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CARRYING CAPACITY OF NON-RICE FEATURED CROPS FOR ALTERNATIVE FOOD AVAILABILITY IN BANGGAI REGENCY, CENTRAL SULAWESI

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ABSTRACT

Basic human needs are something that is needed by man to maintain his life, and the carrying capacity of food crops is very important for food availability in the face of food crises in each region. The purpose of this study is to find out which non-rice food crops are superior and the carrying capacity of non-rice superior food crops that can be used as alternative food in Banggai Regency. The data used in this research is data on the production of non-rice food crops in 2017 and 2021. Furthermore, the research was conducted using qualitative methods that were analyzed descriptively quantitatively with the LQ-SSA approach and the Carrying Capacity of Agricultural Area Land. So that the results of the analysis of LQ and SSA of non-rice food crops that are superior are obtained, namely corn which is spread in 14 districts, sweet potatoes in 5 districts, peanuts in 4 districts, and soybeans in 1 district. Furthermore, the land carrying capacity of non-rice superior food crops, obtained the results of corn, sweet potato, peanut, and soybean plants experiencing a surplus (SL>DL), which means that these superior food crops can contribute to a decent life for the population and determine the carrying capacity of the agricultural area of food crops. non-rice seed, the result is corn ($\ell > 1$), which means that corn can be used as an alternative food to replace rice. As well as for Sweet Potato, Peanut, and Soybean plants, the results obtained ($\ell < 1$), which means that these plants cannot be used as an alternative food to replace rice in Banggai Regency.

***Keywords**: carrying capacity, location quotient, shift share, superior commodities*

BACKGROUND

Food is a basic human need and is the human right of every human being this is stated in Law Number 18 of 2012, so that food becomes a strategic and important crop, considering that food is a basic human need that sufficient quantity with decent quality, safe for consumption at a price reached by the community. In addition, food has a high carbohydrate content as a source of energy in the body. Therefore, realizing the availability and fulfillment of good enough food at the national level to the regional level is very important. According to Nurdin et al. (2023), An important issue for countries with developing economies is food security guarantees, where the agricultural sector plays a strategic role in increasing food availability. Furthermore, food has a high sensitivity value in economic, social, and political aspects, so the role of food (rice) becomes very meaningful in realizing food independence as one of the pillars of national food security.

According to Suryawati (2019) theoretically, the concept of food security contains broad aspects, including the ability to provide sufficient food, whether sourced from anywhere, but local

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food independence is the best solution that can guarantee and meet the needs of affordable alternative food and is supported by various food sources following local food self-sufficiency available in each region such as Corn, Peanuts, Soybeans, Sweet Potatoes, Cassava and Green beans in Banggai Regency. Following the statement of Utami and Budiningsih (2015) that local food is an alternative food other than rice that is produced and developed following the potential, regional resources, and local culture to meet the needs of the community. Therefore, the quantity and quality of superior local food products in the Banggai regency will largely depend on the specific conditions that exist in the Banggai regency area.

This condition is not only based on land suitability, soil properties, climate, and aspects of cultivation that influence, but also social conditions. A good physical environment will be more beneficial to apply to an area to protect areas that have the potential for certain commodities (Fauzi et al., 2019). According to Hidayah et al. (2020), the preparation of Sustainable Food Agriculture Areas (KP2B), Sustainable Food Agricultural Land (LP2B), and Sustainable Food Agriculture Reserves (LCP2B) must be carried out by the government as an effort to ensure food sustainability. supply to the community and as an effort to protect fertile land with high production that has the opportunity to develop self-sufficiency of local food other than rice (Keratorop et al., 2016).

Banggai Regency with an area of 9,672.70 km² which includes 23 districts with a population of 376,808 people (BPS Banggai, 2021). The growth of the population of Banggai Regency, which continues to increase from year to year with an average of about 2%, has indirectly shifted land use, which in turn has caused the problem of original food land which gradually changes its function to non-agricultural (Widiarsa & Suartika, 2018). Furthermore, Katili and Sataral (2021) stated that the demographic development of Banggai Regency has also decreased accompanied by the area of agricultural land, where the use of agricultural land has been used as settlements, industries, and other built-up areas, this is what causes food land to continue to be narrow and the carrying capacity of land continues to decrease. Increasing population growth demands food production with a very significant increase (Kunu, 2020). Therefore, to meet the food needs of the population, the carrying capacity of food crop agricultural land needs to be continuously increased, so that it will be able to guarantee the fulfillment of food needs for the community (Mubarokah et al., 2020).

The relationship between population pressure and efforts to meet food needs is discussed in Malthus's theory, which states that population growth resembles a geometric series, while an increase in food production resembles an arithmetic series, which means that population growth is much faster than an increase in food production (Katili and Sari, 2021). In line with Pridasari and Muta'ali (2018) describes a very critical case related to the carrying capacity of the environment, namely population pressure on land, especially in agricultural areas that are self-sufficient in food. Population growth must be supported by adequate land and environmental carrying capacity as a function of the economic condition of the population of an area. The global environmental carrying capacity of an area is the threshold of human population and land resources that can support such human activities based on their accessibility and physical environment. According to Rafiuddin et al. (2016), environmental carrying capacity achieves good quality if the amount of land used for built-up areas is between 30-70% of the total usable land. According to Sakti and Ihkwan (2019), support can be used as a tool or measure for development planning that provides an overview of the relationship between residents, agricultural land use, and the environment. So, there are at least two

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main variables that need to be known for sure to carry out a carrying capacity analysis, namely the potential of available land and the number of inhabitants (Rafiuddin et al., 2016).

One of the efforts that can be done is to study the carrying capacity of non-rice food crops based on superior commodities, needs, and availability of agricultural land. The analysis of the carrying capacity of non-rice superior food crops is closely related to the concept of prolonged alternative food security. This study aims to analyze the superior crops of non-rice food, the availability and needs of land in determining the carrying capacity of the land, and the carrying capacity of agricultural areas to determine the ability of the region to implement alternative food self-sufficiency for decent community life in Banggai Regency. Considering that the population continues to increase every year, the results of this study are expected to be a reference for the Banggai Regency regional government to determine non-rice food commodities that will be used as alternative food security to meet the food crisis for the needs of its population, as well as develop these commodities optimally in the Banggai Regency area.

RESEARCH METHODS

The study was conducted in the Banggai Regency area covering 23 sub-districts from June to December 2022. The data used in this study came from primary data and secondary data. Primary data are obtained from direct field surveys through free interviews or direct field observations as supporting materials. In addition, the secondary data used in the production of non-rice food crops in 2017 and 2021 was sourced from the Department of Food Crops, Horticulture and Plantations (TPHP) of Banggai Regency in 2022. This study uses qualitative methods that are analyzed descriptively quantitatively with the approach of Location Quotient (LQ), Shift Share Analysis (SSA), and Land Carrying Capacity and Carrying Capacity of Agricultural Areas.

Location Quotient (LQ) analysis and Shift Share Analysis (SSA) were used to identify and determine the leading non-rice food crops in Banggai Regency. In general, this analysis method is used to show the location of the concentration/base. According to Paramartha et al. (2020), Location Quotient (LQ) analysis is defined as the ratio between the percentage of total activity in the i-th sub-region and the percentage of total activity in the observed region. In addition, from the results of the Shift Share Analysis (SSA), an overview of the performance of activities in an area with different periods will be obtained. According to Bangun (2017); Pranadi et al. (2022), an analysis Location Quotient (LQ) is used to determine commodities that have a comparative advantage, while Shift Share Analysis (SSA) is used to determine commodities that have a competitive advantage. So that the LQ-SSA method is used to determine superior non-rice food commodities, especially from the supply side (production) in producing a commodity that has the potential to supply other regions. The mathematical formula of the LQ analysis (Rustiadi et al. 2011; Rahman et al. 2015) is as follows:

$$LQ_{ij} = \frac{X_{ij} / X_i}{X_j / X_{...}}$$

Information:
LQ : Location Quotie

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Xij : The value of the commodity production indicator j in the i-th region
Xi : The total number of activities in the i-th unit of the region;
Xj : The number of activities to j across regional units
X... : The amount of total activity across regional units.

The interpretation of the results of the analysis is as follows:
1. LQ>1: meaning that the non-rice food commodity is a base commodity. The production of these commodities is not only able to meet the needs of the region but can be exported to other regions.
2. LQ=1: means that the non-rice food commodity is a non-base commodity. The production is only enough to meet the needs within the region.
3. LQ<1: meaning that the non-rice food commodity is a non-base commodity. Its production cannot meet the needs of its territory so it needs to be imported from outside the territory.

The mathematical formula of the SSA analysis (Rustiadi et al. 2011; Rahman et al. 2015) is as follows:

$$SSA = \underbrace{\left(\frac{X..(t1)}{X..(t0)} - 1\right)}_{a} + \underbrace{\left(\frac{Xi(t1)}{Xi(t0)} - \frac{X..(t1)}{X..(t0)}\right)}_{b} + \underbrace{\left(\frac{Xij(t1)}{Xij(t0)} - \frac{Xi(t1)}{Xi(t0)}\right)}_{c}$$

Information:
a : Share Component
b : Proportional Shift component
c : Differential Shift Component
X... : The total value of the region's commodity production activities in the aggregate
X.i : The total value of a particular activity in the i-th unit of territory
Xij : Value in the i-th region and j-th activity
t1 : End year point;
t0 : Point of the starting year

If the yield of SSA >0 (+) then the commodity is experiencing growth. On the contrary, If the SSA result is < 0 then the commodity does not experience growth. In addition, the determination of the carrying capacity of the land is carried out by comparing the availability and needs of the land. The determination of land carrying capacity analysis refers to the Regulation of the Minister of Environment No. 17 of 2009 concerning Guidelines for determining environmental carrying capacity in regional regional planning. The calculation of land availability (SL) is calculated using the formula (PermenLH 2009; Katili and Sataral 2021) as follows:

$$SL = \frac{\sum(Pi\ x\ Hi)}{Hb}\ x\ \frac{1}{Ptvb}$$

Information:
SL : Land availability (ha)
Pi : The actual production of each type of commodity calculated is the Non-Rice Food crop;
Hi : Unit price of each type of commodity (Rp/unit) at the producer level;

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Hb : The unit price of rice (Rp/kg) at the producer level;
Ptvb : Commodity Productivity (kg/ha)

Furthermore, the calculation of Land Needs (DL) is calculated using the formula follows:

$$DL = N \; x \; KHLL$$

Information:
DL : Total rice equivalent land needs (ha);
N : Number of inhabitants (soul);
KHLL : Area of land necessary for decent living per inhabitant

Determination of Land Carrying Capacity Status was obtained by comparing land availability (SL) and land needs (DL). If SL > DL, the carrying capacity of the land is declared surplus. If SL < DL, the carrying capacity of the land is declared a deficit. After that, the calculation of the region's ability to carry out self-sufficiency of food independence as alternative food is carried out, namely by comparing the optimum population with the results of non-rice paddy food production. The concept is to understand this critical threshold of carrying capacity. The carrying capacity of agricultural areas refers to Muta'ali (2012); Imansyah *et al.* (2020) by using the following formula:

$$\ell = \frac{Lp/Pd}{KFM/Pr}$$

Information:
ℓ : The carrying capacity of agricultural areas
Lp : Area of harvested land (ha)
Pd : Total population (soul)
KFM : Minimum physical requirement (kg/capita/year)
Pr : Average land production per hectare (kg/ha)

RESULT AND DISCUSSION

Location Quotient (LQ) Analysis and Shift Share Analysis (SSA) Non-Rice Food Crops of Banggai Regency

Data used in calculating the Location Quotient (LQ) value of non-rice food agricultural commodities is the production data of each of these commodities in 2021 with the number of six food crop commodities, namely Corn, Soybeans, Peanuts, sweet potatoes, cassava, and green beans spread across Banggai regency. The results of the LQ analysis of non-rice food crops in Banggai Regency can be seen in Table 1.

According to Rustiadi et al. (2011); Rahman et al. (2015), to find out the LQ value of a non-rice food crop commodity that is base or non-base, then a region will be said to have a base strength on the commodity if the LQ value is > 1, on the contrary, if the LQ is < 1, then it is said that it is not a base force. Furthermore, the results of the analysis of LQ non-rice food crops which are the largest base in Banggai Regency are corn plants found in 18 districts, furthermore, cassava plants

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there are 8 districts, and peanuts, sweet potatoes, and green beans found in 6 districts, and for soybean crops in 5 districts (Table 1). This means that all non-rice food crops can be said to be the leading commodity of the company in each district in Banggai Regency.

Table 1. Results of LQ Analysis of Non-Rice Food Crops in Banggai Regency

District	Non-Rice Food Crops					
	Corn	**Soybeans**	**Peanuts**	**Sweet potato**	**Cassava**	**Green Beans**
Toili	**1.11**	**1.80**	0.67	0.65	0.68	-
Toili West	**1.62**	-	-	-	-	-
Moilong	0.31	**1.84**	0.90	**2.31**	-	-
Batui	**1.29**	**3.22**	-	-	0.87	-
South Batui	**1.62**	-	0.09	-	0.16	-
Bunta	**1.11**	0.15	0.81	0.95	0.94	0.75
Nuhon	-	**2.32**	**1.05**	**2.70**	**2.90**	0.88
Simpang Raya	0.84	0.00	0.27	**1.60**	0.02	0.03
Kintom	**1.45**	-	**7.39**	-	0.95	**23.50**
Luwuk	-	**8.35**	-	**1.67**	-	-
East Luwuk	**1.53**	-	-	-	**3.64**	-
North Luwuk	**1.31**	-	-	-	**12.18**	**2.25**
South Luwuk	**1.58**	-	-	-	**1.86**	-
Nambo	0.20	0.23	-	**2.89**	-	-
Pagimana	**1.44**	0.23	0.21	0.32	0.14	0.10
Bualemo	**1.55**	0.02	0.01	0.14	0.12	0.08
Lobu	**1.26**	-	**17.09**	0.00	**4.04**	-
Lamala	**1.47**	-	-	-	**6.02**	0.28
Masama	**1.17**	-	-	0.89	0.99	-
Mantoh	**1.45**	0.05	**10.67**	0.00	0.15	**1.22**
Balantak	0.76	0.02	**1.30**	**1.64**	**1.27**	**9.71**
South Balantak	**1.21**	-	0.44	0.83	0.24	**1.37**
North Balantak	**1.29**	-	**4.05**	-	**9.78**	**12.04**

Source: Primary Data, 2022

Furthermore, Shift Share Analysis (SSA) to determine competitive advantage, if the commodity results have a positive SSA value (+ > 0), then it is categorized as a commodity that is competitive or has competitiveness from other commodities (Pratama 2020). The results of the SSA calculation on non-rice food commodities in 2017 and 2021 are presented in Table 2.

According to Guslan et al. (2020), positive Shift Share value means that it shows that sector growth at the level of region one is faster than sector growth in the second region (comparison region). The following are the results of the Shift Share Analysis of non-rice food crops in Banggai Regency, where non-rice food crops in each District have positive values (+ > 0) namely corn crops in 19 districts, peanut and sweet potato crops obtained in 10 districts, then green beans obtained in 7 districts, and cassava obtained in 5 districts and soybeans obtained in 2 districts (Table 2). Thus, it can be said that 6 types of non-rice food crops are competitive crops in every District of Banggai Regency. According to Mardiyanti et al. (2021); Wusqa et al. (2022) the value of a positive SSA commodity > 0, then the commodity has the potential to be exported outside the region.

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Table 2. SSA Analysis Results of Non-Rice Food Crops in 2017 and 2021 Banggai Regency

District	Non-Rice Food Crops					
	Corn	Soybeans	Peanuts	Sweet potato	Cassava	Green Beans
Toili	**6.11**	**0.25**	**0.88**	**8.30**	**0.05**	-
Toili West	-0.92	-	-	-	-	**2.49**
Moilong	**1.24**	-	-0.32	**36.60**	-	-
Batui	**12.11**	-	-	-	-0.16	-
South Batui	**2.25**	-	**0.25**	-	-0.40	-
Bunta	**2.85**	-	**0.59**	**10.62**	-0.49	**3.28**
Nuhon	-	-	**1.35**	**12.84**	-0.16	**3.32**
Simpang Raya	**3.43**	-0.96	**1.91**	**22.03**	**0.05**	**2.81**
Kintom	**4.87**	-	-	-	-0.44	-13.81
Luwuk	-	-	-	**94.83**	**0.09**	**2.49**
East Luwuk	**5.71**	-	-	-	0.00	-
North Luwuk	**2.45**	-	-	-	-0.41	-13.93
South Luwuk	**8.07**	-	-	-	-0.10	-
Nambo	0.32	-	-	-	-	-
Pagimana	**15.26**	0.00	**9.59**	-	-0.47	-14.00
Bualemo	**1.71**	-0.87	-0.72	**54.81**	-0.21	**3.19**
Lobu	**3.99**	-	**3.17**	-1.00	-0.66	-
Lamala	**2.38**	-	-	-	-0.37	**2.70**
Masama	**36.42**	-	-	**70.32**	**0.18**	-
Mantoh	**9.31**	**0.62**	**2.88**	-0.95	-0.51	-8.34
Balantak	**2.74**	-	-	**20.71**	-0.15	-13.58
South Balantak	**2.14**	-	**15.86**	**31.68**	**0.24**	-6.24
North Balantak	**4.58**	-	**1.35**	-	-0.26	-14.13

Determination of Superior Non-Rice Food Crops in Banggai Regency

The determination of non-rice superior crops can be seen from the combination of LQ and SSA values. If the LQ value > 1 and the SSA value > 0 (+), the commodity is said to be relatively superior and competitive. The leading commodity has a concentration of activities in certain areas and can supply the supply of goods to other regions and the commodity experiences significant growth over time (Rustiadi et al. 2011; Rahman et al. 2015; Pratama 2020). More details of the analysis of non-rice superior food crops can be seen in Table 3.

Table 3. LQ-SSA Results of Non-Rice Food Crops of Banggai Regency

Non-Rice Featured Commodities	LQ-SSA Region	Number of Subdistricts
Corn	Toili, Batui, Batui South, Bunta, Kintom, Luwuk East, Luwuk North, South Luwuk, Pagimana, Bualemo, Lobu, Lamala, Masama, Mantoh, Balantak South, Balantak North.	16
Sweet potato	Moilong, Nuhon, Simpang Raya, Balantak	5
Peanut	Nuhon, Lobu, Mantoh, North Balantak	4
Soybean	Toili	1

Source: Primary Data, 2022

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The results of the analysis of superior non-rice food crops that are comprehensive and competitive in Banggai Regency, namely corn plants spread across 14 districts (60.9%), sweet potatoes spread across 5 districts (21.7%), peanut plants spread across 4 districts (17.4%) and soybean crops only in 1 district (4.34%) of the total, while for cassava and green bean crops, there are no comparative and competitive advantages. This is evidenced in accordance with the facts on the ground, that farmers in Banggai Regency cultivate the most crops of Corn, Sweet Potatoes, Peanuts, and Soybeans in addition to paddy rice crops. in addition, some people in Banggai Regency also make these plants as daily interlude food. So that the local-based food independence program in Banggai Regency can overcome the food crisis and can meet the needs of the community because the availability of alternative food other than rice is superior in Banggai Regency. In line with Hassan (2014); Wastutiningsih et al. (2020) local food that has the potential to be developed comes from local food sources, such as non-rice food must be developed in accordance with the potential resources owned to meet the needs of its people from the national food crisis (Hujairin et al., 2017).

Determination of Carrying Capacity of Non-Rice Food Crop Land in Banggai Regency

From the results of the LQ-SSA analysis of non-rice food crops in Banggai Regency, results were obtained, namely corn, peanuts, soybeans, and sweet potatoes. Furthermore, an analysis of the carrying capacity of land from superior non-rice food crops in Banggai was carried out, so it can be estimated using production data. According to Yusra et al. (2018), the carrying capacity of the land is largely determined by the area of harvest and production of a crop, the greater the area of crop harvest, the better the carrying capacity of the land. The results of the comparison of this commodity with rice are the basis for determining the surplus or deficit of the carrying capacity of an area (Katili, 2020; Katili and Mihwan, 2021). Furthermore, in determining the carrying capacity of the soil, it is carried out by calculating and comparing the availability of land with land needs. Determination of soil carrying capacity refers to the Regulation of the Minister of Environment No. 17 of 2009. Therefore, the results were obtained from the availability of land (SL) and land needs (DL) for superior non-rice crops in Banggai Regency. The results of the calculation of land carrying capacity can be seen in Table 4.

Table 4. Results of Determining the Carrying Capacity Status of Non-Rice Food Crop Land in Banggai Regency

No.	Commodities	Land Availability	Land Needs	Status DDL
		SL	DL	SL > DL
1	Corn	78,716.49	76,294.74	Surplus
2	Sweet potato	850.42	824.26	Surplus
3	Peanut	7,118.86	6,899.84	Surplus
4	Soybean	35,280.04	34,194.63	Surplus

Source: Primary Data, 2022

According to Putra et al. (2016), The calculation of land carrying capacity is carried out using a production value approach, where the total commodity production value of all produced will be calculated and equated with the price of rice in an area to be assessed (Afni, 2016). The determination of land carrying capacity (Table 4) shows the results of a comparison between the

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availability and land needs of 4 non-rice food crops in Banggai Regency obtained from corn, sweet potatoes, peanuts, and soybeans, namely (SL > DL) so that the carrying capacity of the land is surplus, which means, non-rice food crops are excess. This is because many people cultivate non-rice food crops. The surplus condition shows that the availability of land is still able to meet the need for non-rice food crop production. In addition, according to the facts, the area has a fairly large land availability compared to current needs. Thus, the availability of land in Banggai Regency is still able to meet the needs of decent living per population until the future. In line with research by Maisyaroh (2014), the carrying capacity of agricultural land in the area is in surplus, because the area has a high availability of land compared to its land needs. In addition, factors affecting the carrying capacity of surplus land include 1). High diversity of raw materials in the agricultural sector; 2). Many people work in the agricultural sector; 3). The agricultural sector has comparative and competitive advantages (As-Syakur, 2015). with the availability of land that exceeds the need for land, the Banggai Regency area needs to maintain or even expand the cultivation land of non-rice food crops based on the available land area to increase the carrying capacity of the land in the future.

Determination of Carrying Capacity of Non-Rice Food Agriculture Area of Banggai Regency

The carrying capacity of agricultural areas in general can change, this is because it depends on the factors that affect it. In this case, the population is the main factor that results in exceeding the carrying capacity of agricultural areas. The need for land for crop production is very important because it supports the achievement of regional independence in achieving self-sufficiency in food security both nationally and locally. In this study, the minimum physical requirement (KFM) based on calorie needs per person per day was 2,600 per person per day or 265 kg/person/year (Muta'ali, 2012). With this caloric base, all foodstuffs have been covered in it. Another consideration is that agricultural products are mostly carbohydrates such as rice, corn, cassava, sweet potatoes, soybeans, and peanuts which are the largest sources of calories in the composition of foodstuffs (Misbahuddin, 2015). This basic need is the minimum measure for a person to be able to live normally. The calculation of the carrying capacity of agricultural areas in supporting the non-rice food needs of the people in Banggai regency can be seen in Table 5.

The results of determining the carrying capacity of agricultural areas (Table 5) show that the leading non-rice food crops in the Banggai Regency area are obtained from corn crops, namely (ℓ > 1) so it is assumed that the area can carry out self-sufficiency or be able to provide a decent life for its population. This means that the corn crop can be used as an alternative food substitute for rice or as an interlude food at certain times, this is done to overcome the food crisis in the Banggai district. Furthermore, for sweet potato, peanut, and soybean crops, results were obtained (ℓ < 1) where the region was unable to carry out self-sufficiency. According to Keratorop et al. (2016), This is because the area of agricultural land is still limited. So it is necessary to expand the planting area for these non-rice food crops so that there is an increase in production and can be self-sufficient as an alternative food substitute for rice. On the other hand, the population continues to increase so automatically the need for food will increase (Imansyah et al. 2020). Katili and Mihwan (2021) stated that very rapid population growth requires land as a place to live and activities other than agriculture that support human activities to meet their needs. In line with Akuba et al. (2020) states that the factors that determine the decline in the carrying capacity of agricultural land are population

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growth and diversity of plant types, as well as the percentage of area. So based on the results of the analysis obtained from the carrying capacity of agricultural land in Banggai Regency, a crop that can be prioritized from other superior non-rice food crops is the Corn crop. Thus, the Banggai Regency government, especially the Department of Food Crops, Horticulture and Plantations (TPHP) is expected to focus on implementing and developing corn crops optimal in each district as an alternative to rice in the face of the food crisis in Banggai Regency.

Table 5. Results of Determining the Carrying Capacity of Non-Rice Food Crop Agricultural Areas in Banggai Regency

Commodity	Harvest Area	Population	Minimum Physical Needs (KFM)	Productivity	Carrying Capacity of Agricultural Areas	Status
	ha	person	kg/person/year	kg/ha		
Corn	32,785	376,808	265	4,938.8	1,6	**(ℓ** > 1 < 2,47) the region is able to carry out food self-sufficiency or is able to provide a decent life for its population
Sweet potato	149	376,808	265	457,147.7	0,7	**(ℓ** < 1) the region has not been able to implement self-sufficiency
Peanut	252	376,808	265	54,611.1	0,1	**(ℓ** < 1) the region has not been able to implement self-sufficiency
Soybean	2,153	376,808	265	11,019.5	0,2	**(ℓ** < 1) the region has not been able to implement self-sufficiency

Source: Primary Data, 2022

CONCLUSION AND SUGGESTION

Based on the discussion of the carrying capacity of superior food crops of non-rice food in Banggai Regency, it can be concluded as follows: the results of LQ and SSA analysis in the Banggai Regency area, non-rice food crops which are superior, namely corn plants spread across 14 districts (60.9%), sweet potatoes spread across 5 districts (21.7%), Peanut Plants spread across 4 districts (17.4%) and soybean crops spread across 1 District (4.34%) of the total Regency Banggai. Furthermore, the comparison between the availability of land and the land needs of superior non-

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rice food crop commodities in Banggai Regency obtained the carrying capacity of corn, sweet potato, peanut, and soybean crops experiencing a surplus (SL>DL), Furthermore, the determination of the carrying capacity of agricultural areas for superior non-rice food crops in the Banggai Regency area, obtained corn crop yields, namely ($\ell > 1$), which means that corn crops can be used as alternative food substitutes for rice, to overcome the food crisis due to an increase in the number of residents in Banggai Regency. Furthermore, for sweet potatoes, peanuts, and soybeans, results were obtained ($\ell < 1$), which means that these crops cannot yet be used as an alternative food for rice claimants in Banggai Regency.

From the results of research that has been carried out by the author, it is recommended to the Banggai Regency government, especially the Department of Food Crops, Horticulture and Plantations (TPHP) to be able to set policies for corn crops as superior crops that are used as food self-sufficiency nationally. So that the local government continues to focus on developing corn crops optimally in each district so that it obtains high production. In addition, it can also be used as an alternative food to replace rice, besides that it can also increase the income of the community, especially corn farmers in Banggai Regency.

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