

The Impact of Rice Policy towards Poverty Reduction in Indonesia

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Abstract: Poverty is an important issue in the Indonesian economy which should be addressed immediately. Rice is a major source of calories most of the Indonesian people that affect the welfare of million people. The objective of this research was to analyze the impact of rice policy on poverty in Indonesia. Specifications of research model using simultaneous equations and allegedly with the method two Stages Least Squares (2SLS). The results of research shows that poverty in Indonesia is influenced by economic growth, government spending on infrastructure, percapita income, fuel prices, inflation, the amount of imported rice, the rice price retail premises and poverty previous year. The decline in the retail price of rice is able to reduce poverty. Real retail rice price increase 1 percent would increase poverty by 0.037 percent in the short term and amounted to 0.124 percent in the long term. 1 percent increase in economic growth will reduce poverty by 0.090 percent in the short term and amounted to 0.306 percent in the long term. In an effort to reduce the number of poor people, government purchasing price policy should be followed by other rice policy.

1 INTRODUCTION

Poverty is an important issue in economy which must be addressed immediately. Poverty rate measurement is conducted by Central Bureau of Statistics (BPS) Indonesia that using concept of ability to meet basic needs. This approach sees poverty as an economic disability to meet the basic needs of food and not food as measured by the expenditure side. So the poor are residents who have an average monthly per capita expenditure below the poverty line (BPS 2015).

Asian economic shocks in 1997-1998 had an impact on increasing poverty in Indonesia. In 1998 poverty increased to 24.2 percent or as many as 49.5 million people. In 2012 and 2013, poverty fell only 0.5 percent per year, the smallest decline in the past decade. The slowing down of poverty can not be separated from the slowing economic growth and the unbalanced income conditions experienced by Indonesia, where the Gini Index of Indonesia is 0.41 in 2014. This number is considered very high inequality katogeri. Inequality is increasing because most of the economic growth that occurs is not enjoyed evenly, but only enjoyed by the few upper class society.

People who in recent years can get out of poverty are people living a little above the edge of the

poverty line but very vulnerable to fall back into poverty. In line with the decrease of that group, the group which are in the bottom of poverty line and the group which are slightly listed above poverty line are the groups must be helped to rise up. Research conducted by World Bank (2015) produced important findings which had relation with the susceptibility of Indonesian people who fell in poverty. Many of Indonesian people could escape from poverty, but they were still survive just above poverty line. In 2014, about 28 million people were classified in poverty category with the income about US\$1.30 per day, but 68 million people were slightly listed above that number. Those people were people who were susceptible in poverty with the income about US\$1.90 per day. This empirical experience show Indonesian people are still susceptible in poverty if there is a shock impacted on the decline of purchasing power.

Specifically related to food problem (rice) which cannot be postponed needs a guarantee either the availability or the accessibility in order not to be fallen in poverty if there is a shock. This finding was supported by Booth (2000) in his research which reviewed poverty and income distribution on President Soeharto era in 1966-1998. The results of this tells that agricultural development becomes an important thing to decrease poverty in Indonesia. By

noting, development program is directed more not only in developing food plants but also specific needs for poor people. Furthermore, Timmer (1997) also suggests that the impact of agriculture development towards poverty reduction depends on income distribution.

Problems faced by agricultural sector (food) are production problem (availability) and price stability. Production problem occurred is unfulfilled food needs (rice) in country so as to import, poor competitiveness of food products and prosperity of farmers. However, price problems are the instability of food price. The high price of rice harms people, either for farmers or non-farmers, because most of calories takes from rice.

Rice expenditure portion which is relatively big in the income of poor people, therefore if there is changes of rice price, it will influence towards the number of poor people. Every 10 percent rice price increases, it will cause the increment of poor people as much as one percent (Malian et al 2004). Since the vulnerability of foods (rice) is crucial, food security is not only economic community, but also it becomes politic commodity. According to the explanation, therefore this research purpose to analyze the impact of rice policy towards poverty reduction in Indonesia.

2 LITERATURE REVIEW

Prominent government policy on rice commodity is useful price policy to stabilize price. According to Sadoulet and De Janvry (1995), that policy is main device of government intervention in agriculture contribution towards economic development. Whereas all this time, Indonesian government policy in agriculture is focused on the achievement of food self-sufficiency and price stability (Godoy and Dewbre 2010).

On rice self-sufficiency, the escalation of productivity policy through new technology breakthrough, the investment of irrigation infrastructure, subsidy and procurement of production facilities (superior seeds, fertilizer, and pesticide), price policy and rice commerce, as well as provision of subsidized credit, are main factors which cause Indonesia achieved rice self-sufficiency in 1984 (Rosegrant *et al* 1998). Besides, Anriquez and Stamoulis (2007) argue that agricultural sector is important component from developed rural economy in developing countries.

Rice is main food of Indonesian people. Rice becomes main calorie resource for most of

Indonesian people. Segment of rice on total calorie consumption is 54.3 percent, therefore half of calories are from rice (Harianto 2001). It is not impossible if rice demand in Indonesia is high. Kasryono *et al* (2001) estimates that growth of rice demand rate in Indonesia as much as 2.3 percent/year. Since food (rice) vulnerability is crucial, rice commodity is not only economic commodity, but also political commodity in which rice scarcity can cause political unrest like occurred on the end of Orde Lama regime (Manning 1987).

3 METHODS

Research method used is Two Stages Least Squares (2SLS) on simultaneous equation model with econometric analysis. Econometric analysis is a description from relationship of each explanatory towards dependent variables, especially that involves magnitude and sign from parameter estimator in accordance with theoretical expectation. Good model must have criteria of economic theory (theoretically meaningful), criteria of statistic viewed from one degree of precision (goodness of fit) known by coefficient of determination (R^2) as well as real statistically (statistically significant), however criteria of econometric establishes whether one estimation has needed properties, mainly unbiasedness, consistency, sufficiency and efficiency. Data used for regression are data in 1981-2014.

Elasticity Concept

To get quantitative measurement of response of one function towards influenced factors, it is used elasticity concept. On dynamical model, it can be calculated elasticity-short term (E-SR) and elasticity-long term (Gujarati 1995), with the formula as follow:

$$E-SR = \delta Y_t / \delta X_t * X_t / Y_t \dots\dots\dots (1)$$

$$E-LR = E-SR / 1-b \dots\dots\dots (2)$$

Notes:

- E-SR = short term elasticity
- E-LR = long term elasticity
- B = parameter estimated of lag endogenous variable
- X_t = exogenous variable average
- Y_t = endogenous variable average.

4 RESULTS AND DISCUSSION

4.1 Rice Productivity

According to estimation results on table 1, it can be explained that rice productivity in Indonesia is influenced by grain price on farmer level, ratio of urea price, rainfall level and productivity level on the last year. Variable of grain price in farmer level and rainfall have a positive relationship with rice productivity variable. According to estimation result, it can be found out that variable of grain price has real influence toward productivity and has positive relationship. It means variable of grain price in farmer level has important role in the increasing of grain harvest productivity. It also occurred in rainfall variable and productivity on the last year that had real influence statistically. It showed that the importance of rainfall condition towards the escalation of rice harvest productivity.

Table 1: Estimation results of rice productivity equation

Variable	Parameter Estimate	t Value	Elasticity	
			SR	LR
Intercept	877.3366	3.27		
Grain price	0.065231	3.04*	0.021	0.090
Urea fertilizer price	-3.51445	-0.12	-0.471	-1.97
Rainfall level	0.067227	2.01*	0.035	0.147
Lag produktivity	0.761826	11.62*		

R-Square : 0.971, F-statistic : 234.74, * $\alpha = 5\%$

Productivity response towards grain price changes in farmer level is in elastic, with E-SR 0.021 and E-LR 0.090. It means grain price in farmer level influence to the changes of rice harvest productivity, but with the small changes. The escalation 1 percent of grain price in farmer level will increase productivity 0.021 percent in short term and increase 0.090 percent in long term. The small elasticity value of grain price toward rice productivity shows that rice productivity encounters saturation, therefore although rice price increases, but it is difficult for farmers to increase productivity.

Rainfalls variable on equation of productivity, coefficient of different rainfall is significant affect, this shows that how rainfalls are important toward the increasing of productivity of rice harvest, but productivity is not responsive toward rainfalls changes with E-SR 0.035 and E-LR 0.147. It is different from two others exogen variables in equation of productivity, ratio variable of urea fertilizer price influences not real with productivity and negative relation. It means the increment or

reduction of urea fertilizer price will influence to the lowering or increasing of rice harvest productivity. It can occur if urea fertilizer price increases, then farmers will use urea less that the use of urea ideally on farmers' rice. The result is the productivity also decreases because the use of urea decreases.

This research is supported by the result of Mulayana's research (1998) which concludes that response of rice productivity is inelasticity (not responsive) toward the changes of grain price and fertilizer price. According to Cahyono (2001), the behavior of rice productivity and field are determined by grain price, the use of superior seeds, intensification areal, rainfalls and El-Nino. However, Sitepu (2002) concludes rice productivity is influenced by grain price, urea fertilizer price, the number of urea use, the large of irrigation area, intensification area and symptoms of global warming (EL-nino), but the response is inelastic. This shows rice production has undergone levelling-off as a result from unbalanced fertilizer use.

4.2 Price of Retailed Rice in Indonesia

According to estimation result of equation of retailed rice price in Table 2, it can be found that coefficient of government purchase price has real influence to retailed rice price. It indicates that Bulog's role which is very central in deciding government purchase price in keeping stability of retailed rice price. Price of retailed rice becomes important because it becomes final price in consumer level. It also influences to people's purchasing power. Besides government purchase price, grain price in farmer level also has a significant influence toward price of retailed rice in mark $\alpha = 0.05$. It means the influence of grain price is very good in deciding retailed rice price.

Table 2: Estimation results of the retail rice price equation

Variable	Parameter Estimate	t Value	Elasticity	
			SR	LR
Intercept	102.7107	0.17		
Rice produktivity	-0.00174	-0.29	-0.195	-0.211
Gov' purchase price	0.118601	1.52*	0.086	0.093
Urea fertilizer price	0.297236	1.06	0.062	0.067
Grain price	1.778837	9.59*	0.912	0.985
lag retail rice price	0.074442	1.04		

R-Square: 0.9982, F-Statistic: 3085.44, * $\alpha = 5\%$

The result of this research is also supported by Kusumaningrum (2008) in her research which said that coefficient of grain price in farmer level has a real influence toward retailed rice price. Retailed rice price is not responsive toward grain price in farmer level with E-SR as many as 0.3617 and E-LR as many as 0.6294. Price of retailed rice is influence in real by rice production in Indonesia negatively. The response is either E-SR (1.2495) or E-LR (2.1748). It proves that the more rice production the more rice price decreases. This result is in line with Sawit (2003) who mentions that the more production level the more Bulog can provides rice (Sawit, 2003). The purpose of that procurement is to stabilize the price. Therefore, Bulog’s role in this part is needed, in which if rice production increases, Bulog must buy rice/grain from farmers to keep the price stability. Price of rice or grain production level influence positively toward Bulog procurement.

4.3 Poverty in Indonesia

According to Table 3, it can be found that poverty in Indonesia is influenced by economic growth, government’s expenditure for infrastructure, and income per capita of Indonesian people with negative sign. Besides, fuel price variable (premium), inflation, the number of rice import, retailed rice price in Indonesia and the poverty in the last year gives positive influence toward poverty in Indonesia.

Statistically, the influence of growth variable toward poverty variable has real influence. It indicates economic growth becomes an alternative sustainability in decreasing poverty in Indonesia. No one to doubt about (potency) relation between economic growth and proverty decline. One of study which includes data panel involves 80 countries and covers periods for 4 decades shows that the growth of group of people 20 percent lowest moves proportionally with the growth of GDP per capita. This study also finds that there is no different pattern between superpower countries and developing countries and there is no different relation if it is viewed per decade. It means this study finds that (positive) influence from economic growth has the same goodness toward poor people (Dollar and Kray 2000).

Tabel 3: Estimation result of poverty equation

Variable	Parameter Estimate	t Value	Elasticity	
			SR	LR
Intercept	11496010	1.98		
Economic growth	-595319	-1.80*	-0.090	-0.306
Fuel price	560.0010	0.46	0.035	0.117
Gov’ Spending on Infrastructure	-0.01935	-0.62	-0.027	-0.091
Percapita Income	-0.78510	-0.61	-0.234	-0.791
Inflation	95083.38	0.86	0.028	0.095
Nett rice import	0.000049	0.09	0.002	0.005
Retail rice price	427.5662	0.32	0.037	0.124
Lag Poverty	0.704099	5.89*		

R-Square: 0.864, F-statistic: 19.20, * $\alpha = 5\%$

Empirical proof as long as several years shows economic growth in Indonesia is a main factor supporting the decreasing of poverty for 30 years. Poverty alleviation in long term can only be achieved with sustainable economy. This finding is supported research by Olowa (2012) conducted in Nigeria. The research concludes that the low economic growth is the main cause of poverty. According to Timmer (2004), the main challenge faced is food security is not focused on productivity dimension, but it is to create fast growth and focuses on poverty alleviation in context of new structural transformation.

In table 3, it can be viewed that estimation parameter for variable of retailed rice price has positive mark. It means the increasing of price can increase poverty. It is in line with Warr (2005) who shows that raising rice price, raising poverty. Among farmers, only rich farmers who enjoy benefits from this policy.

This finding is in line with research conducted by Yudhoyono (2004) that the number of poverty is influenced by fiscal policy, economic growth and wage rate. Government’s expenditure gives positive influence for decreasing poverty. The increasing of government’s expenditure for infrastructure in real decreases the number of poverty. Besides, according to Simatupang (2000) in his research shows that the development of agriculture sector is very effective in poverty alleviation, the value of increasing of income per capita and the decreasing of food price especially rice price. The decreasing of rice price is very effective in decreasing the number of poor people in rural areas or in urban areas.

The Impact of Rice policy in Indonesia

Every policy conducted by government can cause positive or negative impact toward each endogen variable. Policy conducted by government also has a possibility not to have impact toward other

endogen variables. Simulation conducted in this study is by applying combination of price policy that can decrease poverty in Indonesia from 1981 till 2014. These are the recapitulation of simulation conducted in research.

Tabel 4: Recapitulation of simulation combination of price policy

Variable	Simulation (percent)			
	A	B	C	D
Poverty	0.0106	-0.0350	-0.2650	-0.2620
Rice productivity	1.0589	1.1520	1.0580	0.1240
Price of retail rice	0.3932	-1.3350	-9.9270	-9.8440

Notes:

1. Simulation A: Policy in increasing the price of government purchase and the large of irrigation areal each 20 percent and 12 percent and decreasing urea price 20 percent.
2. Simulation B: Policy in decreasing urea 20 percent as well as increasing credit and irrigation areal each 20 percent.
3. Simulation C: Policy in removing government purchasing price, decreasing urea price and increasing the large of irrigation areal each 20 percent and 12 percent.
4. Simulation D : Policy in removing government purchasing price and import tariff with the policy of decreasing urea price and increasing credit each 20 percent.

According to table 4 which explains simulation in research, simulation C shows best result in decreasing poverty, that is 0.2650 percent. Simulation showed on simulation B and D still shows smaller impact toward the decreasing of poverty. Simulation B is the best simulation in increasing rice production in Indonesia. That is 1.523 percent.

This result is in line with Hutaaruk (1996) who states that the policy of the increasing of irrigation areal will increase domestic product and impacts to the decreasing of rice import. It is also supported by Sitepu (2002) who said the increasing of irrigation areal will increase the number or grain production and farmers' income.

Simulation that decides the policy of the increasing government purchasing price has impacted to the increasing of poverty. It is in line with Ritonga (2004) who states that the policy of the increasing basic price has commonly increased the prosperity level in one party. However, in another party, the increasing of grain basic price is followed by the increasing of retailed rice price, causing the decreasing of consumers' prosperity level. The decreasing of prosperity level has implication to the

increasing of the number of poor people. This finding indicates that the policy of removing the government purchasing price becomes one of good recommendation in decreasing poverty in Indonesia. Besides, simulation B and C still shows small impact toward the decreasing of poverty. The simulation shown on simulation A and D shows the increasing of poverty, each 0.0459 and 0.0435 percent. It indicates the policy to increase government purchasing price influences to the increasing of the value of poor people.

5 CONCLUSIONS

Variable of economic growth in Indonesia influences significantly toward the poverty in Indonesia. In trying to reducing poverty, policy is directed to the increasing of people's purchasing, therefore policy which focuses on rice availability and stability of rice price becomes main focus in taking government policy. The decreasing of rice price can decrease poverty, but the influence is still small. The removing of government purchasing price for commodity becomes alternative policy which impacts to poverty alleviation. In trying to decrease poverty and increasing rice production, the policy of government purchasing price is combined with another price policy, such as policy to increase irrigation areal.

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