p-ISSN: 2406-7489 e-ISSN: 2406-9337

Accredited by
Ministry of Research and Technology/NRIA
Strengthening No: 200/M/KPT/2020; December 23, 2020

JITRO (Jurnal Ilmu dan Teknologi Peternakan Tropis)
May 2022, 9(2):335-343

DOI: 10.33772/jitro.v9i2.21359
http://ojs.uho.ac.id/index.php/peternakan-tropis

Development Strategy for Organic Fertilizers in Farmers Groups Banyuwangi Indonesia

Nanang Dwi Wahyono[1*], Niswatin Hasanah[2], Tanti Kustiari[1]

[1]Department of Management Agribusines, Politeknik Negeri Jember
Jl. Mastrip Po Box 164, Jember 68101, Indonesia
[2]Departmen of Animal Husbandry, Politeknik Negeri Jember
Jl. Mastrip Po Box 164, Jember 68101, Indonesia
*Corresponding author: nanang_d_wahyono@polije.ac.id

(Submitted: November 04, 2021; Accepted: January 30, 2022)

ABSTRACT

Purpose of this study was to determine the factors that influence the strategy and development of the use of organic fertilizers in Banyuwangi Regency to make the land healthier. This research was conducted in April-June 2021 in Banyuwangi Regency. The population in this study came from 5 farmer groups in Banyuwangi Regency, amounting to 350 people. The data used in the form of primary and secondary data. Primary data was obtained from the distribution of questionnaires, while the secondary data sources were obtained from the Agriculture and Food Service of Banyuwangi Regency. The data obtained were analyzed using AHP (Analytical Hierarchy Process) and CSI (*Customer Satisfaction Index)*. The results of this study indicate that priority of the strategy for developing organic fertilizer in the Banyuwangi Regency is the role of the government in supporting all activities related to organic fertilizer, Farmers are satisfied with the current performance of the Banyuwangi Regency Agriculture and Food Service with a satisfaction value of 80.79%

Keywords fertilizer organic, AHP, CSI, Banyuwangi

INTRODUCTION

Agriculture is one sector that affects the economy in Indonesia. This is because small communities are involved in the agricultural sector to meet their daily needs. Rice, corn, cassava, and other tubers play an important role as staple foods for the population in Indonesia. This agricultural system in Indonesia has its own characteristics and adapts to the conditions of the agricultural area, each of these systems will determine the commodities produced (Irawan & Winarti, 2015).

The matched system can be successful because of the role of the farmer in cultivating the crop. Plant processing cannot be separated from the use of fertilizers. Fertilizers will have a major effect on crop yields, most agriculture in Indonesia has long known organic fertilizers, but currently, their use is decreasing along with the number of chemical fertilizers circulating (Dewa, Sudarma and Suardi, 2019). Chemical fertilizers used by farmers cause agricultural land to become "sick" meaning that the organic matter content in the soil is less than 2% where the ideal organic matter content is 5% (Rangkuti, 2013). Soil contaminated with chemical fertilizers constantly becomes loose, the color of the soil is not dark, productivity decreases and there are many types of pests and diseases on plants (Aprian, 2014). Organic fertilizers have a lot of positive effects on plants, especially to improve nutrients in the soil. The government has set regulations related to organic fertilizers through the Regulation of the Minister of Agriculture Number 28/Permentan/SR.130/5/2009 concerning Organic Fertilizers, Biological Fertilizers and Soil Improvement (Permentan, 2009).

Government regulations that have been set should be applied to the maximum agricultural system by providing direct assistance to farmers (Tripomo & Udan, 2005). Organic fertilizers have been widely circulated in Indonesia, organic fertilizers have been used by farmers in several areas in Indonesia, namely Central Java, West Kalimantan, and Lampung. They use Bekapomi organic fertilizer for their rice cultivation and are satisfied with the yields obtained. Farmer satisfaction reached 80.22% (Gama, Oktaviani and Rifin, 2016). Farmers in Banyuwangi Regency have also made and used organic fertilizers in farming, but their use has not been maximized because many still rely on chemical fertilizers. The agricultural sector in Banyuwangi Regency needs special attention in the use of organic fertilizers because it is one of the contributors to food availability in Indonesia. Banyuwangi Regency has the 2nd largest paddy field in East Java, covering an area of 65,457 hectares. The biggest agricultural potential in Banyuwangi Regency is rice production, where Banyuwangi is included in the rice barn in East Java Province. The production of rice plants in Banyuwangi Regency in 2014-2019 was 4,247,699 tons (Arifianto, 2016). Corn is also a food product in Banyuwangi Regency, producing 26,136 tons. This has prompted research on the factors that influence the strategy and development of the use of organic fertilizers in Banyuwangi Regency so that paddy fields become healthier.

MATERIAL AND METHOD

This research was conducted in April-June 2021 in Banyuwangi Regency which includes several sub-districts of Glagah, Lixin, Kalipuro, Rogojampi, and Blimbingsai. The data used in this study are primary data and secondary data. The primary data source comes from the results of the questionnaire distribution while the secondary data source comes from the Banyuwangi Regency Agriculture and Food Service. The primary data collection method was by distributing questionnaires to respondents, while secondary data was obtained by obtaining research-related data from the Food Crops Division of the Banyuwangi Regency Agriculture and Food Service as well as documentation methods (Hasanah and Fanani, 2018).

The population in this study came from 5 farmer groups in Banyuwangi Regency including the Rukun Tani Group, Duku Poktan, Sumber Urip Poktan, Kembang Cloves Poktan, and Tunas Harapan Poktan with 350 members. The sample size is determined by population estimation using the formula proposed by Yamane.

RESULT AND DISCUSSION

A SWOT analysis was conducted to identify the factors that influence in determining the strategy of developing organic fertilizers in Banyuwangi Regency, at this stage the statements related to organic fertilizers were grouped into two factors, namely internal and external factors. Both of these factors have strengths and weaknesses in the development of the use of organic fertilizers. Meanwhile, external factors have opportunities and threats to develop the use of organic fertilizers. Table 1 and Table 2 are the results of the calculation of the factors that influence the strategy of developing organic fertilizer in farmer groups in Banyuwangi Regency in the form of internal and external factors (Kotler, 2000).

Based on the table the total score of internal factors determines the ranking of factors seen from the total score. The highest score is the one with the strongest effect, so it can be stated that a very important factor in the development strategy of organic fertilizer in farmer groups in Banyuwangi Regency is that organic fertilizer does not have side effects on the body with a total score of 1.57. The next factor is an increase in yields of up to 10 tons/ha with a total score of 0.64, the price of organic fertilizers is cheaper than others with a total score of 0.58, the technique of using organic fertilizers is easy to adapt, a total score of 0.36, the availability of organic fertilizers that are easy to find in total. a score of 0.34 and farmers know about the process of making organic fertilizer using advanced technology with a total score of 0.12. The most important weakness factors are complaints of plant pests with a total score of 0.280, then the existence of farmer groups that support the use of organic fertilizers, the relationship between farmers and breeders, and the last is the low experience of farming due to basic education. Calculating scores from external factors, namely opportunities (opportunity) and threats (treat) (Fidaruzziar et al., 2022).

Table 1. Result of SWOT internal factor calculation

No.	Indicator	Score	Weight	Total Score
	Strength			
1	Organic fertilizer has no side effects on the body	4.74	0.33	1.57
2	Yields increase to 10 tons/ha	4.65	0.14	0.64
3	Organic fertilizer prices are cheaper	4. 48	0.13	0.58
4	Techniques for using organic fertilizers are easy to understand	3.84	0.09	0.35
5	Organic fertilizers using advanced technology	3.06	0.04	0.12
6	Availability of organic fertilizers that are easy to determine	3.56	0. 09	0.34
	Total Strength	24.33	0.83	3.61
	Weaknesses			
1	Existence of farmer groups that support the use of organic fertilizers	3.42	0.05	0.17
2	Complaints of plant pests	4.58	0.06	0.28
3	Existence the relationship between breeders and farmers	2.74	0.03	0.084
4	Low farming experience due to educational background	2.66	0.03	0.083
	Total Weakness	13.4	0.17	0.62

Table 2. Results of calculation of external factors

No.	Indicator	Score	Weight	TotalScore
	Opportunity			
1	Demand for organic rice products increased	3.76	0.12	0.45
2	Abundant livestock manure	3.64	0.11	0.41
3	The intensity of extension on organic fertilizer	3.96	0.05	0.19
4	Farmers are proud to use domestic products	4.84	0.09	0.42
5	Strong support from the Banyuwangi Regency Agriculture and Food Service	4.86	0.35	1.70
	Total Opportunities	21.06	0.72	3.17
	Threats			
1	Farmers readiness to switch completely to organic fertilizers	3.90	0.07	0.29
2	Availability of government-subsidized products other than organic (inorganic) fertilizers	4.00	0.11	0.46
3	The decreased interest of the younger generation about agriculture	4.18	0.09	0.40
	Total Weakness	12.08	0.28	1.14

Tables 1 and 2 show that the most powerful opportunity factor in the effort to develop an organic fertilizer strategy for farmer groups in Banyuwangi Regency is the strong support from the Department of Agriculture, with a total score of 1.70. The next factor is the demand for organic rice products with a total score of 0.45, then farmers are proud to use domestic products with a total score of 0.42, then livestock manure is abundant with a total score of 0.41, then the intensity of counseling about organic fertilizers with a total score of 0.19 (Sulasti et al., 2020). The strongest threat factor is the existence of government-subsidized products other than organic fertilizer with a total score of 0.46, then the declining interest of the younger generation about agriculture with a total score of 0.40, and the level of readiness of farmers to completely switch to organic fertilizers with a total score of 0.29 (Fahmi I, 2013).

The value of the Internal Factor Evaluation Matrix (IFE) and the External Factor Evaluation Matrix (IFE)

IFE and EFE were determined to evaluate internal and external factors resulting from the study. Strengths and weaknesses are used as the main internal factors in the evaluation (Gama, Oktaviani and Rifin, 2016). Key external opportunities and threats that affect or are likely to affect the environment to support further analysis (Kotler and Keller, 2012). IFE is obtained by reducing the score of strengths and weaknesses. While the EFE value is obtained from reducing the score of opportunities and threats. The total score of the strength factor score is 3.61 and the weakness factor is 0.62. It is clear that the strength factor is very important and influences the organic fertilizer development strategy in farmer groups in Banyuwangi Regency compared to the weakness factor. Likewise, the opportunity factor is 3.17 which is higher than the threat of 1.14. The following table shows the results of the IFE and EFE calculations.

The total IFE value from the results of reducing the strength and weakness factors is 2,99. While the EFE value is the reduction of the opportunity and threat factors, which is 2,03. Where the IFE and EFE values will be used to describe the SWOT diagram.

SWOT Diagram

SWOT diagram shows that the results of this study (Figure 1) are in quadrant I (Aggressive). Quadrant I is the most profitable position. The strategy for developing organic fertilizers for farmer groups in Banyuwangi Regency is a strategy that is generally directed to use the strengths they have to take advantage of existing business opportunities. So that management has many choices of strategies that can be used to develop the bussinerss that is being run.

Table 3. Total calculation of IFAS and EFAS

Factor	Total Score
Strength	3.61
Weakness	0.62
Opportunity	3.17
Threat	1.14
Factor	
IFE	2.99
EFE	2.03

Analitycal Hierarchy Process (AHP)

AHP conducted on determining a hierarchy that includes objectives, criteria, and strategy. The criteria are obtained from four factors that have the highest weight in the SWOT analysis while the strategy is made by researchers to develop the use of organic fertilizers. Then make a questionnaire related to these criteria and strategies. The following is a picture of the AHP hierarchy of organic fertilizer development in the Banyuwangi Regency (Sardjono, Susilo and Wignyanto, 2012). The four strategies will be calculated using a comparison matrix based on the criteria that have been determined to formulate a strategy that will later get the highest ranking of which strategies are suitable for use in the development of organic fertilizers in farmer groups in Banyuwangi Regency.

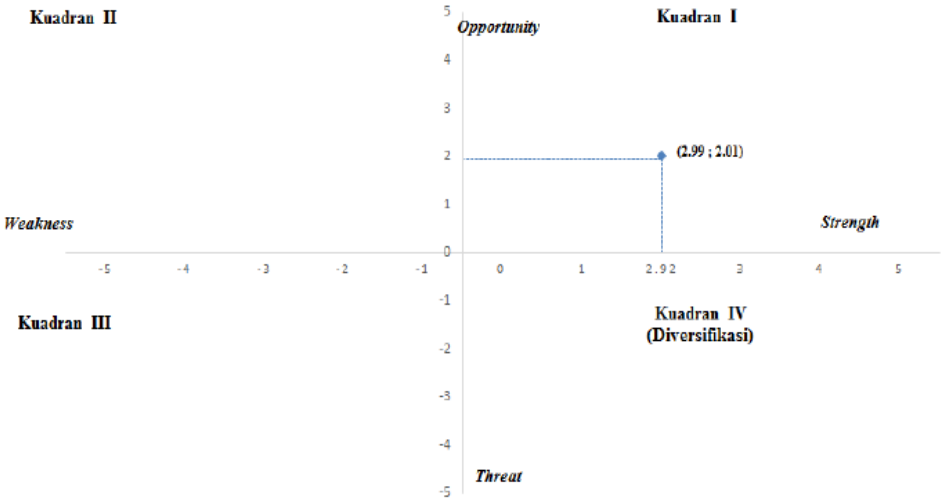

Figure 1. SWOT diagram

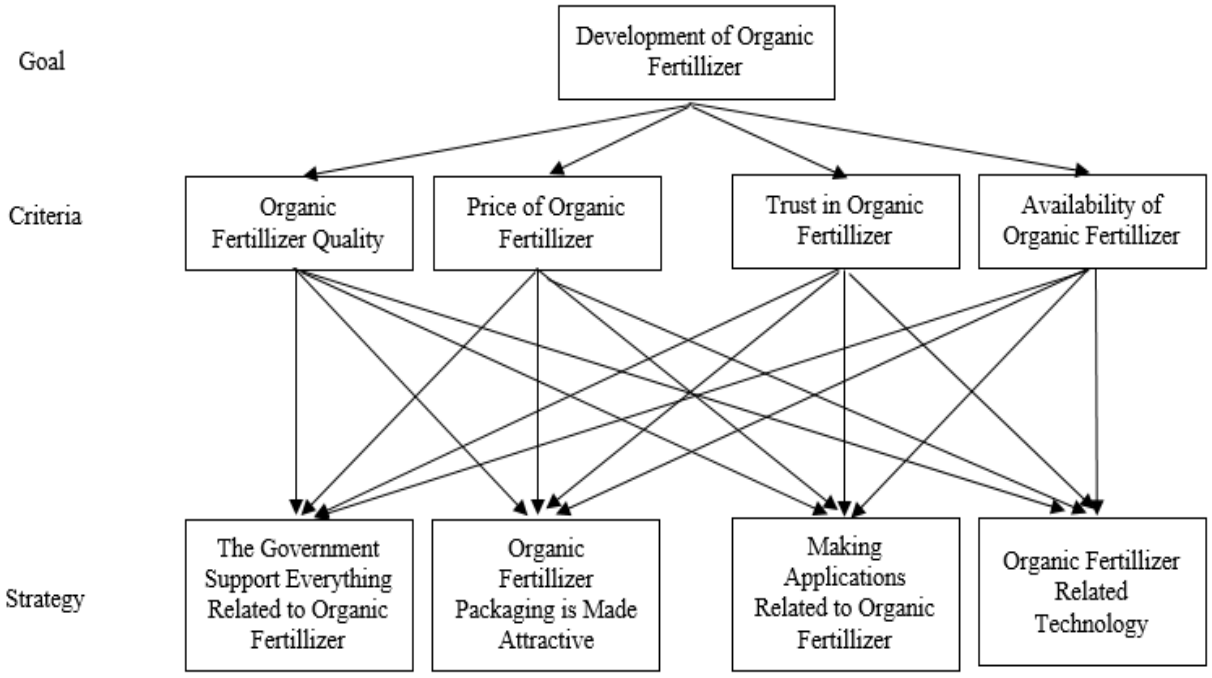

Figure 2. Hierarchy diagram

Matrix Comparison between Criteria

The comparison matrix between criteria is obtained from the results the questionnaire that has been distributed about the comparison of the interests of each factor, the geometric mean comparison matrix of the alternative strategies can be seen in table 4.8. If the comparison between the criteria is the same, then it is given a value of 1. If the comparison of different criteria is taken from the geomean value, namely the average value of the respondent's questionnaire. The criteria in the matrix will be simplified by using letter symbols as follows:

A = Quality of Organic Fertilizer
B = Price of Organic Fertilizer
C = Trust in Organic Fertilizer
D = Product Availability

Table 3. Matrix comparison between criteria

Criteria	A	B	C	D
A	1	2.95	2.15	2.00
B	0.34	1	2.74	1.12
C	0.46	0.36	1	0.31
D	0.50	0.90	3.20	1

Table 4. Consistency ratio (CR) calculation results

Coefisient of	Value
Lamda Max	4.234
Consistency Index (CI)	0.078
Index Random (IR)	0.900
Consistency Ratio (CR)	0.087

If there is data that has a consistency ratio of <0.1 then it is considered inconsistent, a re-evaluation of the value of the intensity of interest in the questionnaire must be re-evaluated. From the calculation of the AHP matrix, the CR value is 0.087, which means that if CR (0.087) 0.1, it indicates that the respondents' answers and the determination of comparison measurements between criteria are consistent and can be used in determining strategies for developing organic fertilizers in farmer groups in Banyuwangi Regency. In addition, the average value of each criterion will be obtained which will influence in determining the next strategy.

Comparison Matrix between Criteria and Strategy

Matrix comparison between criteria and strategy is carried out by comparing each criterion with the strategy so there are 4 matrices obtained. The criteria in the matrix will be simplified by using letter symbols as follows:

E = Government supports all activities related to organic fertilizers
F = Packaging of Organic Fertilizer Products is made attractive
G = Makes applications related to Organic Fertilizer information
H = Organic Fertilizer Processing Technology

Table 5. The following is a matrix table comparison of criteria with strategy

Quallity of organic fertilizer	E	F	G	H
E	1	3.00	2.58	2.78
F	0.33	1	0.29	0.46
G	0.39	3.45	1	2.00
H	0.36	2.15	0.50	1

Table 6. Criteria price comparison matrix organic fertilizer with strategies

Organic fertilizer pricing	E	F	G	H
E	1	2.24	2	1.74
F	0.45	1	0.46	0.50
G	0.50	2.17	1	2.00
H	0.57	2.00	0.61	1

Table 7. Comparison matrix of trust criteria for organic fertilizer with strategy

Trust in organic fertilizer	E	F	G	H
E	1	3.00	2.10	3.00
F	0.33	1	2.68	2.00
G	0.48	0.37	1	1.21
H	0.33	0.50	0.82	1

Table 8. Matrix Comparison of Criteria for Availability of Organic Fertilizer Product with Strategy

Product availabality	E	F	G	H
E	1	1.49	1.16	1.27
F	0.67	1	0.48	0.33
G	0.86	2.07	1	1.89
H	0.79	3.07	0.53	1

After calculating the comparison of the criteria with the strategy, then determining the value of Lamda max, *Consistency Index* (CI), *Random Index* (IR), and *Consistency Ratio* (CR) to determine data consistency. The following table 8 the results of the consistency of the strategy of the four criteria which indicate that:

Table 9. The analysis of priority strategies

Coefisient	A	B	C	D
Lamda Max	4.169	4.085	4.206	4.175
Consistency Index	0.056	0.028	0.069	0.058
Index Random	0.900	0.900	0.900	0.900
Consistency Ratio	0.063	0.032	0.076	0.065
Description	Consis-tent	Consis-tent	Consis-tent	Consis-tent

There are 4 (four strategies) used by researchers to develop the use of organic fertilizers in the Banyuwangi Regency. First, the government supports all activities related to organic fertilizers. The government is the facilitator for farmer groups in Banyuwangi Regency, meaning that the Department of Agriculture and Food fully supports the activities of farmer groups from fostering the manufacture of organic fertilizers, applying organic fertilizers, and providing consulting services on plant development. The government also provides support in the form of tools and materials related to organic fertilizers. Both Organic Fertilizer Product Packagings are made attractive, some farmer groups that produce organic fertilizers only pack their organic fertilizers in plain sacks, therefore the organic fertilizer packaging should have a logo, color, and make a slogan containing an invitation to use organic fertilizer. Third, namely making applications related to organic fertilizer information (Permana and Mudiono, 2019), the Banyuwangi Regency Agriculture and Food Service has an e-bilaperdu digital platform that can be added to information related to the availability of organic fertilizers, benefits, and prices. Fourth, organic fertilizer processing technology continues to be developed in order to shorten the time of making organic fertilizers.

The results of the AHP calculation obtained priority weights which will be ranked to determine the order of factors from the highest to the lowest value. Based on the comparison matrix between criteria and strategies, it is found that the ranking order of the most important strategies used in the development of organic fertilizers in farmer groups in Banyuwangi Regency. The most important strategy used is that the Government supports all activities related to organic fertilizers. The following table 10 shows the ranking results or strategic priorities of the AHP method.

Table 10. Strategic priorities of AHP method

Coefficient	Value	Rank
▪ The government supports all activities related to organic fertilizers	0.400	1
▪ The packaging of organic fertilizer products is made attractive	0.135	4
▪ Create applications related to organic fertilizer information	0.269	2
▪ Organic fertilizer processing technology	0.195	3

Table 10 shows that the strategy of development organic fertilizer, namely from the Government to support all activities related to organic fertilizer. The Government of Banyuwangi Regency, through the Department of Agriculture and Food, must improve its performance, both field officers and structural officials who serve in their fields. Government support will be very meaningful for farmer groups to be more active in using and developing organic fertilizers that they have been producing.

Figure 3 shows that 40% of the strategy for developing organic fertilizer in farmer groups in Banyuwangi Regency is influenced by the Government supporting all activities related to organic fertilizer. The next strategy is to make applications related to 26.94% Organic Fertilizer information, 19.53% Organic Fertilizer Processing Technology, and the last is Organic Fertilizer Product Packaging is made attractive 13.54%.

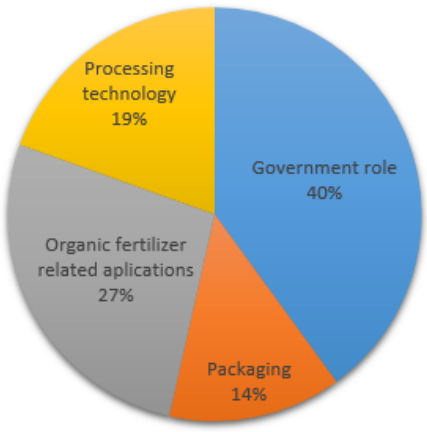

Figure 3. The Percentage of development strategy for the use of organic fertilizers in farmers' groups in Banyuwangi Regency

Customer Satisfaction Index (CSI)

SWOT and AHP analysis have been obtained, then the next is CSI analysis to determine the level of farmer satisfaction in Banyuwangi Regency against the strategy obtained from the research results, namely the Government support all activities related to organic fertilizer in Banyuwangi district. Therefore, researchers measure farmers' satisfaction with activities that have been carried out by the government through the Agriculture and Food Service of Banyuwangi Regency at this time. The CSI analysis is carried out in the following way:

1. Calculating the Mean Importance Score (MIS) which is the average expectation of each statement that has been made, namely there are 18 statements to determine the score between performance and expectations with a total value of 72.22.
2. Calculating the Mean Satisfaction Score (MSS) is the average performance of each statement with a total value of 70.87.
3. Weight Factor is each MIS value divided by the total MIS with a total value of 100.
4. Weight Score is each WF value multiplied by MSS with a value of 403.959 5. CSI is WT divided by the Likert scale. The scale used is 5, so the percentage of CSI is 80.79%.

Table 10. Calculation results of the customer satisfaction index (CSI)

Factor	Mean Importance Score (MIS)	Mean Satisfacyion Score (MSS)	Weight Factor (WF)	Weight Score (WS)
1	4.940	4.740	6.84	32.423
2	4.700	4.650	6.508	30.282
3	4.520	4.480	6.259	28.039
4	3.980	3.840	5.511	21.162
5	3.020	3.060	4.182	12.796
6	3.280	3.560	4.542	16.168
7	3.920	3.420	5.428	18.563
8	4.780	4.580	6.619	30.313
9	3.500	2.740	4.846	13.279
10	2.560	2.660	3.545	9.429
11	3.680	3.760	5.096	19.159
12	3.700	3.640	5.123	18.649
13	4.000	3.960	5.539	21.933
14	4.840	4.840	6.702	32.436
15	4.820	4.860	6.674	32.436
16	3.740	3.900	5.179	20.197
17	4.000	4.000	5.539	22.155
18	4.240	4.180	5.871	24.541
Total	72.220	70.870	100	403.959

CONCLUSION

The fertilizers in priority of organic fertilizer development strategies in Banyuwangi Regency, namely the role of the government is obtained from the Analytical Hierarchy Process (AHP) method, namely the Government supports all activities related to organic fertilizers. The government through the Banyuwangi Regency Agriculture and Food Service carries out various activities that support the development of organic fertilizers by means of continuous guidance and providing assistance with tools and materials to farmers. Analyze satisfaction using the CSI method. Farmers in Banyuwangi Regency who have used organic fertilizer based on the priority strategy obtained from the AHP method. Farmers are satisfied with the current performance of the Banyuwangi Regency Agriculture and Food Service with a satisfaction value of 80.79%

CONFLICT OF INTEREST

The authors whose names are listed have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

REFERENCES

Aprian, O. 2014. Persepsi Petani Terhadap Pupuk Organik Pada Usahatani Padi di Kecamatan Sakra Kabupaten Lombok Timur. Fakultas Pertanian Universitas Mataram. Mataram. [Indonesia]

Arifianto, S. 2016. Penggunaan Media Baru di Komunitas Petani dan Nelayan. Puslitbang Aptika IKP, Badan Penelitian dan Pengembangan Sumber Daya Manusia Kementerian Komunikasi dan Informatika RI. Jakarta. [Indonesia]

Dewa, P. B., I.M. Sudarma, & I.D.P.O. Suardi. 2019. Strategi Pengembangan pemasaran pupuk kompos organik pada Yayasan Pemilahan Sampah Temesi, Kabupaten Gianyar. Jurnal Manajemen Agribisnis 7(2):121-130.

Fahmi, I. 2013. Manajemen Strategi Teori dan Aplikasi. Alfabeta. Bandung.

Fidaruzziar, I. N.D. Wahyono, Y. Wibisono, & N. Hasanah.. 2022. Strategi keberlanjutan usaha ekspor peternakan domba sebagai komoditas ekspor di Kabupaten Jember. Jurnal Ilmiah Fillia Cendekia 7(1):21-25. [Indonesia]

Gama, I.G.M., R. Oktaviani, & A. Rifin. 2016. Analisis kepuasan petani terhadap penggunaan pupuk organik pada tanaman padi. Jurnal Agro Ekonomi 34(2):105-122. [Indonesia]

Hasanah, N. & Z. Fanani. 2018. Factors influencing the revenue of broiler open house system partnership corporate X in Indonesia. Journal of Development Research 2(1):28-31.

Irawan, R. & S. Winarti. 2015. Sistem pendukung keputusan pemilihan lokasi dan evaluasi lokasi pemasaran produk (gula) menggunakan metode AHP (studi kasus: PT.Madubaru). Jurnal Informatika 9(2):1079-1087. [Indonesia]

Kotler, P. 2000. Manajemen Pemasaran. Milenium. Indeks Kelompok Gramedia. Jakarta. [Indonesia]

Kotler, P. & K.L. Keller. 2012. Manajemen Pemasaran. Erlangga. Jakarta. [Indonesia]

Permana, A. & D.R.P. Mudiono. 2019. Expert System for typhoid fever disease diagnosis using a web-based application. Proceeding of the 2nd International Conference on Food and Agriculture. Bali, 2-3 November 2019. Politeknik Negeri Jember. Jember. pp: 64-69.

Permentan. 2009. Peraturan Menteri Pertanian Nomor 52 tahun 2009 tentang Metode Penyuluhan. Kemnterian Pertanian. Jakarta. [Indonesia]

Rangkuti, F. 2013. Analisis SWOT: Teknik Membedah Kasus Bisnis Cara Perhitungan Bobot, Rating, dan OCAI. Gramedia Pustaka Utama. Jakarta. [Indonesia]

Sardjono, N., B. Susilo, & Wignyanto. 2012. Strategi pengembangan sistem produksi pupuk organik pada unit pengolahan pupuk organik (Uppo) di Desa Bangunsari Kabupaten Ciamis. Jurnal Teknologi Pertanian 13(2):138-148. [Indonesia]

Tripomo, T. and Udan. 2005. Manajemen Strategi, Rekayasa Sains. Bandung.