



FARMERS' ADOPTION TO HAZTON TECHNOLOGY AND ITS DETERMINING FACTORS IN SELUMA REGENCY

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ABSTRACT

This study aims to determine the level of adoption of hazton technology by farmers and the factors that influence it in Semidang Alas Maras Subdistrict, Seluma Regency. This research was carried out in Gunung Kembang Village and its surroundings, which was conducted in June - July 2019. This study used a descriptive method and direct interviewed using a questionnaire as a data collection instrument. Data collected in this study include areas (land area), inc (income), exp (rice farming experience), cons (counseling), tech (technology), and ol (internet). The analysis tool in this study is multinomial logistic regression with SPSS. The results showed that the Tech (technology / innovation) significantly affected the adoption of hazton technology in Semidang Alas Maras Subdistrict, Seluma Regency. The value of the likelihood ratio test (sig) from Tech (technology / innovation) is less than the value of $\alpha = 0.05$ and the value of χ^2 count > χ^2 table (0.05; 2). Meanwhile, the variable Area (land area), Inc (income), Exp (Experience), Cons (counseling) and Ol (access to information) did not significantly affect the adoption of hazton technology..

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INTRODUCTION

Rice is one of the basic needs for the people of Indonesia, so rice being fundamental and strategic commodities. The distribution of rice get special attention from the government because the people needs to rice continues to rise. To achieve food sovereignty the government to have support farmers in increasing productivity and domestification of new spesies (Agricultural Research and Development, 2016).

To increase productivity of agricultural land required some improvement of new technology. One of the technology is a Hazton Technology. Hazton technology is farming methods using the seeds more. The number of seeds used is in 20 – 30 per seeds them. In 2016 the Agriculture Ministry throught the government of Seluma District introducing a Hazton Technology development activities. The Gunung Kembang Village, Semidang Alas Maras Sub-district were chosen as the site apply this program. The village chosen on the consideration that the broad paddy fields in this village suitable for Hazton Technology Development. Gunung Kembang Village have land cover an area of 40 hectares.

At the beginning application of the Hazton Technology in Gunung Kembang Village, the participants in this program as many as 32 people with the area under reached 27 hectares. At 2017 the number of participants increased to 65 people with the land area of 40 hectares. There is an increasing of rice production afterward applied this technology. Before application of Hazton Technology rice famers in Gunung Kembang Village produced rice just as many as 3 – 4 ton per hectare but after they used this technology, they can produced rice as many as 5 – 6 ton per hectare (Agriculture Department Seluma District, 2017).

The volume of rice production in Gunung Kembang Village increased, but it did not directly attracted the interest of farmers to adopt Hazton Technology. Before adopting a technology, the farmers in Semidang Alas Maras Sub-district, Seluma District that peer to hear and see after that trust. This has been serious obstacles to introduce new technology to them (BPP Kembang Mumpo, 2016).

In the process Hazton Technology development in Semidang Alas Maras Sub-district influenced by many factors. Hence in this research will be looking at about the level of Hazton Technology adoption by farmers. In addition the research also analyze factors influencing the farmers to adoption of Hazton Techology in Gunung Kembang Village, Semidang Alas Sub-district Seluma District.

RESEARCH METHODS

Method The Determination of Location and Timing of Research

This research was conducted in the Gunung Kembang Village, Semidang Alas Maras Seluma District because this location is the only one village in Seluma District that have implemented Hazton Technology development program. The study was done between June to July 2019.

The Method of Determination of Respondents

Singarimbun and Efendy (2006) and Sukiyono (2018) stated that the population is the sum whole of analysis unit having a accord to be expected. Respondents in this research was all farmers in the Gunung Kembang Village. The number of farmers involved as many as 125 that have implemented Hazton Technology.

Data Analysis Method

Descriptive Analysis

The analysis method used in this research is the descriptive method. Winarno (1998) said that the descriptive research aims to focus on problem-solving actual, from the data collected analyzed and concluded. In addition, the research objectives is to make a descriptive systematically, concerning the fact and the nature of the relationship between the study.

Empirical Model

Multinomial logistic regression performed when variable category bound have more than two with several independent variables is continuous, categoric or both (Gujarati, 1999; Subekti, 2014).The equation model used in this research was as follows:

$$Adopt = Y = \frac{\exp(b_0 + b_1Area + b_2Inc + b_3Exp + b_4Tech + b_5Cons + b_6Ol)}{1 + \exp(b_0 + b_1Area + b_2Inc + b_3Exp + b_4Tech + b_5Cons + b_6Ol)} \quad (1)$$

Notes: Y= Adoption; Area= land area; Inc= farming income; Exp= farming experience; Tech= technology/ inovation; Cons= counseling; Ol= access to information/ internet.

RESULTS AND DISCUSSION

Characteristic of Farmers

Characteristic of farmers observed in this research include age, formal education, land area, farmers experience, and income is presented in Table 1. Rice farmers have age between 30 – 62 years and the average age of they are 43,75 years. This condition shows that they were considered in productive age. Of that age they have high spirits to do various activity. And after that they will conducts the business of maximally related of the farming them, one of them is by applying new technology.

Education is associated factors for these someone in conducting their farming activities. A good level of education will form a person in be castrated frame of

thinking and acting. As many as 58% of farmers have had a formal education for 8 – 10 years. They have the average of educational level 9,2 years. This condition shows that the level of their education are medium category.

Table 1. Characteristics of Rice Farmers

No	Characteristic	Amount (Person)	Percentage (%)	Average
1	Age (years)			
	<40.67 (young)	41	32.8	
	40.67 – 51.33 (middle)	61	48.8	43.75
	>51.33 (old)	23	18.4	
2	Formal Education (years)			
	<8 (low)	22	17.6	
	8–10 (middle)	73	58.4	9.2
	>10 (high)	30	24.0	
3	Land Area (Hectare)			
	<0.50 (low)	18	14.4	
	0.50 – 0.75 (middle)	99	79.2	0.52
	>0.75 (high)	8	6.4	
4	Income (Rp)			
	< 9.716.666 (low)	38	30.4	
	9.716.666 – 15.733.333 (middle)	79	63.2	9,489,200.00
	>15.733.333 (high)	8	6.4	
5	Experience of farming (years)			
	< 10	17	13.6	
	10 - 15	44	35.2	15.1
	> 15	64	51.2	

Source: Primary Data, 2018

Education is one of very decisive factor change and development of a person. The education level farmers will affect their ability to receive material counseling and change their behaviour that leads to knowledge, attitudes and skills as well as their actions in farming. The same opinion delivered by Bahua, dkk (2010), in his research explained that the higher the level of education a farmer hence tending having if responsive to adoption new technology so they can drive quality of their farming. Therefore many farmers who follow non-formal education in form of agricultural extension services, training of other agricultural meeting. It is meant to increase their knowledge and improve their abilitu in the field of farming enterprises.

Farmers in the mountain veltage a having agricultural land between 0.25 – 1 hectares with the average land size is 0.52 hectares. As many as 79.2% of farmers have land between 0.5 – 0.75 hectares. Thus most farmers have land in medium category. Lionberger as cited by Mardikanto (1996), land owned farmers was an expedient adopted technology due having the economic ability is better. By which land they have expected farmers to adopt Hazton Technology well.

Farming income of farmers between Rp 3,700,000 up to Rp 21,750,000 per season, with an average of Rp 9,489,200, the farmers income is medium category, To fulfill their needs, they have a side job as farm laborers, traders, a builder and others, Nevertheless they keep making farming enterprises as a major source of income.

Farmers have the farming experience for 5 – 20 years, with the average during 15.1 years. This indicates that they have had a long experience in the field of farming. Farmers had a wealth of experience to be able to plan better because his crops are already proficient in all aspects of cultivation. This is in accordance with the results of research conducted Bahua (2010). In the research described that farmers who have the experience that many would be more cautious in accepting something.

Farmers' Adoption to Hazton Technology

Adoption was the implementation or the use of a tool and technology that delivered by extension officer in a message communication and information. Every farmers will receive the information by different levels. Therefore will affect the level of adoption them for the technology. The levels of adoption is certainly going to influence the production of their agricultural product. Parameter of Hazton Technology who farmers applied can be explained as follows.

The varieties or seed quality

The majority of farmers have used seeds according to a recommendation. About 56% farmers have used quality for seeds in accordance with the implementation of Hazton Technology. Some reason farmers have yet to use high quality seed is a matter of access to get such seed and the price is expensive. Some kinds of seed commonly used in Hazton Technology namely Inpara, Margasari and Martapura.

Age of seeds grown

In Hazton Technology, seeds planted must be 25 – 30 days. The adoption level of farmers to age seeds grown reached 100%. The farmers consideration planted the seed after was 25 – 30 days because it is risk of death seeds smaller. In addition seeds is safe from flood and pest attacks like snail and mole cricket. So farmers did not have to do patchwork seeds.

The number of seeds by the plant

In Hazton Technology the number of seeds planted in a hole about 20 – 30 seeds. Regarding this 100% of farmers have done as the suggestion. Consideration farmers do this is to have made all clump plants be a plant parent. It is expected that this way all seeds will be productive because the seeds are in a central role and pinched so it would tent to do not produce saplings.

Setting the cropping distance

The cropping distance is important because it can provide opportunities for plant to get good air circulation and the sunlight that enough. Farmers who have adopt the crop distance in accordance with suggestion is as many as 59.2%. This indicates that most farmers have put the distance planting in accordance suggestion in Hazton Technology. The reason was the farmers adopt this method are time planting faster, seed needs less and easy to do. They also have used legowo system (2:1) in their cultivation.

Weed and water control

The result showed that the majority of farmers not apply appropriate the weed and water control system as the suggertion. Only 44% farmers have done this system based on the suggestion. Farmers have yet to conduct weed and water control system based on the suggestion because paddy fields is swamp so just a few weed that grows. Thus it is not require special handling to control it.

Fertilizing

Most farmers have implemented the fertilizing system of their cultivating the suggestion in Hazton Technology. As many as 75.2% of farmers has implemented this system. They implemented this system because the population of plant are very much, seed grown are old enough and not hope that they receive of tillers of the seeds.

Factors Influencing the Adoption Hazton Technology

To know factors influencing adoption the Hazton Technology in rice farming used multinomial logistic regression fanchion. Table 2 presents the estimation result of multinomial logistic regression the factors influencing adoption Hazton Technology in Gunung Kembang Village. Nagelkerke R^2 value in this research is 0.233 it is means that the model used can explain the relationship between dependent and independent variable of 23.3%, the rest influenced by other variables that is not incorporated into model. The test result in partial statistics shows that only variable that technology that influence the adoption Hazton Technology. Others varibles like land area, farming income, farming experience, counseling, and acces to information not affect to adoption of Hazton Technology in the Gunung Kembang Village Semidang Alas Maras Sub-District.

Table 2. The Estimation Result Multinomial Logistic Regression

Variables	Likelihood Ratio Tests		
	Chi-Square Statistic	Df	Sig
Intercept	0.000	0	-

Area (Land Area)	0.750	2	0.687
Inc (Farming Income)	1.544	2	0.462
Exp (Farming Experience)	4.965	2	0.084
Cons (Counseling)	0.306	2	0.858
Tech (Technology)	8.965	2	0.011*
Ol (Acces to information/ internet)	3.652	2	0.161
Nagelkerke (R ²)	0.233		n = 125

Source: Primary Data, 2018

Land Area

The area of land will not affect to adoption Hazton Technology. In application of Hazton Technology need of production input more like fertilizer and seeds quality so with large area will increase production cost. Besides that the farmers also difficulty in obtaining subsidized fertilizer and quality seeds. Junaria (2007) said that the farmers have large area not necessarily they can adoption new technology higher than farmers have land narrower. This is because farmers afraid to fail in adopting the technology and caused considerable material losses.

Farming Income

The farming income will not affect to adoption Hazton Technology. There are several reasons it is true the farmers with many of the same income levels have a chance in adopting this technology. In addition the land in the Gunung Kembang Village in Semidang Alas Maras Sub-District corresponds to application of Hazton Technology. The rice fields in this area is a swamp so as to give an equal chance on each farmers by various the level of income.

Farming Experience

Before famers adopt a technology is must go through several stages namely the awakening, interest, testing and evaluation and the rest of the decision (Adopted or not). Statistical tests indicate that the experience will not affect the adoption of Hazton Technology. Suwarni (2003) and Kusmiati (2009) said that experience of farming not correlate with the proverty of the farming technoloy adoption. There are several reasons it happens. 1) for applying a technology in the cultivation, farmers not required has the long experience. Every farmers have an equal change in adopting Hazton Technology in accordance suggestion. The farming activities in the Gunung Kembang Village have done hereditaryly so the their experience are inclined to each.

Counseling

Counseling activity which analyzed in this research include intensity, material, a method and media of counseling. The statistical test indicate that the information will not affect the adoption of Hazton Technology. Lalla (2012) said that counseling show the relation not real on the adoption farmers. It was because the absence of a close a meeting between farmers and instructor so that the adoption technology delayed.

Through the extension that intensive farmers perception of counseling benefit can be improved. But during the counseling activity in the Gunung Kembang Village has not been carried out to the utmost. This caused because farmers have yet to entirely follow instructor in adopting Hazton Technology. To change the farmers habit need efforts that is greater than instructor. Moreover to adopt a new technology, farmers faced with the risk of failure that very large. In addition the problem of social and cultural also affect the level of adoption farmers.

Technology

The nature of the technology innovation that is attached to the innovation, directly or indirectly or hinders a process that could lead to the adoption. Statistical test indicate that the technology innovation to depend on the adoption of Hazton Technology. So far the farmers in the Gunung Kembang Village have done a method of farming that resembles with Hazton Technology. For example seed planted the old 25 – 30 days, the number of seeds within a hole cropping to 20 – 30 clump. This indicates that innovation introduced are the farmers capable on innovate and so their change adopt Hazton Technology increased from before.

Access to information/ internet

Internet access is the ability of farmers access information about Hazton Technology of online media by measuring the frequency of farmers obtain information from internet media outlets in one growing season. If innovation can easily accessible by the target groups and the adoption process through the mass media going to be more fast if the topic on technology innovation delivered throught the mass media. But and targeting is relatively difficulty accessing the mass media going to be more so the adoption process fast if the topic on technology innovation delivered with the methods face to face (Mardikanto, 1996).

Statistical test indicate that the information/ internet access will not affect to adoption Hazton Technology. This is not yet available in the study locations adequate internet network. In addition charge also becomes an abstacle to problems for farmers to access informastion through online media. Meanwhile required information about application of technology media communication that led to such as the print, electronic or interpersonal communication media (Bungin, 2008).

Besides information media, social and culture of the people is one factor that impedes farmers access information through online media. Farmers is less

innovative. They often get information about farming by local community leaders. So that the information to be conveyed is subjective and hereditary.

CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

The research it can be concluded that: 1) About 56% farmers have used quality for seeds in accordance with the implementation of Hazton Technology. The adoption level of farmers to age seeds grown reached 100%. As many as 100% farmers have done adoption the number of seeds by the plant according to the suggestion. Farmers who have adopted the crop distance in accordance with suggestion is as many as 59,2%. Only 44% farmers have done weed and water control system based on the suggestion. As many as 75,2% of farmers has implemented the fertilizing system based on the suggestion. 2) Statistical test indicate that the technology innovation influencing the adoption of Hazton Technology, while the other factors do not affect.

Recommendations

Based on the research found out that farmers have much more constraints discovered to get the subsidized seeds and fertilizer. Its hope that the government and his staff can pass assistance in subsidized fertilizer and seeds evenly. There are still some parameters that has not been implemented in accordance with the suggestion in Hazton Technology. Hence instructors have to work more diligently to raise its level adoption farmers in the Gunung Kembang Village Semidang Alas Maras Sub-District Seluma Regency. The most appropriate extension method is by way of face to face, of course with regard to the material and intensity of the meeting.

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