Sustainability Analysis of Tefa Agrimart Polije

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Abstract. Tefa Agrimart has various challenges; one of the most important ones is the willingness of the production units to market their products through Tefa Agrimart. If this is not handled immediately, it will threaten the sustainability of Tefa Agrimart. Efforts to overcome the problems above must be done holistically by identifying the sustainability attributes of the development of Tefa Agrimart. The problem in this research was mainly what sustainability attributes needed to be improved in the development of Tefa Agrimart. The purpose of this research was to identify the sustainability attributes of Tefa Agrimart development. The research method included the following stages: first, data collection on sustainability aspects using multidimensional scaling (MDS) techniques; second, data processing using the RapTefa application (analysis of ordination, leverage, montecarlo, and kite diagrams). The results showed that the most important lever attributes consisted of: join marketing readiness, intensity of technical guidance activities, and market access.

Keywords: Tefa Agrimart, multidimensional scaling, RapTefa.

1 Introduction

Politeknik Negeri Jember (Polije) is one of the universities that organizes vocational education which emphasizes more on the practical aspects in the learning process. Teaching Factory (Tefa) was developed in addition to realizing this practice-based education as well as in order to provide learning experiences to students in real conditions, such as in the industrial world [1].

Tefa Agrimart is a pioneering tefa under the management of the Department of Agribusiness Management (MNA), which is designed to market Polije's superior products. Tefa Agrimart as a pioneering tefa designed to be able to distribute products from all production units in Polije has various difficult challenges, such as the lack of professional marketing human resources, the large number of students who must be accommodated in the Tefa learning process, and the willingness of production units to produce the products that the customers want both in quantity and quality. If this is not handled first, it will threaten the sustainability of all tefa activities. The availability of marketing human resources is important for Tefa Agrimart because without these human resources, it is impossible for Tefa Agrimart to operate properly. Likewise, the capacity of Tefa Agrimart in accommodating student practicum activities is very important, considering the number of students majoring in MNA is very large. If Tefa is not able to accommodate all

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of them, it can be said that Tefa Agrimart has failed in carrying out its function as a place for student learning. No less important is the willingness of the production units to submit their products to be marketed by Tefa Agrimart. If the production units are willing to submit their products continuously, Tefa Agrimart will be able to run its business in a sustainable manner.

Various efforts to overcome the problems above must be done holistically by identifying the elements of the quality of human resources, assigning learning variables to the Tefa Agrimart, and identifying the attributes of the sustainability of product supply. These holistic efforts must then be synchronized with the institutional policies, so that overall they are able to improve the performance of this pioneering tefa. Based on the description above, the scope of the problem includes: elements that affect the quality of marketing human resources, student learning variables, and production sustainability attributes.

The link between the scheme and the university research strategic plan can be seen from the relevance of this research to the priority issues of the Research Master Plan (RMP). This research, which is included in the focus area of the humanities, places marketing strategy as its scope, so that the research is in accordance with the priority issues of RMP in 2022.

2 Research method

The research was carried out at Politeknik Negeri Jember (Polije) for about 4 months from preparation to completion, starting in March 2022. The type of data used was primary data. The population of this research was all stakeholders consisting of tefa managers, lecturers and students in Polije. The research sample was chosen intentionally (purposive sampling [2]), consisting of 2-3 people from each stakeholder.

2.1 Data Collecting

Data collection techniques were carried out through interviews and filling out questionnaires. Interviews were conducted with selected respondents/samples who had knowledge of sustainability aspects.

Data was collected using a multidimensional scaling (MDS) questionnaire [3], which is a questionnaire that aims to obtain data on sustainability status. This questionnaire was related to the attributes in each of the dimensions that had been determined. The research variables consisted of sustainability dimensions, which included social, economic, ecological, technological, and institutional.

2.2 Data Analysis

The research data processing using the multidimensional scaling (MDS) method, which is one of the “multivariate” metric data methods, aimed to determine the extent to which Tefa has sustainability in the future. The identification of the index and sustainability status was carried out by using the ordination technique, namely mapping the results of the assessment on each attribute, so that the index and sustainability status of the development of tefa could be determined. This data processing was assisted by Rapid Appraisal for Fisheries (RAPFISH) software which was modified into MDS-based RapTefa. The scores of each dimension were

analyzed multidimensionally to determine the points that reflected the position of the sustainability of the development being studied relative to the two reference points, namely the bad point and the good point, as shown in Figure 1 [3]. Variable measurement was carried out by measuring sensitive attributes on the change in Root Mean Square (RMS). The greater the change in RMS, the more sensitive the role of these attributes to the increase in sustainability status [4].

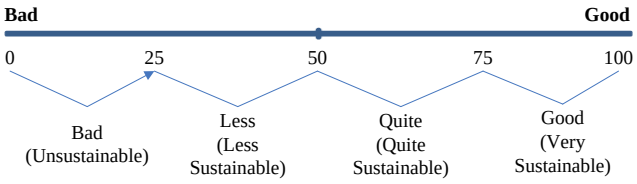

Fig. 1. Two Points of Reference 'Bad' and 'Good'

Furthermore, Laverage Analysis was carried out to determine the sensitive attributes and interventions that need to be carried out. The results of the laverage analysis were expressed in the form of percent (%) of the change in the root mean square (RMS) of each attribute [5]. If the results of the Leverage Analysis were positive, then the attribute was sensitive or dominant in influencing the sustainability of the dimension. Meanwhile, if the value was negative, the result was less sensitive to the effect on the dimensions.

Next was the Montecarlo Analysis, which is a statistical simulation method to determine the effect of random error on the estimation process and was needed to study the effect of uncertainty from several factors, such as: (1) scoring errors in each attribute; (2) the impact of scoring diversity from different scoring; (3) stability of MDS in running; (4) high S-Stress value of the PASCAL algorithm. If the difference between the results of the MDS and Monte Carlo calculations was less than one, then the system being studied was quite good or in accordance with real conditions [6]. The confidence interval for the results of the Monte Carlo analysis was 95% [7].

Kite diagram was the last stage in data analysis. This diagram showed the level of sustainability of a dimension that had the best value and the dimension that had the worst value, which was < 50.

3 Results and Discussion

3.1. Tefa development sustainability status

The assessment made by the respondents on the attributes resulted in the sustainability status of the development of Tefa Agrimart as shown in Figure 2, which includes the sustainability status of three groups of respondents, namely Tefa managers (TEF), teaching staff (LECT), and students (STU). The sustainability index values for the three groups of respondents can be seen in Table 1.

The value of the sustainability index in the three groups of respondents surveyed had a range of values between 50-75, thus the sustainability status of the development of Tefa Agrimart as a

whole was in the 'quite sustainable' category. Two of the three groups of respondents, namely LECT and STU, rated the Tefa Agrimart sustainability index as 'quite sustainable' with a value closed to the lowest point, meaning that both of them considered the sustainability of Tefa Agrimart's development to be in the low category. This showed that to realize this tefa, a hard struggle is needed, especially since the position of tefa is still a pioneer tefa. Meanwhile, one group of respondents consisting of tefa managers in Polije, namely TEFA, gave a higher sustainability index value regarding the development of Tefa Agrimart. This gaves a good enough enthusiasm for the development of Tefa Agrimart to be prepared even more intensively.

Intensive handling efforts related to the results of the assessment of the Tefa respondent group will be able to increase the sustainability category to 'very sustainable', namely by improving the performance of lever indicators (see section 3.2). The characteristics of the 'highly sustainable' category include: Tefa has applied reference prices for buying and selling, product processing is already on an industrial scale, and product sales have reached the provincial market and even been exported overseas.

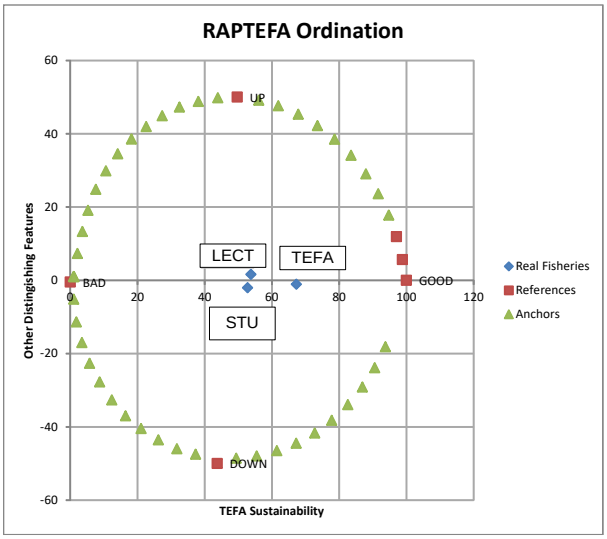

Fig. 2. Sustainability status of tefa development

Table 1. Sustainability index value of three groups of respondents

Groups of respondents	Index value	Sustainability status
Tefa Manager	67.27	Quite sustainable
Lecturer	53.75	Quite sustainable
Student	52.77	Quite sustainable

3.2. Leverage factor

A total of 10 attributes had been generated based on the RapTefa analysis which has the largest RMS value in each dimension (Table 2). Sensitivity analysis showed which attributes contributed to the value of sustainability [7]. The 10 attributes were the leverage factors that played an important role in determining the sustainability index.

Based on Table 2, it can be seen that the leverage attributes had RMS values ranging from 4.40-9.49. Increasing the sustainability of tefa development will start from the attributes of these levers. For important attributes, such as the attribute of join marketing readiness, it give a hint to the policy makers that if they want to improve the performance of this attribute, they can increase their performance from the condition of 'No joint marketing' to 'ready to do joint marketing'.

Table 2. RMS values of lever attributes

Attributes	RMS
Industrial climate	6.82
Resource sharing	4.40
Market access	8.21
Market reach	7.71
Intensity of technical guidance activities	8.27
Employee empowerment	7.82
Intensity of use of marketing technology	7.52
Integrated information on production activities	7.12
Join marketing readiness	9.49
Marketing cooperation between tefa	7.92

3.3. Sustainability scenario

For the purpose of preparing the sustainability scenario, it is necessary to analyze the possibility of changes that occur in the future, so that the sustainability status can be arranged in scenario I (pessimistic), scenario II (moderate) and scenario III (optimistic) as shown in Table 3. The visualization of the sustainability index value for each group respondents are depicted on a kite diagram (Figure 3).

Changes that will occur in the future in this regard are based on the policy of the Polije leadership with the 'one study program one tefa' program. In addition, Polije as a vocational education center will rely on tefa as the main learning place for students [8]. This is the basis for determining the sustainable scenario.

Based on the sustainable scenario in Table 3, Tefa Managers were the group of respondents who assessed the sustainability of Tefa Agrimart with the highest score (67.27) in scenario I (existing condition). In scenario II, the assessment of the Tefa Managers was still in the 'quite sustainable' category with a value of 73.90. However, in scenario III, the Tefa Managers assessed the sustainability of Tefa Agrimart as 'very sustainable' with a value above 75, which was 76.28. Thus, according to the the Tefa Managers respondent group, Tefa Agrimart was already in the 'very sustainable' category in scenario III even though the overall category was 'quite sustainable' with a value of 70.25. Tefa Managers assessed that it was more accurate in

accordance with the real conditions in the field because they knew more about the real problem than the other two groups of respondents.

The visualization of the sustainability index value of each group of respondents is depicted on a kite diagram (Figure 3).

Table 3. Sustainability index value and sustainability status

Groups of respondents	Scenario I	Scenario II	Scenario III
Tefa Manager	67.27	73.90	76.28
Lecturer	53.75	56.82	61.41
Student	52.77	63.58	73.06
Sustainability Index Value	57.93	64.77	70.25
Sustainability Status	Quite sustainable	Quite sustainable	Quite sustainable

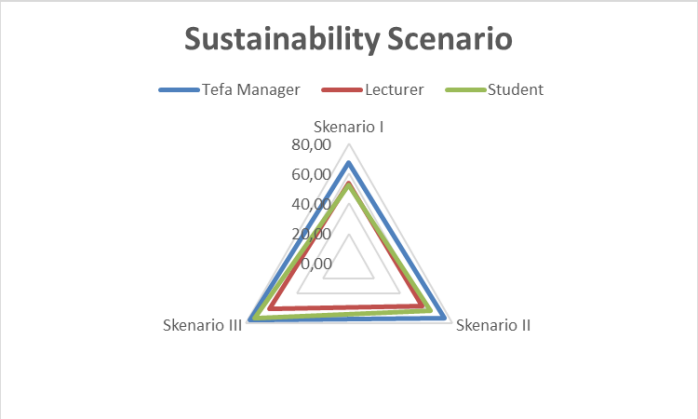

Fig. 3. Kite diagram of the tefa development scenario

These sustainability status values were not too different from the results of the research on the sustainability of commodities in Indonesia, such as the research on the sustainability of dragon fruit [9], vannamei shrimp [10], and food crop [11]. Overall, they generally had a score range between 50 and 75.

4 Conclusions and suggestions

The Tefa Agrimart development sustainability index was predicted to be 70.25 in an optimistic scenario with a 'quite sustainable' status. However, there was one group of respondents who predicted that Tefa Agrimart would be able to hold the status of 'very sustainable' with a sustainability index value of 76.28. Tefa Agrimart will be able to penetrate the 'very sustainable' status if it really gets sustainable handling.

The efforts that need to be made in increasing the sustainability index of the development of Tefa Agrimart are improving the attributes of sensitive levers, including increasing cooperation by conducting joint marketing through Tefa Agrimart, increasing the intensity of technical guidance activities, and increasing the market access.

Further research needs to increase the number of respondents by involving a wider range of stakeholders.

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