

## INCREASED ADOPTION OF APPLICATION-BASED AGRIBUSINESS INFORMATION SYSTEM INNOVATIONS IN KAMPUNG HIDROPONIK GANG HIJAU ASMAT, SOUTH JAKARTA

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### Abstract

This research was backgrounded by urban communities the formed farmer groups to meet the needs of vegetable consumption in residential areas by utilizing the walls and fences of houses to increasing green space, reduce air pollution, and increasing income. Vegetables grown are sold in person or online. Agricultural extension is also not optimal, so it is necessary to adopt innovative agribusiness information systems such as the Farmer Application support. This study aims to. Identify the characteristics of farmers in the Asmat Green Gang Hydroponic Village; Analyze the relationship between farmer characteristics and the level of knowledge and the level of adoption of agribusiness information systems based on farmer applications. Analyze the level of knowledge and perception of farmers with the level of adoption of agribusiness information systems based on farmer applications.

The results of this study show that farmers in the Gang Hijau Asmat Hydroponic Village have not accepted or refused to apply the farmer application to their hydroponic vegetable farming business. This is because the socioeconomic characteristics of farmers are not related to the level of knowledge and adoption even though farmers' perceptions of farmer applications are good. Farmers there are classified as new farmers because they only started planting in 2017. They are also new to the Farmer application so that are still in the adjustment stage from what was originally direct counseling to online counseling. Farmers in This Hydroponic Village are included in the classification of early adopters to determine the speed at which farmers apply farmer applications.

**Keywords:** Hydroponics, Agribusiness Information Systems, Farmer Applications

### INTRODUCTION

Kampung Hidroponik Gang Hijau Asmat is a community that forms an urban farmer group under the guidance of tribal officers of the South Jakarta Food Security, Marine, and Agriculture Service. People in Gang Hijau Asmat use the area where they live in the form of walls and fences of their homes to increase green space and reduce air pollution. Farmers in Gang Hijau Asmat work together to take care of plants by creating groups. A total of 14 groups with each group consisting of 3-5 people. During the Large-Scale Social Restrictions (PSBB) like this, the treatment system was made a picket schedule to comply with government regulations, namely wearing masks and *social distancing*. Each group is assigned in the morning and evening to care for

hydroponic plants. However, during this PSBB period, these activities were also made in shifts and sales only used an online system.

Farmers in Gang Hijau Asmat Hydroponic Village are around 80% already using *smartphones*, not only for consumptive needs but also for productive needs such as creating groups via *WhatsApp* to discuss their agricultural problems and solutions and obtain information without having to meet face to face. Counseling has also experienced a shift due to the development of technology, information, and communication so the concept of counseling emerged in the virtual world that seeks to connect farmers with extension workers in *real-time*. However, agricultural extension activities have not had much effect on the behavior of farmers to adopt new technology even though the technology introduced is the result of improvements or modifications to existing technology. The process of adopting innovation requires effective communication. Before the adoption process takes place, psychologically the farmer will try to understand, based on the desire, and need to know the meaning of the innovations he received.

One of the applications developed is the Farmer application. A wide variety of features or services are offered in this application. Technically, the availability of farmer applications can increase the productivity of commodities that are grown and can be marketed online, but psychologically farmers will still consider other risks that will arise and the prerequisites that must be met. Other risks such as uncertainty and uncertainty in the results that will be obtained by farmers when adopting new technology (Adawiyah et al, 2017: 153). One of the problems in the field in the process of providing innovation is that not all farmers easily know and apply the new innovations provided, especially since each farmer has a different socioeconomic background.

Based on this description, research on increasing the adoption of application-based agribusiness information system innovations needs to be carried out. Based on the problems described, this study aims to, 1) Identify the characteristics of farmers in the Asmat Green Gang Hydroponic Village; 2) Analyze the relationship between farmer characteristics and the level of knowledge and the level of adoption of an agribusiness information system based on farmer applications; (3) Analyze the level of knowledge and perception of farmers with the level of adoption of agribusiness information systems based on farmer applications. The scope of this study is only limited to the relationship of social, and economic characteristics, and farmers' perceptions of the adoption of innovative agribusiness information systems based on farmer applications only.

## **RESEARCH METHODS**

### **Research Time and Location**

This research was conducted at The Asmat Green Gang Hydroponic Village, Jalan Manunggal II, RT 03 RW 02, South Petukangan Village, Pesanggrahan District, South Jakarta. Research in July-August 2020.

### **Data Types and Sources**

The types and sources of data used in this study are primary data and secondary data. Primary data in the form of interviews and filling out questionnaires with related parties. Secondary data in the form of related literature studies.

## Data Analysis

### Ethnographic Qualitative Analysis

Referring to Spradley (1997:57) the steps of ethnographic research are carried out as follows: (1) Establish an informant (2) Interview an informant (3) Make an ethnographic notes (4) Ask descriptive questions (5) Conduct ethnographic interview analysis (6) Make domain analysis (7) Ask structural questions (8) Make a taxonomic analysis (9) Ask contrast questions (10) Make component analysis (11) Find cultural themes (12) Write an ethnography.

### Descriptive Qualitative Analysis

In this study, the results of the questionnaire that had been filled out by the respondent farmers were used to find out information on the characteristics of farmers and socioeconomic farmers, knowledge of direct agricultural counseling and online agricultural counseling which adopted an application-based information system for Farmers in The Asmat Green Gang Hydroponic Village.

### Chi-square analysis

Chi-Square Formula

$$X^2 = \sum \frac{[ (foj - fej)^2 ]}{fej}$$

Information:

$X^2$  = Chi Squared distribution

foj = Frequency of farmers filling out questionnaires from each component of farmers' knowledge of counseling, farmer perceptions and farmer application adoption tests.

fej = Frequency of expectations of each component of farmer knowledge on extension, farmer perceptions, and farmer application adoption test.

To find out whether the result obtained is significant first calculated *the degree of freedom (degress of freedom)*:

$$dk = db = v = (k-1) (b-1)$$

Information:

dk = v = db = free degree

k = round

b = row

Contingency coefficient formula:

$$KK = \sqrt{\frac{X^2}{X^2 + n}}$$

Information:

KK = Contingency coefficient

$X^2$  = Value of Chi squared

n = Number of respondents

## RESULTS AND DISCUSSION

The characteristics of farmers in Gang Hijau Asmat Hydroponic Village consist of age, education, area of land owned, land status, experience, and income every month. The age characteristics of farmers who are members of the farmer group are aged 23-68 years but who has the most adoption power of the farmer application,

namely the age characteristics of 25-54 years, which is 93.34% which is dominated by women because of their interest in growing vegetables at home. The most educational characteristics are the Senior High School or Vocational High School level as much as 66.67%. In this group, the reason farmers grow hydroponic vegetables to increase their activities is that planting hydroponically in front of their homes does not take a long time and increases their income. As much as 60% of the land status in Gang Asmat Hydroponic Village is owned by itself with a land area owned by <100 meters<sup>2</sup>. This is because the area used to plant is the area where they live in the form of walls or pagers of houses. The income received from growing hydroponic plants every month is between < Rp.500,000, and 1-3 years of farming experience.

The characteristics of farmers will largely determine the level of knowledge of farmers about agricultural extension both in person and online and can determine the level of adoption of agribusiness information systems based on farmer applications. Based on the results of *the chi-square* test, shows that there is no real relationship between the characteristics of farmers and farmers' knowledge of agricultural extension. This is because not all members of the farmer group are present if there are direct agricultural extension activities and out of 30 respondents only about 5 farmers know agricultural extension online. Farmers in Gang Hijau Asmat Hydroponic Village are also still adjusting from direct agricultural extension activities to online counseling, and they consider risks such as uncertainty and indiscretion of the results obtained if implementing the Farmer application. When viewed on the relationship of the socioeconomic characteristics of farmers with the adoption rate of farmer applications only the characteristics of age and education have a real relationship to the adoption rate of farmer applications. Based on the results of the analysis of farmers' knowledge about an in-person and online agricultural extension, it is still lacking because they have not felt the benefits and benefits of the application. The characteristics of land status, land area, income, and experience turned out to have no real relationship with the adoption rate of the Farmer application. Here's an explanation of each of the characteristics.

The results of *the chi-square* analysis on farmer knowledge with the adoption rate of the Farmer application obtained  $X_2$  counts of 3.741 and the value of  $X_2$  tables at the level of degree four and the level of reality of 95%  $\alpha = 0.05$  of 9.487, meaning that the value of  $X_2$  count is smaller than  $X_2$  of the table. These results state that the farmer's knowledge level has no real relationship with the adoption rate of the Farmer application. This is because the knowledge of farmers in Gang Hijau Asmat Hydroponic Village regarding agricultural counseling is still low, which is because not all members of the farmer group participate in agricultural counseling, they only get information from the head of the farmer group or fellow members. Based on the results of the *chi-square* analysis on farmers' perceptions of the adoption rate of the Farmer application, it was found that the  $X_2$  count was obtained by 32.513, and the value of  $X_2$  table at the level of free degree four and at the level of reality 95%  $\alpha = 0.05$  of 9.487, meaning that the value of  $X_2$  count is greater than  $X_2$  table. This states that the perception of farmers has a real relationship with the adoption rate of farmer applications in the Asmat Green Gang Hydroponic Village. Farmers' perceptions are good for the Farmer application because they think that the Farmer application can provide benefits in agricultural extension activities because it can be done online, the Farmer application is to the needs of farmers because during a pandemic like this

farmers can still get information about their farming business without having to meet face to face, services, and the features in the Farmer application are also easy to understand, the use of the application is easy to apply in their hydroponic vegetable farming business and farmers feel a better use of time and place from direct agricultural counseling because it can be adjusted to their time and don't have to go to the counseling place. Although farmers' perceptions are good towards the Farmer application, the use of the application is not necessarily done every day, because based on the observations of researchers they only use the application if the researcher comes. They tend to be careful before implementing the Farmer application because they do not like the risks to their farming business and like a simpler and more secure way of counseling such as direct agricultural extension.

## CONCLUSIONS AND SUGGESTIONS

The conclusion of this study is the characteristics of farmers in Gang Hijau Asmat Hydroponic Village who have the most adoption power of farmer applications, namely the characteristics of the age of 25-54 years, high school or vocational education, the status of their land, the area of land owned by <100 meters<sup>2</sup>, monthly income between < Rp.500,000, and farming experience of 1-3 years. The socioeconomic characteristics of farmers, namely age, education, land status, land area, income, and experience, none of which have a real relationship with the level of knowledge of farmers regarding the agricultural extension. The characteristics of age and education have a noticeable relationship with the adoption rate of the Farmer application, while the land status, land area, income, and experience have no relationship with the adoption rate of the Farmer application. Based on socioeconomic characteristics, farmers in The Asmat Green Gang Hydroponic Village refused to adopt the Farmer application. The farmer's level of knowledge has no real relationship with the adoption rate of the Farmer application. Based on the level of knowledge of farmers regarding agricultural extension, it can be concluded that farmers in the Gang Hijau Asmat Hydroponic Village refuse to adopt the Farmer application. Farmers' perceptions based on relative profitability, compatibility, complexity, trialability, and observability have a real relationship with the adoption rate of the Farmer application.

Suggestions that can be given from this research are: 1) it is expected to be able to be open in accepting innovations and be aware of current technological developments, 2) there is a need for continuous guidance to better educate farmers' knowledge, and 3) innovations, especially farmer applications, are expected to be able to attract farmers' interest both in terms of convenience and information provided.

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