Factors affecting optimization of sustainable food house programs of accelerating food consumption diversification in Bantul Regency, Yogyakarta, Indonesia

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Abstract. Sustainable Food House (Kawasan Rumah Pangan Lestari/KRPL) is one of the programs to accelerate food consumption diversification (Percepatan Penganekegaragaman Konsumsi Pangan/P2KP) to fulfill food needs in Indonesia. This study aims to describe the implementation, analyze optimization, and determine the factors that influence the optimization of the KRPL program in Farmer Women Group (Kelompok Wanita Tani/KWT) Migunani. The data were collected through interviews, observation, and documentation. All members of the KWT Migunani, of which as many as 27 people, are taken as respondents. The analysis was done using descriptive analytics to identify the factors that influence the optimization. The results showed that the program implementation was successful, as indicated by 78.6% of KWT members who were active in group activities, agriculture, and high-level extension workers. Program optimization is also sufficiently implemented (score 2.73 out of a maximum score of 5), seen from indicators of the number of commodities and technology, the use of more yards, and additional food supply for families. The internal factors that affect the optimization are formal education, family income, cosmopolitan rate, and motivation; while the external factors are the intensity of extension, availability of production facilities, and member involvement in KWT.

1. Introduction

Fulfillment of food needs is the obligation of all parties to put into action. There is a way to improve food procurement by planning at the community level living in the agricultural area for national development and community welfare [1]. Government through regulation no. 15 / Permentan / OT.140 / 2/2016 establishes a program to increase diversification and food security by containing the program of accelerating food consumption diversification/ Percepatan Penganekegaragaman Konsumsi Pangan (P2KP) to the community. The P2KP Program serves as a guideline for improving the diversification of food consumption based on local wisdom, cooperation between communities and governments. Forms of implementation of the P2KP program include (i) Optimizing the utilization of the yard through the concept of Sustainable Food House/ Kawasan Rumah Pangan Lestari (KRPL); (ii) Model Local Basic Food Development/ Model Pengemangan Pangan Pokok Lokal (MP3L); (iii) Socialization and
Promotion P2KP (Permentan P2KP, 2014). Of the three programs that are being pioneered to do and socialized is the program KRPL.

KRPL program is an activity that helps the community to utilize their own yards to meet family food needs. The use of yard can increase food security by varying the types of plants grown and adjusting to the nutritional needs of the family [2]. This program of yard land utilization program has been implemented in Bantul Regency for six years since 2012 with the program of Model Kawasan Rumah Pangan Lestari (M-KRPL) Projotamansari. The local government office department of Agriculture, Food, Marine, and Fisheries Agency of Bantul District prioritizes this program for KWT which has the resources and willingness to empower its yard. In 2016 KRPL P2KP program is optimized, at least as many as 30 KWT in Bantul Regency has been registered and involves in the program from the local government. KWT Migunani is one of the three KWT beneficiaries of the KRPL program in the Sewon Sub-district who are still active and run the KRPL program until now.

Members of KWT Migunani apply for the KRPL program by utilizing their own yard area in which each has a yard area of approximately 25 m² to 50 m². The yard is called optimal if it used for agricultural cultivation activities such as food crops, medicinal plants, fruits, fisheries and plantations using some agricultural techniques that all members of the KWT can benefit from. Good yard use is expected to increase the productivity of food crops, thus supporting the food security of the region [3] According to the head of KWT Migunani, KRPL activities that have been implemented currently have not discovered the optimization because until now the level of implementation is still uneven due to certain factors. The application of KRPL and its optimization needs to be described and the factors that affect the KRPL program need to be identified. This research aimed to analyze the external and internal factors that affect members of women farmer groups KWT Migunani in implementing the program to evaluate the program KRPL and to know the level of optimization.

2. Materials and Methods
The research was conducted at KWT Migunani in Druwug, Bangunharjo Village Banguntapan Bantul, Yogyakarta was using purposive sampling. Respondents from this research were the whole KWT Migunani member with total of 27 members. Primary data were obtained through interviews, observation and secondary data from the internal data of KWT Migunani, Food Security Agency and Extension Worker/government agency of Bantul District, Agricultural Extension Agency/ Badan Penyuluh Pertanian (BPP) of Sewon and Bantul Regency Agriculture Office. The scope of the research is the implementation of the program by the KWT Migunani started from January 2018 until December 2018. This research uses the descriptive analysis method to determine the level of program implementation and optimization. The factors that influence the optimization of the Spearman rank correlation analysis program [4].

3. Results and Discussion

3.1. Characteristics of internal factors in KWT Migunani
3.1.1. Level of education
Mother's education in the family can affect the way of thinking to attempt to fulfill daily needs. In general, the members of KWT Migunani are quite high in education because almost half of the members are at the last in the level of senior high school/equivalent and college which have more ability to carry out the utilization of yard land. The way of thinking of members at the last level of high school education is categorized as quite critical and has a higher enthusiasm when activities and agricultural extension at KWT are carried out. Members at lower levels of education are more passive in following directions without asking too many questions. Even though there are members who have difficulty understanding the material, members still try their best to implement the program so that its implementation can still be carried out well. A person's education will affect their values, way of thinking, point of view, and even their perception of a problem [5].
3.1.2 Family income

Financial members of *KWT Migunani* are still called sufficient to meet the needs of families because most members have income above 1,500,000/month. Members of *KWT Migunani* help their husbands to lighten household spending by working and farming in their house yard to meet consumption and ease the burden of the family economy. Household income affects the role of women in food diversification efforts to achieve food security at the household level [6].

3.1.3 Rate of cosmopolitan

The rate of cosmopolitan on each member of *KWT* can affect the knowledge and desire of members in implementing and optimizing the program KRPL. Total sociopolitans nearly not affect the program because based on almost all member states that they rarely travel outside the area, never read the print media, hardly use electronic media that causing have really little benefit from the usage of the media.

3.1.4. Motivation

Motivation of women farmers is an asset to keep on trying to increase the productivity of their yard land. The hobby, the use of free time and vacant land are quite higher because more than half of the members stated that the use of their time and vacant land to carry out the program can be a hobby for members. Improved communication and family nutrition are influenced by the involvement of family members in program implementation. The lack of family members to assist with program implementation such as plant maintenance and unpredictable harvests also lead to uncertain family food additions. The addition of beauty to the house was quite high because the majority of members stated that their houses were more beautiful and comfortable after the program was implemented. Support from several parties can also affect motivation members, support is quite high given by fellow members of *KWT*, groups and from *PPL*. Motivation is the willingness to spend effort as much as possible in the achievement of organizational goals, which is influenced by the effort and ability of individual efforts itself in meeting some individual needs. High motivation causes individuals to be more productive and accept innovation well [7]. A high level of motivation regarding the needs for relatedness is because farmers need other people to interact and communicate with, in order to develop their farms. Basically, relatedness is needed by all people as social beings, including farmers [8].

3.2. Characteristics of external factors in *KWT Migunani*

3.2.1. Intensity of agricultural extension

The intensity indicators of training and extension agriculture at *KWT Migunani* consist of the suitability of the material in the form of media preparation, nursery, planting training, maintenance, post-harvest, understanding the training material and feel the positive impact of its implementation, namely getting additional resources food. The suitability of the material with the needs of group members shows that the material provided is sufficient in accordance with the needs and member’s abilities. The material is also quite easy for members to understand so that the implementation and optimization can run well. *KWT* members feel the positive impact of the training provided by *PPL* and agricultural extension. They obtain new information in the field of agriculture, are enthusiastic about developing a hobby of farming and receive the results from using the yard in the form of additional food and the economy for the family.

3.2.2. Availability of production facilities

Indicators of production facilities and infrastructure used for the implementation and optimization of the KRPL program can be obtained from various sources, ease of search, utilization of surrounding resources, and use of group facilities. Sharing between members can also influence the implementation and optimization of KRPL program activities. *KWT* members are not constrained by planting facilities and infrastructure. Most of the members know a nearby shop that sells agricultural supplies. The head of *KWT Migunani* also sells several facilities such as polybags and seeds. Some seeds can be taken for
free by grouping or exchanging them with other members, so members can be easier in obtaining the means of production.

3.2.3. Member involvement in KWT
Member involvement can increase the sense of responsibility of members to be able to implement the KRPL program and develop it to be more optimal. In general, members of KWT Migunani have been quite involved in various activities. The majority of the members are involved as active participants in various training and agricultural extension activities, daily picket community service in the village and responsible for each of the respective pre-determined teams. The involvement of an active member can encourage members to implement and optimize the KRPL programs better.

3.3. Implementation of the KRPL program
Implementation of KRPL program in KWT Migunani included in the high category with a total score of 11.79. The distribution of program implementation scores of KRPL in KWT Migunani can be seen in Table 1.

| Indicator                                | Score | Score average | Category |
|------------------------------------------|-------|---------------|----------|
| Member activity level                    | 0 1 2 6 18 | 4.51          | High     |
| Frequency of training and counseling     | 0 2 2 6 17 | 4.40          | High     |
| Application of the program               | 1 11 8 3 4 | 2.88          | Moderate |
| Total                                    | 11.79 |               | High     |
| Average                                  | 3.93  |               |          |

Information:
Score rate of the implementation of KRPL program:
- 1.00-2.32 = Low
- 2.33-3.66 = Moderate
- 3.67-5.00 = High

Membership levels in group activities and training and agricultural extension are in the highest category because almost all members follow the overall activity. Members of the KWT Migunani majority are housewives in the application of the program is classified as moderate because many members do not understand the main program and just follow other fellow members.

3.4. Optimization of KRPL program

| Indicator                                | Score | Score average | Category |
|------------------------------------------|-------|---------------|----------|
| Utilization of yard land                 | 0 16 1 7 3  | 2.89          | Moderate |
| The types of crops                       | 0 2 7 13 5 | 3.78          | High     |
| Technology usage                         | 1 4 12 6 4 | 3.29          | Moderate |
| The result is an additional source of family food | 4 11 4 6 2 | 2.67          | Moderate |
| The result is an additional source of family economy | 20 6 1 0 0 | 1.29          | Low      |
| Total                                    | 13.92 |               | Moderate |
| Average                                  | 2.78  |               |          |

Information:
Score rate of the optimization of KRPL program:
- 1.00-2.32 = Low
- 2.33-3.66 = Moderate
- 3.67-5.00 = High
The optimization of the KRPL program is in the moderate category with an average score of 13.92. The distribution of the optimization score for the KRPL program is shown in Table 2. The optimization of the KRPL program is considered sufficient because the use of yard land, the types of technology used and the addition of family food are classified as not too many and varied. The types of plants planted vary because KWT members have planted more than 2 types of plants. Members who get additional economic are still very few because the results obtained are also uncertain or sometimes fail.

3.5. Factors affecting the optimization of the KRPL program

3.5.1. Internal factors

Factors that have a relationship with the optimization of the overall program KRPL are formal education, family income, rate of cosmopolitan and motivation Table 3.

Table 3. Correlation between internal factors and optimization of KRPL program.

| Internal factors                  | Y1       | Y2       | Y3       | Y4       | Y5       | Total Y  |
|----------------------------------|----------|----------|----------|----------|----------|----------|
| Age                              | 0.096    | 0.169    | -0.146   | -0.075   | -0.318   | 0.001    |
| Formal education                 | 0.249    | 0.254    | 0.321    | 0.285    | 0.446    | 0.392    |
| Occupation                       | -0.074   | -0.016   | 0.002    | 0.214    | 0.264    | -0.145   |
| Family income                    | 0.282    | 0.065    | 0.244    | 0.276    | 0.399    | 0.280    |
| Number of family members         | 0.053    | -0.365   | -0.044   | 0.024    | -0.216   | -0.033   |
| Flow times for land use          | 0.319    | 0.413    | 0.275    | 0.119    | -0.013   | -0.058   |
| Rate of cosmopolitan             | 0.250    | 0.114    | 0.370    | 0.321    | 0.251    | 0.375    |
| Motivation                       | -0.072   | 0.057    | 0.473    | 0.711    | 0.403    | 0.446    |
| Land yard dimensions             | 0.089    | 0.058    | 0.115    | 0.018    | 0.147    | 0.079    |

Information:  
Y1 = Utilization of yard land  
Y2 = Types of crops  
Y3 = Technology usage  
Y4 = Result is an additional source of family food  
Y5 = Result is an additional source of family economy

Formal education has a low and positive relationship to the optimization of the KRPL program. The higher the level of understanding of the members about the KRPL program, the better the program optimization will be. Members will optimize the KRPL program if they have knowledge in accordance with the needs of each member and can develop their land use. Household food security is influenced by the level of education, sex of the head of the household (male/female), age of the head of the household, the number of household members, the number of household members who work in the household, loans, income from agriculture and the number of livestock which is owned. It is in line with a study of Sayekti et al., (2020) that the selection of food (tapioca vermicelli) is influenced by the level of knowledge about food diversification, education level, age, household income and knowledge level about nutrition [9]. Higher education can influence a person's way of thinking to apply knowledge [10]. Highly-educated peasant women should have a better ability to access agricultural extension services than middle- and lower-level peasant women. Family income has a low and positive relationship to the optimization of the yard area. The greater the family finances, the better the implementation of the KRPL program. This is because members have the capital to develop their yards. The more members who have agricultural facilities, the more optimal and productive land use will be because members can innovate the technology used. The results obtained are more abundant, both for family consumption and for processing and selling. Farmers who have high incomes will usually adopt the innovation more quickly [11].

The overall cosmopolitan level has a significant and positive relationship with the optimization of the KRPL program. The more members of the cosmopolitan KWT, the better the optimization. This
indicates that the higher the use of media and the mobility of members outside the region, the more optimal the KRPL program. Members will be informed and motivated to improve program optimization if the cosmopolitan is high. A society that is relatively more cosmopolitan will find it easier to acquire new knowledge that allows a more developed mindset to see an innovation [12].

The motivation of women farmers comes from self and support from family, members of farmer groups, and from extension workers [4]. Overall motivation has a significant relationship with the optimization of the KRPL program. The greater the motivation of the members in utilizing their yards, the better the program optimization. This happens because the optimization of the program can be achieved if the member has a high intention and a willingness in its application. The high motivation of women farmers is the capital to keep on trying to increase the productivity of the yard land. The results of this study are in line with the findings of [13] that the motivation of farmers can increase the adoption of organic vegetable farming system. Thus the high motivation of female group members can increase sustainable land use activities.

3.5.2. External factors

External factors that have a relationship with the optimization of the KRPL program are the intensity of counselling, the availability of production facilities and the involvement of members in existing activities in the KWT.

| Table 4. Correlation Between External Factors and Optimization of KRPL Program. |
|-----------------------------------------------|
| **Optimization of KRPL Program**               |
| External Factors                              | Y1  | Y2  | Y3  | Y4  | Y5  | Y Total |
| Intensity of counselling                      | 0.267| 0.140| 0.367| 0.459| 0.095| 0.373    |
| 1. Conformity of the counselling              | 0.204| 0.169| 0.252| 0.512| 0.113| 0.349    |
| 2. Convenience of the counselling             | 0.161| -0.101| 0.380| 0.439| 0.214| 0.286    |
| 3. Impact from counselling                    | 0.329| 0.323| 0.311| 0.284| -0.076| 0.373    |
| Availability of Production Facilities         | -0.006| -0.040| 0.439| 0.440| 0.112| 0.298    |
| 1. Ease of buying production facilities       | -0.059| -0.175| 0.028| -0.020| -0.134| -0.046   |
| 2. Ease to use natural resource               | 0.054| -0.079| 0.417| 0.383| 0.187| 0.261    |
| 3. Ease in accessing group garden             | -0.019| -0.030| 0.253| 0.351| 0.294| 0.243    |
| Group atmosphere                              | -0.139| -0.442| -0.062| -0.022| -0.090| -0.142   |
| 1. Interaction                                | -0.173| -0.465| -0.037| -0.032| -0.145| -0.193   |
| 2. Conflict existence                         | -0.044| -0.173| -0.207| -0.183| -0.248| -0.226   |
| 3. Convenience inside group                   | -0.044| -0.244| 0.438| 0.359| 0.266| 0.206    |
| Member involvement                            | 0.422| 0.261| 0.230| 0.363| 0.128| 0.384    |

Information: Y1 = Utilization of yard land, Y2 = Types of crops, Y3 = Technology usage, Y4 = Result is an additional source of family food, Y5 = Result is an additional source of family economy.

The intensity of the overall extension has a low relationship with the optimization of the KRPL program. The higher intensity of counselling conducted at KWT Migunani hence the better optimization. A better understanding of the members can lead to the desire to develop the yard area more optimal. The intensity of the counselling received by the community can greatly affect the slow speed of human in accepting a learning process [14].

The availability of production facilities as a whole has a low and positive relationship with the optimization of the KRPL program. The more availability of production facilities in KWT Migunani hence the optimization of the program by the member will be better. Members can apply KRPL...
optimization if their production facilities are sufficient and easy to obtain so members can be more productive and can innovate with new technology and add family food sources.

Member involvement has a low and positive relationship with home garden optimization. The more involved members in the implementation of the program KRPL, the higher the optimization obtained. This is because members become more responsible and are increasingly following it so that they more active in innovating the land yard. The involvement of members in program implementation increases, so the role of members in the group will also increase. Interaction between members will make members have sufficient knowledge and skills both theoretically and practically [15].

4. Conclusions
The implementation of the KRPL program carried out by KWT members was in the high category with an average score of 3.93 meaning that the program implementation was carried out very well. This is because the level of active members in group activities and training and agriculture extension is in the high category because almost all members participate in all activities. The majority of members are housewives who are permanent members of KWT Migunani. Program implementation is classified as low because many members do not understand the program and implement the program by only following other members who have implemented it because they do not understand the program.

The results of program optimization analysis show that the implementation of the KRPL program is in the moderate or quite optimal category with an average score of 2.78 which is obtained from indicators of planting various commodities, land use and technology and has received additional family food sources. However, they have not received additional economic results because the members are still unable to sell their crops.

Optimization of the Sustainable Food House Program is influenced by factors of formal education, family income, cosmopolitan and motivation. External factors that influence the optimization of the KRPL program are the intensity of extension, availability of production facilities and involvement of members in groups. Internal factors that influence the optimization of the KRPL program are formal education, family income and cosmopolitanism. Motivation has a strong influence in implementing the KRPL program.

The intensity of extension, availability of production facilities and involvement of members in activities at KWT have a low positive relationship. The higher the extension intensity, the availability of production facilities and the more optimal involvement of members in the group.

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