

ADOPTION OF AGRICULTURAL CROPS CULTIVATED ON COASTAL LAND IN THE SOUTHERN COASTAL AREA OF YOGYAKARTA

Subejo

*Lab. of Agricultural Extension and Communication
Faculty of Agriculture, Gadjah Mada University
Yogyakarta, Indonesia, E-mail :subejo@lycos.com*

ABSTRACT

For several years, some farmers have been cultivating of coastal land in the southern coastal area of Yogyakarta (*Sultan Ground*) to plant agricultural crops such as chilli, water-melon and peanuts. Cultivating coastal land has made a significant contribution to the farmers incomes. To support the development of The use of the coastal land we require a study about the adoption of agricultural crops cultivated on coastal land in the southern coastal area in Yogyakarta. The objectives of this study are (1) to identify of adopter-farmers profile and adoption process of agriculture crops cultivated in coastal land, (2) to identify the factors which influence agriculture crops cultivated land, (3) to identify of the factors which influence the time period of adoption in adoption process of agriculture crops cultivated on coastal land in the southern coastal area of Yogyakarta. The random method are used to obtain samples. 40 farmers are sampled. The data collecting technique is direct interview with the farmers.

The main results of this study are. (1) agricultural cultivation technologies need to be distributed and improved: pest protection, price and product, marketing and post harvest, (2) Most of the farmers dopted the agricultural crops cultivated on coastal land land 1 to 5 years ago with a time period of adoption of less than 1 year, (3) Information sources are dominated by the farmers companions who live in the same or neighborhood villagess the role of agricultural extension agents and mass media are still minor, (4) the main which have been cultivated by farmers are chilli and water-melon, (5) Farmers still have authority to make final decision in adoption process, (6) The factors which have significant influence (α 0,05%) on the adoption level of agriculture coinmodlties cultivated on the coastal land are : educational background, age, information sources and the role of leader"s opinion, (7) The fctors which have significant influence (α 0,05%) on the time period adoption of agricultural crops cultivated on the coastal land are age and the role of the leader's opinion.

INTRODUCTION

For several years, some farmers have been cultivating of coastal land in the southern coastal area of Yogyakarta (*Sultan Ground*) to plant agricultural crops such as chili, water-melon and peanuts. Cultivating coastal land has made a significant contribution to the farmers incomes. To support the development of The use of the coastal land we require a study about the adoption of' agricultural cotnmodlties cultivated on coastal land in the southern coastal area in Yogyakarta.

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Adoption process is an applying/using process of idea/tool/technology, which distributed in communication messages to distributed information. This process runs step by step according to communication steps. Rogers (1983) states that adoption phases are classified in five groups; (1) *awareness*, understanding about something new, (2) *interests*, being interested in something new/being active to search for information, (3) *evaluation*, evaluating and measuring distributed innovation, (4) *trial*, trying phase to get new innovation, and (5) *adoption, receiving/applying/implementing* of innovation based on a trial in small scale.

According to Rogers (1983) people who adopt innovation at beginning phase on diffusion process possess some characteristics. They, generally tend to have higher in educational background, they manage agricultural units in larger scale (they are owner), and the management of agricultural crops commonly are more specific compared to agricultural crops managed by other farmers. The study concerning the adoption of rice technology conducted by Suhendar (1997) tells us that the factors which influence the adoption level of rice technology are land-owning, farmers age, and farmers economic motivation.

Various farmers ages, educational backgrounds, assets, farmer's mobility and social status have caused the *time period of adoption process* to each person to be different. Young people who have high educational backgrounds, many assets. High mobility, high social status will have a faster tendency (time period of adoption shorter) to adopt the process of new innovation (Rogers, 1993). The adoption process for the innovation influenced by internal factors and external factors. The external factors include farmers access to information sources and the role of the leader's opinion in their community.

MATERIAL AND METHODS

Materials and Tools

Materials in this study are (1) farmer's who have been cultivating agricultural crops in the southern coastal area of Yogyakarta (2) documented reports and data related to agricultural crops in the southern coastal area of Yogyakarta. The tools used in this study are question-lists/questioner which contain some questions based on the objectives of study.

Procedure of Study

The Basic method used in this study is the analytic descriptive. The study was conducted in coastal land in the southern coastal area of Yogyakarta. The purposive method was needed to select the location. Selected locations are taken in two steps. The first step was to take the sub-district that has the largest coastal area in Yogyakarta including the Bantul and Kulon Progo Districts. Second, the step was taken to one village from the selected sub-district, which has the largest coastal land. The selected location in this study is Karangwuni Village, Wates Sub-district, and Kulon Progo Regency, Yogyakarta.

The sampling method used in this study is random. The farmer's taken, as samples were farmers who cultivated agricultural crops in coastal land in the village. The number of samples is 40 farmers. The data collecting technique is direct interview with the farmers

Analysis

To analyze the first. Objective of the study. That is to identify the adopter–farmers profile and adoption process of agricultural crops cultivated in coastal land, analytical tables is used. In these tables we present some information about farmers profiles and adoption processes which are represented by qualitative numbers and percentages

To analyze the second objective, that is to identify, the factors which influence agriculture crops cultivated in coastal land, and the third objective, that Is to identify, of the factors which influence time period of adoption, we used regression model analysis.

1. Hypothesis 1

$$Y = b_0 + b_1X_1 + \dots\dots\dots b_6X_6$$

Note :

- Y : adoption level of agricultural crops on coastal land
- b₀ : intercept
- b₁ - b₆ : regression coefficient
- X₁ : educational background
- X₂ : size of owned land
- X₃ : farmer's age
- X₄ : economic motivation
- X₅ : information resources
- X₆ : the role of leader opinion

2. Hypothesis 2

$$Y = b_0 + b_1X_1 + \dots\dots\dots b_7X_7$$

Note :

- Y : time period of adoption of agricultural crops on coastal land
- b₀ : intercept
- b₁ - b₇ : regression coefficient
- X₁ : farmer's age
- X₂ : educational background
- X₃ : owned assets
- X₄ : economic motivation
- X₅ : social status
- X₆ : information resources
- X₇ : the role of leader opinion

RESULTS AND DISCUSSION

The Profile Of Farmer-Adopters Of Agricultural Crops Cultivated In Coastal Area

Selected farmers have various compositions of ages. Most of them are under 50 years old (77,55). Farmers in this group have high potential to produce agricultural products in coastal area. Most of them are men (87,5%), generally in the coastal area men work full time to manage their farms. The level of farmer's educational background is variable. The biggest percentage is farmers who have educational background of elementary school (45%); the next is farmers who have educational background of secondary school (30%). Viewed from their social status, the farmers are divided into village public figures, village officers, and chairman of farmers groups and member of farmer groups. Most of them are member of farmers groups (87,5%).

Agricultural extension agents still have low performance in distributing information about agricultural crops in coastal land. The farmer's companion who has live in the same or neighborhood villages dominates the most important role. Their field visiting activity shows the agricultural extension agent's role. The method of agricultural extension activity is variable, but still is dominated by the classical and conventional method, that is face to face meeting with farmers (65%). Field visiting activity by the agricultural extension agent is not conducted using regular schedules. 22,5% farmers have the perception that the agricultural extension agents never conduct field visiting activities.

The agricultural cultivation technologies required to be distributed and improved are pest protection (72,5%), price and product marketing and post-harvest (52,5%).

Adoption Processes Of Agricultural Crops In The Coastal Area

Most of farmers state that they got information and knowledge about agricultural crops cultivated in coastal land areas 1 to 5 years (62,5%); 27,5% of farmers have said that they got it 6 to 10 years ago; and 10 % of the farmers got it more than 11 years ago. The dominant information resources about agricultural crops cultivated in coastal area are farmers companions who live in the same village (70%) and farmers companions who live in the neighborhood villages (67,5%). Other information resources are group's officers (27,5%) and village officers (12%). This indicates that farmer community in the location of study still has strong communal relationship.

Farmer's perceptions of the role of public figures in the village in the adoption process of agricultural crops in coastal land are variable. Most farmers have perception that public figures in village have important roles (40%) while 27,5 % of the Farmers State that public figures in the village do not have important roles in adoption process.

According to Rogers studies (1983)), before adopting an innovation, some farmers do some small scale trial activities. They count relative advantages and adapt innovations to the social norms and compare their own experiences to other people (compatibility). This is also indicated from the results of this study; most of the farmers (77%) performed trial activities planting agricultural crops on small scale. Farmers also took into account relative advantages (50%) and they also considered the their farmer companion who live in the same or neighborhood villages.

Most of the farmers responded positively to the agricultural crop ad adoption on coastal. This shown by the 62,5% of the farmers who directly adopt the innovation less than!

Month since they first know about the new innovation; 7,5 % of the farmers state that they fully adopted the new innovation after 1 to 6 months and 30 % of the farmer's adopted the innovation less than 6 month after. Most of the farmers believe that growing agricultural crops on coastal land will be advantageous (80% of farmers).

The width coastal land used by farmers to cultivate agricultural crops is various. The highest percentage (37,5% of farmers) cultivate coastal land more than 2.500 m² wide, while other farmers used a coastal area less than 2.500 m² wide. The main kind of crops which have been cultivating by farmers are chili (100% of farmers) and watermelon (70% of farmers). Other crops, which have been cultivated by farmers, are corn, peanut, cassava and eggplant. Commonly farmers cultivate these crops in the first dry season and the second dry season.

The average of the farmer's income from agricultural crops cultivated on coastal land per year make a significant contribution to the total farmer's income. Farmer whose income is less than Rp 2.000.000/year is 20%, while 80 % of farmers have an income more than Rp 2.000-000/year including 27,5% farmers whose total income from agricultural crops cultivated on coastal area is Rp 8.000.000/year The total income from cultivation on coastal land is also supported by the application of some cultivation technologies. More than 90% of farmers apply some agricultural cultivation technologies. The technologies which are not applied properly are pricing and product marketing (42, 5%).

Before making a final decision about agricultural crops cultivated on coastal land, farmers consider a number of the thinks. The main consideration in the adoption process is the *price* of agricultural product (70%) and the cost of production materials (85%). It is indicated that most of farmers take into account the input and output of agricultural crops cultivated. Most farmers (62,5 %) still have the authority to make the final decision in the adoption process; family decision (32%), group decision (27 %) and other factors influence other decisions. The main motive in adopting the agricultural crops cultivated on coastal land are to increase of farmers income (80%) and to follow the farmers companions who live in the same or neighborhood villages (72,5%).

The farmer's assets are various, and the size of land owned generally is 47,5% of farmers own less than 1000m²; 2,5% of farmers own more than 5000m². This condition also plays a role in supporting farmers use of coastal land to cultivate agricultural crops. 35% of farmers 1 own labor asset, 35% farmer's 2 productive labor assets and 30% have 3.

Most farmers have cows (70 % of farmers), and this kind of assets means family saving and capital to cultivate agricultural crops and also other family business. Farmer's ownership of cattle is supported by geographical conditions, which have high potential. There are many kinds of grass on the coastal land, which can be used to be feed cattle.

Housing assets are various. Most of the farmers have permanent houses made of bricks (67,5% of farmers), less than 7,5% houses made of wooden material. The size of farmers houses are various, the farmers houses are 51–100 m² (50% of farmers). 5% of farmers have cars, 45% of farmers have motor bikes and 77,5 % of farmers have bicycles.

The Factors, Which Have Significant Influence To The Adoption Level Of Agriculture Crops, Cultivated On The Coastal Land

Table 1. Variables, Regression Coefficient, t- Value and Significant Level of Adoption Level of Agriculture Crops Cultivated on the Coastal Land

No	Variables	Reg. Coef.	t-value	Sig (Prob)
1	Educational background	0,323	2,122	0,041*
2	Width of land owned	0,136	0,963	0,343
3	Farmers age	0,390	2,622	0,013*
4	Economic motivation	0,016	0,109	0,914
5	Information sources	0,340	2,277	0,029*
6	The role of leaders opinion	0,323	2,204	0,035*
Constant : 2,218				
R Square : 0,57				
F : 3,250 (sig=0,013 ^a)				
* : significant level α 0,05%				

Source: Primary Data Analysis, 2000

Regression model:

$$Y = 2,128 + 0,323X_1 + 0,136X_2 + 0,390X_3 + 0,016X_4 + 0,340X_5 + 0,323X_6$$

The factors, which have a significant influence on the adoption level of agriculture crops cultivated on the coastal land in Southern Coastal of Yogyakarta, are:

a. Educational background (X_1)

Based on the regression analysis, the regression coefficient to educational background variable (X_1) is 0,323 with t value 2,122 (significant level α 0,041%). This indicates that educational level has a significant influence to the adoption level of agriculture crops cultivated on the coastal land in Southern Coastal of Yogyakarta. If farmers have a higher educational background, the level of adoption will be higher. Farmers with higher educational backgrounds have higher level of information exposure and have higher ability to receive and use new information/Innovations optimally.

b. Farmers age (X_3)

Based on the regression analysis, the regression coefficient to farmer's age variable (X_3) is 0,390 with t value (significant level α 0,013%). This indicates that farmer's age has significant positive influence on the adoption level of agriculture crops cultivated on the coastal land in Southern Coastal of Yogyakarta. If a farmer is older, the level of adoption is higher. Older farmers have more experiences in agricultural cultivation on coastal land and they have more opportunity to know about new innovation on longer time.

c. Information sources (X_5)

Based on the regression analysis, the regression coefficient to information sources variable (X_5) is 0,340 with t value 2, 277 (significant level α 0,029%). This indicates that information resources have significant positive influence to the adoption level of agriculture crops cultivated in the coastal land at Southern Coastal of Yogyakarta. The higher the variety

of information resources obtained received by farmer's give more opportunity to the farmers to choose the kind of information resources, which can be adapted to their conditions and capabilities. They can choose the kinds of information resources to support their farming activities on coastal land.

d. The role of leaders opinion (X_6)

Based on the egression analysis, the regression coefficient of the role of opinion leaders variable (X_6) is 0,323 with t-value 0,204 (significant level \propto 0,035%), This indicates that the role of the leaders opinion has a significant positive influence to the adoption level of agriculture crops cultivated on the coastal land in Southern Coastal of Yogyakarta. If the role of leader opinion on agricultural crops cultivated on coastal land is higher, the adoption level is higher. Communities on the coastal area still follow paternalistic patern. Village public figures still become references and important consideration in adopting an innovation.

The Factors Which Influenced To The Time Period Of Adoption

Table 2. Variables, Regression Coefficient, t- Value, And Significant Level of Time Period of Adoption Agricultural Crops Cultivated on Coastal Land

No	Variables	Reg. Coef.	t-value	Sig (Prob)
1	Farmers age	0,368	2,345	0,025*
2	Educational background	0,018	0,114	0,910
3	Farmers assets	0,010	0,067	0,947
4	Economic motivation	0,050	0,322	0,750
5	Social status	0,268	1,500	0,143
6	Information sources	0,137	0,867	0,392
7	The role of leaders opinion	0,381	2,462	0,019*
Constant : 3,569				
R Square : 0,63				
F : 2,349 (sig=0,053 ^a)				
* : significant level \propto 0,05%				

Source: Primary Data Analysis, 2000

Regression model:

$$Y = 3,569 + 0,368X_1 + 0,018X_2 + 0,010X_3 + 0,050X_4 + 0,268X_5 + 0,137X_6 + 0,381X_7$$

The factors, which have significant influence on the time period of adoption of agriculture crops cultivated on the coastal land at Southern Coastal of Yogyakarta, are:

a. Farmer's age (X_1)

Based on regression analysis, the regression coefficient to farmer's age variable (X_1) is 0,368 with t-value 2,345 (significant level \propto 0,025%). This indicates that farmer's age has significant positive influence on the time period of adoption of agriculture crops on the coastal land in Southern Coastal of Yogyakarta. If a farmer is older, the time period of adoption is

longer. Young farmers have a tendency to be more progressive in applying a new innovation. Including a shorter time in the time period of adoption of agriculture crops cultivated on the coastal land.

b. The role of opinion leaders (X_7)

Based on regression analysis, the regression coefficient of the role of leader's opinion variable (X_7) is 0,381 with t-value 2,4624 (significant level α 0,019%). This indicates that the leader's opinion has significant positive influence to the time period of adoption of agriculture crops cultivated on the coastal land in Southern Coastal of Yogyakarta. The higher the role of leader's opinion on agricultural crops cultivated on coastal land, the shorter the time period of adoption will be. Communities on the coastal still follow paternalistic patterns. Village public figures still become references and are an important consideration in adopting innovation.

ACKNOWLEDGMENT

I thank The Research Institute of Gadjah Mada University for the financial assistance, Dr. Sri Peni Wastutiningsih and Akhmad Zaini for their technical assistance. My thanks also go to Mr. Tata Survian for manuscript editing.

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