Commodity Analysis of Carbohydrate Food Availability in the Banyumas Regency Area

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ABSTRACT: The study aims to determine the potential of carbohydrate food sources regarding the availability of carbohydrate food sources in Banyumas Regency. The research method is carried out through descriptive research. The data used in this study are primary data sourced from the services or agencies related to the problem being studied, namely the Banyumas Regency BPS, and the Banyumas Regency Agriculture Service. With SPSE analysis. The results of the study concluded that in Banyumas Regency there is availability of carbohydrate food sources, namely rice, corn, and cassava. The suitability of land and climate conditions is the main consideration for farmers to grow rice, corn, and cassava. Dry or marginal land in Banyumas Regency can be planted with one or even all three of these plants. In carbohydrate commodities in the last 5 years, namely in 2019-2023, almost every sub-district has a good food security value. Where these conditions make rice, corn and cassava the main commodities to meet food availability

KEYWORDS: Carbohydrate Commodities, Rice, Corn, Cassava, Food Availability

I. INTRODUCTION

Food is an important and strategic commodity, considering that food is a basic human need (Rozi et al., 2023). At all times in every settlement, food needs to be available, in sufficient quantities, with adequate quality, safe for consumption and at a price that is affordable for the community (Mkhize et al., 2023). Providing food for the entire population is one of the most crucial issues in every country (Odo et al., 2023) states that the most basic need is the need for food. In general, 100% fulfillment, which means that almost all households consume rice. Every era of government in Indonesia has consistently committed to maintaining the availability of domestic rice because of its very important role. In addition to rice, other carbohydrate sources that are commonly consumed are rice, corn, cassava, sweet potatoes, and wheat and its derivatives such as bread and instant noodles (Farida et al., nd). Rice, cassava and sweet potatoes are important commodities in the staple food diversification program (Mulyaningtiyas & Supriyono, 2024a). Meanwhile, according to Law Number 18 of 2012 concerning Food, it is food consumed by the local community in accordance with local wisdom. The policy of food diversification in accordance with local wisdom is based on Presidential Regulation Number 22 of 2009 concerning the Policy for Accelerating the Diversification of Food Consumption Based on Local Resources (Wijayati & Suryana, 2019a).

Each region has different potential resources. Banyumas Regency has a very diverse variety of food (Floresti et al., 2023). Several important raw materials that support the food security system are developed here on a large scale, including plants containing carbohydrates, rice, corn, cassava, and sweet potatoes (Mulyaningtiyas & Supriyono, 2024b). So that in every sub-district of Banyumas Regency must have fulfillment and income for special needs in carbohydrates. Household income will increase the amount demanded at a certain price level (Odo et al., 2023). The nature of food consumption generally has positive income elasticity. The nature of carbohydrate food consumption is interrelated. This relationship can be known through cross elasticity which describes the percentage change in the amount of commodities demanded (Rozi et al., 2023). Through cross elasticity, the direction of changes in consumer preferences can be determined when the price of one of the carbohydrate-source food commodities increases (Mulyaningtiyas & Supriyono, 2024a). This can happen either due to internal factors such as reduced foreign exchange or external factors such as limited supply in the international market (Panunggul et al., 2023). In Indonesia, according to the Center for Agricultural Data and Information Systems of the Ministry of Agriculture (Pusdatin Kementan 2018),

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in 2018, rice consumption/capita was 81.60 kg, down from 2017 which was 86.82 kg (Qinthara et al., 2024). The data shows that there is a change in the pattern of carbohydrate food consumption from rice to other carbohydrate sources.

The availability of food is indeed very important, especially to meet daily food needs, so an analysis to see the availability of food in Banyumas Regency is indeed necessary, with the condition of the area already densely urbanized, it does not rule out the possibility that farmers can still plant carbohydrates. Research on food availability is always needed from time to time because consumer preferences are always changing following changes in economic capacity and community knowledge (Fatkhan & Chasanah, 2024). One important issue is whether food availability is sufficient to complete the source of carbohydrates in the community, which has never been studied significantly (Qinthara et al., 2024). Analysis of carbohydrate food consumption is very important to provide information in formulating policies related to increasing carbohydrate food consumption (Wijayati & Suryana, 2019b). Therefore, this study aims to analyze the availability of carbohydrate sources on a district scale by considering the future food availability of each sub-district in Banyumas Regency.

II. METHOD

The research method was carried out through descriptive research (Rustamana et al., 2024), the data used in this study are primary data sourced from the service or agency related to the problem being studied. The data obtained in this study are related to the potential and availability of local food sources of carbohydrates, rice, corn, and cassava. This study was analyzed using SPSE food security analysis (Aprianti & Chairuddin, 2024), with the following formula:

$$SPSE = \frac{\{(1-F) \times O - T \times L\}(V \times B \times E) \times 10.000}{U \times 365}$$

Information :
F : Correction factor for feed, losses, industry
O : Production (tons)
T : Correction Factor for Seeds
L : Planted area (ha)
V : Conversion value of paddy to rice = 0.68
B : Edible parts
E : Energy Content
U : Population

There are 3 (three) levels of balance between Supply and Demand:
- Food Security: S > D, SPSE > 1
- Balanced: S=D. SPSE =1
- Food Insecurity: S < D, SPSE < 1

The results of this analysis can describe the availability of non-rice carbohydrate food sources in Banyumas Regency from 2019-2023.

III. RESULTS

Based on the results of the analysis of food security of carbohydrate source foods, the following results were obtained:

Table 1. SPSE Value of Rice Commodity

No.	SUBDISTRICT	PADDY				
		2019	2020	2021	2022	2023
1	Lumbier	0.84	1.61	0.89	0.85	0.85
2	Wangon	1.02	1.04	1.24	1.11	1.04
3	Jatiluwih	1.53	1.58	1.25	0.6	1.58
4	Rawalo	1.56	1.61	1.16	1.61	1.61
5	Basement	0.7	0.9	1.21	1.19	0.9
6	Kemranjen	1.55	1.58	1.47	0.89	1.58
7	Sumpiuh	1.4	1.5	1.43	1.5	1.5
8	Pond	1.79	1.89	1.3	1.89	1.89
9	Somagede	0.6	1.04	1.21	0.76	0.76
10	Kalibagor	1.9	1.58	1.47	1.11	1.11

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11	Banyumas	0.5	1.61	1.43	0.6	0.6
12	The King	1.54	0.9	1.3	1.61	1.61
13	Purworejo	1.1	1.58	1.19	1.19	1.19
14	The Good	0.75	1.5	0.89	0.24	0.89
15	Gumelar	1.22	1.89	1.21	0.11	1.24
16	The Headmaster	1.19	0.9	1.43	0.35	1.25
17	The Climbing	1.13	1.58	1.3	1.47	1.16
18	Karanglewas	1.02	1.5	1.21	1.43	1.07
19	Bullfighting	1.12	1.89	1.47	1.3	1.21
20	Baturraden	1.22	1.04	1.43	1.16	1.47
21	Discordant	1.32	1.61	1.3	0.18	1.43
22	Twins	1.1	0.9	1.3	1.3	1.3
23	Sokara	1.09	1.58	1.16	1.16	1.16
24	South Purwokerto	0.1	1.5	1.19	1.89	0.18
25	West Purwokerto	0.19	1.89	0.89	0.76	0.24
26	East Purwokerto	0.09	0.9	1.24	1.11	0.11
27	North Purwokerto	0.23	1.89	1.25	0.6	0.35

Based on the SPSE analysis that has been carried out on rice commodity production in Banyumas Regency, the SPSE value can be seen in Table 4. The SPSE value is used to determine the level of regional food availability in Banyumas Regency. Based on Table 4, in the last 5 years of rice commodities, namely in 2019-2024, almost every sub-district has a good food security value. In 2019, there were 18 sub-districts that were considered to have good food availability (SPSE> 1), namely Wangon, Jatilawang, Rawalo, Kemranjen, Sumpiuh, Tambak, Kalibagor, Patikraja, Purwojati, Gumelar, Pekuncen, Cilongok, Karangluwas, Kedungbanteng, Baturaden, Sumbang, Kembaran, and Sokaraja Districts. In 2020, there were 22 sub-districts that had good food availability (SPSE >1), namely Wangon, Jatilawang, Rawalo, Kemranjen, Sumpiuh, Tambak, Somagede, Kalibagor, Banyumas, Purwojati, Ajibarang, Gumelar, Cilongok, Karanglewas, Kedungbanteng, Baturaden, Sumbang, Sokaraja, South Purwokerto, West Purwokerto and North Purwokerto. In 2021, there were 24 sub-districts that had good food availability (SPSE >1), namely Wangon, Jatilawang, Rawalo, Kebasen, Sumpiuh, Tambak, Somagede, Kalibagor, Patikraja, Purwojati, Gumelar, Pekuncen, Cilongok, Karanglewas, Kedungbanteng, Baturraden, Sumbang, Kembaran, Sokaraja, South Purwokerto, East Purwokerto, North Purwokerto. In 2022, there were 17 sub-districts that had SPSE values >1, namely Wangon, Rawalo, Kebasen, Sumpiuh, Tambak, Somagede, Kalibagor, Patikraja, Purwojati, Cilongok, Karanglewas, Kedungbanteng, Baturraden, Kembaran, Sokaraja, South Purwokerto, East Purwokerto. In 2023, there will be 18 sub-districts that have good rice food availability (SPSE > 1), namely Wangon, Jatilawang, Rawalo, Kemranjen, Sumpiuh, Tambak, Kalibagor, Patikraja, Purwojati, Gumelar, Pekuncen, Cilongok, Karanglewas, Kedungbanteng, Baturraden, Sumbang, Kembaran, Sokaraja.

Table 2. SPSE Value of Corn Commodity

No.	SUBDISTRICT	CORN				
		2019	2020	2021	2022	2023
1	Lumbier	0.01	0.01	0.02	0.01	0.01
2	Wangon	0.02	0.01	0.1	0.01	0.01
3	Jatiluwih	0.01	0.01	0.01	0.01	0.01
4	Rawalo	0	0	0	0	0
5	Basement	0	0	0	0	0
6	Kemranjen	0	0	0	0	0
7	Sumpiuh	0.02	0.02	0.02	0.02	0.02
8	Pond	0	0	0	0	0
9	Somagede	0.07	0.07	0.07	0.07	0.07
10	Kalibagor	1.3	1.6	2.1	1.4	1.6
11	Banyumas	0.01	0.01	0.01	0.01	0.01
12	The King	0	0	0	0	0

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13	Purworejo	0.01	0.06	0.06	0.06	0.06
14	The Good	0.01	0.65	0.02	0.02	0.02
15	Gumelar	1.5	1.5	0.9	1.4	1.5
16	The Headmaster	0.06	0.02	0.02	0.02	0.02
17	The Climbing	0.02	0.01	0.01	0.01	0.01
18	Karanglewas	0.06	0.01	0.01	0.01	0.01
19	Bullfighting	0	0	0	0	0
20	Baturraden	0.02	0.02	0.07	0.02	0.02
21	Discordant	1.6	1.7	1.4	1.1	1.7
22	Twins	2.0	1.9	1.2	1.3	1.9
23	Sokara	0.01	0.01	0.02	0.03	0.03
24	South Purwokerto	0	0	0	0	0
25	West Purwokerto	0	0	0	0	0
26	East Purwokerto	2.0	3.8	1.4	2.0	3.8
27	North Purwokerto	1.7	3.2	1.7	3.1	3.2

Based on the SPSE analysis in Table 5. It can be seen that there are 6 sub-districts that have an SPSE value of >1 in 2019-2020 and 2022-2023. These sub-districts are Gumelar, Sumbang, Kembaran, East Purwokerto and North Purwokerto. Meanwhile, in 2019 there was a change in Gumelar sub-district, which initially had an SPSE value of >1, in 2019 there was a decrease in production, so that in 2021 the SPSE value was <1. So it can be concluded that based on the SPSE calculation there are 6 sub-districts that have a good level of food availability in 2019, 2020, 2022, and 2023, while in 2021 there are only 5 sub-districts that have a good level of food availability.

Table 3. SPSE Value of Cassava Commodity

No.	SUBDISTRICT	CASSAVA				
		2019	2020	2021	2022	2023
1	Lumbier	1.31	1.49	1.06	1.46	1.49
2	Wangon	0.06	0.27	0.02	0.33	0.27
3	Jatiluwih	0.33	0.54	0.08	0.34	0.54
4	Rawalo	0.27	0.06	0.06	0.26	0.06
5	Basement	1.6	1.6	0.9	1.1	1.2
6	Kemranjen	0.14	0.26	1.49	0.34	0.27
7	Sumpiuh	0.94	0.08	1.49	0.26	0.46
8	Pond	0.16	0.27	0.27	0.08	0.23
9	Somagede	1.94	0.54	0.54	0.94	0.56
10	Kalibagor	0.1	0.06	0.06	0.12	0.34
11	Banyumas	0.26	0.34	0.02	0.02	0.26
12	The King	0.08	0.26	0.08	0.14	0.08
13	Purworejo	1.3	1.3	1.6	1.7	0.0
14	The Good	1.3	1.3	1.0	0.7	0.7
15	Gumelar	1.94	0.06	1.49	0.01	1.94
16	The Headmaster	0.1	0.34	0.27	0.01	0.1
17	The Climbing	0.27	0.54	0.54	0.12	0.38
18	Karanglewas	0.54	0.06	0.06	0.02	0.14
19	Bullfighting	0.06	0.26	0.12	0.01	0.01
20	Baturraden	0.33	0.27	0.01	0.01	0.01
21	Discordant	0.27	0.54	0.1	0.12	0.12
22	Twins	0.46	0.06	0.38	0.02	0.02
23	Sokara	0.14	0.34	0.14	0.14	0.14
24	South Purwokerto	0	0	0	0	0

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25	West Purwokerto	0.01	0.01	0.01	0.01	0.01
26	East Purwokerto	0	0	0	0	0
27	North Purwokerto	0	0	0	0	0

Based on the SPSE analysis in Table 6. There are 6 sub-districts that have SPSE values > 1 in 2019, namely Lumbir, Kebasen, Somagede, Purwojati, Ajibarang and Gumelar sub-districts. In 2020 there are 4 sub-districts that have SPSE values > 1, namely Lumbir, Kebasen, Purwojati, Ajibarang sub-districts. In 2021 there are 6 sub-districts that have SPSE values > 1, namely Lumbir, Kemranjen, Sumpiuh, Purwojati, Ajibarang, and Gumelar. In 2022 there are 3 sub-districts that have SPSE values > 1, namely Purwojati, Kebasen, and Lumbir. While in 2023 there are 3 sub-districts that have SPSE values > 1, namely Gumelar, Kebasen, and Lumbir sub-districts. So it can be said that the sub-districts that had good food availability in 2019 were Lumbir, Kebasen, Somagede, Purwojati, Ajibarang and Gumelar sub-districts, in 2020, namely Lumbir, Kebasen, Purwojati, Ajibarang, in 2021, namely Lumbir, Kemranjen, Sumpiuh, Purwojati, Ajibarang, and Gumela, in 2022, namely Purwojati, Kebasen, and Lumbir, in 2023 namely Gumelar, Kebasen, and Lumbir. This is in accordance with the withdrawal of the SPSE value decision, if the SPS value ≥ 1, then an area is said to have sufficient food availability, while if the SPSE value <1, then it can be said that an area still does not have enough food.

IV. DISCUSSION

Based on the analysis above, it is known that in the last 5 years, namely in 2019-2024, almost every sub-district has a good food security value. Where this condition makes rice the main commodity. Food availability cannot be separated from the existence of potential natural resources supported by research. In rice cultivation, it is also known as dryland rice cultivation (Khatri et al., 2024). This cultivation is carried out on dry agricultural land such as fields or dry fields which have many irrigation channels, so that the fulfillment of water needs is very significant (Bwire et al., 2024). Although the amount of harvest area, production and productivity are not as large as other regencies, dryland rice can be an alternative pattern of rice cultivation farming which until now is still a source of carbohydrate food that is widely consumed, especially by the people of Banyumas Regency. So it can be concluded that the availability of rice food as a carbohydrate commodity is quite good and is a top priority sector in the planning of economic development of Banyumas Regency.

Corn commodities in Banyumas Regency have a high level of food needs. Corn commodities are the third highest production commodity when compared to other carbohydrate source commodities in Banyumas Regency. Although classified as 3rd, corn is a staple food that is widely used by the community. This condition can be seen from the corn harvest which can be done 4-5 times in well-maintained and good conditions (Mayo & Villarta, 2023). It is often seen that the character of corn plants does not require much water and this plant is very suitable for planting in dry environments, although Banyumas Regency has a rare soil culture in dry conditions, but a good and well-maintained cultivation system actually increases the harvest (Koryati et al., 2022). Not all corn is planted in Banyumas Regency, but farmers choose corn seeds that are cultivated to meet the needs of food sources of carbohydrates for the community, especially rural communities, but are more widely used for mixed or composite materials in animal feed. However, efforts to continue to introduce corn as a non-rice carbohydrate source continue to be carried out by both the government and the private sector. Corn plants require good aeration and drainage so that soil loosening is needed (Utami & Budiningsih, 2015). In general, land preparation for corn plants is done by plowing to a depth of 15-20 cm, followed by harrowing the soil until it is even (Koryati et al., 2022). When preparing the land, the soil should not be too wet but moist enough so that it is easy to work and not sticky (Utami & Budiningsih, 2015). For heavy soil types with excess, it is necessary to make drainage channels, with these results it is concluded that by looking at natural conditions and analyzing corn commodities, it can be used to fulfill good food needs in the Banyumas Regency area.

Until now, some Indonesian people consider cassava to be a secondary corps or second class commodity (Utami & Budiningsih, 2015). Cassava is more widely known, cultivated and processed for the fulfillment of staple foods and snacks. Easy and cheap cultivation techniques are the main considerations for many farmers in Banyumas Regency to choose this plant compared to other types of tubers or others. Moreover, many areas in Banyumas Regency are included in the category of marginal land or dry land, especially the Wangon, Ajibarang, and Gumelar areas. So cassava is very suitable for cultivation both in mass on large land and on a household scale in yards or gardens (Sari et al., 2024). The amount of local food source production shows the amount of food available for household consumption and industry needs (Zaid et al., 2024). With the availability of abundant food, cassava has become an alternative for the community to replace rice carbohydrates, where cassava is very easy to plant and cultivate, even with limited land conditions, you can plant and produce abundant cassava so that cassava in Banyumas Regency has increased from year to year.

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V. CONCLUSIONS

Based on the analysis above, it is known that in the last 5 years, namely in 2019-2023, almost every sub-district has a good food security value. Where this condition makes rice, corn and cassava the main commodities to meet food availability. This condition is seen from the harvest from each year experiencing stability and there are areas that have increased. With these results, it is concluded that by looking at natural conditions and analyzing the right carbohydrate commodities, it can be used to meet good food needs in the Banyumas Regency area.

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