# ANALYSIS OF FOOD SECURITY LEVELS IN PADANG LAWAS DISTRICT

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**Abstract**
Food security is a condition where food is met for the country as well as individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable and affordable and does not conflict with the religion, beliefs and culture of the community, to be able to live a healthy life. , active and productive in a sustainable manner. This research aims. The method used in this research is descriptive qualitative and quantitative using the same analysis as the Food Security and Vulnerability Atlas of Indonesia (FSVA) 2009. This analysis of food security indicators consists of 3 indicators and 6 variables then entered into a formula, the results will be grouped based on 6 categories of food security and a food security map was created by calculating the composite index results for each of the 6 variables. The results of this research are the distribution of food security at the village level in Padang Lawas Regency, showing that in each village there are several categories of very resistant, resistant, moderately resistant, somewhat vulnerable and very vulnerable. Meanwhile, the condition of food security at the sub-district level is based on food availability, there are three sub-districts which are in the highly resilient category, namely Sihapas Barumun Subdistrict, Barumun Tengah Subdistrict and Huristak Subdistrict, and the food security condition is based on food affordability, namely all sub-districts in Padang Lawas are in the resilient category while it is based on utilization. Only one sub-district is considered food secure, namely Barumun Tengah sub-district. Meanwhile, a comparison of Padang Lawas district with other districts shows that Deli Serdang district is in first place, while the lowest or last place is Gunung Sitoli city, but Padang Lawas district is ranked 24th.

Keywords: *Food Security, Food Security Map, Food Insecurity*

## 1. INTRODUCTION

Food security is defined as a condition where food is met for the country and individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable and affordable and does not conflict with the religion, beliefs and culture of the community, to be able to live. healthy, active and productive in a sustainable manner (Law Number 18 of 2012 concerning Food). The realization of national food security starts from fulfilling food in the smallest areas, namely rural areas as the basis for agricultural activities. The basis of rural development aims to realize food security in an area that has integrated facilities and infrastructure starting from aspects of availability to food consumption to provide sufficient and realize household food security (Suryana Achmad, 2004). One of the socio-economic aspects that greatly influences food security is the problem of poverty. According to the Central Statistics Agency (2010), poverty is a condition of a person's inability to fulfill basic needs, both food and non-food, as measured in terms of expenditure. Meanwhile, according to Irawan (2000), poverty is a condition of family prosperity and is seen as the inability to fulfill basic food and non-food needs as measured using the poverty line. High levels of poverty are very sensitive to inflation and inflation is very sensitive to increases in prices of basic necessities. Soaring food prices, especially rice, cause people's purchasing power for this commodity to decrease, which will affect access to food and food utilization, which ultimately worsens food security and insecurity. Based on data from the Padang Lawas Regency Central Statistics Agency (2018-2022), the number of poor people has increased from year to year. The number of poor people in Padang Lawas Regency in 2018 and 2019 was 23,050 people and 23,320 people. Meanwhile, in 2020 and 2021 it was 23,870 people and 24,450, and in 2022 it will be 25,780 people.

Apart from the problem of poverty, the high conversion of agricultural land to non-agricultural land is worsening food conditions in Padang Lawas Regency. Land conversion has a

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serious impact on food production and the welfare of agricultural and rural communities. The development of conversion of paddy fields to non-rice fields, both for other agricultural and non-agricultural commodities from 2020 to 2022 in Padang Lawas Regency shows a decline. The Padang Lawas Regency Agriculture Service (2023), explained that there had been a very significant decrease in the area of rice fields in Padang Lawas Regency from year to year which could result in the inability to meet food needs in Padang Lawas Regency. The total area of rice fields in Padang Lawas Regency in 2020 was 27,369 hectares, then in 2021 it decreased to 25,553 hectares, and in 2022 it became 18,332 hectares. Conversion of rice fields into oil palm plantations, housing and other non-agricultural areas, which is not balanced with the creation of new rice fields, will have an impact on increasing food production and will threaten food security. This decrease in rice fields can cause a decrease in the production potential of rice fields.

The population in Padang Lawas Regency has increased from year to year. The population in Padang Lawas Regency from 2020 was 237,299 people, then in 2021 it increased to 239,761 people, and in 2022 it became 242,166 people. The increasing population will influence the level of food needs which will also increase, in other words there will be an increase in consumption of food. If the increasing demand for food is not balanced with an increase in food production, it will greatly affect the situation of food security levels in Padang Lawas Regency. the background description presented above, as a first step to understanding this, it is necessary to identify problems regarding the level of food security in Padang Lawas Regency. This identification aims to ensure that the distribution of levels of food security in Padang Lawas district which is included in the categories of food insecurity and food insecurity can be known, so that ways to resolve it can also be found. It is on this basis that researchers are interested in conducting research on "Analysis of Food Security Levels in Padang Lawas Regency".

## 2. IMPLEMENTATION METHOD

The method used in this research is a qualitative and quantitative descriptive method. The qualitative descriptive method is to provide an overview of the characteristics of certain phenomena or certain aspects of life in the society being studied by collecting data, analyzing and interpreting them. Quantitative descriptive research is to accurately describe the nature of an individual, circumstances, symptoms, or special things in society. Quantitative descriptive research tries to provide a careful and complete picture of the object being studied (Rianse & Abdi, 2012). Explanations regarding the status of food security are analyzed using food security indicators, namely food availability, food access and food utilization.

Data collection comes from secondary data taken from related agencies. Data processing comes from calculating secondary data consisting of 3 food security indicators.

| Food Security Indicators | Variable |
|---|---|
| Aspects of Food Availability | The ratio of the standard area of rice fields to the area of the village |
| | The ratio of the number of facilities and infrastructure providing food to the number of households. |
| Aspects of food affordability | The ratio of the population with the lowest level of welfare to the number of village residents |
| | The ratio of villages that do not have adequate connecting access via land, water or air |
| Aspects of Food Utilization | The ratio of the number of households without access to clean water to the number of households. |
| | The ratio of the number of village residents per health worker to population density |

**Data analysis**

Data analysis in this research uses analysis in accordance with the Food Security and Vulnerability Atlas of Indonesia (FSVA). The data used is adjusted to the indicators used in analyzing food security, then the data is calculated using each related indicator formula. Analysis of the distribution of food security levels using Microsoft Excel 2010 software and the Quantum Qis Application Version 2.18.

| Priority | Value/Rank | Category |
|---|---|---|
| 1 | 0.0000 – 0.0456 | Very vulnerable |
| 2 | 0.0456 – 0.0615 | Prone |
| 3 | 0.0615 – 0.0788 | Somewhat vulnerable |
| 4 | 0.0788 – 0.1068 | Just Hold On |
| 5 | 0.1068 – 0.1398 | Stand |
| 6 | 0.1398 and above | Very Resistant |

## 3. RESULTS AND DISCUSSION
**Aspects of Food Availability**

Food availability is measured using two variables related to food availability in meeting food security. The variables include the ratio of the standard area of rice fields to the area of the village and the ratio of the number of facilities and infrastructure providing food to the number of households. Availability indicators relate to the availability of food for consumption by the community. Food availability will be divided into 6 priorities in each variable, namely very resistant, resistant, moderately resistant, somewhat vulnerable, vulnerable and very vulnerable. The higher the priority, the area can be said to have a food supply for its people.

1. Ratio of Agricultural Land Area to Village Area
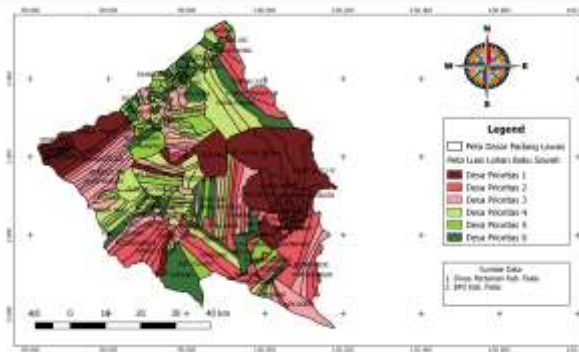


The ratio of agricultural land area to village area is used as an indicator in the aspect of food availability because agricultural land has a positive correlation with the level of food availability by influencing food production capacity. Therefore, the higher the ratio of rice field area to village area, it is assumed that food availability will also be better, and vice versa. The ratio of the standard area of rice fields to the area of villages, which is included in the very food secure criteria is 45 villages, the resistant criteria or priority 5 is 48, for the villages with moderately resistant criteria or light green color gradation and priority 4 there are 62 villages, Meanwhile for villages with There are 62 villages in the criteria for being slightly food insecure or the pink gradation in priority 3, the criteria for food insecurity or the red gradation in priority 2 are 45 villages, while the criteria for very food insecurity or the dark red gradation in priority 1 are 44 villages.

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2. Ratio of the Number of Facilities and Infrastructure Providing Food to the Number of Households

The ratio of the number of facilities and infrastructure providing food to the number of households is the ratio between the number of facilities and infrastructure providing food (markets, minimarkets, shops, food stalls, restaurants, etc.) to the number of households in the village.
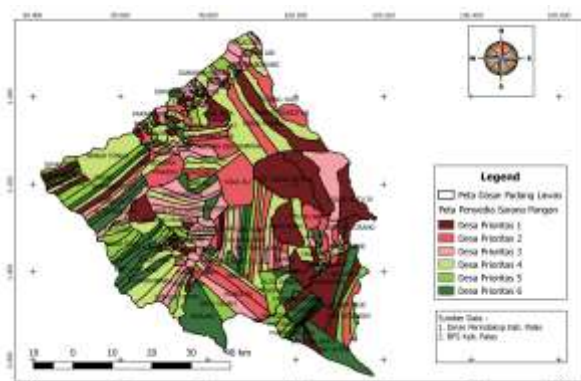


The ratio of the number of facilities and infrastructure providing food to the number of households shows that the number of villages that fall into the very food secure criteria is 45 villages, the resistant or priority 5 (Five) category is 46 villages, the moderately resilient and somewhat vulnerable categories are both equal. There are 61 villages in the vulnerable category or priority 2 (two), totaling 46 villages, while in the very vulnerable category or priority 1 (one) there are 45 villages. The level of regional food security based on the aspect of food availability is influenced by how widely the village utilizes the potential of existing agricultural areas. Apart from that, it is also influenced by how the farmers in the village use the land to produce food other than rice, namely corn and cassava on dry land. The availability of dominant or extensive dry land in an area will affect the level of food security based on the availability aspect. If the dry land is not used as food production land, it will make the area food insecure due to low food production, especially rice commodities which cannot be produced. in one whole year. However, if it is utilized optimally as land for the production of other food crops, such as corn and cassava, it can make the area food secure because it can produce enough food other than rice to meet the food needs of the people.

**Aspects of Food Affordability**

Food affordability is the ability of all households and individuals with the resources they have to obtain sufficient food for their nutritional needs, including economic and physical access. Economic access to food is the main determinant of food and nutritional security, even though food is well available in the market, if household access to food is still low, which depends on household income and food price stability, then people will not get the food they need. A high-quality road network built by the central and regional governments, especially Padang Lawas Regency, can reduce the risk of trade costs and increase access to markets. Developed transportation facilities can reduce food prices, while supporting increased farmer income by reducing intermediary costs related to damage, transportation and other supply chain imperfections (DKP & WFP 2015).

1. Ratio of Population with the Lowest Level of Welfare to Total Village Population

Talking about the problem of poverty cannot be separated from the problem of food security in a region. Poverty is one of the main factors in food insecurity, the poverty rate reflects groups who do not have sufficient access to productive sources of income for their needs.
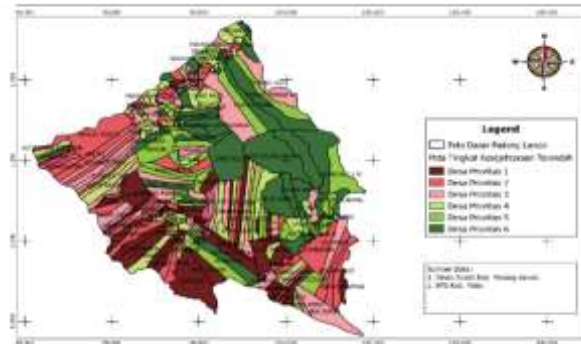
Distribution of the ratio of the population with the lowest level of welfare to the total population, the number of villages that are in the very resistant criteria is 44 villages, for the resistant category there are 46 villages, while for the moderately resistant or priority category 4 (four), there are 62 villages, the moderate category. There are 60 villages in the vulnerable category, 45 villages in the vulnerable or priority 2 (Two) category, and the very vulnerable or priority 1 (One) category, there are 47 villages. Poverty is still a very common problem around Padang Lawas district. The problem of poverty that occurs will also affect people's food purchasing power, as a result people are unable to meet their basic needs. The number of poor people in a region will also influence the condition of food security in that region, this can be seen from the ability of poor people to obtain existing food. The level of community welfare in an area can be seen from the poverty rate in that area. If the poverty rate in an area increases, the level of welfare of the population will be very bad, especially in terms of getting food for their survival (Indonesian Food Security Council and World Food Program, 2003).

2. Villages that do not have adequate connecting access via land or water or air

Unequal infrastructure development will result in remote areas and areas with poor geographical conditions experiencing difficulties in obtaining their daily necessities and this can result in limited opportunities and adequate government facility services.
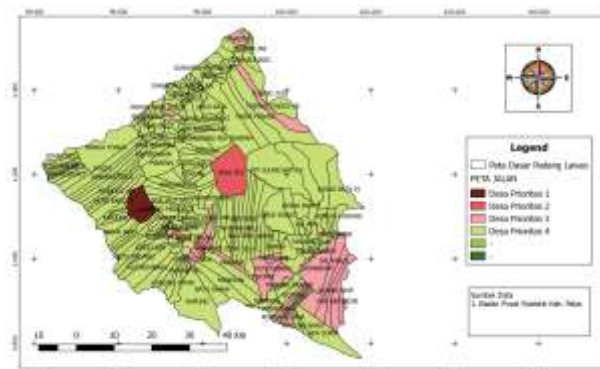


Based on the image above, the food security distribution map for villages that do not have adequate connecting access by land, water or air, the largest number of villages in the very resistant category is 268 villages, for the resistant category there are 30 villages, while the categories for moderately resistant and somewhat vulnerable has the same number of villages, namely 3 villages each.

**Aspects of Food Utilization**

Nutritional status is the final source of all food systems which can reflect the good and bad of a region's or individual's food security. Monitoring the development of trends in food problems can be seen through analysis of the food situation that occurs in the region. The number of health workers can also influence the use of community food in Padang Lawas Regency. If there are

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health problems and errors in processing food, it will affect the quality of the food for individuals. The number of Health Workers and access to clean water are very good indicators to use in the aspect of food absorption or utilization.

1. Ratio of the Number of Households Without Access to Clean Water to the Number of Households

The ratio of the number of households without access to clean water to the number of households is the ratio between the number of Decile 1-4 households with unprotected clean water sources and the number of households in the village. The results of the distribution of village food security levels based on the FSVA (Food Security and Vulnerability Atlas) of Indonesia are as follows:
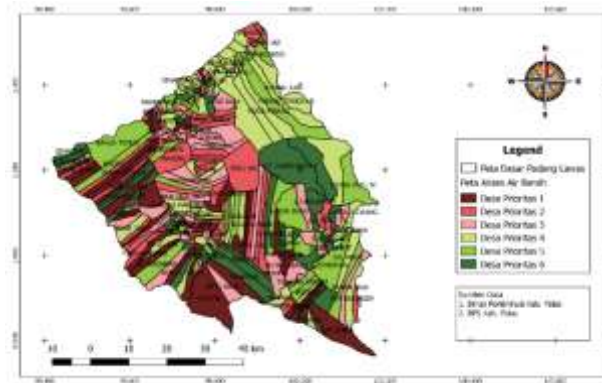


Based on the image above, the map shows the ratio of the number of households without access to clean water to the number of households in the very resistant category, which is 43, in the resistant or priority 5 (five) category, which is 46 villages, in the moderately resistant category, which is 63 villages. The category for somewhat vulnerable is based on the results of the level distribution. Food security in villages is 60 villages, the vulnerable category is 45 villages, while the very vulnerable or priority 1 (one) category is 47 villages.

2. Ratio of Village Population Per Health Personnel to Population Density

The ratio of the number of village residents per health worker to population density shows the ability of the number of health workers in the village area to serve the community. An adequate number of health workers will improve the community's food utilization status. Map of the distribution of village food security levels based on the results of the FSVA (Food Security and Vulnerability Atlas) of Indonesia, namely as follows:
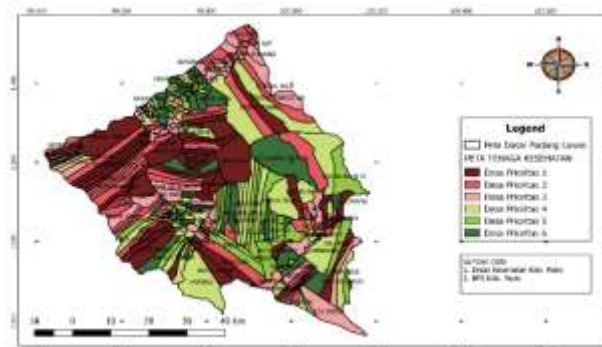


Distribution of the ratio of village population to health workers to population density, the largest number of villages in the moderately resistant category is 62 villages, the somewhat

vulnerable category is 60 villages, for the very vulnerable, vulnerable and resistant categories there are 46 villages, while for the very vulnerable category there are 46 villages in the very vulnerable category. There are 44 villages. According to Nugroho and Mutisari (2015) community nutritional status is an indicator used to determine food absorption. Factors that influence community nutritional status are environmental conditions and maternal parenting patterns as well as the distribution of health workers which are influenced by the food security situation in a region. This is in line with the existing conditions in Padang Lawas Regency, namely that many sub-districts are in the vulnerable category, which shows that environmental conditions and parenting patterns as well as the distribution of health workers are not good, and the condition of food security in these sub-districts seen from the aspect of food utilization is not good. Many cases of the nutritional status of people in a region can be used to assess the condition of food security in that region.

**Comparison of the Food Security Index with other districts in North Sumatra Province**

In comparing the food security index value of Padang Lawas district with other districts in North Sumatra province, the author used food security index data from the National Food Agency for 2023, because the indicators used are similar so the differences can be seen clearly. From the Food Security Index data, it was found that Padang Lawas district's food security lags far behind other districts for three food security indicators (food availability, food affordability and food utilization).

| Rating | Regency/City | IKP | Criteria | Priority |
|--------|--------------|-----|----------|----------|
| 1 | Deli Serdang | 87.15 | Very resistant | 6 |
| 2 | Toba Samosir | 82.79 | Very resistant | 6 |
| 3 | Serdang Bedagai | 82.13 | Very resistant | 6 |
| 4 | Medan | 80.93 | Very resistant | 6 |
| 5 | Simalungun | 80.84 | Very resistant | 6 |
| 6 | karo | 80.36 | Very resistant | 6 |
| 7 | Dairy | 80.17 | Very resistant | 6 |
| 8 | Pematang Siantar | 78.42 | Very resistant | 6 |
| 9 | Humbang Hasundutan | 77.91 | Very resistant | 6 |
| 10 | North Tapanuli | 76.30 | Very resistant | 6 |
| 11 | Batu Labuan | 75.83 | Very resistant | 6 |
| 12 | Step up | 75.36 | Stand | 5 |
| 13 | Samosir | 75.06 | Stand | 5 |
| 14 | Binjai | 74.89 | Stand | 5 |
| 15 | Coal | 74.65 | Stand | 5 |
| 16 | South Tapanuli | 72.68 | Stand | 5 |
| 17 | North Padang Lawas | 71.74 | Stand | 5 |
| 18 | Sharpening | 71.65 | Stand | 5 |
| 19 | North Labuhan Batu | 71.34 | Stand | 5 |
| 20 | Central Tapanuli | 70.89 | Stand | 5 |
| 21 | Pakpak Bharat | 70.52 | Stand | 5 |
| 22 | Nias | 69.99 | Stand | 5 |
| 23 | North Nias | 67.12 | Just hold on | 4 |
| 24 | Padang Lawas | 67.01 | Just hold on | 4 |
| 25 | High cliff | 66.47 | Just hold on | 4 |
| 26 | Mandailing Christmas | 66.36 | Just hold on | 4 |
| 27. | South Nias | 65.80 | Just hold on | 4 |
| 28. | Sibolga | 62.01 | Just hold on | 4 |
| 29. | West Nias | 60.60 | Just hold on | 4 |
| 30 | Padang Sidimpuan | 57.96 | Just hold on | 4 |
| 31. | South Labuhan Batu | 54.52 | Just hold on | 4 |
| 32. | Tanjung Balai | 53.17 | Just hold on | 4 |
| 33 | Mount Sitoli | 43.70 | Just hold on | 4 |
|  | North Sumatra Province | 69.09 |  |  |

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Based on the table above, Deli Serdang district is ranked first with a food security index value of 87.15, which shows that food security indicators in terms of food availability, food affordability and food utilization are good, while the lowest or last place is Gunung Sitoli City, however Padang Lawas district is ranked 24th.

## 4. CONCLUSION AND SUGGESTION
### Conclusion

Distribution of food security at the village level in Padang Lawas Regency. From the results of determining food security indicators using 6 variables, namely: the ratio of the standard area of rice fields to the area of the village, which is included in the criteria for very food security, there are 45 villages, the criteria for resilience or priority 5 are 48, for There are 62 villages in the criteria for moderately resilient or light green gradations and priority 4. Meanwhile, for villages that fall into the criteria for being somewhat food insecure or pink gradations in priority 3 there are 62 villages. The criteria for food insecurity or red gradations in priority 2 are 62 villages. 45 Villages, Meanwhile, for the criteria for very food insecurity or the dark red color gradation in priority 1, there are 44 villages, the ratio of the number of facilities and infrastructure providing food to the number of households, shows that the number of villages that fall into the criteria for very food security is 45 villages, in the resilient category. or priority 5 (Five) totaling 46 villages, for the moderately resistant and somewhat vulnerable categories there are both 61 villages, the vulnerable category or priority 2 (two) totaling 46 villages, while the very vulnerable category or priority 1 (One) totals 45 Village.

The ratio of the population with the lowest level of welfare to the total population, the number of villages in the very resilient criteria is 44 villages, for the resilient category there are 46 villages, while for the moderately resilient or priority 4 (four) category there are 62 villages, the somewhat vulnerable category totaling 60 villages, for the vulnerable or priority category 2 (Two) there are 45 villages, for the very vulnerable or priority 1 (One) category there are 47 villages. Villages that do not have adequate connecting access by land, water or air, the largest number of villages in the highly resistant category is 268 villages, the resistant category has a total of 30 villages, while the moderately resistant and somewhat vulnerable categories have the same number of villages, namely: each consisting of 3 villages. The category is highly resistant to the ratio of the number of households without access to clean water to the number of households totaling 43, the resistant or priority 5 (Five) category totaling 46 villages, the moderately resistant category totaling 63 villages, the category for somewhat vulnerable based on the results of the distribution of levels of food security in the villages totaling 60 Villages, in the vulnerable category there are 45 villages, while in the very vulnerable or priority 1 (one) category there are 47 villages. The ratio of village population to health workers to population density, the largest number of villages in the moderately resistant category is 62 villages, the somewhat vulnerable category is 60 villages, for the very vulnerable, vulnerable and resistant categories the same is 46 villages, while for the very resistant category totaling 44 villages.

### Suggestion

It is necessary to handle food insecurity in Padang Lawas Regency by the local government by prioritizing areas that have food insecurity conditions to raise their condition status to food resistant or very food secure, such as Hutaraja Tinggi District and Barumun District which have problems at the level of the amount of land which is decreasing every year as well as the problems of poverty and increasing population, methods that can be applied include intensifying agriculture, making special efforts for food crops to increase domestic food availability due to the low number of rice fields and food providers in Huristak District and Barumun District as well as increasing the creation of new rice fields in areas that have future agricultural potential.

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