

## THE RELATIONSHIPS OF RISKS AND INCOMES IN FARMING IN WETLAND AND DRYLAND OF NORTH LOMBOK, INDONESIA

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### ABSTRACT

Risk is a constant threat to businesses, including to farms in North Lombok, Indonesia. This paper examines the relationships between risks of farming and incomes generated by the selected farms. Data related to farm risks and incomes were collected from samples of farmers in wetland and dryland in North Lombok Indonesia, through series of face-to-face interviews on the farms or farmers houses, guided by a semi-structured questionnaire. Quantitative analyses were carried out on farm risk levels and income, followed by descriptive comparative on examination of the relationships between the two main variables of this paper. Results of analyses revealed that incomes from farming crops in North Lombok were not obviously related to the risks associated with the crop production and market. However, agricultural producers have selected crops for their suitability to the land (soil) and local climate, by which farming risks were reduced or eliminated, for sustaining farming activities, and expecting high farm income. Since crops have been suitable to the land climate, as well as to the acceptable risk, then agricultural production is continued and income is generated for the farmers.

**Keywords:** Dryland, Farming, Incomes, Risk, Wetland.

### INTRODUCTION

North Lombok Regency, West Nusa Tenggara, as other regions in Indonesia, has been developing its economy. One of economic sectors being developed in North Lombok is agriculture. This sector

development is adjusted to the local resources, such as the condition of land and agro climate (DPRD KLU, 2021). This follows that agriculture or farming in North Lombok comprises of farming in wet land and dryland (BPS, 2021 and BPS,2022).

Both land types have specific risk level for farming of crops (Sjah T, et, al., 2022). In general farming in wetland is practiced yearly around, while in dryland farming is practiced once a year, that is only during the rainy season. The main consideration for the practices is the suitability of the crops to the land and climate. Of central importance of the consideration is the availability of water (Sjah T, et, al., 2022). In wetland water is available more than in dryland. In more precise way, it can be stated that water is available during the whole year (or almost) in wetland while water is only available in the rainy seasons in dryland (BPS, 2021 and BPS,2022). Water is one of risk sources in farming, in which less water availability means more risk (Sjah T, et, al., 2022 dan Jaya I K D, 2021). In line with this, farming is more actively practiced in wetland than in dryland (BPS, 2021 and BPS,2022). In addition, there was also crop adaptation to the farms, in order to adjust to the risk levels. The adaptation includes in crop types and its varieties (Sjah T, et, al., 2022).

Furthermore, both land types have different productivities. In addition to more times (generally three times) productions in wetland than in dryland, the productivity in wetland is also higher in wet land than in dryland (BPS, 2021 and BPS,2022). This difference can be considered sourced from the land condition and the varieties, since both variables have different qualities.

As a consequence of different productivity of crop farms then there will be differences in farm income, since production determines revenues, from which production cost is deducted (Suratiah K, 2006., Olson K D, 2004., Kay R D, et, al.,1994 and Hernanto F, 1994). Income differences are not only between different crops grown in the same land types, but also in the same crops grown in different land types.

It appears that there is relation between the income and risk of farming in both land types in North Lombok. To

prove the relationship, this paper examines the relationships between risks of farming and incomes generated by the selected farms in wetland and dryland of North Lombok. Results of this study are expected to help agricultural producers and government as policy makers to determine policy in agriculture and extension activities related to this issue, particularly in the effort to increase farm incomes.

## RESEARCH METHODS

Research methods applied in study similar to the method applied the study on farm risks in North Lombok farming (Sjah T, et, al., 2022), with additional topics on farm income and its relationship with the risks associated with producing the crops on wetland and dryland farming in North Lombok. This section briefly presents the applied methods. This study was carried out in all five districts existed in North Lombok, with each district was represented by one village, selected purposively (Bryman A, 2016., Babbie E, 2004., Zikmund W G, 2003 and Cooper D, 2003) on the basis of having more agricultural lands than other villages within the district. In each of the selected villages, six farmers were selected for wetland agriculture and the other six for dryland agriculture, accumulating into 30 farmers in wetland and 30 farmers in wetland. The respondents were selected accidentally on the ground of their availabilities at the time of surveys. They were interviewed in face to face mode, with the guidance of structured questionnaires. This study applied the following analysis. Farm Income was analyzed by reducing total costs from total revenues, and revenues are the multiplication of total production with its prices (Suratiah K, 2006., Olson K D, 2004., Kay R D, et, al.,1994 and Hernanto F, 1994). Risks of farming were analyzed by using 'coefficient of variation' (Santoso, et, al., 2005) abbreviated as CV, and the analysis was aided by Microsoft excel program. The relationships of these

two variables were analyzed descriptively (Sugiyono, 2007 and Moore D S, 2000) by using cross table, showing the values of the variables such that the comparisons are possible to be made, and then be explained.

## RESULTS AND DISCUSSION

### The crops

The cropping systems in North Lombok are varied the land type. In general cropping system in wetland is mono cropping system, while in dryland farmers apply multiple cropping systems (Sjah T, 2017). All is done with reasons, showing farmers as either rational persons or business managers who strategically manage risk of farming (Sjah T, et, al., 2022., Sjah T, et, al., 2019 and Sjah T, et, al., 2021).

As this paper presents comparisons of risks amongst crops grown and relates those risks with the incomes generated from crops farmed, then only several crops selected. From 30 sampled farmers in dryland and 30 sampled farmers in wetland, there were only three crops selected to enable comparisons, and they were rice, corn, and peanut, with a note that rice type in wetland is wetland rice type and in dryland is dryland rice type. These three crops and its risks and income are presented in Table 1.

### Farm risk

Risks of farming here is defined into two types, i.e. production risk and market risk, despite risks can be various and of

several sources (Komarek A M, et, al., 2020., Nadezda J, et, al., 2017., Zirdgiute L, 2012., Just D R, et, al., 2003., Moschini G, et, al., 2001 and Huirne R B M, et, al., 2000)

Production risk for the three crops grown is lower in wetland than in dryland (Table 1). The cause of the lower production risk in wetland is apparently due to the availability of water for irrigation for the whole year round, under which three times plantings within a year were possible. Conversely, planting is only once per year in dryland, and this indicates high production risk. The calculation risk level (with CV) has proven this high production risk. This high production was also naturally informed to agricultural producers in the area, by which they only plant one time in a year, as one of the strategies for reducing production risk in dryland.

Market risk is low in the both types of land, with market risk in dryland is slightly higher than in wetland (Table 1). The similarly low market risk of the three crops grown in the both land types is understandably given that the both area have similar access to market. Crop production can be easily marketed in the farm gates (with buyers come to purchase) in the nearby markets in central districts, with easy transportation access for the products. It can be stated that there is (almost) no problem in marketing of agricultural products in North Lombok, and this situation brings market risk down.

Table 1. Relationship of risks and income of farming in dryland and wetland in North Lombok.

Measures	Land type					
	Wetland			Dryland		
Crop	Rice	Corn	Peanut	Rice	Corn	Peanut
Production risk (CV)	0.09	0.08	0.06	0.65	0.77	0.58
Market risk (CV)	0.06	0.02	0.03	0.10	0.05	0.08
Income (IDR/ha)	16,310,758	15,099,492	11,536,491	6,180,630	7,698,374	14,013,369

### **Farm income**

Farm income per hectare was generally higher in wetland than in dryland (Table 1). Income per hectare from rice and corn farms in wetland was about double of those incomes in dryland. The different may have been contributed by the availability of more water in wetland than in dryland. However, further research is needed in order to confirm this result. The case of income per hectare from peanut was reversed, by means that the income was a bit higher in dryland than the income in wetland. It is possible that peanut is more suitable to dryland than to wetland, such as more suitable to partly sandy porous soil in dryland than to hard firm soil in wetland. This also will need further study for confirming this finding.

Given the higher crop productivity in wetland than in dryland, then it is clear that farming in wetland is better than in dryland. This also states that water is an important factor in determining crop growth and production. The more water availability the better the production or productivity. This implies that provision of water for crop irrigation is important and should become a priority in developing agriculture in a region. However, this provision will need a large resource, and appear to be insufficient to be handled by farmers alone, but the government should intervene with its aids. There should be transformation of dryland into wetland.

The availability of more wetland for farming than dryland then agricultural production may have more chances to increase. This will provide more foods for the people or enable farmers and other related activities to gain more income than currently. Their income obtained by related parties is spendable for accessing and consuming foods. These all three ways, i.e. food production, accesses, and consumption, are the ways to improve food security. However, this is not meant to under estimate the role of dryland, since the size of dryland are higher than wetland in several places or region. For examples in North Lombok there is more

proportion of dryland than wetland (BPS, 2021., BPS, 2022 and BPS, 2020).

### **Relationships of farm income and farm risk**

Table 1 shows the relationships between farm income and farm risk. It can be seen in the table that the relationship between the two variables is not very obvious. Data showed irregularity. Farm income can be high or low at low risk (of production and market). For instance, farm income of rice was high at wetland with low production risk and low at dryland with high production risk, but both land type have low market risk. Corn farm income was high at low risk and low at high risk. Peanut farm income was low at low risk and high at high risk.

The conclusion that can be drawn from this relationship is that farm income apparently did not have a specific relationship with farm risk, including production and market risk. Farm income can be high at low risk or high risk. In reverse, farm income can also low at high risk or low risk. Farm risk did not determine farm income.

The finding of no specific relationship between farm income and risk can become the contribution of this study. This finding contradicts the previous several studies that concluded that the higher the risk of a business then the high the income from it (Hoberg G, et, al., 2009., Brav A, et, al., 2009, Muller A, Scarsini M, 2002., Keenan D C, Snow A 2002 and Stoddard J E, Fern E F, 1999). The finding suggests taking risk in a business in order to gain high return or income. If entrepreneurs or companies behave aversely to risk, then they usually would not have much gain.

### **CONCLUSION**

Incomes from farming crops in North Lombok were not obviously related to the risks associated with the crop production and market. However, agricultural producers have selected crops for their suitability to the land (soil) and

local climate, by which farming risks were reduced or eliminated, for sustaining farming activities, and expecting more farm income. Since crops have been suitable to the land climate, as well as to the acceptable risk, then agricultural production is continued and income is generated for the farmers.

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