

RESEARCH ARTICLE

Analysis of Food Demand Elasticity of Rice for the Poor in Aceh, Indonesia: An Almost Ideal Demand System Approach

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Abstract: The purpose of this study is to empirically explore the effect of rice for the poor (*Raskin*) or subsidized rice consumption on the food demands elasticity of poor households. The study utilizes the primary data collected in 2015 based on the purposive sampling method for establishing the homogeneity characteristics of *Raskin* beneficiary's households. An Almost Ideal Demand System approach is adopted to measure the proportion of food commodities expenditure of the poor and the demand elasticity as well as their responses to the income elasticity. Additionally, the correlation analysis is utilized to investigate the relationship between the selected socioeconomic variables and expenditure of the poor households. Apart from the *Raskin*, five other food commodities were also investigated, comprising rice, meat, fish, milk, and eggs. The study found that the highest proportion of the expenditures of the poor households was spent for the rice, while the lowest one was spent for milk. The highest coefficients of price and income elasticity were documented for *Raskin*, while the lowest ones were for the milk. The poor households were highly dependent on the *Raskin* although it has a lower quality, implying the *Raskin* as the superior good. Finally, the study found that the proportion of expenditures for each food commodity by the poor related significantly to the number of dependents, income, and their aggregate expenditure. These findings showed that the *Raskin* has ensured the fulfillment of the rice as one of primary needs of the poor in Aceh, Indonesia.

Keywords: Demand elasticity, Almost Ideal Demand System, Rice for the poor (*Raskin*)

JEL Classifications: D12, I32, I38, P46, R22

INTRODUCTION

Indonesia still faces the problem of poverty and food security. The main problem of food security and poverty are not only on food availability, but also on lower public purchasing power. Food security can be strengthened when people have the productive economic activities, sufficient source of income,

improved economic conditions, and increased income above the poverty line (Hariyati & Raharto, 2012).

Poverty is always associated with the unfulfillment of food needs. The food problems of the poor are problems that will never clearly solve. A large number of people in the poverty group reflects the level of food security in a region. Food security at the household's level is associated with the ability to fulfill the

basic needs of food both from the physical and the affordability sides.

In Indonesia, the government efforts to prosper the poor through the optimization and efficiency of programs have been ongoing continuously. One of them is the Rice for the Poor Program or better known as *Raskin* (*Beras Miskin*). It is a government program that portrays the country's true function to secure food for its people. This program aims to provide enough availability of food so that none of the Indonesian citizens are living under starvation due to the lack of access to food.

The program of rice subsidy started in 1998 when the country was hit hardest by the 1997 ASEAN economic crisis, aiming at strengthening households' food security, especially for the poor households. Initially, the program was called as the Special Market Operation Program (OPK), and then changed into the rice for the poor (*Raskin*) program in 2002. The *Raskin* expanded its function—not just as a social safety net—as part of the social protection program of the community (“*Raskin*,” 2010).

This research is focused on Aceh Province, one of the provinces in Indonesia which is geographically located at the northern end of Sumatra Island, Indonesia. Aceh was once a food self-sufficient region in 2008. However, until now Aceh has received the *Raskin*. Food self-sufficiency failed to meet the needs of the poor in Aceh. This is because the food sought by the government to be encouraged in Aceh is still diverse and not solely rice, then the concentration of rice production has been not optimal. Actually, this condition has been very unfortunate given the existing agricultural land in the province of Aceh is quite extensive and rice is the primary commodity for the people of Aceh. Distribution of the rice for poor into the province of Aceh was due to the constraints on development experienced by the province with high levels of poverty.

In 2014, the poverty rate of Aceh reached 11.36% lower than the 11.55% in 2013. Meanwhile the poverty rate of Aceh in 2014 was still higher than the national poverty rate which was 8.16 % in 2014 (Central Bureau Statistic, 2015). This indicates that the poverty rate in Aceh Province was higher than its national level. This issue has become one of the biggest challenges to the government of Aceh in improving the welfare of its citizens.

In Indonesia, a household who deserves to receive *Raskin* is called households of benefit receiver target (RTS-PM). The program recipients are the households from the 2011 Social Protection Program Data Collection (PPLS), which was managed by the Speeding Up National Team of Poverty Prevention (TNP2K) and legalized by the Ministry of Cooperation and Citizenry Prosperity of Republic of Indonesia. *Raskin* provides subsidized rice to 17.5 million of RTS-PM with the lowest socioeconomic conditions in Indonesia (the poor and susceptible poor group). However, in 2013, *Raskin* provided subsidized rice to 15.5 million of the RTS-PM. The amount of the RTS-PM in 2014 has not changed since 2013 nationwide (National Team of Poverty Prevention, 2015).

Social Protection Card (KPS) is the participation sign or Poor Households Statement Letter (SKRTM) for households' successor determined at the village level. The amount of RTS-PM in 2014 reached 25% of inhabitants with the lowest level of prosperity covering poor and susceptible poor households nationwide.

Some previous studies on food consumption in Indonesia have been done by Putri (2011), Nur, Nuryati, Resnia, and Santoso (2012), Yuliana, Bangun, and Mardiningsih (2013), which documented the service quality dimensions (tangibility, reliability, responsiveness, assurance, and empathy) and distribution (right target, right quality, precise quantity, price, timely, and proper administration) of the rice for the poor simultaneously and partially enhanced the satisfaction of Households Target (RTS-PM) of the *Raskin* beneficiaries. The variable that contributed most to the satisfaction of the RTSPM was the quality of service.

According to Musawa (2009), the targeting of *Raskin* beneficiaries encountered a mistarget, indicated by non-poor households being beneficiaries of *Raskin* and the presence of poor households that have not become *Raskin* beneficiaries. Murda's (2009) study utilized the 2007 Susenas panel data of Indonesia and found that food group was normal goods and almost all of them included in the main category, while other food categories belong to the category of luxury goods for whole and poor households. Murda (2009) also documented that the effect of rice price on the demand of all food groups was greater than the effect of non-rice prices on rice demand.

Moreover, Nurkhayani (2009) stated that the price is associated with the consumption of calories and protein. An indirect subsidy policy proven from the simulation showed the greater impact to an increase in the consumption of calories and protein of poor households than the direct subsidies. Almost similar to Nurkhayani (2009), Pangaribowo (2012) also identified the rice for the poor program caused an increase in households' consumption on nutrient-rich food, animal food sources despite the presence of fungibility or a positive impact on food and non-food items. Similarly, Sasongko (2009) adopted a path analysis model explaining some of the sample areas showed that *Raskin* has affected the consumption expenditure and some other samples have not affected the additional consumption but resulted in net social cost from the distribution of the poor rice subsidy.

Unlike the previous studies on food consumption in Indonesia, this study directly incorporates the *Raskin* variable with other food commodities as the dependent variables to analyze food demand of the poor people from the expenditure aspect by using an Almost Ideal Demand System with Seemingly Unrelated Regression model in analyzing the effect of rice for the poor on demand elasticity, in terms of the proportion of spending on each commodity and total expenditure. Thus, it can be compared directly to the expenditure. The population of this study is the poorest inhabitants of the *Raskin* beneficiaries (RTS-PM), which is officially registered by TN2PK, while the sample of

this study was selected using the purposive sampling technique to find homogeneous characteristics of poor households.

The descriptive statistics for the poor households is illustrated in Figure 1. As observed from Figure 1, the poor households surveyed and sampled in this study are those who are nationally recorded and already married.

The displayed figure is the total households in percentage. Majority of the respondent aged are still productive (40-59 years old) and more than 50% of them were women and widows. On average, the respondents have three dependents and farming is their dominant job whose monthly income was below the regional and national minimum wage.

The determination for food commodity variable in this study was based on the commodity survey (Susenas) conducted by Central Bureau of Statistics, Indonesia. These commodities included non-subsidized rice (normal rice), fish, egg, milk, and meat. Vegetable is not included as the investigated commodity in this study as it is not difficult to obtain because the garden is often planted with various types of vegetables. Additionally, the main focus of this study was on the proportion of food expenditure that is considered important to the respondents only. Specifically, this study aims to (1) measure the expenditure of the poor on food commodities, then (2) analyze the elasticity of the poor's demand for food commodities with the help of *Raskin*, and (3) investigate the correlation of the

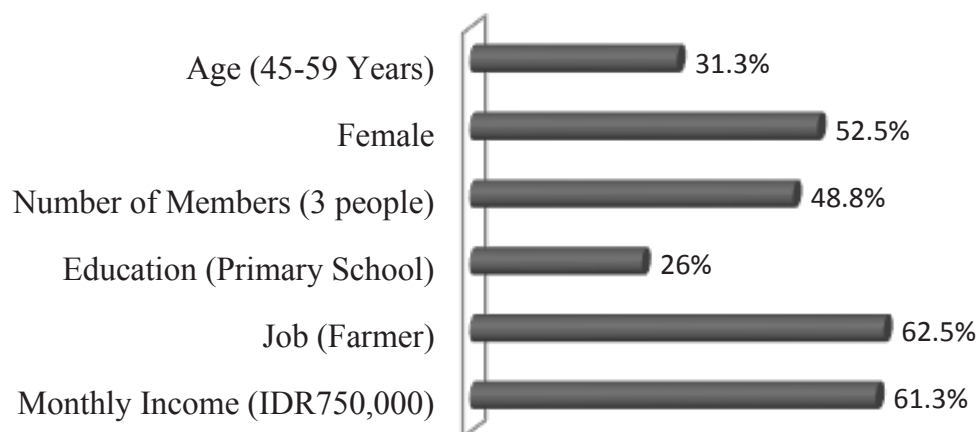


Figure 1. Characteristics of households.

socioeconomic variables with the expenditure variable to the food needs.

The findings of this study, on the impact of the *Raskin* on the food demand of the poor and the determinants that influence the consumption behaviour of the poor with the help of poor rice to other food needs, are hoped to shed some lights for the policy makers in ensuring the effectiveness of social assistance programs for the poor by taking into account their main needs.

The remainder of this study is structured as follows: the theory of demand for food by the poor will be highlighted in Section 2. The selected relevant works of literature to the demand for food by the poor will be discussed in Section 3, followed by the discussion on empirical framework and methodology in Section 4. Before the conclusion is provided in the last section, the findings and their discussion will be provided in Section 5.

Demand for Food by the Poor

According to Ismanto (1995), poverty could be identified by the social, economic, and politic dimensions. Social poverty is interpreted as social net weakness, the social structure with less support and limitation of access for someone to increase the resources (Effendi, 1993). Politics of poverty is related to the political incapacity of wide society group in affecting the allocation process of resources (Bulkin, 1998). Meanwhile, economics of poverty is construed as the limitation of economic sources to defend and fulfill proper living necessity (Esmara, 1986).

Limited economic resources can be seen from demand-driven consumer behavior. The theory of demand is based on consumers' behavior, which indicates their behavior in consuming their living need goods. However, the demand itself is the consumer's desire to buy goods at any price level during certain time period. Therefore, demand is affected by its price. The higher price of goods causes the demand of goods to decrease and vice versa (Pindyck & Rubinfeld, 2015).

Besides the price of goods itself, the price of other goods also affects consumer's demand. These are called substitution and complementary relationships. On substitution relationship, if the increase in price occurs to a good, it will affect the increase of other

goods' demand. But, on the complementary relation, if the increase of price on one good, it will reduce the demand for other goods (Pusposari, 2012). There are two functions of demands, namely, demand function derived from satisfaction function (Marshallian's demand function) which is acquired by maximizing satisfaction with the obstacle to income and demand function derived from expenditure function (Hicksian's demand function), obtained by minimizing expenditure of obstacle of satisfaction level (Jogiyanto, 2004).

Selected Previous Studies

Several previous studies on food demands, especially for rice commodities for the poor, have been studied abroad. The study of Hoang, Pham, and Ulubaşoğlu (2015) found that rice production and rice productivity have no significant contribution to poverty alleviation in Vietnam. Similarly, the rise in rice prices, driven largely by the integration of the country into world markets, has not helped rural households and large-scale rice production households escape poverty.

The problem of food security has also been examined by Bibi and Cockburn (2009), the research related to the welfare of children. Increased food prices lead to increased food poverty among children. In the Philippines, using quantitative restricting approach, Cororaton (2004) documented that all poverty indicators in the sample groups studied showed higher scores in terms of the worsening poverty situation.

The importance of observing the effectiveness of public expenditure of subsidized rice in the case of the Philippines was also investigated by Jha and Mehta (2008). They found that there was an inequality between the estimated national consumption of NFA (National Food Authority) rice and the amount of rice officially supplied. Meanwhile, by using LA/AIDS, Aftab, Yaseen, and Anwar (2016) evaluated the welfare costs of rising food prices in three densely populated countries in South Asia, namely: Pakistan, India, and Bangladesh. The results showed that cereals were inelastic to price fluctuation, meanwhile protein rich food like chicken was elastic compared to income consumers.

Funing and Jun (2013), whose study focused on income versus price subsidy, found that when compared with price subsidies, income subsidies were much more efficient and desirable because the subsidy

funds come from the taxpayers. Thus, reducing the cost of the policy means reducing the burden of the taxpayer. Studies on the effect of subsidies on households' nutrition have not only been studied in the ASEAN countries, but also on other countries. Using a causal methodology, Shaw and Telidevara (2014) compared calorie consumption per person for households with ration and households cards that have no ration card in India. They found that the Targeted Public Distribution System (TPDS) induced households to consume more cereals and reduce non-cereals. Umali-Deininger, Sur, and Deininger (2005) investigated the shifting of TPDS in India which has a positive impact on the well-being of the poor by improving access and availability.

Empirical Framework

Basically, this study is the result of two years of field research (2015-2016) funded by the Ministry of Research and Technology and Higher Education, Republic of Indonesia. This study explores the impact of *Raskin* to consumption of food by the poor in Aceh Province, Indonesia. The impacts are analyzed by the proportion of expenditure from the elasticity of demand for food commodities as well as the analysis of the relationship between socioeconomic variables and the expenditures spent by the poor with the subsidy of rice for poor households (*Raskin*).

The selection of the study area was based on the RTS-PM data for the highest *Raskin* beneficiary's households in the sub-districts of Aceh Province, namely: Pidie Jaya and North Aceh. The population of the study is the poor who are recorded as the *Raskin* beneficiaries. Determination of 80 respondents as the sample of the study was selected using the purposive sampling method that is the respondent with the homogeneity characteristics.

Thus, the characteristics of the poor households selected as the sample of the study with special characteristics of nine indicators based on the Central Bureau of Statistics (2014), namely the households who have: (1) Floor of residential building of less than eight square meters; (2) Type of residential floor is made of cheap ground, bamboo, or wood; (3) Type of residential wall is made of bamboo, *rumbia*, low-quality wood, or wall without plaster; (4) The

household does not use electricity for lighting; (5) Source of drinking water comes from unprotected wells, streams, or rainwater; (6) No defecation facility together with other households; (7) Daily cooking fuel is firewood, charcoal, or kerosene; (8) Only consume meat, milk, or chicken once a week; and (9) Only buy one set of new clothes a year.

The system approach used in this research is the AIDS, introduced by Deaton and Muellbauer (1980). This study adopts the AIDS approach due to its ability to perfectly aggregate consumer and has a form of equity that is consistent with households' budget data. This method is based on the Marshallian demand function derived from the expenditure derivation. Referring to Deaton and Muellbauer (1980), the unrestricted model of AIDS method can be written as follows:

$$w_i = \alpha_i + \sum y_{ij} \log p_j + \beta_{ij} \log(x/p^*) \quad (1)$$

Where w_i is commodity proportion expenditures i , while ij is 1, 2, 3, ..., n commodity group (rice, meat, *Raskin*, fish, milk, and egg), α is a constant, β is the regression parameter, p_j is the commodity price j , y is the total expenditures, and p^* is the Stone Price Index ($\text{Index } p^* = \sum w_i \ln p_i$).

Equation (1) is used to provide the answer for the first objective of study that is to analyze the expenditure of the poor on food commodities in the presence of *Raskin*. In the AIDS method, there is a close relationship between the demand and income variables. The demand for this model is derived from the differences between the expenditure of a type of goods and the total expenditure of all goods in the system. For price variables, it commonly obtained from the division of the total expenditure of a commodity divided by quantity. This close relationship often causes bias if it is reordered using the Ordinary Least Square (OLS) because it is likely to violate the classical assumption test. The solution to this problem is to use the Seemingly Unrelated Regression (SUR) model. The advantage of the SUR model is that it can estimate the system simultaneously. In order to overcome the simultaneous bias, the determination of instrument variables is done by calculating the price in the logarithmic form of each commodity group.

To measure the elasticity of demand, the study uses the following formula introduced by Chalfant (1987):

$$\frac{d \ln P^*}{d \ln P_j} = w_j \quad (2)$$

Price elasticity;

$$\varepsilon_{ij} = -\sigma_{ij} + (y_{ij} - \beta_i w_j)/w_i \quad (3)$$

Therefore, own price elasticity ($i = j$) becomes:

$$\varepsilon_{ij} = (y_{ij} - \beta_i w_j)/w_i - 1 \quad (4)$$

Cross elasticity ($i \neq j$) become:

$$\varepsilon_{ij} = (y_{ij} - \beta_i w_j)/w_i \quad (5)$$

Income elasticity becomes:

$$\varepsilon_{ij} = (1 + \beta_i w_j)/w_i \quad (6)$$

Equations (2) through (6) were used to answer the second objective of the study: to analyze the elasticity of *Raskin* and food demand with own price and cross price elasticity and income elasticity. Finally, the Chi-Square test with cross-tab was used in the study to investigate the correlation between the social-economic variable with the expenditure of the poor on *Raskin* and food commodities. The Chi-Square is one type of non-parametric comparative test performed with two variables, where the data scale of the two variables is nominal. If there is one variable with nominal scale then the Chi-Square test with reference should be tested to the lowest degree.

The details of variables investigated in the study are measured as follows: (a) Demand elasticity is the price elasticity of the goods itself; Cross price elasticity and income elasticity, as measured by percent units; (b) Expenditure is the total *Raskin* consumption expenditure, measured in the unit of Indonesian Rupiah (IDR); (c) The price of *Raskin* is the *Raskin* redemption price measured in the IDR unit; (d) The price of rice other than *Raskin* is the prices of other substituting goods also measured in the IDR units; (e) The price of meat/fish/egg/ milk is the price of other complementary goods, measured in the IDR units; (f) Socioeconomic variables investigated in this study, comprising age, education, job, side job, number of family members, adequacy of *Raskin*, number of dependents, and quality

of *Raskin*; and (g) RTS-PM is a nationally recognized poor beneficiaries of *Raskin* by the TN2PK.

Results and Discussions

Table 1 illustrates the proportion of expenditure spent on the poor for the subsidized rice (*Raskin*) from the AIDS method approach by including the price (p) and expenditure (w) of each commodity. In general, from the total expenditure (Lw) of food commodities, the expenditure of rice significantly affected the expenditure of the poor (RTS-PM). This showed that rice is the primary commodity that must be met for the poor in Aceh. This finding is in harmony with the Saidah (2014) who investigated the impact of subsidized rice on the consumption of *Raskin* beneficiaries in the Province of Papua, Indonesia and documented that rice significantly affected the proportion of commodity expenditure for local foods.

Furthermore, the analysis of expenditures could be seen from the influence of prices. The price of *Raskin* did not affect the proportion of rice, meat, fish, and egg commodity expenditure. Meanwhile, *Raskin* prices have a negative and significant effect on milk. The results of this study supported earlier finding by Pangaribowo (2012) who investigated the impact of poor rice to households' consumption, which found that the rice for the poor program increased the expenditure of better nutritional food like meat, fish, and milk.

After estimating the proportion of expenditure of six variables of the food commodity, the study continued its analysis of measuring price elasticity (own and cross-price) and income elasticity responses (see Table 2). As observed in Table 2, the value of own price elasticity of each commodity was negative. This indicated that if there was an increase in price then the demand decreased, showing that the food commodity is categorized as normal goods. The result of this study is in line with the finding by Murda (2009), who found that the food groups are normal goods and almost all fall under the main category.

For the own price elasticity of rice, meat, fish, and *Raskin*, the study found them elastic with the value of greater than 1. This elastic nature means that demand for rice was very sensitive to the price changes of the goods' own price, especially for the

Table 1. Findings from the AIDS with Unrestricted Model

Variables	wRice	wMeat	wFish	wRaskin	wMilk	wEgg
Intercept	-2.1249***	-0.0201	2.2242***	0.0323*	-0.4336**	0.0454
pLRice	-0.4260***	-0.0055**	-0.0076	-0.0010**	-0.0268***	-0.0028
pLMeat	-0.0075***	-0.0764***	-0.0011	0.0002	-0.0035	0.0003
pLFish	0.4115***	0.0112	-0.4517***	-0.0051	0.1143***	-0.0064
pLRaskin	-0.0020	-0.0005	0.0004	-0.0330***	-0.0048*	0.0009
pLMilk	-0.0069***	-0.0011	0.0012	0.0000	0.0145*	-0.0005
pLEgg	0.0031	-0.0020	-0.0002	0.0003	-0.0085**	-0.0019
Lw	0.6667***	0.1293***	0.1937***	0.0749***	0.0048	0.0274***
	0.9283	0.8452	0.6966	0.9304	0.4399	0.5284

Note: ***, **, and * denotes significance levels at the 1 %, 5%, and 10%, respectively.

Table 2. Coefficients of Elasticity

Variables	Price						Income
	PRice	PMeat	PFish	PRaskin	PMilk	PEgg	
Rice	-2.7245	-0.0771	0.2497	-0.0092	-0.0682	-0.0952	2.6555
Meat	-1.6276	-3.2890	-1.3884	-0.0222	-0.1425	-0.2845	4.6552
Fish	-0.1835	-0.0170	-2.1621	-0.0002	-0.0102	-0.0263	1.4152
Raskin	-1.2616	0.0152	-3.0201	-14.1901	-0.0569	-0.0240	30.7625
Milk	-0.9329	-0.1176	3.6390	-0.1141	-0.5353	-0.2854	1.1551
Egg	-0.2235	-0.0106	-0.3080	0.0127	-0.0202	-1.0574	1.4407

Note: The figures written in **bold** are the own price elasticity.

Raskin commodities that have a very large elasticity value as compared to the other food commodities that were equal to -14.1901 (absolute value).

This finding showed that if there was an increase in the *Raskin* price, it would decrease the demand for the *Raskin* commodities in large quantities. Nevertheless, the price of *Raskin* has been set by the government in the *Raskin* general regulations, thus this empirical finding could be ignored. This empirical finding is supported by the results from our interviews where it has been well-known that the low quality of the *Raskin* is one of the reasons for declining demand for the *Raskin* when its price increases.

Milk commodities have a negative value and it was elastic. As the price of milk rises, the demand for milk declines. This finding is understandable, given that milk is a nutritional need whose consumer segment is limited, for example, the needs of toddlers for the poor

RTS-PM who have sufficient nutritional awareness. With rising milk prices, households would reduce the amount of milk demand given their children's nutritional needs.

Next, eggs have a negative value and it unitary elastic, implying that an increase in price leads to a decrease in the demand for eggs proportionately. The egg is a food requirement that almost all the poor RTS-PM consumed. The unitary nature of eggs shows that considerable prices affected egg demand in Aceh. This could be partly due to the availability of many substitutes for the commodity eggs, namely tofu, *tempe*, and fish. The substantial amount of protein substitution causes the eggs to be sensitive to price changes. Rising egg prices would be followed in proportion to the fall in egg demand. Increase in prices tends to lead households to look for cheaper substitutes with the same protein content.

In the elasticity of cross price, the positive value means having substitution properties, whereas the negative value means having complementary properties. For rice commodities, the average coefficient of cross-elasticity of other food commodities was complementary (negative value), with the exception of fish. This means that if the price of rice declines, the demand for other food commodities (meat, *Raskin*, milk, and eggs) also declines. This condition shows that rice commodity was more important for poor RTS-PM. However, between rice and fish, it has a positive relationship, showing the substituting commodities among the two. When fish prices increase, demand for rice increases. Households prefer to buy more rice than fish.

Similarly, the meat and fish commodities are complementary to other foods. This indicates that if there was a decrease in the price of meat and fish, it would lead to an increase in the demand for other food commodities. These commodities were complementary and tended not to stand alone.

Raskin was substituted with meat and meanwhile, eggs were substituted with *Raskin*. Since the *Raskin* price has been set by the government, then, if the price of meat and eggs increased, the poor would choose to consume the *Raskin*. Milk commodities were substitutes for fish commodities. This showed that milk was still an important requirement on households that must be met for milk needs for babies rather than fish. However, milk demand could be complementary for rice, meat, *Raskin* and eggs commodities.

Moreover, viewing the value of income elasticity in Table 2, it showed that the average value of income elasticity closed to unity for fish, milk, and eggs, but different from rice, meat, and *Raskin*, which were elastic commodities. The income elasticity value was quite high for *Raskin* (30.7%). This meant that if income rises then it would allocate more income to *Raskin* consumption since *Raskin* as a food subsidy with low prices could meet the basic needs of the poor. In other words, it showed that the purchasing power of the poor to basic needs increased from the *Raskin* subsidy. This further implied that the level of households' welfare in Aceh Province was still very low. In this perspective, the *Raskin* could be categorized as a superior commodity, because it was severely needed by poor RTS-PM. When considered from a low quality of *Raskin*, it should be an inferior commodity that would decrease its consumption when

income increased, but this did not apply to the poor RTS-PM in this study.

The value of income elasticity was very large for *Raskin* commodities, while *Raskin* has low quality. This showed that the very low level of welfare tended to be closer to poverty. This finding is in accordance with the increasing number of poverty in the province, supported by the finding of Seale, Regmi, and Bernstein (2003) who documented that households spent a greater proportion of expenditure for food consumption, indicating that the households were poor. Sengul and Tuncer (2005) also found that the poor households can be considered as low-income households as poor households have to negate some of the other basic needs to meet certain basic needs.

Finally, to answer the last objective of the study, it can be analyzed through the relationship of socioeconomic variables with expenditure using the Chi-Square test. As observed from Table 3, the probability values of the asymptotic 2-sided significance indicate that the values of some variables in the study were smaller than 0.05 or significant at 95% level.

This finding indicated that there was a close relationship between those variables. However, the probability value of greater than 0.05 was not reported in the study was simply due to their unimportant role in our model and provides no significant contribution to the policy recommendation for poverty alleviation program in the province.

Meanwhile, rice expenditure has a significant relationship with the expenditure of fish. In harmony with the culture in Aceh, fish is a complement of rice every day. Similarly, regarding meat expenditure, it is done in certain time only at certain events in the village, such as *mauled* (the Prophet Anniversary), wedding ceremony, and *aqiqahan* (celebration after 7-day of a baby born).

There was also a significant relationship between income and total expenditures—these two variables were clearly correlated because of the total expenditure spent by the poor (RTS-PM). This happens when there is an increase in the real income of the poor, thus, they could consume more rice and other food. If the poor did not meet the needs of the RTS-PM for rice, the poor spend more for rice.

Table 3 also showed a significant relationship between the number of dependents and expenditures for *Raskin*, fish, and milk. This indicated that every

Table 3. Findings from the Correlation Analysis

No	Cross Tabulation	Chi-Square	Asymp. Sig. (2-sided)
1	Expenditure of rice – Expenditure of fish	12.135	0.016
2	Expenditure of rice – Expenditure of meat	9.629	0.047
3	Income –Aggregate expenditure	16.085	0.003
4	Income - Expenditure of rice	14.888	0.005
5	Number of dependents–Expenditure of <i>Raskin</i>	24.074	0.000
6	Number of dependents – Expenditure of fish	13.092	0.011
7	Number of dependents –Expenditure of milk	41.220	0.000
8	Number of dependents–Aggregate expenditure	20.772	0.000
9	Number of dependents –Adequacy of <i>Raskin</i>	9.764	0.045
10	Number of dependents–Income	17.193	0.002
11	Dependence of <i>Raskin</i> –Quality of <i>Raskin</i>	10.975	0.004
12	Education – Income	10.423	0.034

RTS-PM who has a large number of dependents would have a large amount of expenditure according to the needs of each family member. Therefore, the number of dependents has the significant relationship between the total expenditure and income.

The number of dependents also has a relationship to the adequacy of *Raskin*. In this regard, in *Raskin* general regulations, there was no discussion on the number of dependents of the RTS-PM. Provision of *Raskin* for one household amounted to 15 kg without taking into account the number of dependents. The *Raskin* dependents also have a relationship to the quality of *Raskin*. In other words, the poor households (RTS-PM) were looking for better *Raskin* quality, especially the hygiene and nutrition levels of *Raskin*. The relationship between education and income explained that education was important for the poor—increasing the productivity of the poor, in turn, improves the welfare of the poor.

Conclusion

The purpose of this study is to empirically explore the effect of rice for the poor (*Raskin*) or subsidized rice consumption on the food demands elasticity of poor households in Aceh, Indonesia. An AIDS approach is adopted to measure the proportion of food commodities expenditure of the poor and the demand elasticity as well as their responses to the income elasticity. Apart

from the *Raskin*, five other food commodities were also investigated in the study, comprising of rice, meat, fish, milk, and eggs. Additionally, correlation analysis is utilized to investigate the relationship between the selected social-economic variables and expenditure of the poor households. The study found that the highest proportion of the expenditures of the poor households was spent on rice, while the lowest one was spent on milk. The highest coefficients of prices and income elasticity were documented for *Raskin*, while the lowest ones were for the milk. The poor households were highly dependent on the *Raskin* although this subsidized rice has a lower quality, implying that the *Raskin* as the superior goods. Additionally, the study found that the proportion of expenditures for each food commodities and the selected social-economic variables by the poor related significantly to the number of dependents, level of education, quality, number of dependents, adequacy of the *Raskin*, and total income.

The findings of the study implied that rice is the main commodity for the poor, especially in the Aceh, Indonesia, that must be fulfilled. Hence, *Raskin* program has been very helpful for the poor in meeting their daily food needs. This further proved that the dependence of the poor from the subsidized rice (*Raskin*) has been very high although in fact, the households received *Raskin* with low quality. The findings of this study are in harmony with the findings of previous studies in Indonesia, such as Murda (2009), Musawa (2009), Sasongko (2009), Putri (2011), Nur et

al. (2012), Pangaribowo (2012), Yuliana et al. (2013), and Saidah (2014).

The findings of study further confirmed that the *Raskin* program has been very helpful for the poor households (RTS-PM) to fulfill other food needs with the subsidized rice from the government. The income of the poor could be diverted partly to get other food needs, to satisfy basic needs and other demand for rice, meat, milk, eggs, and fish. Rice for the poor has an effect on consumption and expenditure of the poor households. However, the nature of this food assistance has been temporary for the short run since the number of *Raskin* received by the poor is only for 2-3 months.

The *Raskin* program has ensured the fulfillment of the rice as one of primary needs of the poor in Aceh, Indonesia, thus it would reduce the poverty level in the province in the long-run. The *Raskin* program should be continued, but with several improvements such as increasing the quality of the *Raskin*, shorten the distribution channel of *Raskin*, and extending the duration of providing *Raskin* to the poor along the year.

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