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# Food Security Analysis of Household Paddy Farmer in Flooding Area

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## Abstract

This study aims to determine the level of household food security of rice farmers in areas at risk of flooding. The research was conducted by using survey method in Padaherang and Kalipucang subdistricts of Pangandaran district which was chosen purposively as research area. The sample size of 360 farmers was determined using the Slovin formula. The data used consisted of primary and secondary data analyzed descriptively. The results showed that most farm households were in the food supply deficit condition, most of the farm households had high purchasing power, and most of the farm households were in the medium category of food quality. In general the level of household food security of farmers is in the category of less food resistant.

**Keywords:** food security, household, flood

## 1. Introduction

Badan Penelitian dan Pengembangan Pertanian (2011) states that climate change is one of the most serious threats to the agricultural sector and has the potential to create new problems for the sustainability of food production and agricultural production systems in general. The results of Boer and Subbiah (2005), show that from 1844 until 2009 there have been 38 times the La-Nina phenomenon that caused flooding and disruption to national rice production. Research from Timmerman, et al (1999) and Hansen, et al (2006) also showed that global warming led to the strengthening of the La-Nina phenomenon. Lamusa (2010), states that the extreme climate of El Nino and La Nina causes crop failures and lowering farm production.

Padaherang and Kalipucang sub-districts are flood-prone areas that occur almost every year. The location of the lower rice field compared to the river water surface and the high sedimentation rate in the Citanduy River is one of the causes of the flood. Kementerian Lingkungan Hidup PPE Jawa (2015) reported that the total sedimentation of the Citanduy River which leads to Sagara Anakan is 5,000,000 m<sup>3</sup> per year and is deposited in Sagara Anakan Lagoon as much as 1,000,000 m<sup>3</sup> per year.

Efforts that have been made by the government such as the manufacture of water retaining embankment along the flow of the Citanduy River that passes both areas. Nevertheless, these efforts have not produced much results. Bappeda Kabupaten Pangandaran (2015) stated that the total area of flooded rice fields in Pangandaran Regency during 2014 covering 2,728 hectares or 16.93 percent of the total existing rice field area in Pangandaran Regency.

Rice fields inundated by floods that often hit the area indicate a food security problem that affects food insecurity. According to Supardi, et al (2012), floods that occur almost every year cause the loss of agricultural production, food stocks, income and property owned by farm households in flood-prone areas. Floods that occur each year also cause food security at the regional level will be disrupted.

## 2. Research Methodology

The research was conducted by using survey method in Padaherang and Kalipucang subdistricts of Pangandaran district which was chosen purposively as research area. The sample size of 360 farmers was determined using the Slovin formula (Umar, 2000). The data used consisted of primary and secondary data analyzed descriptively. The household food security of farmers is analyzed descriptively using several indicators as follows:

### (1) Adequacy of food availability

This indicator is measured from the proportion of self-produced staple food to basic family food needs. The greater the availability of family food or the increasing stock of household foodstuffs shows the higher level of household food security. This indicator is calculated by the following equation:

$$TSP = \text{PUB/KSB}$$

Where:

LFS : Level of food subsistence

ORPER : Own rice production is equivalent to rice

NER : Needs equivalent of rice

The criteria used are as follows:

- TSP < 1, means a deficit in the availability of household food
- TSP = 1, means the availability of household food is only sufficient for consumption needs
- TSP > 1, means the availability of household food surplus not only for consumption and there are even



remnants for sale.

(2) Accessibility/affordability to food

Accessibility / affordability indicators are viewed from households' convenience in obtaining food. Household food access in this study is measured from household purchasing power that reflects the level of household welfare. The higher the purchasing power of households, the better access to households on food which indicates the higher food security level of households.

(3) Quality/food safety

Measurement of food quality is very difficult because it involves various types of food with different nutritional content, so the size of food quality in this study is only seen from the share of food expenditure. The higher share of household expenditure for food indicates that household expenditures are still focused on food purchases indicating low levels of household food security. On the contrary, the lower share of household food expenditure signifies the increasingly diverse consumption of household food, thus indicating the higher level of household food security.

(4) Level of food security

The food security index is calculated by summing the three indicators of food security (food availability, food availability stability, accessibility and quality / food safety). Based on this, the level of household food security is categorized into three, namely food resistant, less food resistant, and not food resistant.

### 3. Results and Discussion

#### Adequate Availability of Household Food

The results of the analysis show that from the adequacy of household food availability, the average farmer categorized food deficit is shown by the value of LFS < 1. This means that most farmers can not meet the needs of food consumption of their households from the results of farming. The lack of food availability in households indicates that household food security levels are low. Household distribution based on availability adequacy is presented in Table 1.

**Table 1. Distribution of Households Based on Sufficiency of Food Availability**

Availability Adequacy (Day)	Number (people)	Percentage (%)
Deficit (LFS < 1)	247	68,61
Subsistent (LSF = 1)	7	1,94
Surplus (LSF > 1)	269	29,44
<b>Total</b>	<b>360</b>	<b>100,00</b>

Facts in the study area indicate that households with food deficit are more dominated by farmers with narrow land ownership (less than 0.50 hectares). Farming with narrow land is unreliable to meet the needs of household food.

The main obstacles in the fulfillment of rice availability are more due to uncertain crop yields as a result of climatic conditions as well as flooded areas. In addition, pest and plant disease attacks based on these conditions become more than usual.

#### Accessibility of Household to Food

The analysis of the purchasing power level shows the ability of the farm household to fulfill the household needs of both food and non-food necessities and to finance their farming. Distribution of households based on accessibility to food can be seen in Table 2.

**Table 2. Distribution of Household Based on Accessibility Indicator to Food**

Category (Skor)	Number (people)	Percentage (%)
Low	173	48,06
Medium	6	1,67
High	181	50,28
<b>Total</b>	<b>360</b>	<b>100,00</b>

Table 2 shows that most farm households have high access to food. Although their rice fields are constantly inundated by floods, most of the farmers are still able to provide for their family's food needs while at the same time they can finance their farms so that they can cultivate for the next planting season.

Some farm households have low purchasing power so that they can not provide for their family's food needs and finance their farms. Although they can finance their farms, they have to sacrifice their level of consumption by performing various savings.

The poverty line according to BPS refers to per capita income per month for rural areas in 2016 of Rp 343,646 per month. The average household income of farmers in the study area is Rp 462,629 per capita per month so it is not included in the category of poor people because their per capita income is above the poverty line.

### Quality of Household Food

Household food quality is seen from the share of expenditure for food. The share of expenditure for household food of farmers in the study area ranged from 25.97 to 76.42 (Table 3).

**Table 3. Distribution of Households by Indicator of Food Expenditure Share**

Category (Skor)	Number (people)	Percentage (%)
Low	81	22,50
Medium	229	63,61
High	50	13,89
<b>Jumlah</b>	<b>360</b>	<b>100,00</b>

Viewed from the share of food expenditure, the average level of household food resilience of farmers in the study area is in the medium category, meaning that the quality of food consumed by family farmers is quite diverse. Nevertheless, the share of food expenditure from 22.50 percent of farm households is high. This indicates that the level of household food security of farmers is low. Households with a high share of food expenditure are households whose income is mostly spent on food, meaning that most of their income is still focused on primary needs, whereas secondary needs are still unmet..

### 4. Conclusion

- (1) Food security of farm households seen from the indicators of food availability are in the category of food insecurity.
- (2) Food security of farm households seen from the indicator of accessibility to food is in high category.
- (3) Food security of farm households seen from food quality indicator is in low category.

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