thai cassava has a competitive advantage and a large share of the export market (such as China). This can be presumed as a result of the Thai government's policy of providing full protection for its strategic commodities. In addition, Pramesti et al. (2018) provide two conclusions, namely based on the RCA value of cassava Indonesia does not have competitiveness compared to other countries. However, the PCR value shows that cassava farming in Indonesia still has a competitive advantage.

Table 2. Land area, price, and profit of cassava farming in Lampung Province, 2020

Description	Per Farm	Per Ha
Land Area (ha)	1.20	1.00
Price (Rp/kg)	972.54	972.54
Productivity (tons/ha/ustan)	27.62	23.02
Revenue (Rp)	26,862,411.00	22,385,342.00
Profit on Cash Fee(Rp)	17,481,734.26	14,568,111.88
Profit on Total Cost(Rp)	8,153,650.78	6,794,708.98

Table 3. Financial and economic benefits of cassava farming in Lampung Province, 2020

Description	Revenue	Cost		Profit
		Tradeable Input	Domestic Factor	
Private/Financial	22,385,303	2,932,471	12,780,958	6671,874
Social/Economic	26,777,263	3,507,105	14,038,283	9,231,876
Divergences	-4,391,960	-574,633	-1,257,324	-2,560,002

Strategies and Policies to Increase the Competitiveness of Cassava

Policy simulations are carried out to find out the best strategy (PCR and DRCR values) for each change made. The strategy for increasing the competitiveness of cassava is carried out with several simulations, including: a) increase in fertilizer costs and revenues by 10%, b) increase in fertilizer costs and revenues by 20%, c) increase in wages and 10% revenue, d) increase in wages and 20% revenue, e) 10% decrease in fertilizer cost and 10% increase in revenue, f) 20% decrease in fertilizer cost and 20% increase in revenue, g) 10% increase in fertilizer and wages but fixed income. The complete strategy simulation results is presented in Table 4.

Fertilizer costs and labor costs are fixed components in variable costs. This makes the increase and decrease greatly affect the profits of farmers. The increase/decrease in revenue is assumed to be due to an increase in the productivity or price of cassava.

Based on the policy simulation, the best financial and economic profitability is to increase output by 20% even though fertilizer costs increase by 20%. In addition, the best PCR and DRCR values were also obtained by performing these simulations. This indicates that increasing the productivity and price of cassava is the key to increasing profits compared to reducing farming costs. Thus, the policy of intensification of dryland agriculture in farming and the policy of basic prices can be an alternative choice in order to increase the competitiveness of cassava.

On the other hand, the lowest financial and economic profitability is in the simulation of fertilizer and labor increase by 10% and output remains constant. This simulation naturally often occurs in the field. The increased price of fertilizer and wages will add to the cost burden for farmers if production does not increase. This shows that farmers/producers must be motivated to increase their farming productivity in cultivation activities. The cost of fertilizer and labor is a cost component that is still under the control of the government. Therefore, the government must make efforts to monitor these two cost components.

The government's policy towards tradable inputs and tradable outputs has been proven by Widyatami and Wiguna (2019) that it has a positive impact on rice farming. This is because the policy can reduce farming costs and increase the added value of farmers.

In line with research by Zulkarnain et al (2009) on cassava farming, an increase in output accompanied by a decrease in fertilizer prices makes cassava's competitiveness higher and the profits obtained are even greater. According to Asriani (2011), in the future, on average Indonesia should be able to increase productivity in efforts to produce cassava, tapioca, and cassava starch. Although they have a comparative advantage, the data shows that the trend of development is negative. This is based on the fact that as the largest cassava producing country in the world, Indonesia also acts as an importer of cassava starch. Therefore, policies in order to support the increase in cassava productivity must be carried out as a guarantee for increasing the competitiveness of cassava.

Table 4. Financial, economic benefits, PCR and DRCR values in the sensitivity analysis of cassava farming in Lampung Province, 2020

Change	Profit (Rp)		PCR	DRCR
	Financial	Economy		
Fertilizer and Output Increase 10%	8,736,400.09	11,669,638.79	0.59398	0.54607
Fertilizer and output up 20%	10,800,926.89	14,107,402.29	0.54198	0.49877
Wages and output increase by 10%	8,406,677.53	11,405,875.53	0.61244	0.56043
Wages and output increased by 20%	10,141,481.76	13,579,875.76	0.57620	0.52560
Fertilizer Down 10%. Output Up 10%	9,084,407.09	12,149,564.39	0.58453	0.53606
Fertilizer Down 20%. Output Up 20%	9,258,410.59	12,389,527.19	0.57991	0.53119
Fertilizer and Labour Increase 10% and output is fixed	5,994,143.73	8,488,186.43	0.68908	0.63143

In order to increase the productivity and price of cassava, strategies that can be implemented as the following:

- a. Improvement of seed quality with innovative technology. Based on the research results, the seeds used by cassava farmers are not certified seeds. Even some farmers use seeds of unknown origin. The majority of cassava seeds that circulate in the field are Thailand and Casesart which both have their respective advantages based on the experience of farmers' cultivation. Cassava with Thai varieties has the advantage of short harvest life (6-8 months) and large weight. However, Thai varieties has a weakness such as the low aci content. In contrast, casessart has the advantage of high aci content but long harvest life (8-10 months). Research and development on cassava seeds has not been widely carried out and disseminated. Hence, cassava farmers tend to use random seeds in their farming. As a result, is necessary to develop new varieties with high aci content, short life, and high weight.
- b. Equitable access to subsidized fertilizer for cassava farmers. Based on the results of the PAM analysis on cassava farming in 2020, the policy on fertilizer subsidies has a positive impact on increasing the competitiveness of cassava. The fertilizer policy gave an increase in competitiveness of 0.077 and 0.013 for the PCR and DRCR values, respectively. According to Nugraha (2015), adjustment of plant spacing, and fertilizer dosage can increase cassava productivity. In line with research by Sari and Fahmi (2018), it shows that production costs are reduced by 14,1%/ha due to the fertilizer subsidy policy and can save Rp2,355,000. The addition of subsidized chemical fertilizers has a positive impact on increasing crop productivity. Therefore, fertilizer is an important variable in the policy to increase the competitiveness of cassava. According to Darwis and Supriyati (2013), there are three main things in the procurement of fertilizers, especially subsidized fertilizers such as meeting the number of needs, distribution, and supervision. Optimization needs to be done on these three things. In relation to meeting the number of needs, an integrated and digital-based system (E-RDCK) is needed. This system will facilitate the pattern of data coordination for each stakeholder. In terms of distribution to farmers, gapoktan should have a large portion to realize an independent Gapoktan. Gapoktan can be independently or in partnership with kiosks to carry out distribution so that it is right on target.
- c. Furthermore, it is necessary to optimize supervision at every level.
- c. Improvement of water network facilities and infrastructure for dry land farming. The availability of water is a necessary condition for the success of sustainable agriculture, especially increasing productivity. To be able to produce optimally, cassava requires rainfall of 150-200 mm at the age of 1-3 months, 250-300 mm at the age of 4-7 months, and 100-150 mm in the phase before and during harvest (Wargiono et al. 2006). Based on these water needs, cassava can be developed in almost all areas both in wet and dry climates water is available in accordance with the needs of plants for each growth phase (Roja, 2009).
- d. Increasing access to knowledge and capital for cassava farming. In the last 5 years, the transfer of knowledge to cassava farmers is very minimal. Assistance to cassava farmer groups needs to be intensified. For access to capital, cassava farmers usually get a capital loan from a cassava collector agent. Farmers is rare to get access to capital from banks or other official financial institutions. This has an impact on the behavior of farmers who cultivate cassava "roughly". This behavior can be seen from the farmers' behaviour in harvesting cassava such as many farmers harvest cassava under the age of 8 years. In addition, the role of institutions is considered quite important in terms of knowledge and capital. A study conducted by Poku et al. (2018), the use of cassava in bioeconomic development depends on strong institutional relationships between marketing actors and support from the government in the form of policies.
- e. The policy of determining the basic price of cassava is the "ultimate" policy that has not been implemented in Lampung Province. The selling price expected by farmers is the best profit. On the other hand, the factory certainly wants the purchase price in accordance with the factory's wishes. The basic price is a bridge between farmers and industry. The basic price makes the cassava agribusiness system more sustainable (Zulkarnain et al. 2021). Based on the results of in-depth interviews, farmers want a price of Rp1,500. However, the average factory only wants to buy in the price range of Rp1,000 (both lower or higher). Therefore, based on the assumption calculation, the price of cassava is increased by 50% (gross) or becomes Rp1,228.

The impact of the basic pricing policy is presented in Table 5. Table 5 shows that there has been a twofold increase in profits due to an increase in the selling price of cassava farmers from Rp6,671,874 to Rp12,563,397. In addition, the OT indicator showed a significant change. changing from Rp-4,391.96 to Rp1,499,564. This shows that the policy of determining the basic price provides additional incentives for farmers of Rp1,499,564. The NPCO indicator is 1,056, which was originally 0.836. With this price, the government has indirectly provided strong protection for the domestic price of cassava. Thus, preventing large-scale imports of cassava commodities which will harm farmers. The reduced value of PCR shows that the competitiveness (competitive advantage) of cassava with the policy of the base price has increased to moderate from the previous low status.

Table 5. Financial Benefits. Value of OT. NPCO. PCR. and DRCR in Simulation of Basic Price Determination of Cassava Farming in Lampung Province 2020

Description	Before Base Price Policy	After Base Price Policy
Financial Advantage (Rp)	6,671,874	12,563,397
OT (Rp)	-4,391,960	1,499,564
NPCO	0.836	1.056
PCR	0.657	0.504
DRCR	0.603	0.603

Based on this description, the policy on the basic price of cassava has a positive impact on farmers so that the welfare of farmers and the competitiveness of cassava commodities will increase. This is in line with the research of Sinaga et al. (2021) that the efficiency of cassava farming production and government policies related to the selling price of fresh cassava have implications for increasing the competitiveness of cassava as well as efforts to protect farmers and the cassava processing industry. Moreover, the policy on the basic price of cassava has a positive impact on farmers so that the welfare of farmers and the competitiveness of cassava commodities will increase.

This is in line with the research of Sinaga et al. (2021) that the efficiency of cassava farming production and government policies related to the selling price of fresh cassava have implications for increasing the competitiveness of cassava as well as efforts to protect farmers and the cassava processing industry.

The policy on the basic price of cassava has a positive impact on farmers so that the welfare of farmers and the competitiveness of cassava commodities will increase.

This is in line with the research of Sinaga et al. (2021) that the efficiency of cassava farming production and government policies related to the selling price of fresh cassava have implications for increasing the competitiveness of cassava as well as efforts to protect farmers and the cassava processing industry. Zakaria et al. (2019) emphasized that one of the reasons why the cooperation between factories and farmers did not continue was that there was no agreement on the price.

Managerial Implications

Policies and strategies for increasing innovation and seed quality, equitable access to fertilizers, increasing agricultural infrastructure in the regions, training, and empowering farmers, as well as pricing policies can have implications for production cost efficiency, improving cassava quality, increasing cassava quantity, and increasing cassava farmer income. Production cost efficiency is due to the efficient use of inputs in the form of seeds, fertilizers, and the use of dry land irrigation technology. In addition, increasing the quality and quantity of production should increase farmers' income. Furthermore, the cassava price protection policy is of course very helpful in boosting commodity competitiveness.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The cassava commodity in Lampung Province has both competitive and comparative advantages. although it is relatively low. The policy in order to increase the competitiveness of cassava in Lampung Province that can be done is to increase output by 20% even though the cost of fertilizer increases by 20%. Increasing output can be done with strategies. namely improving technology by increasing seed quality. equitable access to subsidized fertilizers. and increasing access to irrigation infrastructure. in addition to human resource development policies and basic price policies are also the main strategies in increasing the competitiveness of cassava in Lampung Province.

Recommendations

Based on the results and discussion, the recommendations that must be carried out by farmers are increasing the quality of yields by planting cassava varieties casesat, adjusting the appropriate harvesting age (8-10 months), and diversifying the business by implementing integrated farming. Besides that, the recommendation for researchers is that further research is needed on superior and certified varieties by farmers. In addition, further studies are needed regarding strategic commodity price policies as an effort to protect farmers. For the government, the recommendations given are that the government together with the private sector and researchers develop seeds to improve the quality of the yield. In addition, supervision needs to be carried out as an effort to equalize access to fertilizers for cassava farmers. and it is necessary to improve water network facilities and infrastructure in the context of production efficiency. as well as regulation of cassava basic pricing policies. In addition, it is recommended for the private sector to open investment in cassava derivative products and build mutually beneficial cooperation with farmers.

FUNDING STATEMENT: This research did not receive any specific grant from funding agencies in the public, commercial, or not - for - profit sectors.

CONFLICTS OF INTEREST: The authors declare no conflict of interest.

REFERENCES

- Asriani PS. 2011. analisis daya saing ekspor ubikayu Indonesia. *Jurnal Agroland* 18(1):65-70.
- [BPS] Badan Pusat Statistik. 2017. *Data Produksi Impor Dan Ekspor Tapioka Dan Gaplek Indonesia Tahun 2013- 2016*. Jakarta: BPS.
- Darwis V, Supriyati S. 2014. Subsidi pupuk: Kebijakan pelaksanaan dan optimalisasi pemanfaatannya. *Analisis Kebijakan Pertanian* 11(1):45–60. <https://doi.org/10.21082/akp.v11n1.2013.45-60>
- Doubi BTS, Kouassi KI, Kouakou KL, Koffi KK, Baudoin JP, Zoro BIA. 2016. Existing competitive indices in the intercropping system of Manihot esculenta Crantz and Lagenaria siceraria (Molina) standley. *Journal of Plant Interactions* 11(1):178–185. <https://doi.org/10.1080/17429145.2016.1266042>
- Muslim A. 2018. *Prospek Ekonomi Ubikayu di Indonesia*. Jakarta: Universitas Al Azhar Indonesia.
- Monke EA, Pearson SR. 1989. *The Policy Analysis Matrix for Agricultural Development*. New York: Cornell University Press.
- Nugraha HD, Suryanto A, Nugroho A. 2015. Kajian potensi produktivitas ubikayu (manihot esculenta crant.) di Kabupaten Pati. *Jurnal Produksi Tanaman* 3(8):673 – 682. <https://doi.org/10.23960/jat.v3i3.1961>
- Pearson S, Gotsch C, Bahri S. 2005. *Aplikasi Policy Analisis Matrix pada Pertanian Indonesia*. Jakarta: Yayasan Obor Indonesia.
- Poku AG, Birner R, Gupta S. 2018. Is Africa ready to develop a competitive bioeconomy? The case of the cassava value web in Ghana. *Journal of Cleaner Production* 200:134–147. <https://doi.org/10.1016/j.jclepro.2018.07.290>
- Porter ME. 1990. *The Competitive Advantage of Nations*. New York: The Free Press. <https://doi.org/10.1007/978-1-349-11336-1>
- Pramesti FS, Rahayu ES, Agustono A. 2018. Analisis daya saing ubi kayu Indonesia di pasar internasional. *SEPA: Jurnal Sosial Ekonomi Pertanian dan Agribisnis* 14(1):1–7. <https://doi.org/10.20961/sepa.v14i1.21034>
- Rosanti N, Zakaria WA, Hasyim AI, Kasymir E. 2018. Analisis daya saing ubikayu di provinsi Lampung. *Sosial dan Ekonomi Pertanian* 12(1):62–74. <https://doi.org/10.19184/jsep.v12i2.11271>
- Roja. A. 2009. *Ubikayu: Varietas dan Teknologi Budidaya*. Padang: Balai PengkajianTeknologi Pertanian.
- Sari LR, Fahmi A. 2018. Dampak subsidi pupuk terhadap peningkatan pendapatan dan kesejahteraan petani kecamatan megaluh jombang dalam perspektif fenomenologis (studi kasus Dusun Sudimoro dan Dusun Paritan). *MARGIN ECO: Jurnal Bisnis Dan Perkembangan Bisnis* 2(2):86–101.
- Saptana. 2010. Tinjauan Konseptual Mikro-Makro Daya Saing dan Strategi Pembangunan Pertanian. *Forum Penelitian Agro Ekonomi* 28(1): 1–18. <https://doi.org/10.21082/fae.v28n1.2010.1-18>
- Sinaga YJ, Kusnadi N, Rachmina D. 2021. The effect of technical efficiency on the competitiveness of cassava Indonesia. *Jurnal Manajemen & Agribisnis* 18(3):265–274. <https://doi.org/10.17358/jma.18.3.265>
- Sukpanich S, Wang W. 2022. Analysis of the export

- competitiveness of Thai cassava in the Chinese market (2010-2020). *Open Journal of Business and Management* 10(1):337–349. <https://doi.org/10.4236/ojbm.2022.101020>
- Taslim L, Rifin A. 2019. The impact of tapioca import on cassava prices in the development of tapioca industry in Indonesia. *Jurnal Manajemen & Agribisnis* 16(3):133–141. <https://doi.org/10.17358/jma.16.3.133>
- Wargiono J, Hasanuddin A, Suyamto. 2006. *Teknologi Produksi Ubikayu Mendukung Industri Bioethanol*. Bogor: Pusat Penelitian dan Pengembangan Tanaman Pangan.
- Widyatami LE, Wiguna AA. 2019. daya saing dan dampak kebijakan pemerintah terhadap usahatani padi sri di Kecamatan Rogojampi Kabupaten Banyuwangi. *AGRARIS: Journal of Agribusiness and Rural Development Research* 5(2):99–111. <https://doi.org/10.18196/agr.5279>
- Zulkarnain, Haryono D, Zakaria WA, Murniati K. 2021. Daya saing komoditas ubi kayu dengan internalisasi biaya transaksi di kabupaten Lampung Tengah. Lampung Indonesia. *Agro Bali: Agricultural Journal* 4(2): 230–245. <https://doi.org/10.37637/ab.v4i2.712>
- Zakaria WA, Endaryanto T, Ibnu M, Marlina L. 2019. Ketersediaan petani melakukan kemitraan dimasa datang: analisis heckprobit pada petani ubi kayu di Provinsi Lampung. *Journal Of Tropical Upland Resources* 1(1):19–34. <https://doi.org/10.23960/jtur.vol1no1.2019.7>
- Zakaria WA, Endaryanto T, Indah, ML, Mellyya SIR, Mutolib A. 2020. Pendapatan dan kesejahteraan rumah tangga petani ubikayu di provinsi Lampung. *Jurnal Agribisnis Indonesia (Journal of Indonesian Agribusiness)* 8(1):83–93. <https://doi.org/10.29244/jai.2020.8.1.83-93>