**Diversification of Staple Food As a Solutions to Overcome Food Insecurity of Household due to Global Climate Change**

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**Abstract.** The research was conducted in the village of Karang Menjangan Eastern Semendawai subdistrict East Ogan Komering Ulu Regency using survey methods. The results showed that the average of household rice consumption of paddy farmers by 118 kg per capita per year, lower than the national rate of rice consumption in 2010 (139 kg per capita per year). Paddy farmers in East Ogan Komering Ilir was already diversifying staple food. While the climate change, Paddy farmers adapt their staple food diversification as a solution to overcome food insecurity.

**Keywords:** Climate Change, Diversification of Staple Food, Food Insecurity

**1. Background**

Diversification of food consumption essentially expand the people's choice in consumption activities desired to the taste and avoid boredom to get the food and nutrition in order to healthy and active live. However, consumption of staple food diversification program which is expected during the non-rice food to consume more has not been achieved. More people choose to eat fast food or easy to get, easy to cook, and with affordable prices, such as instant noodles that was currently consumed by people as a substitute for rice.

Agriculture is a vital segment for the development of Indonesia, has a dependency on the climate and weather conditions. Climate change is a real threat and a challenge to the agricultural sector in maintaining the sustainability of food production. A shift of the season, will affect the planning of agricultural activities, so the planting schedule will be disrupted resulting in declining production and even crop failure , which will further threaten food security.

About ten years later, farmers feel the change in weather patterns. Among other things, excessive rainfall in a given year and next year is very less rainfall. There is no clear boundary between wet and dry seasons. This weather pattern changes greatly impact on rice farming , because it depends on the weather . Changes in rainfall patterns and climatic extremes result in planted area in some regions / areas experiencing drought. The total areas experiencing drought increased from 0.3 to 1.3 % to 3.1 to 7.8 %. (Ministry of Agriculture RI ; National Action Plan on Climate Change Adaptation Indonesia, 2012 ).

According to the Intergovernmental Panel on Climate Change ( IPCC ), released in April 2007, said that Indonesia will experience a decrease in rainfall in the south , whereas in the northern region will experience an increase in precipitation. It means that declining rainfall region is potentially destructive agricultural cropping systems, especially plants that do not have the potential for resistance to drought.

In that regard, it is interesting to do research on staple food consumption and diversification on rice farmers in Eastern Ulu Ogan Histories as well as to see the effect of climate change and try to analyze it in a frame correlation overcome food insecurity households . Based on the description above , then pulled the problems , as well as research purposes, which is interesting to study, as follows: 1. How does staple food consumption in paddy farmers in Eastern Ulu Ogan Histories? 2. How does staple food diversification on rice farmers in Eastern Ulu Ogan Histories? 3. Is diversification of rice farmers in Eastern Ulu Ogan Histories as a solution to overcome food insecurity due to global climate change?

**2. Assessing Library**

Diversification to be one important factor in overcoming the problems caused by nutritional imbalances nutritional remember that less diversified food consumption resulted in the emergence of good nutrition problems of malnutrition and over nutrition ( Budiningsih, 2009).

Bidarti Tampubolon in 2012, diversification of food is a food that the election process is not dependent on one type of food but rather a variety of foods ranging from aspects of production , processing , distribution aspects , to aspects of food consumption at the household level. The concept of diversification is not a new thing in terms of the agricultural development policy in Indonesia, therefore, the concept has been formulated and interpreted by many experts in the context of its purpose.

Diversification of food consumption essentially expand the people's choice in consumption activities fit the desired taste and avoid boredom to get the food and nutrition in order to live a healthy and active . However, consumption of staple food diversification program which is expected during the non-rice food to consume more has not been achieved . More people choose to eat fast food or easy to get, easy to cook , and with affordable prices , such as instant noodles that is currently widely consumed by people as a substitute for rice.

Food insecurity , according to Ariningsih ening, et al. 2008, occurred when a household, community or region having insufficient food to meet the physiological needs for growth and health of the individual members . There are three important things that affect the level of food insecurity, namely: ( a) the ability to provide food to individuals / home , ( b ) the ability of the individual / household to get food , and ( c ) the distribution and exchange of available food and resources; owned by individuals / households. The third thing , the food shortages are acute or chronic and can appear simultaneously are relatively permanent. Looking at the case of seasonal food insecurity and temporary, factors that affect the possibility of only one or two factors only and are not permanent.

Indirect effects of climate change on world food production decline, for example, through an increase in area and production of bio -fuels ( the conversion of food land ), which resulted in an increase in food prices due to the area allocated to food has decreased. Variability in productivity is strongly influenced by climatic conditions, because the variability of results will lead to variability in supply (supply), the international trade is often used as a tool to overcome the variability of this offer.

**3. Method**

The research was conducted in the village of Karang Menjangan Semendawai District East East Ulu Ogan Histories. The data was collected in February 2013 until June 2013. This study uses survey. The sampling method used was simple random sampling ( simple random sampling ). The sample size is 10 per cent of the population of Rice Farmers Household. The data collected in this study of primary data and secondary data. Tabulation of the data processing is done then analyzed and described. Statistical analysis tools used in this study is a multiple linear regression analysis, using computerized techniques.

**4. Results and Discussion**

Diversification of staple foods have a relationship with food consumption of rice and rice substitutes. Generally the type of food instead of rice consumed by the villagers of Karang Menjangan extremely diverse, due to several things. The types of food such as rice substitute instant noodles, bread, corn, cassava, and so forth. However, in the study area Histories Ulu Ogan East , the food instead of rice consumed is the most dominant of instant noodles. While many other types of rice replacement will be consumed by the population in accordance with consumer tastes and the availability of food instead of rice, such as bread, potatoes and sago are food instead of rice that is easily obtainable by the residents.

While corn and food ketersediaanya oyek is limited and not every week the residents get the replacement food. According to the respondents who met at the time of the study, the average of respondents stated that they consume oyek if the existing food supply or food during the encounter.

The results showed that 33.3 % Rice Farmer Households consume instant noodles instead of rice. In addition to instant noodles, bread is a food replacement for both samples, which is used by rice farmers, this is because bread is a food that is easy to obtain at low prices. Average household consumption of rice paddy farmers was of 118 kg per capita per year. Results of calculation of average rice consumption is decreased by 17.27 percent when compared to the national rate of rice consumption in 2010 (139 kg per capita per year). Low consumption of rice was due to population Histories Ulu Ogan East began to try to reduce the consumption of rice with non-rice staple food consumed.

The results showed that rice farmers in the Eastern District of Ulu Ogan Histories already diversifying staple food , it is evident from the existence of some carbohydrate food besides rice consumed by rice farmers. In line with the findings of this study, the results of research Yunita, et al ( 2010) showed that rice Farmer Households in Ogan Ilir and Ogan Ilir Histories diversify staple food rice as one of their household coping mechanisms in addressing food insecurity in the lean season.

Farmers in the village of East Semendawai Menjangan District Histories Ulu Ogan East in the face of climate change refers to the process of adaptation. Adaptation is done more in the form of staple food diversification, they try to adapt to the response to the effects arising from the uncertain climate conditions or who are expected to take place in order to survive and if possible can take advantage of the opportunity to thrive. Climate change ever occurs in the range of 2010 to 2011. In 2010, there was a transition season with high rainfall levels and difficult to predict. This condition is different from the condition in 2012.

Transition conditions like this, will have a strong influence in terms of rice production. In 2010, the condition of the rice planting season is uncertain due to high rainfall and difficult to predict, so the rice production deficit . Based on the data that the average difference amounted to 138.2 kg of rice consumption between consumption in seasons with high rainfall, in 2010 and at the time of climatic conditions with normal rainfall in 2013.

Based on the data, that in the year 2010, when the climate is not normal, the consumption of other staple food of 17.17 kg . While at the time when the normal climate, in 2013, consumption of other staple food diversification of 12.45 Kg. Thus, if observed with rice there are interesting things, that the level of rice consumption decreases when the climate is not normal, but there was an increase in staple food other than rice. While at normal climate rice consumption levels rise, whereas the level of consumption of staple foods other than rice is reduced.

Reality is interesting, that the diversification of staple food, indirectly become their adaptation strategy to climate change, while keeping as well as a solution to food insecurity rate them, when the production of rice farmers suffered decline due to climate change. Adaptations made rice farmers do in the post- harvest process, by making savings on food patterns and diversified rice staple food, in addition to rice.

Further testing with a paired two-sample test, the t test - Paired Samples t test were used to compare whether there are differences in the average of two sample pairs which in this case is the level of consumption in the diversification of staple food rice farmers in the district of East Ulu Ogan Histories when the climate is not normal, in 2010 and at the time of normal climate, in 2013. 16:00 SPSS processing results



This means that there are differences in the diversification of staple food consumption in the district of East OKU before and after conditions of climate change. Then the value of the average ( mean ) obtained by 1.1732 meaning a declining trend in rice consumption and increase consumption of non- staple food rice after the conditions of climate change in the Eastern District of Ulu Ogan Histories.

 **5 . conclusion**

Based on the results of research and discussion can be summed up some of the following:

1. Average household consumption of rice paddy farmers by 118 kg per capita per year, meaning that the average consumption of rice in a rice farming family amounted to 471.5 kg per family per year. Results of calculation of average rice consumption when compared with the national rate of rice consumption in 2010 amounted to 139 kg per capita per year, then the tabulation was lower by 24 kg per capita per year or by 17.27 %. Low consumption of rice was due to the population of East Ulu Ogan Histories try to reduce the level of boredom on rice consumption, so the residents do non-rice staple food consumption.
2. Rice farmers in the Eastern District of Ulu Ogan Histories already diversifying staple food, it is evident from the presence of some carbohydrate food besides rice consumed by rice farmers. Food consumption of carbohydrates consumed by rice farmers as much as 130.45 kg/capita/year with rice being the highest food consumed by rice farmers.
3. At a time of climate change, rice farmers adapt their staple food diversification as a solution to overcome food shortages. At the time of abnormal climate, the level of rice consumption decreased, but there was an increase in staple food other than rice. While at normal climate ascending level of rice consumption, instead of staple food consumption, other than rice increased. This means, the adaptations made rice farmers in post-harvest processing is done, by making savings on food patterns and diversified rice staple food, in addition to rice.

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