

The Study of Food Insecurity and Food Supply in Gunungkidul Regency Indonesia

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ABSTRACT

The purpose of this study was to analyze the factors causing food insecurity and the condition of household food reserves in Gunungkidul Regency. The research location was determined purposively, in Watugajah Village and Tegalrejo Village, Gedangsari Subdistrict and Girikarto Village, Panggang Subdistrict, based on the Map of Potential Food and Nutrition Potential in Gunungkidul Regency in 2017 which stated that the three villages were food insecure villages. The data used in this study consisted of primary data and secondary data. The data analysis method in this study uses descriptive analysis with qualitative and quantitative approaches, to calculate the utilization ratio of agricultural products used as food reserves. The results of the study concluded that the factors causing food insecurity in Gunungkidul Regency in the aspect of food access were among others due to low purchasing power, inadequate educational facilities, low education, distance from growth centers far and limited economic facilities. These factors cause high unemployment rates which in turn causes people's access to obtain food very limited. While the factors causing food insecurity in the aspect of food utilization include the availability of staple food, the level of consumption of nutrients, environmental sanitation hygiene, the level of income and the level of parental education. The results of the analysis of household food reserves concluded that 47, 37 percent of agricultural production results in farm households are stored or used as food reserves. In addition, farm households use food production as consumption, for sale, social giving, seeds, and animal feed.

Keywords: food insecurity, food supply, farm household

1. INTRODUCTION

Improving food security is one of the important programs in agricultural development, in addition to the development of agribusiness [1]. This is because food is the most basic need for humans. Food security is closely related to social security, political stability and security or national security (Nainggolan, 2006). For the Indonesian people, attention to the problem of food is considered to be very strategic, including because food ranks the largest in household expenditure. BPS data for 2014 states that the average expenditure on food for the Indonesian people reached 58.81 percent of the total household expenditure. Therefore, food must be a particular concern in a country's development strategy.

The World Commission on Environment and Development (WCED) states that food supply for all the world's population continues to increase. This is a problem and a challenge that must be faced by the world agricultural sector. New strategies for agricultural development are needed in order to meet current and

future world food needs. Because the surplus of world food production was apparently unable to solve the problem of hunger [2]. Information about food production surpluses is often heard, but in reality, there are still many people who are short of food and threatened with hunger, even in some areas there are still many cases of malnutrition toddlers.

The term food security in world food policy was first introduced in 1971 by the United Nations to free developing countries from the food crisis. In 1992, the International Conference of Nutrition defined food security as: "the availability of food that meets everyone's needs, both in quantity and quality at all times for a healthy, active and productive life". In Indonesia, the government developed the concept of food security in a national development planning document (Repelita VI), and is listed in the 1996 Food Law, article 1 paragraph 17. The definition referred to is that food security is "the condition of fulfilling food for affected households, from the availability of sufficient food, both in quantity and quality, safe, equitable, and affordable [2]. Explanation of the

production surplus and the definition of food security can be concluded that the condition of food security in an area or household does not only depend on the production of food commodities, but also must consider aspects of food access and food utilization.

Various strategies for increasing food security have been carried out by the government in every element of the subsystem that forms food security. The first subsystem is the availability of food (production) which includes the stability and continuity of the provision of food both from domestic production, reserves and imports and exports. The second subsystem namely distribution includes accessibility of food between regions and time and strategic food prices. Third is the consumption subsystem including the quantity, quality of nutrition or nutrition, food security and diversity. If one of the three subsystems does not function properly, what will happen is food insecurity which is indicated by the emergence of malnutrition problems.

Gunungkidul Regency is one area that is focused on solving food problems. Various attempts have been made, including the compilation of village-level Food and Nutrition Potential Maps. The map aims to determine food insecurity villages based on aspects of food availability, access, and utilization. The results of the mapping of food insecurity are used for overcoming and resolving food insecurity problems, as well as developing food and nutrition alert systems.

The mapping of food and nutrition insecurity in Gunungkidul in 2017 shows that there are three villages that are still included in the food insecurity category, namely Watugajah and Tegalrejo villages located in Gedangsari sub-district, and Girikarto village in Panggang sub-district. Two villages in Gedangsari sub-district are included in the category of food insecurity in the aspect of food access. While Girikarto Village in Panggang District is included in the category of food insecurity in the aspect of food utilization.

To achieve food security in Gunungkidul Regency, in accordance with the Food Law No. 18 of 2012, it is necessary to conduct a study of the causes of food insecurity in the three villages. In addition, it is necessary to study food reserves to describe food availability in Gunungkidul Regency. The results of the study can be the basis in determining the policy for resolution and overcoming of food insecure areas in Gunungkidul Regency.

II. METHODS

The research location was conducted in Watugajah Village and Tegalrejo Village, Gedangsari District and Girikarto Village, Panggang District. The location

determination is based on the 2017 Gunungkidul Regency Potential Food and Nutrition Potential Map which concludes that the three villages are food insecure villages. Watugajah and Tegalrejo villages are food insecure villages in the aspect of food access, while Girikarto Village is food insecure villages in the aspect of food absorption or utilization. Whereas the location of household food reserve research was carried out in Kanigoro Village, Ngleri Village and Terbah Village, with the approach to determine the location of the representation of three basic food source supply zones in Gunungkidul Regency, namely the northern zone (Batur Agung zone), the middle zone (Wonokari ledok zone), and the southern zone (thousand mountain zone).

This research uses primary data and secondary data. Primary data is used to determine food stocks in farm households and non-farm households, and to determine the factors causing food insecurity based on aspects of food access and aspects of food utilization. While secondary data is related to the characteristics or general description of the study location, including data on geographical location, physical condition, social conditions of the community, village economy, agriculture, and health.

The analytical method in this study uses descriptive analysis with qualitative and quantitative approaches. The qualitative approach was carried out by conducting field observations, noting what happened, conducting reflective analyzes of various documents found in the field. Whereas the quantitative approach uses descriptive statistics.

III. RESULTS AND DISCUSSION

Food Insecurity Factors Food Access Aspects

Geographical location has an influence on the condition of regional food security, especially aspects of food access. Areas that are located in mountainous areas or dry hills, such as Gedangsari District, are not easy to build buildings let alone industry. Besides the slope of the land, mountainous or hilly areas are often protected forest areas. This has become one of the reasons why investors are not interested in investing in the region. The investment costs of industrial development in the region are greater than building industries in the flat area. The low number of industries causes the availability of low employment, as well as high unemployment. The unemployment rate causes the level of people's purchasing power is also low. Table 1 presents the number of unemployed in the villages of Tegalrejo and Watugajah, Gedangsari District. The table shows that the number of unemployed people in Watugajah Village is higher than in Tegalrejo Village.

In addition to the problem of unemployment, the social condition of the community becomes important in the development of food security, including population. The

population is one important part in formulating food security policies because it is related to the amount of food consumption in an area. The ratio of net availability of staple food sources of carbohydrates per capita per day to normative consumption shows the adequacy of food in an area. Normative consumption (C_{norm}) is defined as the amount of staple food sources of carbohydrates that must be consumed by someone per day to obtain energy.

Table 1. Unemployment in the villages of Tegalrejo and Watugajah, Gedangsari District in 2017

Name of Village	Unemployment	Population	%
Tegalrejo	1399	7346	19,03
Watugajah	918	3957	23,19

Data Source: Profile of Tegalrejo and Watugajah Villages, 2017

The population in Gedangsari Subdistrict in 2017 reached 38,078 people [3]. The village which has the largest population is Ngalang Village, with a population of 8081 inhabitants. The second largest population is Tegalrejo Village, with a population of 7,346 people. While the smallest population is Sampang Village, with a population of only 2,901 inhabitants.

Poor families will more easily meet their food needs if they are fed a small amount. Food available to a large family may only be enough for a family of half the size of the family. Children who grow up in a poor family are the most vulnerable group to malnutrition among their family members. The youngest children are usually most affected by food shortages. If family members increase, the food for each child decreases. Ages 1-6 years are the most vulnerable. Less heavy protein energy will be found in families with smaller family members [4].

Table 2. Poor families in the villages of Tegalrejo and Watugajah, Gedangsari District in 2017

Name of Village	Poor population	Population	%
Tegalrejo	1179	7346	16,00
Watugajah	437	3957	11,04

Data Source: Profile of Tegalrejo and Watugajah Villages, 2017

Based on Table 2, the number of poor families in the villages of Tegalrejo and Watugajah reached 16 percent and 11 percent. These conditions indicate that poverty is not a direct causative factor affecting food insecurity in terms of food aspects. This means that poverty becomes a result of other contributing factors, such as low levels of education causing opportunities to get decent work, consequently low income or can be said to be poor.

In addition, education also becomes important in food security, especially in the aspect of food access. One indicator in the aspect of food access is a person's

purchasing power in obtaining food. The ability to buy is determined by one's work which has an impact on the level of one's income per month. The job is influenced by the ability of someone. The higher the level of one's education, the higher one's ability. So the greater the opportunity to get a decent job and salary, and affect the ability of people to buy nutritious food.

The economic conditions of an area affect the conditions of food security in an area. While economic conditions are influenced by economic support facilities in the region. An important facility that must be owned by an area as a support for economic development that ultimately impacts on the condition of food security is a market facility that sells food. Gedangsari District which consists of 7 villages has 5 markets. There are still 2 villages in Gedangsari District that do not yet have a market, namely Sampang and Watugajah Villages. However, food needs in Watugajah and Sampang villages can be met by the availability of food stores and kiosks. There are 12 food stores in Watugajah Village and 3 shops in Sampang Village.

Other economic facilities needed in regional economic development are financial facilities or banks. Gedangsari Subdistrict has 4 banks of which 3 are in Hargomulyo Village, and 1 of them is in Ngalang Village. The other five villages do not yet have banks, only the Koperasi Tani which are run by farmer groups in lieu of savings and loan facilities.

Food Insecurity Factors Aspects of Food Utilization

A person's food consumption and nutrition is determined by the quality and quantity of food consumed. Good food is food that contains all the essential nutrients in sufficient quantities and is balanced to meet the body's needs. Food consumption at the individual or household level can be translated into the form of energy, protein, fat, vitamins. The standard used is the recommended nutritional adequacy ratio (RDA).

Gunungkidul District Health Office has carried out various socialization activities to meet community nutrition. The socialization was carried out through UPT Public Health Center II. Many community nutrition improvement programs in Panggang District are directed at Infants, Toddlers and pregnant women, because this group is a target that is very vulnerable to diseases and health problems, so that many community nutrition improvement programs are directed at this group.

However, the government program will not be optimal if the daily food consumption patterns of the family do not meet the Nutrition Adequacy Rate (RDA) and the Expectation Food Pattern (PPH). There needs to be a massive socialization on the need to fulfill the Expectation Food Pattern (PPH) and Adequacy Rate (RDA) to Public.

So that people understand that what is meant by food is not only limited to "full", but also nutritious.

The nutritional condition of the people is affected by poverty. Poverty as a cause of malnutrition is in the first position in the community. The main problem of the poor population in general is very much dependent on daily income, which in general cannot meet basic needs normally. Based on village profile data, 47.26 percent of Girikarto villagers are farmers. While 16.65 percent did not work. The results of a survey of community leaders, obtained information that some residents have income not reaching Rp. 1,000,000/month or only around Rp. 35,000/day. If it is assumed that only the head of the family works with 3 family members consisting of 1 wife and 2 children, and all daily income is used up for food, then the budget constraint per person to buy food is only Rp. 8,750/day.

Community income is related to the work done. Especially if the work of the people in the area as farmers who depend on income at harvest time, this becomes homework for the government to think about the availability of employment for the people of Girikarto Village.

Education greatly influences the reception of information about nutrition. People with low education maintain more traditions related to food, making it difficult to receive new information about nutrition. In addition, the level of education also influences the process of adopting one's information to knowledge. The higher the level of one's education, the easier it will be to receive new information. The level of education of the people of Girikarto Village, Panggang Subdistrict is still low. Based on 2015 BPS data, 72.61 percent of the population in Girikarto Village only finished elementary school. Only 13.48 percent of the population completed their education until completing junior high school. While those completing high school education (read: high school) are only 9.64 percent. The low level of education has an effect on the level of parental knowledge of family nutrition, especially children. In the end it influences how families can use food properly.

Table 3. Education Level of Girikarto Village

Education Level	Population	%
Elementary School	851	72,61
Junior High School	158	13,48
Senior High School	113	9,64
University	50	4,27
Total	1172	100,00

Food Reserve Analysis

The types of food in Gunungkidul Regency include rice, corn, peanuts, tholo beans, cassava, green beans and sweet potatoes. Food sources in Gunungkidul Regency include

harvests, non-cash food assistance, and purchases. The majority of the population in Gunungkidul Regency are farmers, so that all sources of food reserves come from crops, both for rice, corn, peanuts, tholo beans, sweet potatoes, and cassava. Rice harvest is done once or twice a year, while other commodities are done once a year.

Non-cash food aid is food aid from the government that is given to the Beneficiary Group every month through an electronic account mechanism that is used only to buy food at KUBE e-Warong, PKH / food traders working with Bank Himbara. This assistance program is very useful to help save food reserves, especially for farmers who only harvest once a year.

In addition to harvests and non-cash food aid, the food source of the Gunungkidul Regency community comes from purchases. The location of the purchase of rice in the market, rice milling, and the nearest stall. Rice purchasing activities continue to be carried out even though they still have food reserves or reserves. This is done to anticipate if the next season does not harvest or there is a long dry season. Aside from that, people feel calm and at ease if they have food reserves at home. For example, residents in Terbah Village, even though they still keep 1 sack, still buy rice every month.

Food use categories in Gunungkidul Regency include consumption, sold, given to other parties (social), seeds / seeds, animal feed, and stored. The use of food commodities in Gunungkidul Regency is presented in Table 4.

Table 4. Use of Food Commodities in Gunungkidul Regency

Food Commodity	Use of Food					
	Consumption	Selling	Social Motif	Seeds	Animal Feed	Saving
Paddy	✓	-	✓	-	-	✓
Peanuts	✓	✓	-	✓	-	✓
Tholo beans	-	✓	-	-	-	-
Green beans	✓	-	✓	-	-	✓
corn	✓	✓	-	-	✓	-
Sweet potato	✓	✓	✓	-	✓	-
Cassava	✓	✓	-	-	-	✓

All food commodities are consumed except tholo beans, because the yield of tholo nuts is only small. Besides it can not be eaten immediately if only boiled. The need for consumption is adjusted according to the number of family members. Based on observations and interviews the average amount of rice for family consumption is 0.5 to 1 kilogram per day for 4 to 6 family members.

Food commodities sold include peanuts, tholo beans, cassava and corn. While rice, green peas, and sweet potatoes are not sold. Rice is not sold because it is for consumption, social, and stored in the form of grain as food reserves. Besides the consumption and sale of sweet potato, it is also given to other parties. It is also used as animal feed because some of the results are not good. Green beans are not sold but given to other parties and kept for themselves.

Categories given to others can be divided into donations for the celebration of relatives or neighbors, and given for consumption. Food commodities in Gunungkidul Regency provided to other parties include rice, green beans and sweet potatoes. Rice is given to other parties both for donations from relatives and neighbors. If you have a contribution of 15-25 kilograms of rice, while for neighbors around 5-6 kilograms. Many sweet potato yields are not good, so good ones are chosen and given to neighbors for consumption.

In addition, food commodities in Gunungkidul Regency are also used as animal feed and breeding. Food commodities in Gunungkidul Regency that are used as animal feed are corn and sweet potatoes. Sweet potato commodity is used as animal feed because of its poor quality (*boleng*).

Food commodities stored as food reserves include rice, mung beans, peanuts, and cassava. Rice stored as food reserves is already in the form of grain, because it is more durable and not easily damaged. The stored peanuts are usually in the form of peanuts that still have skin and peel the skin. Cassava dipanpan in the form of cassava.



Figure 1. Harvest Storage (a) rice; (b) sweet potatoes

Table 5 shows an example of food allocation in the form of rice from the harvest in June 2018 to October 2018. Based on the table it can be seen that with a yield of 150 kilograms in June 2018, farmers still have 1.5 sacks of food reserves or reserves, equivalent to 90 kilograms. This can happen because there is help from the government in the form of BPNT every month. In addition, farmers still purchase 5 kilograms of rice each month at a price of Rp 9,000 - Rp 11,000. This shows that although they still have

grain reserves, farmers still buy rice at the nearest market or stall. The aim is to calm life and anticipate if there is a long dry or famine.

All farmers' crops, especially rice, are stored as food reserves. Purpose of storage for consumption and social activities. The form of storage for rice is grain. If it is stored in the form of rice, ticks will appear and when cooked the taste is different. Farmers still have food reserves even though the next planting season arrives (around 1-2 sacks or the equivalent of 50-100 kilograms). There are no shared warehouses to store farmers' harvests, so farmers store in their own homes. The longest time for farmers to store grain is 6 months and at least 3 months. The storage time is also adjusted to the next planting season, meaning that until the next season the grain storage is always sought to remain there even though only 1 sack. This is to anticipate a long dry or famine. In addition, it is also for the peace of life.

Table 5. Description of Food Allocation in the form of Rice in Gunungkidul Regency From June to October 2018.

Food Sources & Allocation	Total	Persenta ge (%)
Food Source:		
1. Harvest	3 sack =150 kg	
2. BPNT	4 x 5 kg = 20 kg	100,00
3. Purchases	4 x 5 kg = 20 kg	
Total	190 kg	
Food Allocation :		
1. Consumption (4 orang)	0,5 kg x 120 days = 60 kg	31,58
2. Social (neighbors)	3 x 5 kg = 15 kg	7,89
3. Social (sibling)	1 x 25 kg = 25 kg	13,16
4. Reserves	1,5 sack= 90 kg	47,37
Total	190 kg	100,00

IV. CONCLUSION

The results of this study concluded that the factors causing food insecurity in the villages of Watugajah and Tegalrejo, Gedangsari Subdistrict, Gunungkidul Regency, were located in the aspect of food access including low public purchasing power, inadequate education facilities, low education, distance from growth centers (cities) far and limited economic facilities . These factors cause high unemployment which in turn causes people's purchasing power to obtain food very limited.

Factors causing food insecurity in Girikarto Village, Panggang District, Gunungkidul Regency lie in the aspect of food utilization including the availability of staple food, the level of nutrient consumption, environmental sanitation hygiene, income level and parents' education level.

Utilization of food production in Gunungkidul Regency, among others, is for consumption, sale, social giving, seeds/seeds, animal feed and as food reserves (stored). Production results stored or as food reserves reached 47.37 percent.

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