

# An Analysis of the Demand for the Consumption of Rice Substitutes in Households in the Province of Maluku

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**Abstract**— The aim of this Research is to analyse the partial relationships between the variables of the price of rice substitutes, the price of rice, income per household and the number of household members against the variables of household food availability and household food consumption patterns in Maluku Province. This research was carried out in Maluku Province using a sample of 200 people. Data used in this research is the primary data based on questionnaires and interviews with respondents and using secondary data taken from SUSENAS data covering a research period from 1995 through to 2014. The analysis used to test the hypothesis is the regression analysis using the SPSS application. The results of this research demonstrate that the variables of the price of rice substitutes, the price of rice, household income and the number of household members has a significant influence on the variables of the household food availability and the pattern of household food consumption in Maluku Province.

**Keywords**— The Price of Rice Substitutes, The Price of Rice, Income Per Household, Number of Household Members, Household Food Availability, Pattern of Household Food Consumption, Maluku.

## I. INTRODUCTION

At this moment the world is facing two great crises, that is the food crisis and the energy crisis. The food crisis has been triggered by the phenomena of global warming and the uneven distribution of food. While the energy crisis has been triggered by the great reduction of reserves of fossil fuel energy (Louhenapessy, 2010). Food is a basic need of the people that has to be fulfilled so that it is a human right for all people to obtain food. The increase in

the population and the quality of life of the people causes the demand for food to continuously increase. Robert Maltus (in Abdurachim, 1973 and Hafisah, 2006) explained that the increase in population was not in proportion to the growth of world food supply, where food materials will increase according to arithmetical progression while the population will increase according to geometrical progression, which causes scarcity in the supply of food in the world. Therefore, the need for food for all the people of Indonesia has to become one of the priorities in national development.

The definition of food security since the world food conference in 1971 until the 90's continued to experience change starting from global and national levels, to the household and individual scales that can be seen from the food first perspective to the livelihood perspective and from objective indicators to subjective perception (Maxwell and Frankenberger, 1992).

Indonesia is a country with a large population and covers a vast area so that the problem of food security is an important agenda in the development of the economy. Data demonstrates that food security situation in Indonesia at this time is still weak. This can be seen from the following conditions: (a) the number of population experiencing food insecurity (consumption level of less than 90 percent of the recommended 2,000 cal/cap/day) and extreme food insecurity (consumption level of less than 70 percent of the recommendation) is still quite large, that is 36.85 million and 15.48 million people in 2002; (b) the number of toddlers who are experiencing malnutrition is still quite large, i.e. 5.02 million and 5.12 million toddlers in 2002 and 2003 (Khomsan, 2003). Data from Susenas (2010) also shows that consumption level of rice of the

population of Indonesia in 2009 was the highest in the world, i.e. 102.2 kilogram/capita/year or almost twice the average consumption of rice of world population which is only 60 kilogram/capita/year. This data shows that endeavours to create food security in Indonesia need to be carried out.

In Indonesia, food is associated with rice because rice is the main staple food. Based on the writer's research, data shows that rice is the staple food of more than 95 percent of the population in Indonesia. This situation makes their consumption pattern dominated by rice commodities. Therefore, the government is always endeavouring to increase the availability of the main food especially rice. This can be seen from the government policies related to food are still focused on the commodity of rice. Besides that, the government also carries out strict control concerning the availability of rice and is not unwilling to import rice. The consumption dependence of the people of Indonesia on rice needs to be quickly overcome in order to increase food security. Therefore, alternative food sources, such as local foods can become the solution to overcome the problem of food security in Indonesia which is a country that possesses various other types of food such as sago, corn and various other types of tubers that can become the source of food for the people. Food besides rice has local historical and cultural roots so that the majority of the people of Indonesia, especially in Eastern Indonesia are used to consuming local food such as tubers, corn and sago. This indicates really that alternative food sources can become a consumption alternative for the people of Eastern Indonesia and rice can be focused to supply the needs in Java.

The policy of implementing food security by making use of local foods is the right step, because of the availability of local foods in each area and the ease by which they can be developed. For example, the people of Papua and Maluku are able to consume sweet potatoes as the staple food to replace rice. Nusa Tenggara Timur and North Sulawesi as the main producers of corn can consume corn as the staple food to replace rice. Another commodity which also has the possibility as a staple food to replace rice is sago which is widely available in Eastern Indonesia and Sumatera (Nainggolan, 2004).

Bustaman and Susanto (2007) explain that the farming of sago in Maluku Province can be utilised as a food source and has been proven to be the solution to the local food problem in this area. The people in the Maluku Province generally consume sago and other local foods as a source of staple foods in the past. According to Louhenapessy (2007), in the 1980's, 33% of the people of Maluku Province still used sago as the staple food, 50% used sago and tubers and only 17% used rice as the staple

food. However, Girsang (2014) states that the consumption of sago and other local food in Maluku Province has started to decrease while the consumption of rice has increased significantly in the last decade. Data from Susenas (2009) shows that there has been a shift in the consumption patterns of the people of Maluku Province who used to consume local food to consuming rice, where in 2005 the total of number of rice consumption was 68,52 kg/cap/year and has continued to increase in 2009 to 85 kg/cap/year.

In Maluku Province, there are approximately 52,000 ha of sago forests which have the potential to produce more than 268 kg of carbohydrate per capita per year for 1.55 million population of Maluku. Factors that influence the food consumption patterns in one region are the availability of the local food commodities. The availability of local foods has become the main important factor because it is one of the three main pillars of food security. The availability of food is linked to the supply of food to fulfill the needs of the whole community, both from the point of quantity, quality, variety, and safety. The distribution factor functions to create a distribution system that is effective and efficient in order to guarantee that the community can procure food in the reasonable quantity, quality and continuity with prices that are affordable. The consumption factor functions so that the pattern of the national utilisation of food fulfills kaidah quality, variety, nutritional value, safety and halal norms (Rossi, 2010).

The food consumption patterns of the community generally are influenced by social and cultural factors, demography and lifestyle factors, including the relationship to the risk of certain degenerative illnesses. The food consumption patterns of the community also are significantly related to the food insecurity or food security conditions of the community. Evaluating food consumption patterns is one method that can be used to understand the food and nutrition situation of a community. One method used to evaluate the qualitative nature of food consumption patterns can be reflected in and demonstrate the sufficiency of individual dietary intake by evaluating the variety and quality of the nutritional value of the food. Rice is the main source of energy that is consumed in Indonesia, while the main source of energy of rice substitutes is obtained from cassava (Yudaningrum, 2011). The main difference in food consumption is obtained from the consumption levels of the community, which show that the consumption of rice in the villages is much higher than the consumption of rice in the cities.

## II. LITERATURE REVIEW

### Conceptual and Theoretic Review Concerning Demand

The theory of consumer demand is based on the theory of consumer behaviour. Consumer behaviour is the direct behaviour that is involved in the procuring, consumption and the finishing off of the product and services, including the decision making process before and after the action reveals consumer behaviour in determining the consumption of goods. While the level of personal demand is the desire of the consumer to purchase certain goods at various price levels over a certain period of time. Therefore, the demand for a number of goods has a great influence on the price of those goods. The higher the price of the goods means that the demand for certain goods will decrease, and the reverse is also true. General demand theory describes how a consumer consumes a certain number of goods at a certain price level. If the price is high, then the quantity of goods consumed decreases on the other hand if the price is low, then the quantity of goods consumed rises *ceteris paribus*. In the consumption process the consumer uses the income that he has obtained from the production process. The problem is how does a consumer allocate his income to procure a certain number of goods so that the consumer will achieve maximum satisfaction. This is because the main aim of the consumer in the consumption process is to achieve maximum satisfaction.

### Household Consumption of Rice Substitutes Expenses

The consumption patterns of the community describes the allocation and composition or form of consumption that is generally valid for members of the community. Consumption can be defined as an activity in satisfying the needs or desires at this time in order to increase prosperity. Thus, the allocation of consumption is very dependant on the definition and perception of the community concerning needs and the obstacles they face. The life of urban communities demands a consumption lifestyle that is totally fast and instant. The consumption behaviour that is of urban communities no longer considers the function or use of goods that are purchased rather they take into account the social status attached to the particular goods. Urban household consumption patterns are caused by the busy lifestyle of each member of the household especially when the mother goes to work, then household consumption patterns that are applied when the members of the household get together in one place and order various types of fast food, without waiting long and also saves time on eating.

### Household Food Availability

Food availability for the community does not guarantee food security household, this is because the purchasing power of the community is not able to afford the food or

the household does not have access to the food although it is readily available in the market. Therefore, household food availability is more determined by the ability of the household to control their food needs. The ability to control is more influenced by the ability of the household in their own ability to produce food and their ability to purchase food in the market. Therefore, ability to buy food becomes the source of household food security, which is more dependant on household purchasing power (Pakpahan, *et al.*, 1993). In order to achieve food security food availability is needed in sufficient numbers and quality, distributed with affordable prices and safe to be consumed by every citizen to support daily activities all the time. (Saliem *et al.*, 2002).

### The Price of Rice Substitutes

Sago, corn and tubers are rice substitutes that are utilized in Indonesia. The use of rice substitutes is based on the availability of food in a region originates from the produce local family farmers and then developed into a local food habit or regional household consumption patterns at a low cost. In fact diverse household food consumption patterns have been in existence for a long time, but as a result of excessively dominant and intensive government policies in the field of rapid rice production, covering all aspects of the industry resulting in a shift from consuming rice substitutes to consuming rice (Ariani, 2010). This has occurred in Maluku where sago and other local food consumption patterns have decreased, while the consumption of imported rice has increased significantly. Besides the community consumption patterns, another factor that also has influenced this situation is the price of rice substitutes. The results of research Ilham *et al.* (2006) show that the definite price of rice substitutes will encourage the community or household to have alternative food consumption in order to protect the stability and availability of food at the community level.

### The Price of Rice

The price of food is an important point for the household when deciding which types of food to be consumed. In this case, the majority of the population of Indonesia consume rice because the price is subsidized by central government. The normal price of rice is Rp 10,000 per kg (USD 1 per kg), but the central government subsidized the price of rice up till 80 percent so that the cost for each household is around Rp 2,000 per kg. However, subsidized rice has been allocated by village officials to all rural households and has failed to solve the problem of the target group of poor households. Therefore every household receives around 5 kg per month.

### Household Income

Generally, household needs can be divided into two large categories, that is food and non food needs. Thus at certain

income levels, households will allocate their income to fulfill these two needs. Naturally the amount of food needed by an individual or a household will reach saturation point while non food needs including the quality of food is not limited in the same way. Thus, the size of income (that which is produced and total expenses) which are spent for food of a household can be used as an indicator of household prosperity (Tri Bastuti and Mewa Ariani, 2007). The size of income will determine the types of food consumed by a household. The types of food consumed by the household will determine household consumption patterns (Sumarwan dan Sukandar, 1998). Income becomes an important factor in determining household expenses, including food consumption patterns. If income increases then household consumption patterns will be more diverse so that consumption of food with high levels of nutrition will increase (Yudaningrum, 2011) so household food availability will be stable.

#### Number Members in a Household

The amount of financial responsibilities is a characteristic related to the increase in income yang berhubungan, including expenses and household food consumption, the more the number of household members then the costs will increase thus expenses and consumption will increase (Arida dan Fadhiela, 2015). At the family level the smaller the number of family members, the smaller the needs that have to be fulfilled by

the family, and the reverse is true. So that in a family whose household members are many then the needs that have to be fulfilled will also be greater (Adiana dan Karmini, 2012). Further it is said that the greater the financial responsibilities of a family is one of the factors that influences the household consumption patterns. The more the members of a household, then the consumption patterns will be more diverse because each member of the household may not have the same taste in food. The number of family members is linked to the household income that eventually influences household consumption patterns.

### III. RESEARCH METHODS

The location of the research is in Maluku Province, with samples taken in Ambon, Central Maluku Regency, West Seram Regency and East Seram Regency. Samples were taken from 200 respondents with the same number of respondents taken in each Regency. This research is quantitative and qualitative in nature. The types of data used in this research are secondary data from the national socio-economics survey (SUSENAS), several publications of the Central Bureau of Statistics (BPS), reports and publications from the Ministry of Agriculture of the Republic of Indonesia, and publications from the National Food Security Board and the Maluku Province Regional Food Security Board.

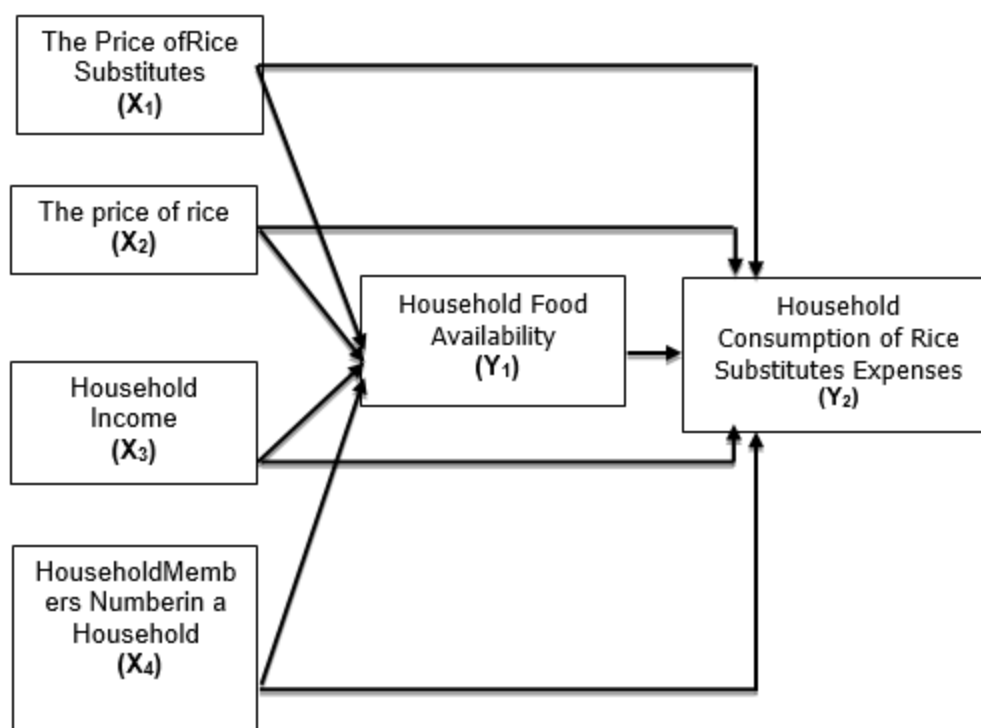


Fig.1: Conceptual Model Design

Primary data was obtained from questionnaires that were distributed to respondents and interviews. The number of population of the area of research is 539,254 people, spread through three regencies and one municipality, West Seram Regency, Central Maluku Regency, East Seram Regency and the City of Ambon as the capital city of Maluku Province. 200 people were used as the Sample in this research, each regency and city represented by 50 respondents. Variables used in this research analysis model were (a). Household Food Availability; (b). Household Consumption Patterns; (c). The Price of Rice substitutes; (d). The Price of Rice; (e). Household Income; (f). Number of Household Members.

#### IV. RESULTS AND DISCUSSION

The price of rice substitutes is one of the variables used in this research analysis model, this is because it is believed that the price of rice substitutes calculated in rupiah can give an overview of the readiness and ability of a household to prepare food stocks in a month. Thus the price of rice substitutes variable in this research can be defined as the value of money from the types of rice substitutes that can be calculated in rupiah.

The price of rice substitutes is a price substitution for the price of rice. This is because if the price of rice is high then household respondents can make a substitution in the consumption process that is to consume other types of food besides rice, such as sago, tubers, nuts and other types of food.

*Table.5.1: Allocation of Household Income of Respondents for the Consumption of Rice Substitutes In the Area of Research 2017*

Household Income	Total	Percentage
≤ 30,000	80	40
31,000 – 40,000	25	12.5
41,000 – 50,000	44	22
≥ 50,000	51	25.5
Total	200	100

*Source: Processed Primary Data*

Table-5.1 shows the household income groups for rice substitute consumption in a month in the area of research. From the data above it is known that households that allocate less than ≤ Rp. 30,000 as 80 households or 40% of the total respondents. Households that allocate income between Rp. 31,000 – Rp. 40,000 and between Rp. 41,000 – 50,000 for rice substitute consumption are 25 households 12.5% of the total household respondents and 22 households or 22% of the

total households. While the allocation of income ≥ Rp. 50,000 are 51 households or 25.5% of the total household respondents.

Information from Table-5.1 can be analysed further that if 40% of households in the research area allocate income in order to consume rice substitutes, because this has a closely related to household consumption patterns of respondents in Maluku who tend to consume rice substitutes besides rice. It was also discovered that the choice of such income allocation was because the rice substitutes were cheaper than the price of rice besides the factor of the availability of rice substitutes were much more easily accessed both in urban and rural areas.

Other phenomena that can be analysed is the households that allocate income rice substitutes consumption ≥ Rp. 50,000 was 25.5% which is second. This was not according to what had been hoped theoretically that every increase in the price of rice substitutes should be followed by a reduction in the household demand for rice substitute products that should influence the availability of household rice substitutes. But the results of correlation and facts in the area of research demonstrate a parallel comparison, with the understanding that if there is a rise in the price of rice substitutes then it is followed by an increase in the consumption of rice substitutes in order to add to the availability of household rice substitutes in the area of research.

According to micro economic theory it is known that the law of demand states that if the prices of a product rises, then the number of products consumed will tend to fall (*ceteris paribus*). But the facts in the field show a different situation that is a deviation of behavior of household respondents in carrying out consumption activity. According to the opinion of the researchers a form of paradox occurs in Maluku, this is in fact is in accordance with the findings of Sir Robert Giffen in Northern Ireland that in micro economic theory is called the *Giffen paradox*. The price is the value associated with certain goods or products that is used as a calculation tool in the economic transaction process. Based on this understanding then the price of rice in this research defined as the value in rupiah that is associated with rice products that function as a calculation tool in the transaction process. The price of rice is one important variable in this research, because rice is one of the strategic foods in Maluku besides rice substitutes, because in various studies and analyses concerning food then rice always becomes the material of research, study and analysis.



Table.5.2: Income allocation Household Respondents For Rice Consumption in the Research Area 2017 (Price per Sack and Price per Kg)

Price per Sack	Household Respondents	Percentage
≤ Rp. 250,000	92	46
≥ Rp. 250,000	108	54
< Rp. 10,000	55	27.5
≥ Rp. 10,000	145	72.5

Source: Processed Primary Data

Table-5.2 clearly shows the actual situation in the area of research that household respondents who consume rice at the price level of rice/kg  $\geq$  Rp. 10,000 is 72.5% or 145 households greater than the number of household respondents who consume rice at the price level of  $\leq$  Rp. 10,000 which was only 27.5% 55 households. It is known that the perception of households in this research area tend to consume rice of a better quality with certain brand names compared to cheaper rice at a lower price. This means it can be concluded that household respondents both rural and urban possess an awareness concerning the consumption of rice that is healthier and of better quality to maintain carbohydrate nutrition rates to fulfill their needs. Another reason households in the research area consume better quality rice although a higher price has to be paid is because the relatively high purchasing power of the household respondents so that income allocation can be directed to consume good quality rice.

Table.5.3: Income of Household Respondents In Research Area in Maluku, 2017

Total Income for Household Members	Total	Percentage
1,000,000 – 4,999,999	54	27
5,000,000 – 9,999,999	55	28
$\geq$ 10,000,000	91	45
Total	200	100

Source: Processed Primary Data

Table-5.3 provides information that households 54 household atau 27% of total household respondents have an income at a level between Rp. 1,000,000 – Rp. 4,999,999. While 55 households or 28% of the total respondents Sedangkan household have an income level of between Rp. 5,000,000 – Rp. 9,999,999 and 91 households or 45% of the total household respondents who have an income level in one month more than Rp. 10,000,000. Income as shown in table-5.1 is the income

Besides income allocation of household respondents, consumption of rice can be seen from the price per sack (25 kg). Thus it is known that households in the research area that consume rice with a price per sack level (25 kg) at  $\geq$  Rp. 250,000 amounted to 108 households or 54% of the total household respondents. While household respondents that consume rice at the price level per sack (25 kg)  $\leq$  Rp. 250,000 only amounted to 46% of the total household respondents or 92 household respondents. From the information from the table above it can be concluded that this occurs because of the awareness of the household respondents concerning consumption and the income factor as explained above.

Household income, wages and salaries based on the work hours that have been completed, overtime, all bonuses and allowances, calculation of time when off work, bonus that is not a regular payment, rewards; and the value of payments in kind. There are two components, that is: (1) for usual work hours or for work that has been completed, and (2) for overtime. All other income components were added together on aggregate. The income indicator used was rupiah (Rp). The source of income of the respondents came from farming and nonfarming jobs. According to research results, the majority of income of household respondents in Maluku comes from basic work as farmers. Besides farmers, household respondents also obtained income income as fishermen and breeders. Other forms of work included unskilled labourers, construction labourers, own business and carpenters. In the following table the size of the average income of household respondents in a month can be seen. of household respondents that originates from farming and non-farming work. This is because the great variety in the characteristics of the household members in these four Regencies / City of the sample area.

The diminishing availability of rice substitutes for the household respondents certainly implications that are not good for the consumption activities of household members in a month. The understanding being that the total number of rice substitutes that are consumed have diminished meaning that the nutrition factor that originates from these rice substitutes will also diminish and long term will greatly influence the quality of the health of the members of the household in the research area. However on the other hand there is another phenomena that has been discovered in this research area, that is, when the income of the household respondents rises, it does not have a significant influence on on the household consumption patterns, this is because the additional income is not followed by an increase in consumption of rice substitutes related to endeavours to increase the availability of rice substitutes of households in the research area.

From the observation results it is known that a rise in income for the household respondents often changes their household consumption expenses where decisions on consumption habits shift from consumption of rice or the consumption of rice substitutes such as the use of money to pay bills to a third party, the purchasing of electronic goods, and also other third party needs. This of course has a close relationship to the change in the consumption behavior of household respondents according to the needs of each household in the research area. This situation is also caused by the rise in income of households in the research area that are not always followed with an increase in the consumption of rice substitutes in order to add to the availability of rice substitutes for the household respondents.

Other findings in the four Regencies/City in Maluku as the research area are that besides farming and laboring that jobs beside the main occupation of household respondents are very sparse which causes the income of the majority of household respondents to be low. Low household income can affect the level of food consumption of the household. But households with high income also do not guarantee food availability in decent amounts in each household or does not meet the minimum standard. This situation can be caused by household consumption habits in the consumption process, or it can be caused by the low level of education of the head of the household so that knowledge and insight concerning how to carry out the consumption process that fulfills the standard nutrition requirements correctly and accurately according to the needs of the members of the household in a month. Although not every head of household gets income from non-farming work, but income from non-farming work is needed to fulfill the needs of the household. While the housewife, who does not have any job except organize the housework, is expected to help the head of the household in working.

The total of financial responsibilities is a characteristic that is related to an increase in income, including expenses and household food consumption. The more the number of members of the household need costs are greater so that expenses and consumption will be greater. Members of a household consist of the husband (head of the household), wife and child. The greater the numbers of members of the household, then the expenses and food needs will also be greater. The results of this research concerning the members of the household that was carried out in four Regencies / City in Maluku can be seen in Table-5.4 below, that explains that 54 households consisting of between 3 – 4 household members is 27% of the total household respondents, while there were 117 households consisting of between 4 - 6 household members

or 58% of the total household respondents and 29 households consisting of more than 6 household members or at 14%.

The information in table-5.4 explains that the average household in the research area included 4 - 6 members consisting of husband, wife, child and other family members that were the financial responsibility of the head of the family. Of course the number of household members has great implications on the household food availability in the research area.

*Table.5.4: Number of Members of Household Respondents In the Research area in Maluku, 2017*

No	Number of Household Members	Total	Percentage
1	1 – 3	54	27
2	4 - 6	117	58
3	6+	29	14
	Total	200	100

*Source: Processed Primary Data*

This is because the head of the household has to allocate his income for the consumption of rice and rice substitutes as previously described. Differences occurred in the proportion of rice and rice substitutes consumption in the research area both in urban and rural area which was actually influenced by on three main factors, that is the habits in the food consumption patterns, the level of income and the number of household members in households of the respondents.

### **The Results of Analysis of the Relationship between Variables**

In describing the results of the research carried out by providing an overview of the results of quantitative calculations according to the model that was used in this research. In analysing the data to discover the influence of the price of rice substitutes ( $X_1$ ), the price of rice ( $X_2$ ), household income ( $X_3$ ), household members ( $X_4$ ) have a real statistical relationship (significant) towards the dependent variable of food availability ( $Y_1$ ), thus a basic mathematical function is formed where  $Y_1$  is the food availability in Maluku,  $X_1$  the price of rice substitutes,  $X_2$ , the price of rice,  $X_3$  household income, and  $X_4$  household members, according to the time period of when the research was carried out.  $\alpha_0$  is the constant or intercept, is the coefficient regression that is sought, and shows the variable error, and above estimation model used the OLS (Ordinary Least Square) approach.

Table.5.5: The Results of the Linear Regression Equation Y1

Dependent Variable	Independent Variable	Parameter	Unstandardized Coefficients		Results Analysis		Comments
			B	Std. Error	t-Statistic	Sig.	
KPRT	PRS (X1)	$\alpha_1$	-1.134	.926	-1.225	0.222	Not Significant
	PR (X2)	$\alpha_2$	-2.847	1.005	-2.832	0.005	Significant
	HI (X3)	$\alpha_3$	.011	.001	15.390	0.000	Significant
	HM (X4)	$\alpha_4$	2466.559	1195.718	-2.063	0.040	Significant
Constant = 69,323.971 R square = 0.560 F-statistic = 61.987 Sig. F-statistic = 0.000							

In the results of the analysis the regression equation as seen above was obtained so an interpretation can be made as follows. The above equation provides information that the price level of rice substitutes (X1), the price of rice (X2), household income (X3), household members (X4) have a positive relationship to food availability in Maluku (Y1). When the price of rice substitutes (X1), the price of rice (X2), household income (X3), household members (X4) = 0, or experiences no change in the household then the value of food availability in Maluku (Y1) = C = 69,323.971. Thus the results of the data analysis (based on appendix 2):  $Y1 = 69,323.97 - 1,134 X1 - 2,847 X2 + 0.011 X3 - 2466.59 X4$ . Every single rupiah rise/reduction of the rice substitutes (X1) has a positive effect 69,323.971 towards the constant value ( $\alpha_0$ ). The implication being the higher the price of rice substitutes (X1) the higher the value of food availability in Maluku (Y1).

The constant 69,323.971 demonstrates that if there is no increase in the value/price of rice substitutes (X1), the price of rice (X2), household income (X3), and household members (X4) the value of food availability in Maluku (Y1) amounts to 69,323.971. The coefficient regression being -1,134 for X1, -2,847 for X2, 0.011 for X3 and -2466.59 X4 demonstrates that every additional value unit (price or person) X1, X2, X3 and X4, will produce a rise of -1,134-2,847, 0.011, and -2466.59 across the board.

Based on an analysis of the results it is known that the coefficient determination is 0.560 that demonstrates that the variables of price rice substitutes (X1), the price of rice (X2), household income (X3), and household members

(X4) together influence the food availability in Maluku variable (Y1) by 56 percent, and the remaining 44 percent is determined by other variables outside of this estimation model.

In order to find out the relation between the variables of household food availability (Y1), price of rice substitutes (X1), the price of rice (X2), household income of consumer (X3), and the number of household members (X4), towards household food consumption patterns of the community (Y2), therefore a second model was formed with a basic mathematical function of  $= f(X1, X2, X3, X4, Y1)$ .

From this mathematical function a double linear regression equation as a basic model to form the following equations, where Y2 rice substitutes household consumption expenses, Y1 food availability in Maluku, X1 price of rice substitutes, X2 the price of rice, X3 household income, and X4 household members, according to the time period of when the research was carried out.  $\beta_0$  the constant or intercept,  $\beta_1 \dots \beta_5$  the coefficient regression that is being sought, and shows the variable error, and the above estimation model used the OLS (*Ordinary Least Square*) approach.

The estimation results of the equation on the following page, can provide information that the level of food availability in Maluku (Y1), the price of rice substitutes (X1), the price of rice (X2), household income (X3), household members (X4) have a positive relation to the dengan rice substitutes consumption expenses in Maluku (Y2).



Table.5.6: Results of Linear Regression Equation Y2

Dependent Variable	Independent Variable	Parameter	Unstandardized Coefficients		Analysis Results		Comment
			B	Std. Error	t-Statistic	Sig.	
PKRT	PRS	$\beta_1$	.496	.061	8.149	0.000	Significant
	PR	$\beta_2$	1.003	.789	1.271	0.205	Not Significant
	HI	$\beta_3$	-.937	.871	-1.076	0.283	Not Significant
	HE	$\beta_4$	.005	.001	5.288	0.000	Significant
	MH	$\beta_5$	3641.467	1026.384	3.548	0.000	Significant
Constant = -225.193 R square = 0.647 F-statistic = 71.036 Sig. F-statistic = 0.000							

When food availability in Maluku (Y1), the price of rice substitutes (X1), the price of rice (X2), household income (X3), household members (X4) = 0, then the value of  $\alpha_0$  consumption rice substitutes expenses in Maluku (Y2) = C = -225.93. Every increase/decrease in food availability in Maluku (Y1) produces a positive effect of .496 towards the constant value ( $\alpha_0$ ). The implication being, the higher the level of food availability in Maluku (Y1) then the value of consumption patterns in Maluku (Y2) will become greater. This phenomenon is in accordance with the data findings in the field during the period of research that describes the increase in food availability in Maluku (Y1), which is always followed by a greater amount or rise in the total household rice substitutes consumption expenses in Maluku (Y2).

Secondly, every single rupiah rise or fall of the price of rice substitutes (X1) does not have an effect on the constant value ( $\alpha_0$ ). The implication being that the higher the price of rice substitutes (X1) then the household rice substitutes consumption expenses in Maluku (Y2) is not effected. So that it can be concluded that the price of rice substitutes cannot be used to measure household rice substitutes consumption expenses.

Thirdly, every one rupiah rise/fall in the price of rice (X2) has no effect on the constant value ( $\alpha_0$ ). The implication being, the higher the price of rice (X1) then the value of household rice substitutes consumption expense in Maluku (Y2) is not effected. So that it can be concluded that the price of rice cannot be used to measure household rice substitutes consumption expenses.

Fourthly, when household income (X3) = Rp.1, then rice household substitutes consumption expenses in Maluku (Y2) = Rp. 005 and so on. This condition is according to what

was expected that every increase in household income (X3), is always followed by an increase in household rice substitutes consumption expenses in Maluku (Y2). This phenomenon is also in accordance with data findings in the field during the period of research which describes the rise in household income (X3) that is always followed by a greater amount or increase in the total household rice substitutes consumption expenses in Maluku (Y2).

Fifthly, when the number of household members (X4) = 1 person, then household rice substitutes consumption expenses in Maluku (Y2) = Rp. 3,641,467. When the household members (X4) = 2 people the food consumption pattern in Maluku (Y2) = Rp. 7,282,934 and so on. This condition is in accordance with the expectations that the increase in the household members (X4) always follows with a greater increase in household rice substitutes consumption expenses in Maluku (Y2). This phenomenon is also in accordance with data findings in the field during the period of research describes the increase in household members (X4) of one person is always followed by a greater amount/increase in the total household rice substitutes consumption expenses in Maluku (Y2).

Constant -225,193 states that if there is no increase in the values of food availability in Maluku (Y1), the price of rice substitutes (X1), the price of rice (X2), household income (X3), and household members (X4) then the value of household consumption patterns in Maluku (Y2) will be -225,193. The coefficient regression of .496 for Y1, 1.003 for X1, -.937 for X2, .005 for X3 and X4 3,641,467 states that each additional unit value (price or person) Y1, X1, X2, X3 and X4, will have an effect of .496, 1.003, -.937, .005 and 3,641,467 put together.

Based on the results analysis it is known that the coefficient determination is 0.647 that demonstrates that the variables of food availability in Maluku (Y1), the price of rice substitutes (X1), the price of rice (X2), household income (X3), and household members (X4) put together effect the food availability in Maluku variable (Y1) of 64.7 percent, and the remaining 35.3 percent is determined by variables outside this estimation model.

## V. CONCLUSION

With reference to the results and the discussion that has been put forward in the previous chapter, then it can furthermore be concluded as follows:

1. The price of rice substitutes has a direct influence on household food availability in Maluku Province. An increase in the price of rice substitutes in Maluku Province is always followed by an increase in the total household food availability. Besides this, the price of rice substitutes has a direct effect on household rice substitutes consumption expenses. An increase in the price of rice substitutes in Maluku Province is followed by an increase in household rice substitutes consumption expenses.
2. The price of rice has a direct influence on household food availability in Maluku Province. An increase in the price of rice in Maluku Province is also followed by an increase in the total of household food availability. Besides this, the price of rice directly influences the household rice substitutes consumption expenses. An increase in the price of rice in Maluku Province is followed by an increase in household rice substitutes consumption expenses.
3. Household income directly influences household food availability in Maluku Province. An increase in household income in Maluku Province is also followed by an increase in the total household food availability. Besides this, household income directly influences the total of household rice substitutes consumption expenses. An increase in household income in Maluku Province is followed by an increase in household rice substitutes consumption expenses.
4. The number of household members directly influences household food availability in Maluku Province. If the number of household members increase then it is always followed by an increase in the total of household food availability. Besides this, the number of household members directly influences the household rice substitutes consumption expenses. If the number of household members increase then it will be followed by a rise in the level of household rice substitutes consumption expenses.

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