Research Article

Community Participation in the Activities of Improving Food Security Through the Climate Village Program in the Madukoro Village Kajoran District Magelang

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Abstract.
This study examines activities that enhance food resilience through the Climate Village Program in Madukoro Village and analyzes how community participation influences this resilience. The research involved 70 members of the Reksobantolo farmer group, using questionnaires, interviews, observations, and documentation for data collection. Descriptive analysis and simple linear regression were employed for data analysis. The findings reveal that Madukoro Village has implemented various strategies to boost food resilience, including polyculture and monoculture farming, rainfed and local irrigation systems, integrated agriculture, food plant diversification with fruits and vegetables, and utilizing yards for fishponds and medicinal plants. Integrated agriculture, combining agriculture, animal husbandry, and fisheries, emerged as a leading activity. Community participation in food resilience efforts is high, with an average score of 55.55 out of 80. Simple linear regression analysis shows that farmer group participation positively affects food resilience, with a coefficient of 0.024. Labor participation ranks highest, while goods participation is the lowest. The Climate Village Program has fostered strong community involvement, but ongoing support from relevant agencies is necessary to help residents further develop their ideas and skills.

Keywords: climate village program, food security, Madukoro village

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1. Introduction

Climate change has impacted most communities, but people are less aware of the change. The incidence of flood, drought, landslide, high waves and the increase of seawater advance is increasingly common with increasing intensity, resulting in casualties, economic (crop-and-failure) and ecology is the impact of climate change. Climate change is no longer a speculative issue and the fact of its impact affects millions of people around the world, negatively impacting their efforts to get out of poverty (1).

The Indonesian Government in presidential regulation number 98 year 2021 on national action Plan for Greenhouse Gas emission reduction (RAN-GRK) to face current

climate change, conducted a participatory approach of central government, local governments and related parties to develop the regional action plan for Greenhouse Gas emission reduction (RAD-GRK) in the efforts to achieve GHG emissions reduction targets in all parts of Indonesia (2). The climate of the village Program comes as an innovation from the government in providing an understanding of the impacts of climate change and the adaptation and mitigation efforts that target communities at the local level. The program of Climate Village (Proklim) as the follow-up efforts of RAN-GRK and RAD-GRK is a community-based program with a national scope developed by the Ministry of Environment and Forestry to encourage the active participation of communities and all parties to carry out local actions in the face of climate change impacts and greenhouse gas emission reduction efforts. Food production is heavily influenced by temperature increase, rainfall pattern change, and intensity of flood exposure and drought in an area (3). Description of activities that can be performed by the community in the framework of the climate Village program in the form of adaptation efforts to the impacts of climate change can be implemented through many activities including the improvement of food security with activities such as the application of polyclinic and monoculture planting pattern system, application of irrigation systems, integrated agriculture by combining agriculture with farms and fisheries, the management of food crops fruits and vegetables and the use of yard land by planting the plant of live pharmacies, and making fish ponds. Sriyanto (2019) Food security became one of indicators adaptation the community in in overcoming global warming according to government Regulation No. 19/2012 (4). Sastroputro (1988) in Saptorini (2003) states the level of community participation is influenced by development programs, socio-economic conditions of the Community and environmental physical conditions of the environment (5). Socio-economic conditions include the level of education, income, culture and social strata in the Community system. Hamijoyo (2007) in Sulistiyorini, et al. (2015) outlines the types of participation, namely the participation of thought, energy, money, skills and goods (6). The dry land conditions and low rainfall in the village of Madukoro cause the public to have efforts to adapt climate change mitigation and mitigations, related to drought disasters that occur for the sustainability of food security in the region. Prevention is done with various activities one of them increased food security. In 2016 Madukoro received an award from KLHK (Ministry of Environment and Forestry) because of its success in managing the environment so that Madukoro Village received PROKLIM award. The purpose of this study is to know the forms of activities in improving food security through the Climate Village program in Dusun Madukoro and analyzing the influence of public participation

on the improvement of food security through a climate village program in Madukoro village.

2. Research Methodology

The research is located in the village of the Madukoro Kajoran District of Magelang Regency. As a population, the community is a member of Madukoro village, which is joined by a farmer group Reksobantolo as many as 70 people. Research using nonprobability sampling techniques. The tools and techniques used are interviews, observations, polls, and documentation. The analytical techniques used in this study are quantitative descriptive analysis, descriptive statistics and simple linear regression.

3. Research Result and Discussion

3.1. General conditions of the village Madukoro

The astronomic village of Madukoro lies at 110 ° 04 ' 11 "-110 ° 05 ' 46" LS and 07 ° 31 ' 55 "-07 ° 32 ' 08" BT. Administratively, Madukoro Village is bordered by other regions that include the north bordered by the village of Sambak District Kajoran, in the south bordered by Kaliabu Village, Salaman Sub-district, bordered by Bumiayu Village, Kajoran Sub-district and the West borders Kwaderan Village Kajoran District. Madukoro Village is located 20 km southwest of Magelang Regency and 6 km from Kajoran district. The village of Madukoro consists of 5 RT, RT 4, 5, 6, 7, and 8.

The village of Madukoro is a village that has been creating autonomy in the field of food, because of its community ability to fulfill its own food needs by powering the natural resources owned, so that in 2011 was chosen to become replica Demapan (Desa Mapan Pangan) built by the village of Wonogiri who had been awarded the food independent village in 2007 along with Sambak village In 2016, Madukoro was again awarded a National Proklim Award for his success in conducting adaptation and mitigation activities in climate change, especially in the activities of increasing food security.

The village of Madukoro is located south of Mount Sumbing with a height of 500 masl which is a major medium-plain typology in the range of 400 to 700 MASL, so the average air temperature ranges from 30 ° per day. The amount of rainfall is detected as

much as 286.9 mm per year with 6 months spread, so the number of rainy season and dry season in Madukoro village is relatively balanced annually.

The village of Madukoro has an area of 45 ha consisting of 25 hectares of forest and 27 ha for settlements, paddy fields, and freshwater pools. The potentials of Madukoro village are farmland, livestock and fisheries. The people's forest is managed agroforestry by combining timber plants with HHBK plants (the result of non-timber forests) and crops under the crop and green crops of livestock food, which previously were in the forest areas of the original people in the form of Moor (dry land) that are planted only cassava. The village of Madukoro is also passed by the flow of river Kali Butek with a length of 2000 meters, the river Kaliurang with a length of 1500 meters and the Balong River with a length of 1000 meters.

3.2. Improvement of Food Security Activities Through The Climate Village Program in Madukoro Village

3.2.1. Planting Pattern System

The planting pattern system applied in the village of Madukoro is a polyclinic and monoculture system. The Polycyulture plant uses an intercropping planting pattern where the planting is carried out at the same time period. In the village of Madukoro cassava and corn plants are planted in the same period, then pasted together with the banana plant. The monoculture system in the village of Madukoro is specially intended for rice crops because rice is still the main commodity of foodstuffs. System of planting patterns applied in Madukoro village as in Figure 1.

Figure 1: Intercropping System in Madukoro Village.

3.2.2. Irrigation system

The irrigation system uses a rain-water irrigation system, and also some irrigation comes from the local irrigated system of springs and streams flowing around the farmland. In addition to the use of paddy fields, the rice field is also used to bury the pond of fish around the rice fields in Madukoro village. This is due to the lack of water availability, so the selection of irrigation systems is very important in addition to the selection of planting commodities.

3.2.3. Integrated farming

The village of Madukoro has combined fishery and farming activities in one land. Mr. Gunaji as an integrated farming community figure says that integrated farming is enabled to optimize all potential resources. Integrated farming is expected to suppress the timmonth of agricultural waste. Its main objective is to have a direct reciprocal relationship between biotic and abiotic environments in agricultural land ecosystems (Figure 2).

Figure 2: Integrated Farming in Madukoro Village.

3.2.4. Variety of food crops

The variety of food plants consist of fruit crops such as papaya, banana, jackfruit, watermelon, coconut. Various types of vegetables such as long beans, chili peppers, and also live pharmacy plants (Figure 3). The plants are cultivated in yard land around the house and in the garden. Not relying on only one foodstuff but trying to cultivate a variety of food crops. With this, the need for food materials can be fulfilled and the community can save spending.

3.2.5. Land Utilization Yard

Madukoro Village uses yard land as a place to grow living pharmacy plant, vegetables using polybag, then there are also make use of making fish pond in front of the map, other than that there are making cage to keep chicken. The main factor that led to the public in the village of Madukoro planting crops is to ensure the availability of various food ingredients continuously and also improve the fulfillment of family nutrition.


Figure 3: Plant varieties cultivated in Madukoro Village.

3.2.6. Community-based education

In this research, there is a non-formal educational material that is accepted by the people of Madukoro village especially the group of farmers Reksobantolo among them with a form of socialization activities, counseling and training conducted by related offices such as DLH, Bappeda, BPK and the livestock and Fisheries office.

3.3. Community participation in the Climte village Program of Madukoro

Based on the results of the processing poll using a statistical method with the help of Microsoft Excel application 2010, indicating that the minimum answer score of the respondent is 35. The respondent's maximum answer score was 77. The score is obtained by summing the total score and then searching for the minimum value and maximum value achieved. Total is 3889 and then divided by all total respondents is 175 so that the average score is 55.55. The form of community participation in the village of Madukoro includes the participation of thinking, skills, energy, goods and money.

Table 1: Community Participation Level Criteria.

Interval Score	Percent (%)	Criteria
66-80	81.25-100	Very High
50-65	62.50-<81.25	High
35-49	43.75-<62.50	Low
20-34	25.00-<43.75	Very Low

Source: Research data, 2022

The highest community participation is in the form of power participation with a score of 233, the participation of money with a score of 208.5, the participation of skills with a score of 196.5, thought participation with a score of 177 and the lowest participation in the form of goods participation 168.5.

Participation in the form of energy includes the community that follows the work of the service in the development of infrastructure for the improvement of food security, such as following service work in mutual assistance in building roads to facilitate accessibility on villages. Participation in the form of money includes community participation in donating money for development in improving food security especially in agricultural activities (7). Participation in the form of skills includes community participation in agricultural cultivation and the type of food crops. Participation in the form of goods includes community participation in contributing agricultural facilities and equipment necessary to improve food security. The participation of the thinking includes community participation in meyuming ideas, presenting ideas in deliberations and giving innovation in the improvement of food security.

Increased food security activities through the climate village Program in Madukoro

Based on the results of the poll given to 70 members of the farmer group Reksobantolo showed that the activities of the climate Village program in the increase of food security is high. Based on the results of the processing of polls using the statistical method with the help of Microsoft Excel application 2010, indicating that the minimum answer score of the respondent is 23. The respondent's maximum answer score was 39. Based on the table of food security score criteria, the interval of 26,0-33,5 score indicates high criteria. The average result of the score is 33.08 which indicates that the average level of food security in Madukoro is high.

The merger of agricultural activities, livestock, and fisheries became one of the solutions for the improvement of land productivity, environmental conservation, and integrated Village development, thereby improving the welfare of the people with more

Table 2: Scoring Criteria for Food Security Activity Level.

Interval Score	Percentase (%)	Criteria
34.0-40.0	>81.25	Very High
26.0-33.0	62.50-81.25	High
18.0-25.0	43.75-62.40	Low
10.0-17.0	<43.75	Very Low

Source: Research data, 2022

income. The management of land undertaken by farmers is able to utilize waste to be processed into products that sell one of the only compost fertilizer produced from the rest of organic materials derived from plants, animals and other materials. Another factor that supports the improvement of food security in Hamlet Madukoro 02 is the ability of food crops despite its contribution is not as much as other activities, due to some things, there are still many people who are more dependent on the staple food of grain, lack of interest in the creation of food crops, and also the lack of public knowledge about the creation of food crops using other crops such as vegetables, fruits and so on.

3.3.1. Influence of Community Participation on Improving Food Security Through The Climate Village Program

The value of 31.759 means that if there is no X value (community participation) then the value of Y value consistency (food security) is 31.759. The value of 0.024 is a regression coefficient number. This figure implies that each addition of 1% of community participation rate (x) then food security will increase by 0.024. The regression coefficient is positive, so it can be said that the directional effect of variable x to variable y is positive. So the equation Regresinya is Y = 31.759 + 0, 024X. Based on the significance value of the coefficient table obtained the significance value of 0.000, for the value of the calculated t greater than T table is 15,752 > 1,667 so it can be declared that the variable x (community participation) affects the variable y (food security).

Based on the results of the research in Hamlet Madukoro 02 showed that the community participation is influential on increasing food security in the Climate Village program, the community was formed by the group with the aim to be able to cope with the food demand. One strategy to deal with climate change is accelerating greenhouse gas (GHG) emissions reduction through a community-based approach. In Indonesia, the government pursues community engagement to reduce GHG emissions through the Program Kampung Iklim (ProKlim) (8). The participation is driven by health awareness

and dietary shifts due to the influence of climate change and the variety of community activities. Another factor that encouraged the public participation of Dusun Madukoro 02 against the desire for improvement of food security is because of the availability of land resources that are increasingly reduced to the height of land utilization competition between the food sector with the non-food sector.

4. Conclusion

The activities of increasing food security through the climate Village program that has been conducted in the village of Madukoro are the application of polyclinic and monoculture planting patterns, application of irrigation systems, integrated agriculture by combining agriculture with livestock and fisheries, the management of food crops fruits and vegetables and the use of yard land by planting plant pharmacies live, and the manufacture of fish ponds. Public participation in the increase of food security through the Climate Village program in the village of Madukoro is high with an average score of 55.55. This shows the climate farm program has had a positive impact that the community feels so that involvement of the participation of the community is high

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