Management strategy for household food security in Jambi Province

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Abstract. This research was aimed to: (1) analyze household food security and (2) formulate a strategy managing household food security in Jambi Province, Indonesia. The research design was a cross-sectional and conducted in four selected districts in Jambi Province, mainly: Kerinci, Merangin, Muaro Jambi, and Tanjung Jabung Barat Districts. This research was done in six calendar months. The object of this research was farm households with research variables: (1) household food security and (2) strategies for managing household food security based on internal factors (aspects of strengths and weaknesses) and external factors (aspects of opportunities and threats). Data was collected using observation, direct interviews, in-depth interviews, Focus Group Discussion (FGD), and documentation methods. The number of respondents was 100 households at each district, which was chosen taken by cluster stratified simple random sampling in each sample district. The total sample was 400 households. Data were analyzed by using the SWOT approach. The results, of the analysis show that the population in Jambi Province is in the food secured level. Based on the SWOT analysis results Jambi Province household food security could be developed in an aggressive strategy.

1. Introduction

Data shows Jambi Province has positive annual economic growth. For example, in 2004, Jambi Province had economic growth of 5.38 % and increased to 7.35 % in 2014, which is higher than the value of National Gross Regional Product (6.4%) [1]. Unfortunately, this high growth rate of economic growth was also followed by a high population growth (2.56 % year-1) in 2010. This figure is higher than the previous population growth in the last ten years which was only 1.89 % year-1. This phenomenon is interesting because the theory states that any increase in population welfare will be inversely proportional to the increase in the number of children wanted by the family [2][3]. This indicates that the implementation of economic development in Jambi Province has not been positively correlated with other sectors, especially between the economic and social sectors.

The high level of population growth in Jambi Province over the past ten years certainly could assure a negative impact on regional economic development, including poverty. Statistical data shows that in 2005, there were 317.8 thousand (11.88 %) people in Jambi Province are categorized as poor with details: as much as 123.5 thousand of them live in urban areas and the rest 194.3 thousand people are in rural areas. Then, in 2008 and 2014, the number of poor people in Jambi Province decreased by 9.28 and 8.28 percent. In 2014, there were still 270.08 thousand poor people in Jambi Province [4]. Although the poor population from year to year has decreased, is seen that the total poverty rate is still relatively high, so that the government burden is still enormous. This means that there needs to be a breakthrough to overcome the problem.
The fundamental problem faced by the population is the lack of access to basic household needs (food), capital sources, markets, and technology, as well as weak community organizations. Thus, the future development plan must be carried out comprehensively and holistically and be oriented to the concept of sustainable welfare development. To overcome and resolve these problems, it is vital for each region (province and district/city) needs to develop a food planning strategy to realize sustainable food security that can have a direct impact on the poor. The purpose of this study was to create an ideal method of household food security for Jambi Province based on regional potential and characteristics of the population.

2. Research method
The research design was cross-sectional. The research was conducted in four districts in Jambi Province, namely Kerinci, Merangin, Muaro Jambi, and Tanjung Jabung Barat. The research was conducted for six calendar months. The object was farmer households based on basic livelihoods with research variables: (1) household food security and (2) strategies of household in achieving food security based on internal factors (strengths and weaknesses aspects) and external factors (opportunity and threat aspects). The types of data taken are primary data and secondary data, by means of observation, direct interviews, in-depth interviews, Focus Group Discussion (FGD), and documentation methods. The number of respondents taken was 400 households that were taken using the cluster stratified random sampling method in each sample district. Data were analyzed by using the SWOT approach. SWOT (Strengths, Weaknesses, Opportunities, and Threats) is a model that is able to connect the research objectives with the program through potential environmental factors [2]. Environmental factors that become indicators of SWOT are internal and external environmental factors as strengths, weaknesses, opportunities, and threats.

3. Results and discussion

3.1. Household food security
Household food security is defined as access to food for all people at any time to get enough food for a healthy and active life [5]. Households with food security have food access, adequacy, and sustainability [6]. According to Anonymous [7], food security is the condition of households' food fulfillment reflected on the sufficient food availability, both in the quantity and quality, and secure, equitable, and affordable.

As a consideration, food security is closely related to the allocation of household food expenditure. Hence in measuring the degree of food security at the household level, a cross-classification of two food security indicators is used, namely food expenditure and the adequacy of energy consumption (kcal) [6]. Thus, a household's food security identification can be done with a single indicator of nutrition/energy sufficiency and also using cross indicators between household expenditures and energy consumption (the food resilience degree) adapted to the needs analysis [8].

Based on the analysis results, household food security in Jambi Province was classified as food resistant, reaching 53.75%. In comparison, family belonging to the food vulnerable-group reached 38.75%. The people belonging to the food deficient-group was only 7.5%, with no household in Jambi Province is in the food insecure-group. The results indicate that the population of Jambi Province is only 53.75% capable of meeting energy sufficiency with an expenditure allocation below 60% and 38.75% of the population is experiencing food insecurity. Thus, the people of Jambi Province can meet their energy sufficiency but requires a relatively large level of expenditure, which is more than 60% of household expenditure for food needs. Besides the level of household expenditure, household food security is also determined by other factors, such as the adequacy of food availability, the stability of food availability, accessibility to food, and quality/safety of food [5].

Food Security has three subsystems are the subsystem of availability, accessibility, and subsystem of nutritional consumption utilization or consumption design. The food consumption pattern is the order of the type, and amount of food consumed by a person or group of people at a particular time to obtain the nutrients needed by the body. The public consumption pattern can indicate the level of community food diversity and the consumption habits of a specific group of people. Then, consumption patterns describe the food of the population, society, or family [9]. In other words, the pattern of human consumption is
determined by the nature of ecology, tradition, and religion so that consumption patterns represent the main characteristics of the local culture of the community so that, in turn, it has an impact on the welfare of the population. Nationwide, AKE and PPA consumption numbers respectively are 2150 kcal/capita/day and 57 g/capita/day [10].

The results of the analysis showed that the consumption portion for rice foods (carbohydrate sources), especially energy sources, reached 47.42%. Side dishes were 30.89%, and vegetables/fruit were 21.68%, but side dishes food source is dominating the protein sources, namely 41.45%, then rice food by 35.53%, and vegetable/fruit food sources by 23.03%. The findings indicate that household food security is directly proportional to regional food security, both based on the basis of food consumed and based on the distribution of food needs expenditure.

Observation results show that the consumption of food and nutrition in the province of Jambi is still relatively low, especially the consumption of protein. Latest data shows that the households' protein consumption in Jambi is still below the recommended standards, only 52.28 g/capita/day, where the recommendation amounts are 57 grams/capita/day [11]. The unfulfilled household protein consumption in the study area is due to the lack of diversity in the types on food consumed by households, limited knowledge of the importance of protein needs in households, and emphasis of the need for adequate daily food, not nutritional adequacy. This condition is in line with the results of Suandi and Yusma Damayanti’s research through a case study in Muaro Jambi District that the food needs that is consumed by the community are not yet diverse and balanced among the nine types of food based on the Expected Food Pattern (Pola Pangan Harapan - PPH). The potential of food for community consumption needs that is available in rural areas is relatively plentiful, especially local food, both from vegetable and animal sources, which are rich in nutrients [12]. According to Nguyen et al. [13], individual or household food consumption patterns can reflect a person's nutritional adequacy. Food consumption diversification is an attempt by someone to fulfill the insufficient nutritional intake either in the form of energy, protein, vitamins, minerals, and others. People who increase food consumption diversity is getting a bigger chance to meet their nutritional needs.

3.2. Analysis of household food security strategy

The strategy is an art in using the skills and resources of an organization to achieve its goals through effective relationships with the environment in the most favorable conditions. In other words, the strategy is an effort to achieve goals by looking at and integrating the external and internal environment to produce the right plans, decisions, and actions [14]. To achieve these objectives can be analyzed by using the SWOT method. SWOT analysis is a strategic planning tool that is important to help planners to compare the internal strengths and weaknesses of an organization with external opportunities and threats [15]. In other words, SWOT analysis needs to be done in planning a company because the SWOT analysis to match the "fit" between internal resources and the external situation of the company. Good matching maximizes the company's strengths and opportunities and minimizes weaknesses and threats [16].

The results of the study indicate that internal and external indicators have related each other. As it is shown in Table 1, the IFAS and EFAS strategies have interrelated each other. Through the IFAS Table, it can be seen that the total strength score is 2.92, with the most massive internal factor score contributed by Labor Availability Factor. On the other hand, the total score of weakness is 2.62, in which the Rice Plantation Index Factor has the highest score. As it can be seen in Table 1, there are two strength factors contribute less, they are Food Affordability and Adequate Nutritional Intake. The low contribution to the strength factor due to their low rating value lower than three. On the other hand, it could be seen that all weakness factors rated less than three with the two lowest contributors are Total Production and Food Consumption Pattern.
Table 1. Internal factor analysis strategic (IFAS) of households food security management in Jambi Province, 2018

| No | Internal Factors: Strength            | Rating | Weight | Score |
|----|---------------------------------------|--------|--------|-------|
| 1  | Family income                         | 3.0    | 0.17   | 0.50  |
| 2  | Labor Availability                    | 3.2    | 0.18   | 0.59  |
| 3  | Nutrition Intake Adequacy             | 2.7    | 0.15   | 0.41  |
| 4  | Number of Family Members              | 3.0    | 0.17   | 0.52  |
| 5  | Food Affordability                    | 2.6    | 0.15   | 0.40  |
| 6  | Per Capita Rice Consumption Rate      | 3.0    | 0.17   | 0.50  |
|    | **Total**                             | 1.00   |        | **2.92** |

| No | Internal Factors: Weakness            | Rating | Weight | Score |
|----|---------------------------------------|--------|--------|-------|
| 1  | Land Ownership                        | 2.5    | 0.14   | 0.35  |
| 2  | Total Production                      | 2.4    | 0.13   | 0.31  |
| 3  | Food Diversity                        | 2.6    | 0.14   | 0.36  |
| 4  | Food Consumption Pattern              | 2.5    | 0.14   | 0.34  |
| 5  | Rice productivity                     | 2.8    | 0.15   | 0.41  |
| 6  | Role of the Government                | 2.6    | 0.14   | 0.38  |
| 7  | Rice Paddy Planting Index             | 2.9    | 0.16   | 0.47  |
|    | **Total**                             | 1.00   |        | **2.62** |

The other SWOT analysis component is the External Factor Analysis Strategy (EFAS) consists of opportunity and treat factors. Weight and rating values of EFAS analysis results can be seen in Table 2. Through the EFAS Table; it can be seen that the total score of opportunity is 2.69 with the most massive score belongs to Market Availability factor, while in the threat factor the most significant score is the conversion of food land to other usages. Other external factors contributing less to the opportunity factor are food prices, cooperation partnerships, and technology factors.

Analysis of strategies for managing household food security in the study area through positioning is based on the assessment of the difference in the total weighted strength score and the weighted weakness score in the IFAS (Internal Factor Analysis Strategic) matrix and the difference in the total weighted opportunity score and the weighted threat score on the matrix EFAS (External Factor Analysis Strategic). The technique used is to reduce each weighted value from the strategic aspects of strengths and weaknesses. As shown in Table 1, the weighted value of strategic factors of strength is 2.92, while the weighted value of strategic weakness factors is 2.62. To get the vertical axis of the two strategic aspects, the weighted strategic factor strength value is reduced by the weighted value of the strategic weakness factor so that the first axis point is 0.33. The comparison between the value of the weighted strategic factors of strength and the weighted values of strategic factors weaknesses showed that 2.92 > 2.62. The power factor in the management of household food security in the study area is more dominant than the existing weaknesses, so it is possible to manage household food security to meet the adequate nutritional intake. The IFAS matrix and EFAS for managing household food security in the study area are shown in Table 1 and Table 2, as presented below.

Determining household food security management position in the research area is determined by weighting the value of opportunities and threats factors. The technique used is the same as the Internal Factor Analysis Summary (IFAS) technique. Practically, position determination is taken by calculating the difference between opportunity and threats weighted value in the External Factor Analysis Summary (EFAS) technique. As shown in Table 2, the weighted value of opportunity factors is 2.69, while the weighted value of threat strategic factors is 2.36.
Table 2. External Factor Analysis Strategic (EFAS) of Households Food Security Management in Jambi Province, 2018

| No | External Factors: Opportunity | Rating | Weight | Score |
|----|--------------------------------|--------|--------|-------|
| 1  | Market Availability           | 2.9    | 0.16   | 0.45  |
| 2  | Social Institution            | 2.8    | 0.15   | 0.41  |
| 3  | Food Prices                   | 2.6    | 0.14   | 0.37  |
| 4  | Cooperation/Partnership       | 2.6    | 0.14   | 0.36  |
| 5  | Food Distribution             | 2.7    | 0.14   | 0.39  |
| 6  | Food Usage Knowledge          | 2.7    | 0.14   | 0.39  |
| 7  | Technology                    | 2.5    | 0.13   | 0.32  |

Total 1.00 2.69

| No | Internal Factors: Threat     | Rating | Weight | Score |
|----|-------------------------------|--------|--------|-------|
| 1  | Season Changes                | 2.4    | 0.13   | 0.30  |
| 2  | Agricultural Extension        | 2.2    | 0.12   | 0.26  |
| 3  | Production Costs              | 2.3    | 0.12   | 0.28  |
| 4  | Food Land Function Conversion | 2.6    | 0.14   | 0.36  |
| 5  | Rice Field Damage             | 2.5    | 0.13   | 0.33  |
| 6  | Food Sources Continuity       | 2.3    | 0.12   | 0.29  |
| 7  | Food Reserves                 | 2.4    | 0.13   | 0.31  |
| 8  | Food Import                   | 2.1    | 0.11   | 0.23  |

Total 1.00 2.36

The second axis on the SWOT strategy is calculated by weighting the score of opportunity and threat. Since the weighted value of opportunity (2.69) is larger than the weighted value of weakness, the second axis point is calculated by reducing the weighted value of opportunity by the weighted value of strategic threat factor. The second axis point is 0.29. The opportunity factor in managing household food security in the research area is more dominant than the threat. Therefore it is possible to manage household food security in the future be fulfilled continuously. Through the results of the difference in weighted values, it can be seen the position of management of household food security as it presented in Figure 1.

Figure 1. SWOT analysis diagram of household food security management in Jambi Province, 2018
Based on the SWOT analysis diagram (Figure 1), the position of household food security management in Jambi Province is located in quadrant I or referred to as an aggressive strategy. According to Rangkuti [17], this position is a very favorable situation. This means that the management of household food security has strengths and opportunities that can be utilized. The strategy that can be applied in this condition is to use the market availability and social institutions in providing aggressive food (growth-oriented system) or aggressive strategy. The results of this study are following the case study conducted by Yunus [18] that aggressive strategies can use force to take advantage of current opportunities.

Strategy for household food security aims to develop the household’s food security for the better, hence improve the welfare of farmers. An alternative method for household food security is to take advantage of existing strengths and opportunities. Based on the research results, the strength factors of household food security consists of family income, labor availability, nutrition intake adequacy, number of family members, food affordability, and per capita rice consumption rate. Meanwhile, the opportunity factors include market availability, social institution, food prices, cooperation/partnership, food distribution, food usage knowledge, and technology. Based on the SWOT matrix analysis, the alternative strategy is to combine the strength factor with the opportunity factor, namely (1) maintaining food affordability, and per capita rice consumption rate and increasing market availability, and cooperation/partnership in the management strategy for household food security; and (2) maintaining family income and nutrition intake adequacy the increasing social institution, food usage knowledge, and technology. This is in line with Ernawati’s et al. [19] research, which recommends that coaching and learning to the Farmers Group Association (Gapoktan) to be able to function not only as a production unit, but even as a provider of production facilities, providers of farming equipment and machinery, development of citrus value chain, providers of capital and also as a marketing unit.

4. Conclusion

Food security in Jambi Province is classified as food-resistant but less secure. Food security is not guaranteed because food is concentrated on the availability of carbohydrates, even though it is a food-resistant area if the area can provide food for the population according to the Expected Food Pattern (EFP). Based on the observation, food and nutrition consumption in Jambi Province is low, especially protein consumption. The latest data shows that household protein consumption in Jambi Province is not sufficient to the recommended standard, namely 52.28 grams/capita/day with a recommendation of 57 grams/capita/day [11]. The unfulfilled household protein consumption in the study area is due to the lack of diversity in the types of food consumed by households, limited knowledge of the importance of protein needs in households, and the need for adequate food every day, not nutritional adequacy.

The results showed that the weighted value of strategic internal factors was 2.92 and 2.62 for both strength and weakness aspects, while the weighted value for strategic external factors were 2.69 and 2.36 for both opportunity and threats aspects. The vertical axis point of SWOT strategy analysis then was 0.33, and the horizontal axis point was 0.29. The arrangement of internal and external environmental factors has made household food security management in Jambi Province an aggressive strategy. This means that household food security has considerable strength and opportunity in supporting its food security.

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