

Demand analysis of rice as a strategic commodity in Makassar

by A Nixia Tenriawaru

Submission date: 18-Apr-2021 11:46PM (UTC+0700)

Submission ID: 1562493721

File name: aru_2021_IOP_Conf._Ser._Earth_Environ._Sci._681_012099.pdf (937.14K)

Word count: 3193

Character count: 16378

PAPER · OPEN ACCESS

Demand analysis of rice as a strategic commodity in Makassar

5
To cite this article: A N Tenriawaru *et al* 2021 *IOP Conf. Ser.: Earth Environ. Sci.* **681** 012099

View the [article online](#) for updates and enhancements.



240th ECS Meeting ORLANDO, FL

Orange County Convention Center Oct 10-14, 2021

Abstract submission due: April 9

SUBMIT NOW

Demand analysis of rice as a strategic commodity in Makassar

A N Tenriawaru¹, M H Jamil¹, R Darma¹, L Fudjaja¹, M Jannah¹, Munira² and Balla²

¹Agribusiness Study Program, Department of Social Economic of Agriculture, Faculty of Agriculture, Hasanuddin University

²Polytechnic of agricultural Development Gowa

Email: nixia_gany@yahoo.com

Abstract. Rice is the primary needs of the human to survive. Moreover, food problems, especially in rice, are relating to availability, distribution, price, consumption, demands, and other impacting factors. Consumer demand toward rice is influencing by many factors, such as the price of rice, the price of substitution and complementary goods, and the total population. This study aims to analyze the factor which impacts the rice demand in Makassar. This study conducted Makassar from May to July 2017. Data used in this study is a time series collected from a 2011-2016 period and analyzed by linear regression analysis method. The result shows a determinant coefficient (R²) score is 0,925, which means that 92,5% of the dependent variable variances (Y) can be explained by its independent variables (X). The residual score of 7,5% has explained by other variables that do not include in the study. A simultaneous test (F-test) together impacts significantly toward the rice demand in Makassar, while partially (t-test) corn and egg price do not significantly impact the demand.

1. Introduction

One of the agricultural developments is to increase agricultural production, which always guided to boost the welfare of farmers until the agricultural sector be an ultimate priority in developing the Indonesia economy. This will donate significantly in sustaining people's lives because 1) food production is generally needed, 2) raw material production for the industries, 3) foreign exchange earner. These three aspects are the agriculture involvement in economic development as a whole and supporting half to other sectors [1].

Along with the growing population, the demand for rice is also increasing each year. Rice consumption level in Indonesia in 2002 has hit 120 kg per capita per year. This, by chance, pushed the government to achieve food sufficiency to reduce food vulnerability [2]. The extensification effort to boost rice production done through intensification and extensification. The extensification has done by expanding land from utilizing the drylands due to solving the decrease land area. The declining area of rice fields in Java is reaching 50.000 ha/year [3].

The developing consumption of rice per capita per year from 2006 to 2014 shows a downward trend that significantly numbered 11,26%. In 2006, rice consumptions per capita were at 95,85 kg per capita per year, decreasing each year for at least 1,5% on average. By 2014, the rice consumption then numbered at 84,63 kg per capita per year. The most extreme decline happened in 2007, where the consumption only rate in 6% or 5,42 kg per capita per year. The developing rice consumption at the



Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

Published under licence by IOP Publishing Ltd

national level is 21,5 million tonnes per year, decreases with an average 0,06% each year or 19.591 tonnes per year [4].

The declining trend on rice consumption assumed to affect the welfare increase on people and health awareness, so the carbohydrate consumption which obtaining from rice has shifted to healthier food. This probably caused by changes in food consumption patterns and preferences. The government using two ways in achieving food sufficient: first, they use the technology innovation and provides subsidized fertilizers to farmers [5], and second, they try to hold the rice consumption by campaigning “one day without rice” for each week and to promote other staple foods. These strategic can’t claim to achieve success due to Indonesians are remaining to determine by rice as the source of carbohydrate. Rice consumption per capita, which fluctuates year-on-year affects the demand for rice, including in Makassar, has shown below [6].

Table 1. Rice demand in Makassar from 2011-2016 (Tonnes)

13

Month	Year					
	2011	2012	2013	2014	2015	2016
January	10652.03	11864.03	18197.83	20012.20	24111.43	25532.12
February	10643.09	12012.54	18243.54	20873.53	24455.17	25876.36
March	10727.21	12689.60	18627.58	21142.94	24672.19	26012.30
April	10782.02	13776.83	18662.38	21747.74	24892.28	26128.43
May	10801.43	14012.32	18921.67	22012.54	24982.17	26231.40
June	10819.07	15329.50	18994.65	22132.21	25132.76	26549.40
July	10822.01	15495.78	19012.43	22321.32	25342.39	26746.70
August	10866.05	15884.21	19176.76	22653.95	25398.75	26719.42
September	10875.50	16621.31	19232.09	22864.43	25437.49	27234.58
October	10893.70	16882.07	19421.56	23012.45	25462.50	27246.12
November	10934.90	17320.81	19521.73	23438.60	25497.80	27453.12
December	10999.23	18112.75	19741.20	23546.23	25501.70	27837.50
Average	10818.02	15000.15	18979.45	22146.51	25073.89	26630.62

Source: Makassar in Numbers (2010-2015)

Table 1 shows that rice demand, on the average increase year on year with a decreasing percentage. It probably caused by the effect of several factors, and according to [7], the inclining or declining of demand is often affected by certain matters, such as the price, substitute and complementary goods, and also total population. Based on what has explained before, research in analyzing rice demand as a strategic commodity considers necessary.

2. Methodology

This research conducted in Makassar in May 2017. The research location is enacted based on some considerations where rice is the primary needs, and rice demand in the city is higher than in the village. The used of time series has taken from 2011 to 2016. The data source is obtained from institutions that supported this research, such as the Centre of Statistics Bureau in Makassar, Department of Agriculture in Makassar, Department of Animal Husbandry in Makassar, and the Indonesia Logistics Bureau (BULOG) in Makassar. Afterward, data is collected through a few methods: 1) taking notes, where it aims to obtain the secondary data; 2) in-depth interview has done through a question-answer session with stakeholders in appointed institutions.

In this research, multiple linear regression analysis aims to analyze all the presume variables like rice price (HB), a total of the population (JP), corn price (HJ) as the substitution goods and egg price (HT) as the complementary goods toward the rice demand. The estimation model generally formed below:

$$Y = B_0 + B_n X_n \tag{1}$$

Based on the general estimation model above, the equation for this research then formed as follow:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \varepsilon \quad (2)$$

Wheres:

- Y = Rice demand (tonnes/from January 2011- December 2016)
- bo = Constant
- X1 = Rice price (Rp/Kg/month, period of January 2011-December 2016)
- X2 = Population in total (Jiwa/ month, period of January 2011-December 2016)
- X3 = Corn price (Rp/kg/ month, period of January 2011-December 2016)
- X4 = Egg price (Rp/kg/ month, period of January 2011-December 2016)
- b1-b4 = Regression's coefficient
- e = error

The data used is normally distributed, so the regression model should be transformed using a natural logarithm (ln). Natural logarithm uses to analyze the linear relation between the independent and dependent variables, which at first did not have any relationship [8].

Equation model (1) onwards transform to model below:

$$Ln = Lnbo + b1 \ln X1 + b2 \ln X2 + b3 \ln X3 + b2 \ln X4 + e \quad (3)$$

Whereas;

- LN = Rice demand (Ton/ month, the period of January 2011-December 2016)
- bo = Constant
- X1 = Rice price (Rp/kg/ month, the period of January 2011-December 2016)
- X2 = Population growth (Jiwa/ month, the period of January 2011-December 2016)
- X3 = Corn price (Rp/kg/ month, the period of January 2011-December 2016)
- X4 = Egg price (Rp/kg/ month, the period of January 2011-December 2016)
- b1-b4 = Regression's coefficient
- e = error

4 3. Results and discussion

3.1. Results

The result of determining factors toward the demand for rice can be seen in table 2 below.

9
Table 2. Parameters of multiple linear regression analysis toward the demand for rice in Makassar

Model	Unstandardized coefficients		Standardized coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	0.128	0.0033		0.000	1.000
Rice price (HB)	-0.390	0.068	-0.390	5.773	0.000
Total population (JP)	0.571	0.055	0.571	10.478	0.000
Corn price (HJ)	0.021	0.047	0.021	0.454	0.652
Egg price (HT)	0.067	0.042	0.067	1.609	0.112

Source: Processed secondary data, 2018.

The analysis result shows that constant score is numbered 0.128, meaning that if there is any change in rice price, population growth, corn price, and egg price for about 1 point, the demand for

rice will increase as much as 12,8%. Rice price (b1) shows a coefficient score of 0.390, meaning that 1% of rice price increase will affect the rice demand for 39%. Likewise, the total population (b2) shows a coefficient score of 0.571, meaning that a 1% increase in population will affect the demand for rice, about 57.1%. Those can imply if the other variables are considered fixed.

Rice price analysis also shows a negative coefficient, meaning that if the price is increasing, then the demand will move oppositely. From a statistic perspective, these variables are significantly impacting the rice demand, meaning that whether incline or decline of rice demand affected by the fluctuating rice price.

Weather condition that keeps changing can affect the agricultural condition and also the harvest quality. This can be the main cause of rising prices in several traditional markets in Indonesia [9]. To enter the rainy season at the moment will cause an effect to drop the harvest quality. As a result, a total of rice stocks is declining while the demand remains high; by that, the supplied rice to the markets is decreasing slowly. To obtain the maximum result, plants should optimally preserve. But if the fertilizer price arises, then farmers are forced to increase their product's price.

The price of agricultural products fluctuates relatively. This relates to a climate condition that has a big impact on the harvest quality. This is aligning with the law of demand, which stated that the lower the price, the higher the demand will be. On the other hand, if the price of rice rises, the demand will automatically decline. Consumers will shift their consumption from rice to another product that has a cheaper price but has similar utilization.

Onwards, the regression coefficient score for the total population concludes that if the population number is climbing up, then the demand for rice will also increase. The t-test result shows that the total of the population variable gives a positive impact significantly on rice demand. This led to a statement that the growing population is directly aligning with the demand for rice. Population growth influences the number of born babies, but will probably alleviate because of the amount of mortality.

3.2. Discussion

In the spatial context, population mobility is also impacting the changes in a number of the population, where immigration will add the population number, and otherwise, emigration will reduce the population in an area. A large-size population for some people is a positive thing because with that in occur will produce a high quantity of labor. However, some said that it would add more burden to the government's spending because it aligns with the rising demand along with the growing population [10].

The corn price variable is not significantly impacting the rice demand in Makassar, even though it shows a positive relation toward the rice demand. This led to the conclusion that if the price of corn rises, the rice demand will also increase. Corn contains carbohydrate which considers as the substitute good toward rice in Indonesia. [11] states that corn is not the staple food of the Indonesian people, so farmers grow rice at certain times when the season is no longer suitable for rice planting. The effect is not too large, only about 0.654% has increased rice demand every 1% increase in corn prices.

According to [12], maize can be positioned as one of the main food crop commodities as a second source of carbohydrates after rice, which is very instrumental in supporting food security. Through this function, placing corn as the government's success in diversifying food to reduce dependence on rice staple foods. Apart from being a corn consumption, material plays a very important role in the feed industry. Corn is the main component (60%) in the feed ration. It is estimated that more than 55% of domestic corn needs are used for feed, while for food consumption, only about 30%, and the rest is for the needs of other industries and seeds.

³
The same thing was stated by [13], which stated that the role of maize had changed into industrial raw material rather than as food. The position of corn as the main food commodity after rice makes it a substitute commodity (substitution) for rice. Corn is an alternative choice for the community when rice prices rise. This consumer behavior influences the behavior of producers by increasing the number of offers. The government's enthusiasm for shifting the staple food menu from rice to non-rice has actually been echoed since the 1960s. Besides, the fluctuating price of corn fluctuating is caused by

changes in demand, changes in production and supply of corn from other regions outside Makassar City, as well as changes in prices at the distributor level.

The last variable in this model is the price of eggs, where the price of eggs does not significantly influence the demand for rice in Makassar City. In the egg price analysis model, the regression coefficient is positive. So it can be interpreted if the price of eggs rises, the amount of rice requested will rise. This can be related to the function of rice and eggs as additional food sources of protein. If the price of eggs rises, the demand for rice will increase in order to fulfill additional food as side dishes for consumption. Eggs are a food source of protein and as a complementary food as a side dish for consumption.

However, from the results of the regression analysis, eggs are positive so that eggs cannot be explained as supplementary items but substitute goods. Eggs as one of the poultry livestock products have a protein that plays a very important role in the human body because protein functions as a building material that is forming new tissue material in the body, regulating substances that regulate various systems in the body and as fuel, the protein will be burned when energy needs the body cannot be filled with carbohydrate and fat. Almost all types of people can consume this type of food as a source of animal protein. This is because eggs are one form of food that is easily obtained and also easy to process. This makes eggs a type of food that is always needed and widely consumed by the community. In turn, the need for eggs will also continue to increase [14].

The F statistical test basically shows whether all independent variables entered in the model have a joint influence on the dependent variable. The F test results show a value of 207.976, which is greater than the F table and means that all independent variables (X) entered into the model together show the effect on rice demand variables in Makassar City. While the R2 test results are 0.925, which means that 92.5 percent of the diversity of the dependent variable (Y) can be explained by the diversity of the independent variable (X) and the remaining 7.5 percent is explained by other variables not included in the model. The analysis results obtained by the correlation coefficient (R) of rice demand of 0.962 with a positive sign and close to 1, it can be interpreted that between the dependent variable (Y) has a close relationship with all independent variables (X).

4. Conclusion

Multiple linear regression analysis shows a significant relation in rice price and total population toward rice demand in Makassar. The simultaneous test shows that independent variables (X) significantly affect the rice demand, and the R2 score is 92.5% which explains the dependent variable variances (Y) can explain by its independent variables (X), and 7.5% is another variable that does not include in the regression model.

References

- [1] Reynaldy and Gustami 2013 Kenaikan Harga Jagung Di Indonesia.
- [2] Heriqbaldi U, Purwono R, Haryanto T and Primanthi M R 2015 An analysis of technical efficiency of rice production in Indonesia *Asian Soc. Sci.* **11** 91–102
- [3] Agung and Hidayat 2000 *Ketersediaan Lahan* (Jakarta: Pustaka Pelajar)
- [4] Yanuarti A R and Dkk. 2016 *Profil Komoditas Barang Kebutuhan Pokok dan Barang Penting: Komoditas Beras, Kementerian Perdagangan Indonesia.*
- [5] Rustinsyah 2015 Social Capital and Implementation of Subsidized Fertilizer Programme for Small Farmers: A case study in rural Java, Indonesia *Int. J. Rural Manag.* **11** 25–39
- [6] Statistik B P Makassar dalam Angka. Jumlah Permintaan Beras Masyarakat di Kota Makassar.
- [7] Hendrik and W.Mulyo 2011 *Analisis Permintaan Beras Di Kabupaten Klaten.* (Universitas Sebelas Maret Surakarta)
- [8] Azzainuri 2014 Uji Breusch-Pangan.
- [9] Tahir 2010 *Penelitian Perkembangan Harga Beras Eceran Di Indonesia.* (Universitas Lampung)
- [10] Hakim 2007 *Pertumbuhan Penduduk.* Lampung: Universitas Lampung. (Gadjah Mada University Press.)

- [11] Nugroho 2010 *Pengaruh Barang Substitusi Terhadap Permintaan Beras*. (Jakarta)
- [12] Krisna 2012 Peranan Jagung Untuk menunjang Ketahanan Pangan.
- [13] F. K 2003 *Perkembangan Produksi Dan Konsumsi Jagung Dunia Selama Empat Dekade yang Lalu dan Implikasinya Bagi Indonesia*.
- [14] Anonim1 2015 *Nutrisi Telur*. (Bogor: Gunungbudi)

Demand analysis of rice as a strategic commodity in Makassar

ORIGINALITY REPORT

13%

SIMILARITY INDEX

9%

INTERNET SOURCES

11%

PUBLICATIONS

8%

STUDENT PAPERS

PRIMARY SOURCES

- 1 N Lanuhu, R M Rukka, A Amrullah, L Fudjaja, C D Muslimah, Suyono, H Sa'diyah. "Analysis of the effect of behavior market segmentation on purchasing decisions of local rice in the modern market", IOP Conference Series: Earth and Environmental Science, 2021
Publication 4%
- 2 M Arsyad, A Amiruddin, Y Kawamura. "Food security and political ecology for sustainable agriculture: some crucial notes from the ICEFS 2020", IOP Conference Series: Earth and Environmental Science, 2021
Publication 2%
- 3 Riduan Sembiring, Swati Sembiring, Seringena Br. Karo. "Responses of Corn (Zea mays L.) to Zeolite and Urea Fertilizer in Karo Highlands", Journal of Agricultural Studies, 2020
Publication 1%
- 4 A A K Sudharmawan, M Widiанти, A H Bahrún. "Expected genetic progress of F2 resulted from crossovers of paddy Situ Patenggang 1%

variety with IPB 3S variety", IOP Conference
Series: Earth and Environmental Science, 2021

Publication

5	eprints.uthm.edu.my Internet Source	1 %
6	Submitted to Universitas Brawijaya Student Paper	1 %
7	Eva Fadhilah, Syaiful Syaiful, Nyimas Wardatul Afiqoh. "Influence of Profitability, Tax Aggressiveness, and Institutional Ownership of Corporate Value", INNOVATION RESEARCH JOURNAL, 2020 Publication	1 %
8	pertambangan.fst.uinjkt.ac.id Internet Source	<1 %
9	es.scribd.com Internet Source	<1 %
10	www.slideshare.net Internet Source	<1 %
11	T Karyani, A Susanto, S Tedy, H Hapsari. "The effect of attractant production factors on the income of curly red chili (Capsicum annum L.) farming (case in Pasirwangi District, Garut Regency)", IOP Conference Series: Earth and Environmental Science, 2021 Publication	<1 %

12	academic.oup.com Internet Source	<1 %
13	www.dcgrant.sa.gov.au Internet Source	<1 %
14	serisc.org Internet Source	<1 %
15	Tono Wartono, Bambang Sudaryana. "THE ASSESMENT OF LEADERSHIP STYLE, COMPETENCE, MOTIVATION, AND COMPENSATION TO EMPLOYEE PERFORMANCE", Indonesian Journal of Social Research (IJSR), 2020 Publication	<1 %

Exclude quotes On
 Exclude bibliography On

Exclude matches < 5 words