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Contribution of sustainable food house area to income and family food security in Tulang Bawang Barat, Lampung Province

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Abstract. This study aims to determine the implementation of the sustainable food house area program, contribution of the program to family income of farmer women's group, and analyze the food security of KWT members in Tulang Bawang Barat Regency. The research was conducted in five groups of women farmers in Margodadi, Marga Kencana, Tirta Makmur, Tirta Kencana, and Mulya Asri Villages. Data were collected in December 2019. Data were collected using survey methods and direct interviews in the field. The sampling method was carried out deliberately (purposive sampling); as many as 62 people were interviewed by visiting the respondent's house. The results showed that the implementation of the program was seen from the development of village nurseries, development of demonstration plot plots, and development of farmer women's group members' yards. The income women's group's income the yard utilization program for one year ranges from IDR 2,565,600 - IDR 6,930,000. Family food security of KWT members subjectively categorized in the medium category from the adequacy of family food availability of KWT members, food distribution in the family is quite good, and aspects of family food consumption are also quite good. The affordability of families to get food is quite relatively. Women farmer groups' knowledge is already good about the food the body needs in the right composition. It is present in all types of food that are useful for health, in consuming family food by taking into account the quality and quantity of food they consume..

1. Introduction

One of the efforts to increase food security and family nutrition is made by utilizing the yard. The yard has the opportunity to be developed to support the life and needs of the family [1]. Yard has an essential role as a living barn, a living pharmacy, a living shop, and a living fence. Home gardens can be a source of food and nutrition, including vitamins and minerals [2]. Optimizing home yards by cultivating various commodities, including leafy vegetables, fruit vegetables, and local food crops, can support the government's efforts to achieve food security. Cultivating vegetables in home gardens has a strategic role in increasing food consumption diversity and increasing community nutrition [3]. The yard is expected to meet the needs of vegetables at the family level so that the level of vegetable consumption increases.

Government policies to improve food security and family nutrition can be carried out by using available resources in the environment. This effort can be made through the use of yardland, which is



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managed by all family members. The government's commitment to involving families in realizing food self-sufficiency through diversification of food based on local resources for the future needs to be actualized in reviving the planting culture in home gardens in urban and rural areas. The use of yard areas managed by families generally apply the model of Sustainable Food House Region (KRPL). The KRPL program is an initiative of the Ministry of Agriculture which seeks to optimize the use of homestead land [4]. The development of KRPL is considered to be able to realize food independence for families, encourage food and nutrition diversification [5] which are based on local resources, and become a source of additional family income for farmers.

The KRPL program is an activity that encourages residents to develop food crops, livestock, and fisheries on a small scale in their home yards. This is a breakthrough for the government in dealing with climate change by using yards to support food availability and diversification. No matter how many yards there is, it can produce food from home because people who have limited land can still plant using verticulture techniques.

The potential area for yards in Indonesia is 10.3 million hectares. In Lampung Province, the highest KRPL program development was occupied by West Tulang Bawang Regency, with a program performance level reaching 80.8 percent in September 2019 [6]. With this KRPL model, there is hope that national food security and independence can be created from the family to the national level.

The success of the KRPL program can be seen from families' ability to meet food needs sustainably towards prosperous families and communities [7]. The Sustainable Food Home Area (KRPL) is a policy made by the government by utilizing the house yard to serve as a provider of quality, diverse and sustainable food by involving the community to increase family income. KRPL aims to fulfill food sufficiency and self-sufficiency, reduce family expenses, and as a form of anticipation of changes in the function of agricultural land by utilizing yards.

Along with developing the KRPL program, the beneficiary communities' lives have changed in terms of social, economic, and environmental aspects [8]. The KRPL program in Tulang Bawang Barat Regency is expected to benefit the community both for KRPL actors and the surrounding area. For KRPL actors, this activity can provide food donations to increase family consumption, save daily food expenses, and diversify food consumption in KRPL family. In contrast, this activity can create a beautiful atmosphere and a more comfortable environment for regional environments. Through this research, it will be known to what extent yard land can contribute to meeting family food and nutritional needs and family income.

2. Research methods

The research method used is quantitative methods. Types of data taken are primary data and secondary data. Data were collected through observation, interviews with respondents with the help of questionnaires, in-depth interviews, and documentation study. The study was conducted on five groups of women farmers in Tulang Bawang Barat, namely the women farmers from Margodadi, Marga Kencana, Tirta Makmur, Tirta Kencana and Mulya Asri villages. Data were collected in December 2019.

The population in this study were members of KWT. The sample selection of KWT members was based on the consideration that the KWTs in Tulang Bawang Regency were KWTs that received KRPL funding from the development stage from the government. The population of KWT members is 162 people from five groups. The determination of the number of samples was using the Slovin formula [9], therefore the number of farmer respondents in this research were 62 people.

Data analysis in this study aims to answer the research objectives and test the formulated hypotheses. The data analysis method used is to describe the variables studied and to provide interpretations according to the research objectives. All collected data were tabulated based on their respective categories and statistical analysis was performed. The data analysis method used is quantitative descriptive analysis.

Family income is analyzed using the expenditure approach. This method performs calculations by adding up all kinds of household expenses. The income used and the amount of money to be spent on food purchases are important factors in determining household income [10]. Meanwhile, to analyze food security using a subjective approach. The subjective approach to family food security is based on

the opinions, views and attitudes of the family towards the food situation, food distribution and family consumption [11]. An attitude of mutual benefit like this which leads the group to continue to be solid and to help each other

3. Results and discussion

West Tulang Bawang Regency is an agricultural area that was just formed in 2008. Tulang Bawang Barat Regency is astronomically located at $104^{\circ} 55' - 105^{\circ} 10'E$ and $04^{\circ} 10' - 04^{\circ} 42' LS$ with an area of 1.201 , 15 Km². Tulang Bawang Barat district is divided into nine sub-districts, namely Tulang Bawang Udik, Tumijajar, Tulang Bawang Tengah, Pagar Dewa, Lumbu Kibang, Mount Terang, Batu Putih, Mount Agung, and Way Kenanga. Tulang Bawang Barat Regency has 103 villages/wards spread across the nine sub-districts.

Geographically, Tulang Bawang Barat Regency is located at the northern tip of Lampung Province. The area is divided into highlands in the form of plains with a slope of 30 percent, which are areas that produce plantation production. A flat land with adequate average rainfall can increase soil fertility. The flat area that stretches out in the southern region is a rice field area located in Tumijajar District. The area which is a dry area is located in the northern part, namely in Lambu Kibang, Mount Agung, Mount Terang and Way Kenanga Districts. In the middle of Tulang Bawang Barat Regency, it is dominated by land in the form of shrubs / shrubs, which are found in most of the Pagar Dewa District area. The potential of the land, if used optimally, will be a high enough potential to support development [12].

3.1. Implementation of the sustainable food house area program

The KRPL program in Tulang Bawang Barat Regency is a program that has received funding assistance from the government since 2018. Women's farmer groups in the district received KRPL funding again in 2019 because they were considered active and showed progress in the implementation of activities until end of the year [13]. The implementation of the KRPL program has a positive effect on the use of household yards for growing vegetables which supports the improvement of family nutrition. all members of the women farmer groups have participated in the program. The assistance provided was in the form of money channeled through group accounts. Funds given in 2018 are in the form of growth stage funds, amounting to IDR 50,000,000.00 and in 2019 receiving development stage funds of IDR 15,000,000.00.

The evaluation of the implementation of the KRPL program is based on a policy made by the government which consists of establishing a village nursery, making demonstration plots and utilizing the KWT members' yards. The results showed that the respondents considered the implementation of the KRPL program in the West Tulang Bawang Regency in the high category. The program has been carried out in accordance with the technical guidelines for government assistance for the 2019.

KRPL program. The KRPL program at the research location is a non-working KRPL activity, although in practice the yards are also used for raising chickens and catfish. The KRPL program at the development stage is expected to increase the number of group members and the community to take advantage of the yard. This stage is aimed at improving and optimizing the function and production capacity of each component. The non-working components of KRPL activities are (1) village nurseries, (2) demonstration plots, and (3) the use of yards.

3.1.1. Village nurseries. The implementation of the KRPL program in Tulang Bawang Barat Regency in the development of village nurseries falls into the high category. This indicates that the development of village nurseries has been implemented by most of the KWTs. The village nursery was built in 2018, so in 2019 the assistance funds were used to increase the group inventory and production facilities such as seeds, fertilizers, medicines, polybags, and others.

The development of a nursery is an activity to increase the production of plant seeds according to the type, quantity, and time required by the members. Village nurseries become facilities for the community to provide plant seeds/seedlings. Village nurseries are used to supply the needs of KWT members and people outside the group. The management of the nursery is the responsibility of KWT members with the division of tasks based on group deliberations. The activities from site preparation

to seeding are carried out in one day together, while for watering and nursery maintenance, schedules are made alternately every day.

The types and numbers of plants sown are based on collective decisions through routine group deliberations. Plant seeds are also adjusted to the KRPL program itself. Plant seeds that are sown include kale, spinach, chilies, eggplant, tomatoes, mustard greens, lettuce, celery, green onions, cabbage and broccoli. Apart from buying seeds, the funds are also used for the provision of planting equipment and media, such as racks, pots, polybags, hoses, sprinklers, sickles, hoes, buckets, and fertilizer.

3.1.2. Demonstration plots (Demplots). The KRPL program is an activity program that aims to optimize the use of home yards. This program will be implemented more effectively if the community is given examples of its implementation. The development of the demonstration plot is the addition of planting seedlings obtained from the nursery to the pilot location. The implementation of the KRPL program in Tulang Bawang Barat Regency in the demonstration plot development was in the high category. This shows that the development of the demonstration plot has been implemented by all KWTs. Activities carried out at this stage include preparing and cultivating the land, planting various vegetable plants whose seeds come from KBD, and procuring planting equipment and media such as para nets, plastic mulch, polybags, racks, fertilizers, and medicines.

Tillage and management of the demonstration plot were carried out routinely by KWT members. The division of work and management time are adjusted to the work of each member so that the management of the demonstration plot remains optimal. The plant seeds used for the demonstration plot area are seeds taken from the nursery (vegetable crops) and bought directly (rhizome plants). Rhizome seeds do not need to be sown, so they are planted directly in the land. The KRPL demonstration plot was filled with vegetables, fruits and medicinal plants.

3.1.3. Development of members' yards. Development of members' yards is the addition of the use of the land yards around the residence of the members, both in terms of the number of plants and the area of the yards as a source of food for the family. The results showed that as many as 30 people or 48.39 percent considered the utilization of the members' yard in the high category, 23 people or 37.10 percent considered the utilization of the yard in the medium category, and the remaining 9 people or 14.52 percent considered the utilization of the members' yard is still low. This shows that the development of the yard that has been implemented by KWT members is highly valued in its implementation. The activity in this stage is the use of the yard of each KWT member for planting and raising livestock.

KWT members have an obligation to use the land around their house to grow vegetables and raise livestock. The maintenance of plants and livestock is the responsibility of each member. Each member is entitled to plant seeds and seeds as well as livestock seeds. The plants planted are adjusted to the members' needs and availability in the nursery, while the animals are raised based on the results of deliberations. Members who have narrow yards usually prefer to use polybags and verticulture systems for their plants.

Most of the respondents' yards are used for growing kale, leeks, celery and eggplant, while the livestock are catfish and chickens. Other types of plants planted are mustard greens, chilies, spinach, tomatoes, basil, lettuce, red ginger, broccoli, luffa, katuk, cabbage, galangal, nangkadak, guava, avocado and mango. The types of plants planted and livestock raised are adjusted to the results of the deliberations based on the needs of members and the availability of seeds.

Based on the descriptions of the three activities above, it can be said that the activities of utilizing yards in all groups of women farmers have been carried out. Farmers prioritize the principles of participation, cooperation and deliberation in carrying out these activities. Collaboration occurs between group members, stakeholders and agricultural extension workers [14] as well as communities who are not part of the women farmer group. Cooperation occurs because of common interests and mutually beneficial relationships [15].

3.2. Contribution of sustainable food house area program to family income of women farmer group members

Utilization of yards designed to increase family income. Family income is a very important economic resource, which allows each member of the family to have the ability to obtain all family needs including food needs. The income received by KWT members from the yard utilization program for one year ranges from IDR 2,565,600 - IDR 6,930,000. Details of respondents' income obtained from the KRPL program can be seen in Table 1.

Table 1. Distribution of respondents' income from the KRPL program in Tulang Bawang Barat

KWT members' income from KRPL for 1 year (IDR)	Classification	Amount (person)	Percentage (%)
2,565,600 - 4,020,400	Low	21	33.9
4,020,500– 5,475,200	Medium	16	25.8
5,475,200– 6,930,000	High	25	40.3
Total		62	100

Based on Table 1 it can be seen that most respondents are high income with the average income obtained from the KRPL program of all respondents in one year reaching IDR 4,778,900.00. The difference in the amount of respondent's income from the KRPL program is based on the number of plants and the area of the yard used. The more land the yard owns and uses, the bigger the income they get, compared to members who have narrower land and a few plants.

In addition to cultivating programmed plants, respondents with large yards innovated to plant commodities other than those programmed. The types of commodities cultivated include long beans, red ginger, cucumber, galangal, luffa, cassava and peanuts. This innovation has a good impact on farmers' income because these crops are sold more by farmers than for their own consumption. The KRPL program implemented can improve the skills and knowledge of KWT members in optimizing the use of their yards so as to reduce expenditure for consumption and increase family business opportunities.

The most positive impacts felt by members of the women farming groups as a result of the sustainable food house program are the use of their yards and an increase in household income [16]. The use of yards to become gardens for vegetables and other food plants has a direct impact on the economy and opens up farming opportunities and improves the economy of the people in Tulang Bawang Barat. Based on the research results, it can be seen that the contribution of the yard utilization program to household income is 35.8 percent.

3.3. The level of household food security of women farmer group members

KWT member's family food security is subjectively based on the opinions, views, and attitudes of KWT family members on the food situation, regarding family food availability, family food distribution and family food consumption for meet the food needs of its members so that they can live healthily and be able to carry out their daily activities from time to time. The aspects of family food availability, aspects of family food distribution and aspects of family food consumption in the level of family food security of KWT members in Tulang Bawang Barat Regency are described as follows.

3.3.1. Aspects of KWT family members food availability. The availability of family food for KWT members is the family opinion of KWT members regarding the condition of food availability in their family as seen from the adequacy of family food availability and the stability of family food availability without fluctuating from year to year. The aspect of family food availability for KWT members in the family food security level falls into the medium category. This shows that family food for KWT members is sufficient to meet their family food needs.

Conditions in the field indicate that the family food supply of KWT members is mostly good enough and that food availability in the study area has fulfilled the family food needs of KWT

members. Part of the family food availability comes from self-production and the other part from buying at the market or at stalls around the farmer's house. Some of the production plants, especially cultivated vegetables, are consumed by themselves and some are sold raw.

Family members of KWT prioritize staple food production products such as harvested rice to be stored as supplies, because rice is the only source of staple food in the area and farmers will sell it if it exceeds the supply. Data in the field shows that only some farmers in the study area produce the staple food in the form of rice, this is due to limited land, while the land is mostly planted with plantation crops.

The stability of food availability at the family level of KWT members is based on the adequacy of food availability and the frequency of meals for family members in a day [17]. Most KWT member families do not prepare food reserves for the next month's needs and buy food for only a few days. The type of staple food consumed is rice without any mixture of other ingredients, such as corn or sweet potatoes, while the frequency of meals is three times a day.

3.3.2. Aspects of food distribution for family members of female farmer groups. Food distribution for KWT family members is the affordability of KWT family members to get food, seen from the ease with which the family can get food and how to get food. The family food distribution aspect of KWT members in the level of family food security in Tulang Bawang Barat Regency is in the medium category, meaning that the distribution of food in the family is quite good. Conditions in the field indicate that the affordability of families to get food is quite easy. This is because the food needed is produced by themselves from yards or other agricultural land, and some from buying. KWT member families are quite easy to buy foodstuffs because they are close to markets, stalls, and there are also traders selling around.

3.3.3. Aspects of family food consumption of KWT members. Family food consumption of KWT members is the condition of food consumed by KWT family member as measured by the family members' knowledge of food, the quality of food they consume and the ability to choose food according to their needs or family sufficiency so it is safe for consumption. The aspect of family food consumption of KWT members in the level of farmer family food security falls into the medium category.

The knowledge of the food consumed by KWT family member is quite good. Data in the field shows that respondents already know about the food the body needs in the right composition and is present in all types of food that are useful for health, in consuming family food by considering the quality and quantity of food they consume. This is not in line with the opinion of [18] which states that the food menu consumed by rural family tends to follow a habitual pattern, namely rice as the main ingredient and tofu as the main side dish so that changing these habits is very difficult to do.

The percentage of food expenditure proportion and the level of energy consumption proves that the level of farmer welfare or food security is quite high. However, it is necessary to increase farmer production so that the income obtained from the utilization of the yards will increase. In addition, it is necessary to increase the capacity of members in managing family consumption so that family food security increases. households should consume more high nutritious food. Improving the quality of food can be improved by taking into account the quantity and quality of the food itself [19].

4. Conclusions

The KRPL program in Tulang Bawang Barat Regency is a program that has received funding assistance from the government since 2018. The KRPL program's implementation is seen from the development of village nurseries, development of demonstration plot plots, and KWT yards members' development. The KRPL program is implemented to help increase farmer family income by utilizing yards. The field results show that the income received by KWT members from the yard utilization program for one year ranges from IDR 2,565,600 - IDR 6,930,000. Most of the respondents have high income with the average income obtained from all respondents' KRPL program in one year reaching IDR 4,778,900.00.

Family food security of KWT members subjectively categorized in the medium category from the adequacy of family food availability of KWT members, food distribution in the family is quite good, and aspects of family food consumption are also quite good. Conditions in the field indicate that the affordability of family to get food is quite easy. KWT members' knowledge is already good about the food the body needs in the right composition and is present in all types of food that are useful for health, in consuming family food by taking into account the quality and quantity of food they consume.

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