

# Analysis of Local Food Security Based on Supply Chain Management: Case Study of Rice Availability and Needs in Bojonegoro Regency in 2024

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Article history: Received May 13, 2025; revised June 27, 2025; accepted July 22, 2025

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## ABSTRACT

*Objective*-This study aims to analyze the balance between rice availability and demand across 28 districts in the Bojonegoro Regency in 2024 by using the availability-to-demand (A/D) ratio as an indicator of local food security. *Design/methodology/approach* – Using a quantitative descriptive method, this study utilizes secondary data from the Central Statistics Agency (BPS) and the National Food Agency. The analysis included rice production, population data, and consumption levels to calculate rice availability, rice demand, and A/D ratios in each district. *Findings* – The results show that 26 districts (92.86%) are in a rice surplus condition, while two districts (7.14%), Bojonegoro and Sekar, are in deficit. Kalitidu district recorded the highest A/D ratio of 14.20, whereas Bojonegoro and Sekar had the lowest at 0.79 and 0.67 respectively. These disparities highlighted the uneven spatial distribution of food availability. *Research limitations/implications* – This study focuses solely on rice as a staple food and uses regional-level data from the Bojonegoro Regency for 2024. Future research can expand the scope to include other staple commodities and multiple time periods for a longitudinal analysis. *Practical implications*: The A/D ratio serves as an effective tool for identifying surplus and deficit regions, which can inform local food distribution policies, emergency stock planning, and targeted agricultural development. *Originality/value* – This study contributes to the literature by applying the A/D ratio as a spatial indicator for food security assessment at the district level, offering practical insights for policymakers to manage surplus and deficit conditions more effectively

## INTRODUCTION

Food is a basic human need that has a strategic role in realizing national resilience, from social, economic, and political aspects. Law Number 18 of 2012 concerning food states that the state is obliged to realize the availability, affordability, and fulfillment of food consumption, both at the national and regional levels, to individuals evenly. Food Availability is a basic subsystem of food security.

The food security system is influenced by several interacting factors, including population growth, climate change, resource use, consumption patterns, governance, resource allocation, distribution issues that are under pressure and uncertainty, land use, environmental consequences, and social acceptance. (Melkonyan et al., 2017) (Lovell, 2010). Food security, especially rice self-sufficiency, is a challenge for the Indonesian government because of dynamic conditions and changes in the factors in each period. Therefore, planning is required for a policy system with knowledge and observation of the dynamics of the system as a whole (Fristovana et al., 2020).

FAO states that the dimensions of food security consist of four aspects: food availability, food access, utilization, and stability. The four indicators describe several aspects, including supply, demand, distribution, utilization, and efforts to maintain the price stability of food commodities. Based on this understanding, we can conclude that food security includes several aspects: (1) adequate food availability, (2) affordable access to food, (3) utilization of food, and (4) food price stability.

Food availability can be met from domestic production or imports for certain food commodities that cannot yet be met from domestic production (National Food Agency, 2024).

Among the various food commodities, rice is the staple food for most of the Indonesian population. Therefore, the availability of sufficient and even rice distribution is an important indicator for ensuring food security in a region or country (FAO, 2021).

At the national level, the government has launched various strategies to maintain the stability of the rice supply and prices, including increasing domestic production, optimizing distribution, and strengthening government food reserves. However, challenges remain due to climate fluctuations, land conversion, dependence on traditional agricultural systems, and increasingly complex supply chain disruptions (National Food Agency, 2023). Therefore, analysis at the regional level is important for identifying the potential, challenges, and projections of rice needs and availability more accurately and contextually.

Bojonegoro Regency is an agricultural area in the East Java Province that significantly contributes to rice production. Based on BPS data (2024), Bojonegoro is the third largest rice producer in East Java after the Ngawi Regency and Lamongan Regency, with most people depending on their livelihoods in the agricultural sector. However, population growth, consumption dynamics, and extreme climate change also affect the balance between rice availability and demand in this region. The population of 1,363,058 people (BPS, 2024) is a factor that influences most of the rice needs of households in Bojonegoro Regency. If food availability is lacking because demand is greater than production, it will result in price fluctuations and even social stability problems (National Food Agency, 2024).

Analysis of rice availability and needs at the regional level, such as in Bojonegoro, is important not only to ensure local food sufficiency but also as a basis for formulating regional and national food distribution policies. Several studies have shown that the mismatch between production and consumption needs can lead to vulnerability to food inflation, dependence on supplies from outside the region, and decreased farmer welfare (Suryana & Hermanto, 2020; Fitriani et al., 2022).

## THEORETICAL STUDY AND RESEARCH MODEL

### 1. Food security

Food security is defined as a condition in which households have sufficient food, both in quantity and quality, safe, evenly distributed, and affordable (Law of the Republic of Indonesia Number 18 of 2012 concerning food). FAO (2009) details the four main dimensions of food security: availability, access, utilization, and stability. These four aspects are interrelated and form the foundation for sustainable food security policies.

Maxwell and Smith (1992) emphasized that inequality in one dimension, such as availability, can weaken the overall food security system, especially in areas with high production fluctuations.

#### 1) *Availability and Need for Rice*

Rice availability is the total amount of rice produced in the harvest area and the agricultural productivity. Conversely, rice needs are calculated based on population and per capita consumption levels. The mismatch between these two components causes a surplus (excess) or deficit (shortage) of rice (National Food Agency, 2024; Fitriani et al., 2022).

#### 2) *Imbalance of Food Surplus and Deficit*

The mismatch between food availability and demand can lead to food inflation, dependence on external supplies, and a decline in farmers' welfare (Lovell, 2010; World Bank, 2008). Dewi, Arifin, and Susilowati (2020) noted that areas in food surplus provinces can also experience deficits at the sub-district level, especially if there are land conversion or irrigation limitations. This imbalance emphasizes the importance of a local (micro) analysis approach for identifying vulnerable food areas more precisely.

#### 3) *Ratio Availability-to-Demand (A/D Ratio)*

This ratio was used to measure the balance between availability and need. An A/D value  $> 1$  indicates a surplus, whereas an A/D value  $< 1$  indicates a deficit. This ratio can be used as an indicator of local food security status and as the basis for the regional classification of policy formulation (Suryana & Hermanto, 2020).

#### 4) *Food Supply Chain Management and Surplus/Deficit Management*

Rice surplus and deficit are conditions of imbalance between production and consumption in a region. A surplus occurs when production exceeds consumption needs, whereas a deficit occurs when needs exceed production (Suryana & Hermanto, 2020). In the food management framework, this situation is closely related to production planning, distribution, and stock control.

According to Soeharjo and Widi (2019), food availability management in surplus areas needs to be directed to maintain distribution efficiency and avoid excess stock, which can lower prices at the farmer level.

Conversely, deficit areas require an adaptive logistics management approach so that supplies from other areas can be received on time with efficient logistics costs.

Food supply chain management is an important instrument for addressing this imbalance. Chopra and Meindl (2016) state that distribution network planning and demand planning play a vital role in bridging the gap between surplus and deficit.

Furthermore, a study by Simatupang and Sridharan (2005) explains that collaborative management between producers, distributors, and the government can increase the responsiveness of regional food systems. In the context of rice, strengthening regional-based information systems and increasing coordination between regions (e.g., through inter-regional rice reserves) is necessary to maintain price stability and reduce dependence on external supplies.

Surplus management is closely related to national food procurement and reserve policy. According to the National Food Agency (2023), areas with high surpluses can be integrated as regional rice reserve centers with a government scheme to purchase farmers' harvests to maintain price and supply stability in deficit areas.

## RESEARCH METHODS

This research is a quantitative research by presenting a discussion based on data provided by an authorized agency, so the analysis technique used is quantitative descriptive analysis using secondary data. Secondary data were collected by inventorying documents from the Bojonegoro Regency in Figures (BPS, 2024) and the Food Security and Agriculture Service of Bojonegoro Regency.

Researchers used a research model by calculating the availability and need for rice, referring to the Technical Instructions published by the National Food Agency in 2024, as follows:

### 1. Availability of Rice

**Table 1**  
**Conversion Rate of GKG to Ready-to-Eat Rice in 2024**

No	Uraian	Konversi	Penghitungan	Satuan	Sumber
1	Produksi GKG			Ton	KSA BPS
2	Penggunaan GKG	0,0682	0,0682 x (1)		NBM
	a. Bibit/Benih	0,0090	0,0090 x (1)	Ton	
	b. Pakan Ternak	0,0044	0,0044 x (1)	Ton	
	c. Bahan Baku Industri Non Makanan	0,0056	0,0056 x (1)	Ton	
	d. Susut/tercecer	0,0492	0,0492 x (1)	Ton	
3	GKG yang Diolah Menjadi Beras		(1) - (2)	Ton	
4	Produksi Beras	lampiran 13	(3) x konversi	Ton	SKGB 2018
5	Penggunaan Beras Untuk Non Pangan	0,0333	0,0333 x (4)	Ton	NBM
	a. Pakan Ternak/Unggas	0,0017	0,0017 x (4)	Ton	
	b. Industri Non Makanan	0,0066	0,0066 x (4)	Ton	
	c. Tercecer/susut	0,0250	0,025 x (4)	Ton	
6	Produksi Beras Siap Konsumsi		(4) - (5)	Ton	

Keterangan:

KSA = Kerangka Sample Area

NBM = Neraca Bahan Makanan

SKGB = Survei Konversi Gabah Beras

Source: Bapanas, 2024

## 2. Rice Needs

**Table 2**  
**Consumption Figures for Rice Needs in 2024**

Uraian	Angka Konsumsi	Sumber Data
Konsumsi Rumah Tangga (RT)	Angka susenas nasional/provinsi/kabupaten/kota (Kg/Kap/Th)	Susenas Triwulan I BPS
Konsumsi nonRumah Tangga (nonRT)	Angka survei Bapok provinsi (Kg/Kap/Th)	Survei Bapok BPS 2017

Source: Bapanas, 2024

### 5) *Ratio Availability-to-Demand (A/D Ratio)*

The availability-to-demand (A/D) ratio is a quantitative indicator used to measure the adequacy of rice availability to meet consumption needs in a region within a certain period.

A/D Ratio Formula:

$$\text{A/D Ratio} = \frac{\text{Rice Consumption Needs (tons)}}{\text{Rice Availability (tons)}}$$

### Interpretation of A/D Ratio Value:

#### A/D Ratio

#### Interpretation

$A/D > 1$  Surplus → Rice availability exceeds consumption needs.

$A/D = 1$  Balanced → Availability is equal to consumption needs.

$A/D < 1$  Deficit → Consumption needs are greater than availability.

## RESULTS AND ANALYSIS

Rice Availability was calculated based on the Production of Dry Milled Grain (GKG) in 28 districts minus the GKG Needs, which included Animal Feed, Seeds, Non-Food Industry, and Scattered/Shrinkage. The results of this calculation were then converted into Rice Production with a conversion rate of 64.02%, and the following results were obtained:

**Table 3**  
**Availability of GKG Bojonegoro Regency in 2024**

NO	KECAMATAN	PROD. GKG (TON)	KEBUTUHAN GKG (Ton)				KETERSEDIAAN GKG (TON)	PRODUKSI BERAS (TON)
			PAKAN TERNAK	BENIH	INDUSTRI NON MAKANAN	TERCECER/SUSUT		
1	MARGOMULYO	5.551,04	24,42	49,96	31,09	273,11	5.172,46	3.311,41
2	NGRAHO	31.765,89	139,77	285,89	177,89	1.562,88	29.599,45	18.949,57
3	TAMBAKREJO	26.848,53	118,13	241,64	150,35	1.320,95	25.017,46	16.016,18
4	NGAMBON	3.590,33	15,80	32,31	20,11	176,64	3.345,47	2.141,77
5	SEKAR	3.138,77	13,81	28,25	17,58	154,43	2.924,71	1.872,40
6	BUBULAN	4.179,87	18,39	37,62	23,41	205,65	3.894,80	2.493,45
7	GONDANG	11.074,15	48,73	99,67	62,02	544,85	10.318,90	6.606,16
8	TEMAYANG	17.182,22	75,60	154,64	96,22	845,37	16.010,40	10.249,86
9	SUGIHWARAS	21.363,40	94,00	192,27	119,64	1.051,08	19.906,42	12.744,09
10	KEDUNGADAM	56.032,60	246,54	504,29	313,78	2.756,80	52.211,18	33.425,60
11	KEPOHBARU	62.490,26	274,96	562,41	349,95	3.074,52	58.228,42	37.277,84
12	BAURENO	44.224,79	194,59	398,02	247,66	2.175,86	41.208,66	26.381,78
13	KANOR	57.037,07	250,96	513,33	319,41	2.806,22	53.147,14	34.024,80
14	SUMBERREJO	63.456,09	279,21	571,10	355,35	3.122,04	59.128,38	37.853,99
15	BALEN	46.499,39	204,60	418,49	260,40	2.287,77	43.328,13	27.738,67
16	SUKOSEWU	41.980,77	184,72	377,83	235,09	2.065,45	39.117,68	25.043,14
17	KAPAS	44.351,04	195,14	399,16	248,37	2.182,07	41.326,30	26.457,10
18	BOJONEGORO	11.277,00	49,62	101,49	63,15	554,83	10.507,91	6.727,16
19	TRUCUK	18.606,83	81,87	167,46	104,20	915,46	17.337,84	11.099,69
20	DANDER	55.861,07	245,79	502,75	312,82	2.748,36	52.051,34	33.323,27
21	NGASEM	55.112,99	242,50	496,02	308,63	2.711,56	51.354,28	32.877,01
22	KALITIDU	78.747,73	346,49	708,73	440,99	3.874,39	73.377,13	46.976,04
23	GAYAM	31.162,46	137,11	280,46	174,51	1.533,19	29.037,18	18.589,60
24	MALO	28.487,47	125,34	256,39	159,53	1.401,58	26.544,62	16.993,87
25	PURWOSARI	7.970,78	35,07	71,74	44,64	392,16	7.427,17	4.754,87
26	PADANGAN	26.173,86	115,16	235,56	146,57	1.287,75	24.388,80	15.613,71
27	KASIMAN	25.181,07	110,80	226,63	141,01	1.238,91	23.463,72	15.021,47
28	KEDEWAN	3.767,50	16,58	33,91	21,10	185,36	3.510,55	2.247,46
KABUPATEN BOJONEGORO		883.114,95	3.885,71	7.948,03	4.945,44	43.449,26	822.886,51	526.811,94

Source: DKPP Bojonegoro, 2024

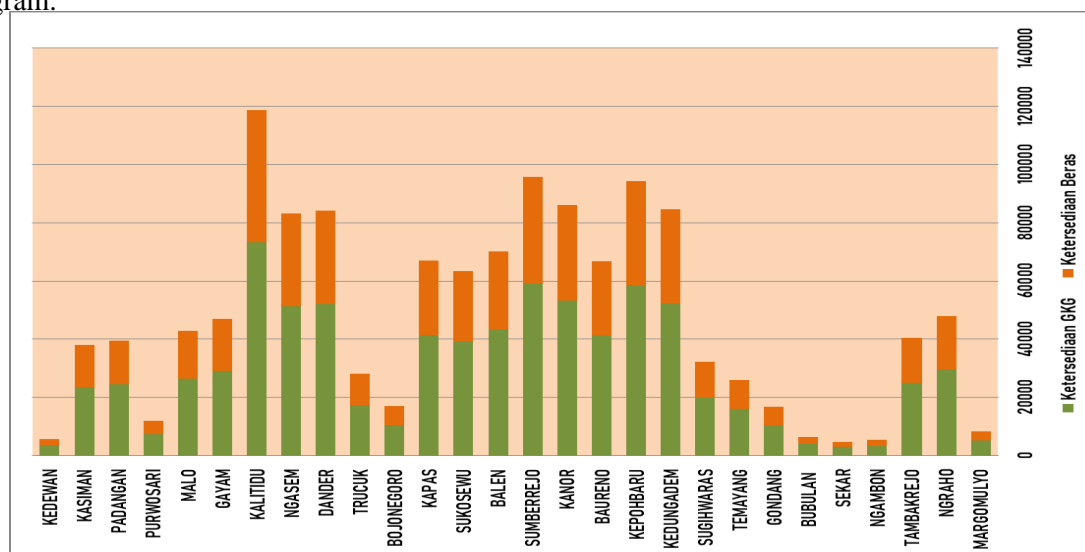
Next, rice production is reduced by rice requirements which include animal feed, non-food industry, and scattered/shrinkage, then the rice availability figure is obtained as in the following table:

**Table 4**  
**Availability of Rice in Bojonegoro Regency in 2024**

NO	KECAMATAN	PRODUKSI BERAS (TON)	KEBUTUHAN BERAS (Ton)			KETERSEDIAAN BERAS (TON)
			PAKAN TERNAK	INDUSTRI NON MAKANAN	TERCECER /SUSUT	
1	MARGOMULYO	3.311,41	5,63	21,86	82,79	3.201,14
2	NGRAHO	18.949,57	32,21	125,07	473,74	18.318,55
3	TAMBAKREJO	16.016,18	27,23	105,71	400,40	15.482,84
4	NGAMBON	2.141,77	3,64	14,14	53,54	2.070,45
5	SEKAR	1.872,40	3,18	12,36	46,81	1.810,05
6	BUBULAN	2.493,45	4,24	16,46	62,34	2.410,42
7	GONDANG	6.606,16	11,23	43,60	165,15	6.386,17
8	TEMAYANG	10.249,86	17,42	67,65	256,25	9.908,53
9	SUGIHWARAS	12.744,09	21,66	84,11	318,60	12.319,71
10	KEDUNGADDEM	33.425,60	56,82	220,61	835,64	32.312,52
11	KEPOHBARU	37.277,84	63,37	246,03	931,95	36.036,48
12	BAURENO	26.381,78	44,85	174,12	659,54	25.503,27
13	KANOR	34.024,80	57,84	224,56	850,62	32.891,78
14	SUMBERREJO	37.853,99	64,35	249,84	946,35	36.593,45
15	BALEN	27.738,67	47,16	183,08	693,47	26.814,97
16	SUKOSEWU	25.043,14	42,57	165,28	626,08	24.209,20
17	KAPAS	26.457,10	44,98	174,62	661,43	25.576,08
18	BOJONEGORO	6.727,16	11,44	44,40	168,18	6.503,15
19	TRUCUK	11.099,69	18,87	73,26	277,49	10.730,07
20	DANDER	33.323,27	56,65	219,93	833,08	32.213,60
21	NGASEM	32.877,01	55,89	216,99	821,93	31.782,21
22	KALITIDU	46.976,04	79,86	310,04	1.174,40	45.411,74
23	GAYAM	18.589,60	31,60	122,69	464,74	17.970,57
24	MALO	16.993,87	28,89	112,16	424,85	16.427,97
25	PURWOSARI	4.754,87	8,08	31,38	118,87	4.596,54
26	PADANGAN	15.613,71	26,54	103,05	390,34	15.093,77
27	KASIMAN	15.021,47	25,54	99,14	375,54	14.521,26
28	KEDEWAN	2.247,46	3,82	14,83	56,19	2.172,62
					-	
	<b>KABUPATEN BOJONEGORO</b>	<b>526.811,94</b>	<b>895,58</b>	<b>3.476,96</b>	<b>13.170,30</b>	<b>509.269,11</b>

Source: DKPP Bojonegoro, 2024

The availability of GKG and rice in Bojonegoro Regency in 2024 is further presented in the following diagram:



Source: DKPP Bojonegoro, 2024

Figure 1. Availability of GKG and Availability of Rice in Bojonegoro Regency in 2024

The rice needs of Bojonegoro Regency in 2025 consist of household (RT) and non-household (nonRT) consumption multiplied by the population, as shown in the following table:

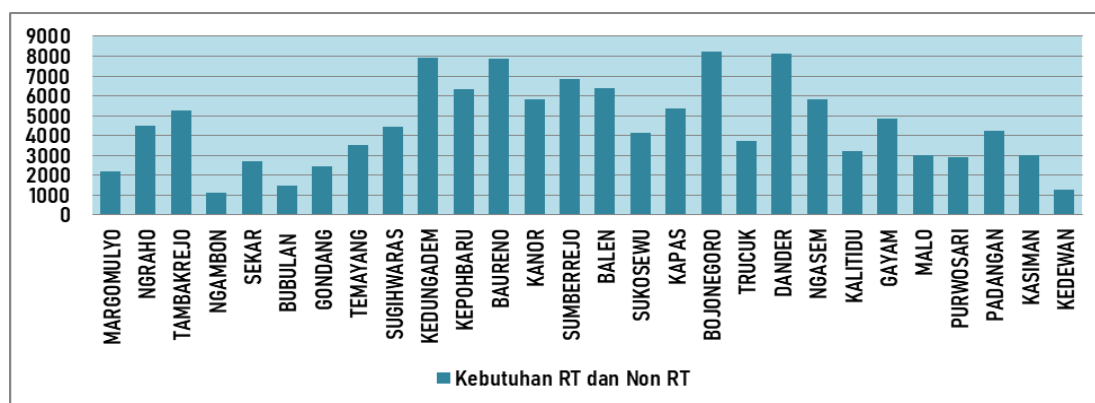
**Table 5**  
**Rice Needs of Bojonegoro Regency in 2024**

NO	KECAMATAN	JUMLAH PENDUDUK (JIWA)	KEBUTUHAN RT dan NON RT
1	MARGOMULYO	23.403	2.177,85
2	NGRAHO	48.362	4.500,50
3	TAMBAKREJO	56.583	5.265,53
4	NGAMBON	11.944	1.111,49
5	SEKAR	28.845	2.684,27
6	BUBULAN	15.700	1.461,02
7	GONDANG	26.570	2.472,57
8	TEMAYANG	37.897	3.526,64
9	SUGIHWARAS	47.798	4.448,01
10	KEDUNGADAM	85.289	7.936,87
11	KEPOHBARU	68.069	6.334,40
12	BAURENO	84.557	7.868,75
13	KANOR	62.583	5.823,88
14	SUMBERREJO	73.672	6.855,81
15	BALEN	68.881	6.409,96
16	SUKOSEWU	44.579	4.148,46
17	KAPAS	57.750	5.374,13
18	BOJONEGORO	88.449	8.230,93
19	TRUCUK	40.132	3.734,62
20	DANDER	87.386	8.132,01
21	NGASEM	62.822	5.846,12
22	KALITIDU	34.377	3.199,07
23	GAYAM	52.194	4.857,10
24	MALO	32.541	3.028,22
25	PURWOSARI	31.030	2.887,61
26	PADANGAN	45.506	4.234,72
27	KASIMAN	32.392	3.014,35
28	KEDEWAN	13.747	1.279,28
	<b>KABUPATEN BOJONEGORO</b>	<b>1.363.058</b>	<b>126.844,17</b>

Source: DKPP Bojonegoro, 2024



The needs of RT and Non RT in the Bojonegoro Regency in 2024 are further presented in the following diagram.



Source: DKPP Bojonegoro, 2024

Figure 2. Needs of RT and Non RT in Bojonegoro Regency in 2024

The rice balance is obtained by reducing the amount of rice availability with the amount of rice demand in each sub-district in Bojonegoro Regency or by using the Availability to Demand Ratio so that a surplus/deficit condition is obtained in each sub-district with the following results:

**Table 6**  
**Classification of A/D Ratio of Rice in Bojonegoro Regency in 2024**

NO	KECAMATAN	A/D RATIO	KLASIFIKASI	NO	KECAMATAN	A/D RATIO	KLASIFIKASI
1	MARGOMULYO	1,47	Surplus	15	BALEN	4,18	Surplus
2	NGRAHO	4,07	Surplus	16	SUKOSEWU	5,84	Surplus
3	TAMBAKREJO	2,94	Surplus	17	KAPAS	4,76	Surplus
4	NGAMBON	1,86	Surplus	18	BOJONEGORO	0,79	Defisit
5	SEKAR	0,67	Defisit	19	TRUCUK	2,87	Surplus
6	BUBULAN	1,65	Surplus	20	DANDER	3,96	Surplus
7	GONDANG	2,58	Surplus	21	NGASEM	5,44	Surplus
8	TEMAYANG	2,81	Surplus	22	KALITIDU	14,20	Surplus
9	SUGIHWARAS	2,77	Surplus	23	GAYAM	3,70	Surplus
10	KEDUNGADEM	4,07	Surplus	24	MALO	5,42	Surplus
11	KEPOHBARU	5,69	Surplus	25	PURWOSARI	1,59	Surplus
12	BAURENO	3,24	Surplus	26	PADANGAN	3,56	Surplus
13	KANOR	5,65	Surplus	27	KASIMAN	4,82	Surplus
14	SUMBERREJO	5,34	Surplus	28	KEDEWAN	1,70	Surplus

Source: DKPP Bojonegoro, 2024

The distribution of rice surplus/deficit areas in Bojonegoro Regency is shown in the following image.

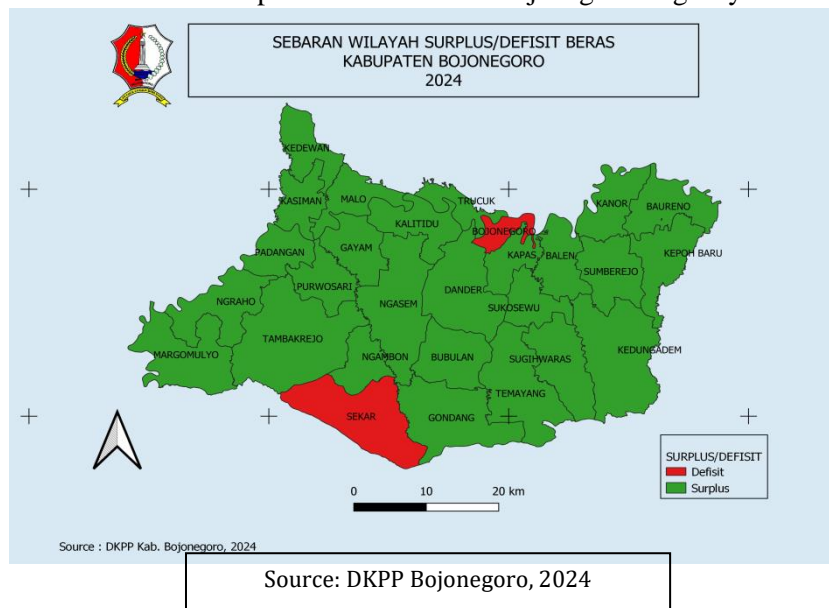


Figure 3. Distribution of Rice Surplus/Deficit Areas in Bojonegoro Regency in 2024

## DISCUSSION

This study shows that out of 28 sub-districts in Bojonegoro Regency, 26 (92.86%) are in a rice surplus condition, while two (7.14%) are in a deficit. This reflects that, in general, Bojonegoro has a fairly high production capacity to support local food security, especially in terms of availability, as emphasized by the FAO (2009) and Law No. 18 of 2012.

Although, in aggregate, Bojonegoro Regency is classified as a surplus area, the analysis results show an imbalance in production distribution between sub-districts. Kalitidu District recorded the highest availability-to-demand (A/D) ratio of 14.20, indicating a very large surplus, whereas Bojonegoro (0.79) and Sekar (0.67) districts were in deficit conditions.

This finding supports the spatial theory of food security proposed by Dewi et al. (2020), which states that surplus areas at the district level can hide inequality and vulnerability at the sub-district level. This also strengthens the importance of a micro approach to food distribution planning (Melkonyan et al., 2017).

This imbalance in availability can be explained by two main factors: the production capacity and population. Kalitidu, as a sub-district with the highest harvest area and production yield, has a large surplus. On the other hand, the Bojonegoro Sub-district, which is a city center with limited agricultural land and high population density, experiences a deficit. This is in line with the study by Suryana and Hermanto (2020), which showed that population and consumption pressure are determining factors in creating a food deficit in non-productive areas.

This inequality between the sub-districts highlights the importance of implementing regional food supply chain management. As explained by Chopra and Meindl (2016), efficient distribution planning must bridge surplus areas with deficit areas to maintain the stability of rice availability and prices. This strategy is also strengthened by the supply chain collaboration approach (Simatupang & Sridharan, 2005) which recommends coordination among producers, local governments, and distribution institutions.

Furthermore, in accordance with the National Food Agency guidelines (2023), areas with high surpluses, such as Kalitidu, can be used as a regional food reserve base to support the needs of deficit and vulnerable areas.

*Availability-to-demand ratio* (A/D) used in this study has been proven to be an effective measurement tool for describing local food security conditions. This ratio is in line with the FAO literature and national food policy indicators and can be adopted to determine regional intervention priorities by the Food Security Service and District Government.

From a management science perspective, the findings in this study not only describe the condition of food security from a statistical perspective but also provide a strategic basis for decision making in managing public resources.



**1. Operational Management**

The uneven distribution of rice between surplus and deficit sub-districts illustrates the need for increased efficiency in the food logistics process. These include inventory management, logistics planning, and demand forecasting. The A/D ratio can be used as a key parameter in the local government's decision support system (DSS) to regulate the movement of food stocks efficiently and on targets.

**2. Public Strategic Management**

Based on Moore's Strategic Triangle approach (1995), local governments can use the results of this study to create public value through fair and sustainable food policies. Public legitimacy can be achieved by formulating data-based distribution policies. Operational capacity is enhanced by integrating information systems between sectors, while the authorizing environment is strengthened through synergy between regional and village organizations.

**3. Risk Management and System Resilience**

Inequality in food distribution is a form of systemic risk in the supply chain. Therefore, local governments must apply the principles of a resilient supply chain, including diversifying supply sources, real-time monitoring of rice reserves, and strengthening responses to disasters or supply chain disruptions.

From the results of this research, the managerial and policy implications include the following:

- a. The Bojonegoro Regency Government needs to develop an inter-district distribution system based on A/D ratio data.
- b. Deficit sub-districts, such as Bojonegoro and Sekar, require planned allocation of rice reserve distribution from surplus areas.
- c. Mapping of data on availability needs to be integrated into the regional food security information system dashboard.
- d. Spatial planning and control of land conversion in deficit areas should be prioritized to avoid increasing external dependency.

**CONCLUSION**

Based on the results of the analysis of rice availability and demand in the Bojonegoro Regency in 2024, it is known that 92.86% of sub-districts are in surplus conditions, while 7.14% are in deficit, namely the Bojonegoro and Sekar Sub-districts. This inequality indicates that although Bojonegoro is classified as a surplus area in the aggregate, there is still an imbalance in distribution between regions. The availability-to-demand (A/D) ratio is an effective indicator for identifying local food security status and shows that food security is not only influenced by production but also by population, land management, and distribution efficiency. Therefore, policies are needed to support the optimization of surplus areas as food reserve centers and rice distribution strategies that are responsive to deficit areas to maintain the stability of regional food security.

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