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THE ROLE OF THE BUREAU OF LOGISTICS (BULOG) IN THE ADEQUACY OF RICE IN BENGKULU PROVINCE, INDONESIA

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ABSTRACT
The availability of rice from domestic production is not stable. The role of the Bureau of Logistics (*BULOG*) is to stabilize the availability of rice by buying the rice at the time of abundant production and distribute it at the time of scarcity. The objective of this study is to analyze the sufficiency of rice in Bengkulu Province based on the availability of rice from the domestic production and the changes in the stock of *BULOG* of the Regional Division of Bengkulu. The data used are the monthly time series data of the period from 2010 to 2015. The adequacy of rice is observed at the level of regency/municipality in four categories of adequacy. The results of the calculation on the basis of annual supply and consumption show that Bengkulu Province is in the surplus of rice or in the safe category. The rice sufficiency in all regencies of Bengkulu are also in the safe category, except in the City of Bengkulu that experiences deficit with a category of severe. The rice deficit is most prevalent in December. The provision of rice from *BULOG* does not have much effect on the sufficiency of rice in Bengkulu Province. *BULOG* should be aware of rice deficit in Bengkulu City and Lebong Regency especially in the months of January, June and December since in these months centers of rice production also experience rice deficit.

KEY WORDS
Adequacy, availability, rice, production.

Rice is the main staple food in Indonesia. As the nation's main staple food, rice becomes a national strategic commodity. Rice is not only an economic commodity, but also a political commodity that has a broad social dimension. The ever increasing growth of population and the declining of paddy field areas because of the land conversion cause the task of fulfilling rice for the population of Indonesia at every moment and in every region become increasingly more and more difficult.

The supply of rice in Indonesia comes from the domestic production and import. The domestic rice production is unstable since it is influenced by many factors, such as land, technology, climate, and farmers. The provision of rice through importing will have an impact on rice self-sufficiency, food independence and food sovereignty. According to Sjarkowi (2015), food sovereignty is far more important than food security, which means that in fulfilling food sufficiency we should be independent, be technologically oriented, and not be dictated by other countries, and be sustainable. Therefore, the rice supply from the domestic production should receive the most attention from the government.

The Public Enterprise of Bureau Of Logistics (*BULOG*) is an agency appointed by the government to maintain the stability of the domestic rice. *BULOG* purchases grain/rice of the domestic production which refers to the Government Purchase Price (GPP) for the Government Rice Reserve (GRR) and rice stocks for subsidized rice program for low-income communities. The rice is then distributed to the poor and the food-insecure population, in a state of emergency or disaster, in a state of social conflict, and at a time when rice prices are uncontrollable. The stock changes of *BULOG* indicates the provision of rice by the government. If the change is positive, the government's rice reserve increases and the

supply of rice for the public is reduced. If it is negative, the government's rice reserve decreases and the provision of rice for the people increases.

Based on the Map of Food Resilience and Food Vulnerability (Food Security Council, 2015), Bengkulu Province is in the category of high surplus of rice, in which the ratio of per capita normative consumption to the net production of cereals (rice, maize, cassava and sweet potato) is less than 0.5. However, the circumstance of this surplus of rice sufficiency is questionable. The question is whether the production is overestimate or the demand is underestimate. In Bengkulu Province, much rice is found from the neighboring provinces, such as Lampung, South Sumatra, West Sumatra, even from outside the island of Sumatra, such as Banten and West Java, as well as imported rice in *BULOG* of the Regional Division of Bengkulu. Therefore, the writer is interested in doing a more in-depth analysis of the role of *BULOG* of the Regional Division of Bengkulu in stabilizing the availability and the sufficiency of rice in Bengkulu Province.

METHODS OF RESEARCH

Time and Location of the Study. This study was conducted from January 2014 to November 2016 in the Province of Bengkulu. Bengkulu was selected as the study area since the contribution of the sub-sector of the agriculture to the GDP is still fairly high at 31 percent and rice is the staple food of the population. Additionally, in the Province of Bengkulu there is one city that always experiences a deficit in rice, which is surrounded by 9 regencies which are in surplus of rice.

Types and Sources of Data. The data used in this study are monthly time series data of the period from 2010 to 2015. The variables used are the size of population, per capita consumption of rice, domestic rice production, and changes in stocks of rice of *BULOG* of the Regional Division of Bengkulu.

Analytical Model. The analytical method used is the descriptive qualitative analysis. The facts, the phenomena, the variables, and the circumstances that occur at the time of study are described as they are and are presented in the form of tables, graphs, or figures.

Rice sufficiency is viewed in terms of the supply (availability of rice) and in terms of the demand (consumption of rice). Rice sufficiency means that there is a balance between the availability of rice with the amount of rice consumption. If the amount of the availability exceeds the amount of consumption, it means a surplus occurs, and vice versa, if the amount of the availability is less than the amount of consumption, a deficit of rice occurs. The rice sufficiency is stated as follows:

$$CB = QSB - QKB \quad (1)$$

$CB > 0$ = *Surplus of rice (ton)*
$CB < 0$ = *Deficit ofrice (ton)*

Where: CB = Rice sufficiency (ton); QSB= Total availability of rice (ton); QKB= Total consumption of rice (ton).

To reveal the role of the Bureau Of Logistics (*BULOG*) of Regional Division of Bengkulu in the sufficiency of rice in Bengkulu Province, the availability of rice is calculated by two approaches. The first approach is to calculate the availability of rice from the domestic production without role of *BULOG*. The rice availability with the first approach is calculated by using the equation:

$$QSB_1 = 0{,}6274(QPG - QGPa - QGC) - (QBPa + QBC) \quad (2)$$

Where: QSB_1= Total availability of rice from the domestic production without the role of *BULOG* (ton); 0,6274= Conversion rate of dry milled grain into rice; QPG = Total grain production (ton); QGPa = The amount of grain used for feed (ton); QGC= Number of grain spilled (ton); QBPa = The amount of rice used for feed (ton); QBC = The amount of scattered rice (ton).

The second approach is to calculate the availability of rice from the domestic production with role of *BULOG*. The availability of rice with this second approach is calculated by using the equation:

$$QSB_2 = [0,6274(QPG - QGPa - QGC) - Q\Delta SBP] - (QBPa + QBC) \quad (3)$$

Where: QSB_2= Total availability of rice from the domestic production with role of *BULOG* (ton); QΔSBP = The role of *BULOG*, proxied by variable changing the rice stok of *BULOG* (ton).

The grain used for feed and that which is scattered is respectively 0.44% and 5.4% of the supply of grain, while the rice used for feed and that which is scattered is respectively 0.17% and 2.5% of the supply of rice (Food Security Agency of Bengkulu Province, 2015). This percentage is used to proxy the availability of rice.

The consumption of a commodity is affected by the price of the commodity itself, the prices other commodities, both the substitutes and the complements, the level of income, the tastes or preferences of consumers, and the population, and other shift factors. For the commodity of rice which is the staple food of Indonesia's population, the factor of the increasing population is the major factor that causes rice consumption to continue growing from year to year.

In addition to household consumption, rice is also used for food processing industry and the needs of hotels and restaurants (Erwidodo and Pribadi, 2003). In this study the reseacher restricted the analysis of rice only for household consumption. The amount of rice consumption of the residents of Bengkulu Province is obtained by multiplying the per capita consumption of rice by the size of population, by using the following equation:

$$QKB = aJP \quad (4)$$

Where: QKB = Total consumption of rice; a = Amount of rice consumption per capita; JP = size of population.

By substituting equation (2) and (4) into the equation (1), the rice sufficiency equation is obtained as follows:

$$CB_1 = [0,6274(QPG - QGPa - QGC) - (QBPa + QBC)] - aJP \quad (5)$$

And by substituting equation (3) and (4) into the equation (1), the rice sufficiency equation is obtained as follows:

$$CB_2 = \{[0,6274(QPG - QGPa - QGC) - Q\Delta SBP] - (QBPa + QBC)\} - aJP \quad (6)$$

Per capita rice consumption is obtained through three approaches, namely the actual consumption, the normative consumption, and the consumption of food-insecure households. The actual consumption is obtained from the information issued by the Provincial Food Security Agency of Bengkulu. The normative consumption is obtained from the Regulation of the Ministry of Health of the Republic of Indonesia Number 75 of 2013 about The Nutrition Adequacy Score that is recommended for Indonesian People, namely as much as 2,150 kcal/capita/day on the consumption levels. Based on the National Desirable Dietary Pattern (NDDP), 50 percent of the energy needs is fulfilled by consuming food of grains group. While the rice consumption in food-insecure households is obtained from the energy consumption of food-insecure households according to Jonsson and Tole in Maxwell et al., (2000), that is < 860 kcal/capita/day.

Rice sufficiency in Bengkulu Province is divided into four categories, namely:

1. Safe, that is the condition when the amount of the rice availability is more than the amount of the actual consumption, which means that there is a surplus of rice (CB > 0). This area is colored purple.

2. Healthy, that is the condition when the amount of the rice availability is less than the actual amount of rice consumption, but larger than the normative consumption, which means that a deficit in rice occurs (CB <0). This area is colored green.
3. Crisis, that is the condition when the amount of the rice availability is less than the amount of rice for normative consumption, but larger than the consumption of rice in food-insecure households, which means that a deficit in rice occurs (CB <0). This area is highlighted in yellow.
4. Severe, that is the condition when the amount of the rice availability is less than the amount of rice for the consumption of insecure households, which means that a deficit in rice occurs (CB <0). This area is colored red.

The sufficiency in rice can be explained in Figure 1.

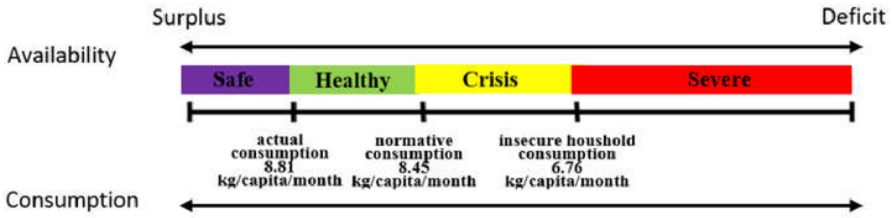

Figure 1 – The Categories of Rice Sufficiency in the Province of Bengkulu

RESULTS AND DISCUSSION

Bengkulu Province is located in the western side of the Bukit Barisan Mountains and is directly adjacent to the Indian Ocean with a coastline of approximately 525 kilometers. The astronomical location of Bengkulu Province is between latitudes 2°16'S to 3°31'S and between longitudes 101°01'E to 103°41'E. The existing area, 1,724,103 hectares (86.55 percent) as agricultural land, consisting of 1,632,452 hectares of agricultural land other than paddy fields and 91,651 hectares of paddy fields. Paddy is the food crops that is dominantly cultivated in the Province of Bengkulu, consists of 93.46 percent wetland paddy and 6.54 dryland paddy (BPS-Statistics of Bengkulu Province, 2016).

The type of climate of Bengkulu Province is categorized as type A according to Schmidt's and Ferguson's climate classification, allowing rice farming throughout the year because the availability of water is ensured. The season that occurred in the Province of Bengkulu are two seasons: the rainy season which occurs in the month of December to March and the dry season which occurs in the month of June to September. While in April-May and October-November is a transition.

The availability of rice comes from the domestic production and the changes in the stock of *BULOG* of Regional Division of Bengkulu. The availability of rice is presented in Table 1.

Table 1 – The availability of rice in the Province of Bengkulu in the period of 2010-2015

No.	Years	Rice Availability (ton)			Growth (%)
		domestic production	changes in stock of *BULOG*	Total	
(1)	(2)	(3)	(4)	(5 = 3 - 4)	(6)
1.	2010	297,193.30	4,468.94	292,601,77	-
2.	2011	288,959.42	-6,228.50	295,358,78	0,94
3.	2012	334,591.57	5,664.88	328,771,29	11,31
4.	2013	358,121.75	-5,877.34	364,160,32	10,76
5.	2014	341,078.00	1,673.83	339,358,25	-6,81
6.	2015	332,718.27	953.69	331,738,42	-2,25

The data in Table 1 show that the availability of rice until 2013 increased 7.67 % per year, but in the period of 2014 to 2015 the availability of rice declined 4.53% per year.

Rice consumption of the population of Bengkulu Province is still high. In 2015, the consumption of food of grains group reached 67.3 percent of the Nutritional Adequacy Score (Food Security Agency of Bengkulu Province, 2016). The development of consumption of food of grains group by the population of Bengkulu Province can be seen in Table 2.

Table 2 – The Consumption of the Food of the Grain Group by the Residents of Bengkulu Province in the Period of 2010-2015

No.	Years	Grain (kg/capita)	Rice (kg/capita)	Corn (kg/capita)	Wheat (kg/capita)
1.	2010	128.30	119.60	0.30	8.40
2.	2011	121.50	111.80	0.70	9.00
3.	2012	114.70	106.30	0.40	8.00
4.	2013	114.80	106.40	0.20	8.20
5.	2014	113.59	105.69	0.40	7.50
6.	2015	119.33	106.13	0.70	12.50
Average (kg/capita)		118.70	109.32	0.45	8.93
Standard (kg/capita)		100.40	91.00	2.70	6.70
Growth (% per year)		-1.36	-2.32	43.10	11.33

The data in Table 2 show that the consumption of rice per capita by the population of Bengkulu Province is the highest as compared to the consumption of corn and wheat. This is consistent with the results of the study by Cahyani (2008) and Lantarsih et al. (2011) which indicates that rice is still the main energy source in Indonesia compared to any other food of grain group.

The data in Table 2 also indicate that per capita rice consumption tends to decline due to rising income of the people. The GRDP of Bengkulu Province based on the valid prices of 2010 was 18.60 trillion. In 2015 the GRDP at constant prices of 2010 increased to 38.07 trillion. According to Engel's Law, at the time of low income, most of the budget is spent on the staple food need. When income increases, the proportion of income spent on buying the staple food is reduced, although the actual expenditures for food increased (Chai and Moneta, 2010).

The rising income of the people lead to the shifting of rice consumption to other foods made of flour, such as instant noodles and bread. This is indicated by the increase of per capita flour consumption by 8.4 kg per capita in 2010 to 12.5 kg per capita in 2015. Wheat is an imported foodstuff, the increase of its consumption will thresten the food independence and food sovereignty.

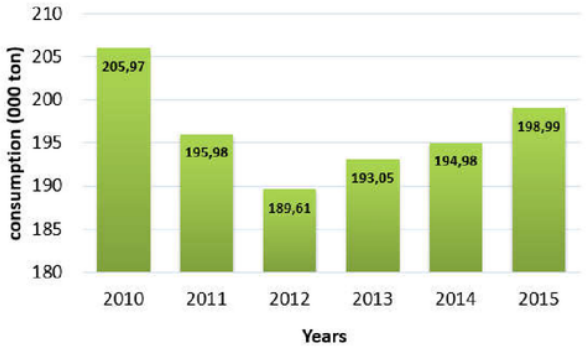

Figure 2 – Total Rice Consumption in Bengkulu Province, 2010-2015

The increasing knowledge about health and nutrition causes the decrease of rice consumption. The results of the study by Park et al. (2005) showed that the pattern of food was very closely related to education and health behaviors. According to Hu (2002), the

increase of disease risk is caused by errors of food consumption patterns, such as excessive consumption of rice can trigger diabetes.

Rice consumption decreases due to the successful implementation food diversification program. The consumption of tubers increased from 27.4 g/capita/ day in 2014 to 33.8 g/capita/day in 2015. In addition, the decline in rice consumption may also be due to saving behavior in consuming rice. The results of the study by Anriany and Martianto (2013) wasteful practices can cause a loss of 4.7 grams of rice per capita per day, an equivalent of 1.72 kg per capita per year. Total rice consumption in Bengkulu Province for 2010 - 2015 period can be seen in Figure 2.

The data in Figure 2 show that the greatest amount of rice consumption occurred in 2010. This is due to the fact that the consumption of rice per capita in 2010 was still very high (119.6 kg per capita). In the period of 2011 - 2012 the consumption of rice decreased with decreasing per capita consumption of rice. Later in the period of 2013 - 2015 per capita rice consumption was declining, however because the population continued increasing, the amount of rice consumption began to rise again from year to year. The results of this study are consistent with the results of the study by Efrita (2001) which show that the projected demand for rice increases annually in Bengkulu Province. Nur et al. (2012) suggested that the elasticity of the population against rice consumption was much higher than the elasticity of the price of rice, the price of wheat, the rice production and the income.

The results of the calculation of rice adequacy are presented in Table 3.

Table 3 – Rice sufficiency in Bengkulu Province, 2010-2015

No.	Years	Sufficiency (kg)		Sufficiency ahead (Months)	
		without the role of *BULOG*	with the role of *BULOG*	without the role of *BULOG*	with the role of *BULOG*
1.	2010	91,226.79	86,635.26	5.32	5.05
2.	2011	92,978.94	99,378.30	5.69	6.08
3.	2012	144,981.61	139,161.33	9.18	8.81
4.	2013	165,074.16	171,112.74	10.26	10.64
5.	2014	146,102.35	144,382.60	8.99	8.89
6.	2015	133,730.46	132,750.61	8.06	8.01

The data in Tabel 3 indicate that the rice sufficiency in Bengkulu Province is in the safe category. The rice availability from the domestic rice production and the changes in the stock of *BULOG* can meet the needs of the population of Bengkulu Province with safe category. The surplus of rice in Bengkulu Province can meet the needs of rice for 5 to 10 months ahead. This is consistent with the Map of Food Resilience and Food Vulnerability (Food Security Council, 2015) which states that Bengkulu Province is in the category of high surplus. These findings refute the statement of Romdhon (2013) which states that Bengkulu Province experiences a deficit in rice, in which domestic rice production meets only 30.39 percent of the need of rice.

The results of the calculation of rice adequacy in the regencies / the municipalities of the availability from the domestic rice production in Bengkulu Province are presented in Table 4.

Table 4 – Rice Sufficiency in Bengkulu Province by the Regencies/Municipalities, 2010-2015

No.	Regency/ Municipality	Years					
		2010	2011	2012	2013	2014	2015
1.	Bengkulu South	19,659	22,077	29,492	25,146	34,858	34,900
2.	Rejang Lebong	11,408	14,284	20,143	30,317	27,002	21,800
3.	North Bengkulu	18,274	14,411	24,884	22,533	31,674	11,875
4.	Kaur	9,558	5,928	17,285	16,706	11,269	17,619
5.	Seluma	25,118	19,029	29,970	28,856	17,090	14,493
6.	Mukomuko	4,041	14,074	8,061	23,029	11,961	28,209
7.	Lebong	18,637	15,459	18,183	17,010	15,371	18,018
8.	Kepahiang	3,964	9,274	13,886	17,157	16,197	13,396
9.	Central Bengkulu	11,236	8,170	10,880	9,188	8,752	6,744
10.	Bengkulu City	-30,668	-29,726	-27,802	-24,868	-28,071	-33,323

The data in Table 4 show that nine regencies in Bengkulu Province are in surplus of rice in which the availability of per capita is higher than the actual per capita consumption, therefore the sufficiecy of rice is in the category of safe and is given a purple color. The only area that experiences a deficit in rice in Bengkulu Province is the City of Bengkulu. The availability of rice from the domestic rice production in Bengkulu City is only 11-32 kg per capita, far below the consumption of food-insecure households in the amount of 80.30 kg per capita. Therefore, the rice sufficiency of Bengkulu City is categorized as severe and is colored red.

An analysis of monthly rice sufficiency is performed to see if the supply of rice from the domestic rice production and the changes in the stock of *BULOG* of the Regional Division of Bengkulu can meet the needs of rice consumption of the population of Bengkulu Province every month. The monthly availability of rice from the domestic rice production and the changes in the stock of *BULOG* are presented in Table 5.

Table 5 – The Monthly Rice Availability in Bengkulu Province, 2010-2015 (Ton)

No.	Years	Availability	Months												Averages
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1.	2010	Production	23,141	21,377	37,536	27,161	18,362	19,431	24,111	31,289	18,462	17,431	26,032	32,860	24,766
		BULOG stock	423	1,026	-600	17	1,560	450	-864	-2,481	601	-1,646	-2,321	-633	-372
		Total	22,718	20,351	38,136	27,144	16,802	18,981	24,975	33,770	17,862	19,077	28,353	33,493	25,139
2.	2011	Production	15,964	20,517	30,298	42,465	21,916	33,297	23,479	16,894	24,659	20,560	28,366	10,544	24,080
		BULOG stock	3233	-1,240	-540	2,617	5,228	-97	-1,027	-2,315	-1,558	1,438	-511	1,000	519
		Total	12,731	21,757	30,838	39,848	16,689	33,394	24,505	19,209	26,217	19,121	28,877	9,545	23,561
3.	2012	Production	17,622	28,491	54,528	43,308	28,362	23,633	26,171	28,866	20,757	21,664	25,159	16,032	27,883
		BULOG stock	592	1,235	-740	-2,466	1,470	-246	90	-392	-3,223	2,633	-2,201	-2,416	-472
		Total	17,030	27,256	55,268	45,774	26,892	23,878	26,080	29,258	23,980	19,031	27,360	18,447	28,355
4.	2013	Production	21,769	29,014	68,086	43,487	29,219	24,270	24,624	19,120	27,764	35,043	21,458	14,268	29,844
		BULOG stock	4,889	604	-1,843	-3,063	4,753	-265	-1,163	1,676	-666	-1,021	-600	2,575	490
		Total	16,880	28,410	69,929	46,550	24,466	24,535	25,787	17,444	28,430	36,064	22,058	11,693	29,354
5.	2014	Production	19,627	35,690	62,221	28,011	17,582	29,669	23,655	19,351	38,245	35,285	19,234	12,507	28,423
		BULOG stock	2,770	-354	-3,299	2,040	-20	-3,002	-551	-606	-1,525	4,146	-227	-1,047	-140
		Total	16,857	36,044	65,520	25,971	17,602	32,671	24,205	19,957	39,770	31,139	19,461	13,555	28,563
6.	2015	Production	16,551	27,378	56,745	40,810	28,910	23,172	12,464	20,557	45,707	27,632	20,701	12,090	27,726
		BULOG stock	-1,655	265	-2,661	882	3,407	-209	-8	499	-196	-1,269	-3,254	3,244	-80
		Total	18,207	27,113	59,406	39,928	25,502	23,381	12,472	20,058	45,903	28,901	23,955	8,846	27,806
		Production	19,112	27,078	51,569	37,540	24,059	25,579	22,417	22,680	29,266	26,269	23,492	16,383	27,120
Averages		*BULOG* stock	1,709	256	-1,614	4	2,733	-561	-587	-603	-1,095	714	-1,519	454	-9
		Total	17,404	26,822	53,183	37,536	21,326	26,140	23,004	23,283	30,360	25,555	25,011	15,930	27,130

The data in Table 5 show that the minimum rice availability is 10,544 tonnes of rice which occurred in December 2011 and the maximum is 68,086 tonnes which occurred in March 2013. The average availability is 27,120 tonnes. The provision of rice from the stock of *BULOG* of the Regional Division of Bengkulu does not function properly. Supposedly, *BULOG* should increase the stock of rice by buying the rice from the farmers during the harvest and release the rice stock at the time of scarcity. In adding and releasing stocks of rice, *BULOG* did not pay attention to the fluctuations of the availability of the domestic rice as shown in Figure 3.

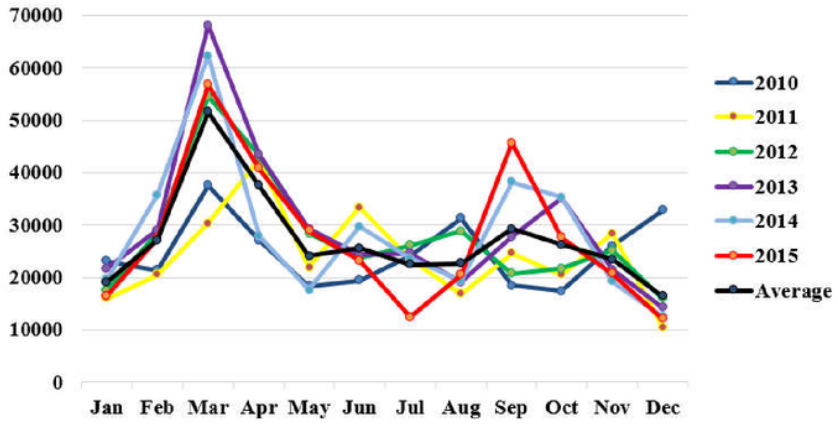

Figure 3 – The Monthly Availability of Rice from the Domestic Rice Production in Bengkulu Province, 2010-2015 (ton)

The data in Figure 3 show that the domestic rice production has a certain pattern, in which during March the production reaches its peak, then it declines and rises again in September. Then the production decreases again and reaches the lowest production in December. Thus, *BULOG* should increase the stock in March and September and release the stock from November to January. However, the opposite happens, *BULOG* releases the stock of rice at the harvest time, namely March and increases the stock of rice during the scarcity, namely in December.

Total monthly rice consumption of the population of Bengkulu Province in the period of 2010-2015 are presented in Table 6.

Table 6 – Monthly Rice Consumption in Bengkulu Province, 2010-2015 (ton)

No.	Years	Months												Growth (%)
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1.	2010	17,164	17,189	17,215	17,240	17,266	17,291	17,317	17,342	17,368	17,394	17,420	17,445	0.148
2.	2011	16,332	16,355	16,379	16,403	16,427	16,451	16,474	16,498	16,522	16,546	16,570	16,594	0.145
3.	2012	15,801	15,823	15,846	15,868	15,891	15,913	15,936	15,959	15,981	16,004	16,027	16,049	0.142
4.	2013	16,087	16,110	16,132	16,154	16,177	16,199	16,222	16,244	16,267	16,289	16,312	16,334	0.139
5.	2014	16,248	16,270	16,292	16,314	16,336	16,358	16,380	16,402	16,425	16,447	16,469	16,491	0.135
6.	2015	16,582	16,604	16,626	16,648	16,670	16,692	16,714	16,736	16,758	16,780	16,802	16,824	0.132

The data in Tabel 6 show that the amount of rice consumption increases each month. The increase of the amount of consumption depends on the amount of rice consumption per capita and the population growth.

The results of the calculation of rice adequacy from the domestic rice production without the role of *BULOG* are presented in Table 7.

Table 7.Monthly Rice Sufficiency in Bengkulu Province Through the Availability of the Domestic Rice Production Without the Role of *BULOG,* 2010-2015

No.	Years	Months											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.	2010	5,977	4,188	20,321	9,921	1,097	2,140	6,794	13,946	1,094	37	8,613	15,415
2.	2011	-367	4,162	13,919	26,062	5,490	16,847	7,004	396	8,136	4,014	11,795	-6,050
3.	2012	1,821	12,668	38,682	27,439	12,471	7,720	10,235	12,908	4,776	5,660	9,132	-18
4.	2013	5,682	12,905	51,954	27,332	13,043	8,071	8,402	2,876	11,497	18,754	5,146	-2,067
5.	2014	3,379	19,420	45,929	11,697	1,246	13,311	7,275	2,949	21,820	18,838	2,765	-3,984
6.	2015	-31	10,774	40,119	24,162	12,240	6,480	-4,250	3,821	28,949	10,852	3,899	-4,734

The data in Table 7 show that the frequency of the deficit in the period of 2010 to 2015 is only 8 months, in which 3 months of them are in the healthy category (green), 1 month is in the crisis category (yellow) and 4 months are in the severe category (red). The deficit frequently occurs in December. The most frequent deficits occurred in 2015.

The results of the calculation of rice adequacy originating from the availability of the domestic rice production with the role of *BULOG* are presented in Table 8.

Table 8 – Monthly Rice Sufficiency in Bengkulu Province Through the Availability of the Domestic Rice Production with the Role of *BULOG*, 2010-2015

No.	Tahun	Bulan											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.	2010	5,554	3,162	20,921	9,904	-464	1,690	7,658	16,428	494	1,683	10,934	16,048
2.	2011	-3,601	5,401	14,459	23,445	262	16,943	8,031	2,710	9,695	2,575	12,307	-7,050
3.	2012	1,229	11,433	39,423	29,906	11,001	7,965	10,144	13,300	7,999	3,027	11,334	2,398
4.	2013	792	12,301	53,797	30,395	8,290	8,336	9,565	1,200	12,163	19,775	5,746	-4,642
5.	2014	609	19,774	49,228	9,657	1,266	16,313	7,825	3,554	23,345	14,692	2,992	-2,937
6.	2015	1,624	10,509	42,780	23,280	8,832	6,689	-4,242	3,323	29,145	12,121	7,153	-7,978

The data in Table 8 reveal that only after the intervention of government, namely through *BULOG* of the Regional Division of Bengkulu, there are 7 months of deficit frequency, namely 1 month in the healthy category, two months in the crisis category, and 4 months in the severe category.

In terms of quantity, the government intervention caused the frequency of deficits to decrease from 8 to 7 months. But in terms of quality, the government intervention does not significantly affect the sufficiency of rice in the Province of Bengkulu.

Table 9 – The Monthly Rice Sufficiency of the Population of Bengkulu Province by Regency/Municipality, 2010-2016

No.	Regency/ Municipality	Months											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.	South Selatan												
	2010	2,400	1,095	6,781	2,938	283	-162	1,771	2,025	-121	102	1,923	523
	2011	-1,091	928	5,847	8,551	1,063	-545	-1,212	-1,158	2,355	1,833	5,490	-77
	2012	-1,177	-1,094	7,405	15,032	1,287	-1,229	-1,179	-313	1,212	7,631	2,838	-1,007
	2013	-1,320	-154	10,820	6,126	261	-1,188	-793	-819	4,591	4,965	2,542	30
	2014	-416	493	15,369	3,355	-475	-744	-1,333	-1,191	4,662	12,509	3,264	-712
	2015	-1,260	1,039	14,700	8,411	-1,336	-1,023	-1,323	-443	3,841	13,242	255	-1,286
2.	Rejang Lebong												
	2010	-414	-88	957	446	1,195	1,939	1,254	2,080	115	167	1,295	2,357
	2011	863	137	56	1,974	768	610	-377	153	3,110	2,911	2,288	1,700
	2012	613	2,579	1,038	785	2,567	3,768	2,028	1,211	2,553	229	1,094	1,590
	2013	7,991	4,630	5,230	2,550	1,507	-680	-829	-1,562	522	6,652	4,205	24
	2014	1,032	5,381	5,718	3,129	1,591	918	-13	-243	1,139	2,445	3,943	1,889
	2015	879	3,075	5,738	3,017	1,561	-457	880	244	3,373	1,734	1,718	-30
3.	North Bengkulu												
	2010	3,989	2,018	3,148	1,613	2,494	1,492	597	2,515	-455	-473	626	399
	2011	-222	2,045	5,392	4,586	1,220	604	1,609	292	862	-596	-548	-1,127
	2012	2,085	4,990	2,978	2,915	2,996	1,427	1,078	410	56	1,143	3,020	1,512
	2013	1,646	1,805	6,035	842	1,515	-179	2,991	3,360	1,569	1,768	131	766
	2014	3,612	3,398	5,152	1,342	1,392	2,298	6,860	2,466	1,709	1,399	11	1,759
	2015	4,056	1,181	831	212	-179	1,824	-400	1,821	1,733	52	-1	471
4.	Kaur												
	2010	1,322	1,109	2,989	2,482	-834	-63	901	-69	-125	-477	1,139	1,101
	2011	1,953	978	-63	1,024	-746	2,004	228	-347	2,244	-1,034	258	-652
	2012	-177	3,371	9,288	4,215	394	-908	-787	1,853	1,603	-201	-780	-659
	2013	141	91	9,890	4,062	-368	-1,007	-844	852	994	1,450	1,121	252
	2014	1,346	3,667	2,826	1,979	670	-247	-686	239	897	862	-199	-154
	2015	2,871	4,901	7,902	2,136	48	-877	-465	593	1,034	-608	800	-787
5.	Seluma												
	2010	2,591	3,382	4,746	2,997	-39	-727	94	2,715	1,317	413	1,222	6,279
	2011	1,885	790	1,259	1,457	2,464	3,474	3,011	4,854	-10	1,112	-206	-1,184
	2012	2,776	6,093	15,260	4,755	-1,503	-1,361	283	7,026	951	-1,336	-1,484	-1,604
	2013	-1,595	8,759	14,387	5,866	-371	-830	-789	2,064	1,311	864	-495	-423
	2014	-957	5,745	7,483	1,788	454	-948	-1,396	2,601	5,683	-266	-1,568	-1,633
	2015	-1,317	5,409	6,628	4,061	13	-1,647	-1,647	2,898	4,629	-1,495	-1,651	-1,495
6.	Mukomuko												
	2010	-425	-452	1,116	-1,015	-867	-63	441	2,298	34	-395	1,822	1,328
	2011	-1,283	-130	1,293	4,365	731	888	106	-630	1,490	2,253	6,027	-1,246
	2012	-791	-1,145	-1,086	77	3,916	-921	2,867	-1,198	334	-578	5,224	1,167
	2013	1,122	-664	238	3,330	7,135	4,332	3,422	-940	2,979	3,434	-926	-637
	2014	-483	2,177	3,444	-1,223	-1,535	-1,538	656	2,545	7,233	1,489	-8	-1,001
	2015	-1,388	-529	4,269	3,173	3,300	-121	1,264	361	13,619	934	2,637	486
7.	Lebong												
	2010	-648	-226	306	10	1,379	955	3,374	4,310	-69	1,994	1,825	5,316
	2011	-569	-392	-99	3,684	582	11,826	4,350	-957	-870	-851	-551	-791
	2012	514	286	-525	-742	298	6,919	7,857	5,255	-599	-638	-265	-269
	2013	-166	-587	-515	-780	4,583	8,995	6,996	937	-854	-459	-618	-614
	2014	-792	-892	-733	-81	1,206	13,918	5,468	-522	-357	-106	-870	-960
	2015	-966	-958	-422	2,506	10,634	11,491	47	-823	-793	-881	-934	-974
8.	Kepahiang												
	2010	-656	-540	972	519	-953	519	141	214	940	655	1,174	899
	2011	-371	391	1,306	422	1,881	937	611	26	964	716	1,685	636
	2012	1,368	59	2,365	929	685	1,470	351	991	530	1,938	909	2217
	2013	826	2,484	2,886	1,463	1,090	1,676	556	816	1,990	470	1,980	857
	2014	1,345	1,564	3,428	845	1,005	1,408	897	308	1,565	3,267	537	-39
	2015	-44	-83	138	-34	536	580	1,028	2,577	2,024	1,678	2,552	2382
9.	Central Bengkulu												
	2010	878	974	1,443	1,443	1,082	1,068	1,104	909	995	439	703	90
	2011	389	1,692	1,118	2,498	492	10	1,642	32	103	93	285	-276
	2012	-501	426	2,192	1,425	3,466	1,377	622	-119	237	232	1,469	-32
	2013	3	-521	2,631	3,552	170	-163	696	1,175	1,022	306	-420	649
	2014	1,399	587	3,588	2,486	-75	1,297	-121	-327	129	-553	302	-47
	2015	242	-237	2,554	1,713	755	-186	-501	-306	1,986	-707	1,671	-328
10.	Bengkulu City												
	2010	-3,060	-3,084	-2,137	-1,513	-2,644	-2,816	-2,883	-3,051	-1,537	-2,388	-3,116	-2878
	2011	-1,919	-2,277	-2,192	-2,499	-2,965	-2,962	-2,963	-1,869	-2,111	-2,424	-2,933	-3033
	2012	-2,890	-2,896	-233	-1,951	-1,636	-2,823	-2,884	-2,208	-2,101	-2,760	-2,891	-2933
	2013	-2,966	-2,938	353	322	-2,478	-2,886	-3,003	-3,009	-2,627	-695	-2,374	-2971
	2014	-2,708	-2,701	-345	-1,923	-2,987	-3,051	-3,057	-2,927	-840	-2,208	-2,645	-3085
	2015	-3,105	-3,024	-2,218	-1,032	-3,093	-3,104	-3,133	-3,098	-2,498	-3,096	-3,146	-3173

Indeed, *BULOG* managed to eliminate the rice deficit which occurred in December 2012 and January 2015 and reduce the degree of deficit of rice in December 2014 which was originally severe turned into a crisis by releasing the stock of rice. However, *BULOG* mistakenly increased the stock of rice, so that in May 2010, month of rice deficit occurred, although it was still in the healthy category, then it aggravated the degree of deficit that

occurred in January of 2011, which originally was in a healthy category turned into a crisis category, and in December 2013 from the category of crisis turned into a severe category.

The monthly rice sufficiency in the regencies/municipalities can be a guideline for *BULOG* in making a purchase and distributing the rice stock. The monthly sufficiency of rice of Bengkulu Province in the regencies/municipalities are presented in Table 9.

The data in Table 9 show that the city of Bengkulu always experiences a deficit of rice with severe category (red). The regency which experiences most deficits is Lebong Regency. Therefore, the issue of rice insufficiency for the population of Bengkulu and Lebong Regency really need to be heeded by *BULOG* compared to other regions. *BULOG* can purchase rice in surplus areas, such as Rejang Lebong, Bengkulu Utara, Kepahiang and Central Bengkulu. The right time to make a purchase is in March, April, May, and September. Whereas the time to be on alert and to release the rice stock is January, June and December.

CONCLUSION

Bengkulu Province is in surplus of rice. The domestic rice production and the changes in the stock of *BULOG* of Regional Division of Bengkulu can meet the needs of the rice consumption of the people of Bengkulu. All of the regencies in Bengkulu are in surplus of rice except Bengkulu City that is in deficit condition with the category of severe (red). The monthly rice supply is unstable, consequently in January, July, and December rice deficit occurs. The deficit in rice in Bengkulu Province most frequently occurs in December.

The role of *BULOG* Regional Division in Bengkulu does not have much effect on the sufficiency of rice in Bengkulu.

IMPLICATION

BULOG Regional Division in Bengkulu should buy rice in Rejang Lebong Regency, North Bengkulu, Kepahiang, and Central Bengkulu, in March, April, May, and September. *BULOG* should be on the alert for distributing the stock of rice in the City of Bengkulu and Rejang Lebong Regency in January, June and December.

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