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Organic Vegetable Sustainability Strategies of Youth Farmer Groups

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Abstract. Sustainability simply focuses on meeting present needs, while considering future generations. Several organizations are passionate in providing adequate structures to drive this fundamental concept. In agriculture, youth farmer groups play a significant role in promoting sustainable technology adoption and innovation. Moreover, the success of these entities depends greatly on vital accomplishment as local institutions. This study was aimed at examining the internal and external factors influencing youth farmers' performance and effective development strategies, using IFE, EFE, IE, and SWOT matrix. The results of internal factors showed the greatest contribution of human resources was dominated by productive youth farmers, while inadequate use of technology to disseminate information and promotion occurred as the major weakness. However, the outcomes of external factors reported an above average position, based on EFE matrix analysis, due to increased demand for organic vegetable products. Furthermore, the maximum threat faced by these persons is assuming agriculture as not a lucrative sector. Overall, the conditions of youth farmer groups demonstrated a robust importance in maximizing potential opportunities and minimizing the existing threats.

1. Introduction

The agricultural sector forms the basis of a community's economy, particularly in rural settlements, and also plays a significant role in reducing unemployment. This industry, regarded as a food supply system, functions as a social defense in critical situations, where other economic contributors become vulnerable [1]. Developing countries constantly encounter various challenges, in an effort to boost the sector. For instance, complex agro-businesses and institutional units are unable to achieve optimal conditions, due to certain complicated processes [2]. Farmers' institutions play an extensive role in every cultivation stage, but majority of the groups are currently at the commencement level, characterized by low performance [3]. Furthermore, the essential objectives of farmer groups include the actualization of consolidated agriculture systems to optimize production activities, increase productivity, income, and welfare [4].

The aim of agricultural development has recently been reviewed to support eco-friendly practices, in line with the provisions of a healthy lifestyle, including safe-to-consume products, high nutrition, and sustainability [5]. In addition, healthy foods are currently produced with organic cultivation systems, and therefore, countless conventional farmers are considering possible migration to this new and fast-growing opportunity [6]. Vegetables are typical examples of organically cultivated crops. Based on 2016



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SPOI data, Indonesia's total natural land mass and the size of organic farmers increased by 21.36% and 54%, respectively, compared to 2014 [7].

The youth are commonly described as the next generation change agents, with a greater responsibility to significantly impact the country's agricultural future. This is due to the prevailing dominance of aged farmers and also the existence of minimal young persons interested in the sector [8]. Based on the results of 2018 Inter-Census Agricultural Survey, the number of farmers above 54 years is approximately 10,379,211, while young farmers aged between 25-34 years are specified at 2,722,446. The high statistical variation shows a tendency to influence sustainable agriculture in Indonesia. Moreover, among the pioneers of organic farming in Boyolali regency is the Argoayuningtani farmer group. This unit is dominated by very creative young members, with high level of technology adoption to leverage existing opportunities. However, farmer groups are prone to various challenges, in terms of cultivation, management, or marketing, specifically within the startup stage. Therefore, it is very important to examine the description related to young farmer groups by observing the present internal and external factors.

2. Methodology

The search for a suitable research location commenced within Senden village, Selo Sub-district, in Boyolali. As a result, the Argoayuningtani farmer group was selected, due to its wider experience in cultivating organic vegetables, particularly tomatoes. Snowball approach was adopted to obtain primary data from in-depth interviews with respondents, recognized as key informants, and with vast knowledge. In addition, the participants were four in number, comprised of extension workers, farmer group leaders, heads of cultivation and marketing division.

This study employed a descriptive method in describing the valid conditions of farmer groups, as obtained from field reports. However, internal and external factor analyses applied an IFE (Internal Factors Evaluation) and EFE (External Factors Evaluation) matrices, followed by subsequent adjustment in the IE matrix. Meanwhile, strategy alternative formulation utilized the SWOT (Strengths, Weaknesses, Opportunities, and Threats) framework [9]. Furthermore, weight and rating values were evaluated, based on researchers' observations.

3. Result and Discussion

Farmer groups in Indonesia tend to function as a communication channel between farmers. According to the regulation of the Minister of Agriculture No. 67, farmer group is defined as a collection of farmers/ranchers/planters with common interests, social equality, economic and resource conditions, similar commodities, and familiarity to improve and develop members' businesses. Evidently, Argoayuningtani farmer group located in Senden village, Selo Sub-district, Boyolali, is a typical instance, and was established on December 12th, 2005, with 26 members. In 2007, the formal legality as a farmer group from the Boyolali regency, was acquired. Furthermore, at the commencement of production, farmer groups relied heavily on conventional farming systems, but eventually switched to organic practices in 2013. The success of a business is tied towards external and internal environmental influences. Similarly, Argoayuningtani farmer group, with focus on organic tomato farming, observed the various effects by internal indicators, including strengths and weaknesses as well as external factors of opportunities and threats. Tables 1 and 2 represent the IFE and EFE analysis results, respectively.

Based on the identification results of key internal influences, 5 strength and 4 weakness factors were generated, while for external indicators, 5 opportunities and 3 threat factors, were obtained. The highest score for the strength factor was dominated by youth at a value of 0.656. Also, the ages for Argoayuningtani farmers ranged between 20-35, 36-45 and 56-65 years, with membership of 11, 13, and 2 persons, respectively. This indicated a more productive individuals, with the capacity to aid optimal knowledge and information acquisition. The younger generation tends to undertake higher risks, compared to the older members. Also, a greater sense of curiosity instigate the need to attempt new opportunities, as well as develop partnership or form digital network. In terms of physical fitness, young farmers are considered more agile to perform farming activities [10]. Consequently, age is regarded as

an important influence on sustainable agriculture, with respect to farmers' psychology, biological power, potential, and sensitivity. However, inadequate use of technology for promotional purposes, obtained a score of 0.362, and therefore, was perceived as the major weakness. The activities are limited to events from external agency and agro expo, observed every 2 years. This creates a challenge for farmer groups to market the products on a broader scale, especially beyond the region. Furthermore, the use of technology was not optimally utilized to obtain price or sales information. The total score of internal factors was estimated at 2.820, and showed the potentials of Argoayuningtani farmer group to maximize the strengths and overcome the weaknesses in organic tomato farming.

Table 1. Result of IFE analysis.

Key Factors	Weight (A)	Rating (B)	Weight Score (AxB)
STRENGTH			
1. Structured book keeping and filing management	0.067	4	0.268
2. Good quality organic vegetables (tomatoes)	0.073	4	0.292
3. Supporting facilities and infrastructure	0.133	4	0.532
4. Dominated by young farmers	0.164	4	0.656
5. There is good communication between farmers	0.082	3	0.246
WEAKNESS			
1. Do not have label, packaging and fixed market	0.164	2	0.328
2. The lack of use of technology as access to information and promotional media	0.181	2	0.362
3. Weak market networks and partnerships	0.072	1	0.072
4. Unstable organic tomato production	0.064	1	0.064
TOTAL	1.000		2.820

Source: Primary Data Analysis, 2020

Table 2. Result of EFE analysis.

Key Factors	Weight (A)	Rating (B)	Weight Score (AxB)
OPPORTUNITY			
1. Location suitable for cultivation of organic crops (tomatoes)	0.169	3	0.507
2. The demand for organic vegetables is increasing	0.142	4	0.568
3. Prices for organic vegetables are relatively favorable	0.126	4	0.504
4. The strengthening of local government support	0.096	4	0.384
5. The active role of the extension agent	0.093	4	0.372
THREAT			
1. Organic land adjacent to conventional land	0.102	2	0.204
2. Pest and disease attacks	0.118	2	0.236
3. The agricultural sector is considered not prestigious	0.154	3	0.462
TOTAL	1,000		3,237

Source: Primary Data Analysis, 2020

The highest opportunity score with a value of 0.568, indicated an increase in the demand for organic tomatoes. Based on AOI 2019, the growth of organic vegetables including tomatoes extended

consistently between 15-20%, due to high purchasing power and enhanced awareness of healthy living. Tomatoes are not barely used as food and beverage ingredients, but also serves as a safe cosmetic additive. The biggest threat factor in farmer groups, with a value of 0.462, was attributed to the assumption of agricultural sector as not lucrative. Rapid modernization and industrialization in urban settlements have caused the migration of countless youths to promising cities, in search for other viable sources of livelihood, beyond agriculture. However, majority of the agricultural activities in Indonesia presently applies conventional methods, with low technology absorption. High business risks, low income, and disproportionate profits, contribute to the least preferential nature [11], [12]. These concerns have triggered crisis in the regeneration of rural farmers, leading to a decline in the number of young persons, in both food crop and horticultural segments. Based on the results of IFE and EFE matrices, the positions and strategies needed by Argoayuningtani farmer group are specified in quadrant II, termed the growth and development strategy, followed by a SWOT matrix analysis. This aimed at determining the appropriate alternative marketing strategy.

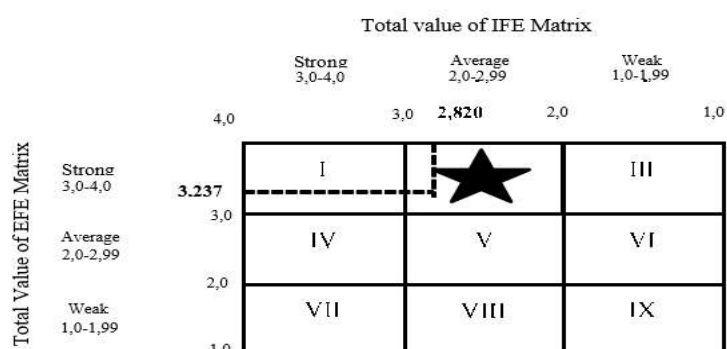


Figure 1. Result of IE Matrix.

	<p>Strength (S)</p> <ol style="list-style-type: none"> 1. Structured book keeping and filing management 2. Good quality organic vegetables (tomatoes) 3. Supporting facilities and infrastructure 4. Dominated by young farmers 5. There is good communication between farmers 	<p>Weakness (W)</p> <ol style="list-style-type: none"> 1. Do not have label, packaging and fixed market 2. The lack of use of technology as access to information and promotional media 3. Market networks and partnerships are not yet strong 4. Organic tomato production is unstable
<p>Opportunity (O)</p> <ol style="list-style-type: none"> 1. Location suitable for cultivation of organic crops (tomatoes) 2. The demand for organic vegetables is increasing 3. Prices for organic vegetables are relatively favorable 4. The strengthening of local government support 5. The active role of the extension agent 	<p>SO</p> <ol style="list-style-type: none"> a. Improve human resource skills by attending training b. Optimizing the quantity and quality of production as well as the sustainability of farming 	<p>WO</p> <ol style="list-style-type: none"> a. Utilizing advances in information and technology to improve organic tomato marketing b. Expanding market networks and partnerships
<p>Threat (T)</p> <ol style="list-style-type: none"> 1. Organic land adjacent to conventional land 2. Pest and disease attacks 3. The agricultural sector is considered not prestigious 	<p>ST</p> <ol style="list-style-type: none"> a. Increase creations by combining cultivation and agro-tourism systems so as to attract consumers to like agriculture 	<p>WT</p> <ol style="list-style-type: none"> a. Improve continuous planting planning and utilization of cultivation technology

Figure 2. Results of SWOT Matrix Analysis

Based on Figure 1, six strategies were formulated from a combination of internal and external factors. The first SO aspect was to improve human resource skills by participating in training and counselling sessions of various sources, including government, private sector, or academia. Farmers are able to optimize location advantages under the requirements for growing organic crops. Training and counselling are not only related to cultivation systems, but also include improving the quality of group management and marketing of organic vegetables, to meet growing demands. These extension services greatly instigates farmers' capacity to upgrade individual economic status [13]. The second SO strategy was to optimize product quantity and quality, as well as promote sustainable agriculture. High valuable outputs were achieved with the appropriate cultivation system, including SOP / GAP / GHP. Facilities and infrastructure to support and ensure product quality assurance have been provided according to standards, and the goods were properly inspected by internal control system (ICS) team. Every cultivation activity up to marketing, involved recording and archiving documents, required to implement organic farming.

The first WO strategy involved the effective use of information technology in marketing organic tomatoes beyond the local consumption. Technological development fosters a wider opportunity in core business models and improve the farmers' welfare [14], [15]. Organic vegetable business in Indonesia is very promising, with factors supporting a high population potential to become consumers. These products have a separate market from non-organic types, and also target the upper-middle class [16]. The second WO strategy expanded market networks and partnerships. Furthermore, effective use of marketing channels to promote organic tomato products to wider areas greatly depends on the experience of young farmers. Farmer groups are expected to collaborate with other entities to form larger organizations or associations with common interests or needs.

In addition, ST strategy combined cultivation and agro-tourism systems to instigate attention to agriculture. This approach was supported by creative youth farmers, as farming activities are not barely centered on cultivation, but also tends to maximize opportunities, by starting organic vegetable picking agro-tourism activities. Visitors were not only trained on the picking methods, but deeply in the farming processes, starting from land cultivation, nurseries to planting, and the selection of ready-to-harvest vegetables. Furthermore, WT strategy aimed to improve continuous planting and utilize cultivation technology. Consistent organic tomato planning are achieved by scheduling cultivation at separate intervals. Also, with the support of extension agents and appropriate environment, farmer groups are expected to produce organic tomatoes optimally and harvest sustainably, in order to improve member's economy. Organic farming development, particularly horticulture, has received government attention, due to the potentials in reducing poverty, creating employment opportunities, and increasing farmers' earnings [17]. Pest and disease issues are overcome with advances in cultivation technology and information. Farmer groups are also known to provide counselling with extension agents or academics, using modern information technology. Under these conditions, solutions related to complex problems in agricultural sector, become more easier and faster to achieve.

4. Conclusion

Based on earlier mentioned analysis, Argoayuningtani youth farmer group possibly maximizes the strength and minimizes weaknesses, in order to explore the viable opportunities and tackle prevailing threats in organic vegetable cultivation, specifically in tomatoes. The required position and strategy occur in quadrant II, termed growth and development strategies. Possible alternatives include (1) improving human resource skills by participating in training, (2) optimizing the product quantity and quality, as well as promote sustainable farming practices, (3) utilizing advancement in information technology to enhance organic tomato marketing, (4) extending market networks and partnerships, (5) increasing recreation by integrating cultivation and agro-tourism systems, aimed at developing interest in agriculture, and (6) updating continuous planting policies and utilizing cultivation technology.

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