

# *The Process Of Adopting Innovation In Online Agricultural Product Marketing By Agricultural Extension Workers In Padang, West Sumatra*

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**Abstract** – Agricultural extension workers are one of the parties that play a role in the process of adopting innovations in agriculture. This study aims to analyze the process of adoption of online agricultural product marketing innovations by Agricultural Extension workers and analyze the factors influencing the adoption of online agricultural product marketing innovations from the perspective of agricultural extension workers in the Padang City Agricultural Department.

Research respondents are agricultural extension workers in the city of Padang totaling of 25 people. The data collected consists of primary data and secondary data. The process of innovation adoption is measured based on the stages consisting of the knowledge inquiry, interest, evaluation stage, the small-scale experimentation, and implementation stage. Data analysis was carried out qualitatively by describing the research results in the form of percentages.

The results showed that in the process of adopting online agricultural product marketing innovations, some agricultural extension workers went through stages including acknowledging the existence of online agricultural product marketing innovations, seeking information and knowledge, assessing the suitability of online agricultural product marketing innovations with farmer conditions in the extension working area. However, the stages of trying innovation on a small scale and implementing online marketing innovations for agricultural products are only experienced by a small number of extension workers.

Several factors that influence the adoption of online agricultural product marketing innovations according to agricultural instructors can be grouped into: farmer characteristics, innovation characteristics, extension intensity, and the availability of supporting facilities for online agricultural product marketing innovations

**Keywords** – adoption process; innovation; online marketing of agricultural products

## I. INTRODUCTION

Online marketing (digital marketing) can be an alternative means in promoting product information in the agricultural sector. This approach tackles limitations in carrying out sales transactions for agricultural products to create a more effective and efficient sales system [1]. Utilization of Information and Communication Technology (ICT) through the provision of facilities for goods and service by online selling and purchasing is one of the major leaps in the use of ICT and it is capable of changing the pattern of human life [3]

As a new innovation in the marketing of agricultural products, various challenges must be faced in adopting this marketing model. The results of the study show that not all innovations known by farmers can be accepted and implemented by farmers, as there are various factors that influence farmers to decide and to accept their implementation. The innovations made will also go through various stages before reaching farmers, called the innovation adoption process. The speed of the adoption of agricultural innovations such as the online marketing model of agricultural products will be influenced by the intensity of agricultural extension.

Agricultural extension is a form of non-formal education that plays a role in improving the human resource capacity of farmers so that they become resilient farmers capable of accessing various resources needed, agricultural information as well as planning and deciding what is best for them in farming business. The objective of extension, according to Mardikanto [5], is to create better farming, better business. In order to achieve the goal, agricultural extension must be supported by strong extension resources and can be a model for farmers as beneficiaries of agricultural extension benefits.

To produce better agricultural products, innovation is required in farming activities from upstream to downstream. Online marketing of agricultural products is a form of innovation that can increase the market for farmer's agricultural products. This online agricultural product marketing innovation is expected to be adopted by farmers. Before these innovations are introduced and adopted by farmers, it is expected that agricultural extension workers can be partners who help farmers to improve their farming businesses by adopting these innovations.

Therefore, this study aims to analyze the process of adopting online agricultural product marketing innovations by Agricultural Extension workers and to analyze the factors influencing the adoption of online agricultural product marketing innovations from the perspective of agricultural extension workers in the working area of the Padang City Agriculture Office.

## **II. RESEARCH METHODS**

This study was designed with a qualitative approach, using a survey method and supported by quantitative data. The research was conducted in the working area of the Padang City Agriculture Office.

The respondents of the research are agricultural extension workers in the city of Padang, totaling 25 people. The data collected consisted of primary data and secondary data. The process of adopting innovation was measured based on the stages of innovation adoption which consist of the acknowledgment stage, interest in innovation, assessment of innovation, testing the innovation on a small scale, and the implementing the innovation. Data analysis was carried out qualitatively by describing the research results in the form of percentages.

Data topics based on research objectives are presented in Table 1.

Table 1. Research topics and data sources

Research Objectives	Data Topic	Data Sources
Analyzing the process of adoption of online agricultural product marketing innovations by extension workers	1. Acknowledgment stage activity	Extension Workers
	2. Interest stage activity	
	3. Evaluation stage activity	
	4. Small-scale testing stage activities	
	5. Adoption stage activity	
Identifying the factors that influence the adoption of online marketing of agricultural products from the perspective of extension workers	1. Farmers Characteristics	Extension Workers
	2. Innovation Characteristics	
	3. Extension Intensity	
	4. Infrastructure Availability	

## **III. RESEARCH RESULT AND DISCUSSION**

### **A. Characteristics of Respondents**

Research respondents are agricultural extension workers who are in the work area of the Padang City Agriculture Service, totaling 25 extension workers. Characteristics of the extension respondents are presented in Table 2

Table 2. Characteristics of Respondents

No	Characteristics	Number (people)	Percentage (%)
	Age (Year)		
a.	35-43	12	48
b.	44-52	6	24
c.	> 52	7	28
	Sex/Gender		
a.	Male	7	28
b.	Female	18	72
	Formal Education		
a.	Higher Education	2	8
b.	D3	2	8
c.	Undergraduate/D4	21	84
	Non-Formal Education (in the last 2 years)		
a.	Yes	5	20
b.	No	20	80
	Number of Farmer Group Partners		
a.	10-21	14	56
b.	22-33	5	20
c.	> 33	6	24

Research data shows that as many as 48 percent of respondents are in the productive age range, which is in the range of 35 to 43 years, with the education level of the majority being at the undergraduate level (48%). The number of partner farmer groups is mostly in the ideal category, namely 10 to 21 farmer groups. The results showed that the majority (80%) of the extension workers had not attended non-formal education, in the form of training in the last 2 years. Based on information obtained in the field, this was due to the condition of the Covid-19 pandemic, so that training activities were reduced, even if they were held in online form.

*B. The process of adoption of online agricultural product marketing innovations by extension workers.*

The process of adopting online agricultural product marketing innovations is measured based on the stages of innovation adoption by Rogers [7], which consist of the acknowledgment stage, interest in innovation, assessing innovation, testing the innovation on a small scale, and lastly implementing innovation. The process of adopting online agricultural product marketing innovations by agricultural extension workers is presented in Table 3.

Table 3. The process of adopting innovation (knowledge stage) of online marketing of agricultural products by agricultural extension worker

Adoption Stages	Frequency	%
Knowing on Innovation		
a. Time of knowing		
• This year	19	76
• 1 year ago	1	4
• >1 year ago	4	16
• Do not remember	1	4
b. Number of Application Known		
• 1 -2	11	44
• 3-4	10	40
• >4	4	16

c. Source of information		
• Friends	8	32
• Social Media	12	48
• Training	5	20
d. Unknown Information		
• Type and Quality of the product	7	28
• Product Processing	1	4
• Product Marketing	11	44
• Information on product Price	3	12
• Non agriculture	3	12

The results showed that all extension workers (100%) already knew about marketing agricultural products online. Most of the extension workers knew about this online marketing of agricultural products a year ago. This was influenced by the Covid 19 pandemic, the existence of social restrictions, causing people to switch to online media in carrying out various activities. However, their level of knowledge varies. Based on the discussions with agricultural extension workers, most of them stated that they knew there was an application to market agricultural products online, but they did not understand how to use it.

The types of agricultural product marketing applications known to extension workers also vary. Lumbungin is the only specific application of agricultural products mentioned by extension workers. Several types of applications known to extension workers were Lumbungin, WhatsApp, market places in Facebook, Bukalapak, and others. Each extension worker knows more than one application that can be used for marketing and promotion of agricultural products.

Plant cultivation techniques, agricultural product marketing techniques, and agricultural product processing were among the types of information known to extension workers while sources of information about marketing agricultural products online are obtained by extension workers from fellow extension workers, through training activities, and also through browsing on social media.

After gaining knowledge about online marketing of agricultural products, extension workers carry out various activities. The activities carried out will show whether they are interested in online agricultural product marketing innovations or not. Innovation adoption theory refers to this stage as the Interest stage (interest in innovation). People who are interested in innovation will seek information about the new innovation. Extension activities in the interest stage are presented in table 4.

Table 4. Distribution of respondents at the interested stage in the process of adopting online agricultural product marketing innovations by agricultural extension workers.

Adoption Stages: Interested	Frequency	%
Activities carried out		
a. Looking for further information	12	48
b. Study innovation	5	20
c. Convey to farmer groups	1	4
d. Buying products offered by the application	4	16
e. Ask the other party	1	4
f. Comparing with conventional	2	8
Level of Interest		
a. Interested	22	88
b. Less interested	3	12
c. Not interested	-	-
Source of information		
a. Friends	10	40
b. Internet	15	60

The results showed that the activities carried out by extension workers after learning about online agricultural product marketing innovations were probing more information about these innovations and conveying to farmer groups about innovations. There were also several respondents who said that they have tried to buy products through the agricultural product marketing application. The behavior of these extension workers who seek information related to innovations shows that they are interested in online agricultural product marketing innovations. The sources for obtaining further information about online marketing innovations used by respondents were the internet and discussions among extension workers. The way to get information is by browsing on Google, videos on YouTube, and opening various agricultural product marketing applications.

The next stage after the interest in the adoption process is the evaluation stage. The behavior of extension workers in the evaluation stage is presented in Table 5.

Table 5. Distribution of respondents at the evaluation stage in the process of adopting online agricultural product marketing innovations by agricultural extension workers

Adoption Stages: Evaluation	Frequency	%
Activities carried out		
a. Conduct Assessment on the innovation	25	100
b. No Assessment on the innovation		
Aspect Assessed		
a. Economical	10	40
b. Technical	15	60
c. Social		
Assessment Results on the innovation		
a. In accordance with the condition of the beneficiary	20	80
b. Less in accordance with the conditions of the beneficiary	5	20
c. Not in accordance with the conditions of the beneficiary		

The results showed that most of the extension workers made an assessment of the online marketing innovation of agricultural products. The aspects assessed are economical and technical innovation. There are several extension workers who say that online marketing of agricultural products is not in accordance with the conditions of farmers and the conditions of beneficiary farming. The condition of the farmers in question is the age of the farmers in their work area who are relatively old, so it is difficult for them to use smartphone while related to farming, the beneficiary types of products are perishable vegetables that spoil quickly, so they are not always ready to be sent to consumers.

The next stage in the adoption process after evaluation is to try it on a small scale. The meaning of trying on a small scale in this adoption process is; someone who has gained knowledge about an innovation, will first try the innovation he receives before deciding to adopt or apply it permanently in his farming. For the small-scale trial stage in the process of adopting online agricultural product marketing innovations by extension workers, it is observed through the practice of using online agricultural product marketing applications by extension workers. The description of the trial stage on a small scale is presented in Table 6.

Table 6. Distribution of respondents at the testing stage on a small scale in the process of adopting online agricultural product marketing innovations by agricultural extension workers.

Adoption Stage: Trying and testing	Frequency	%
Activities carried out		
a. Trying one of the online agricultural marketing applications	2	8
b. Trying an online marketing application not specifically for agriculture	23	72
c. Not Trying any of the online marketing apps		

The results showed that all extension workers have tried online marketing applications but most of what is being tested is an application to buy non-agricultural products. This is because extension workers are not producers of agricultural products, so they

do not have products to market. However, the information obtained in the field is that there are several extension workers who try to market agricultural products from members of their partner farmer groups.

The last stage of the innovation adoption process is the adoption stage. This is indicated by the adopter's decision to implement the innovation he received. The stage of adoption of online agricultural product marketing innovations by extension workers was observed through the following aspects: the intensity of the extension workers conveying online marketing innovations to beneficiaries. The distribution of respondents at the adoption stage is presented in Table 7.

Table 7. Distribution of respondents at the small adoption stage in the process of adopting online agricultural product marketing innovations by agricultural extension workers

Adoption Stage: Adopting	Frequency	%
Activities carried out		
Informing farmers during extension activities:		
a. Never		
b. Rarely	11	
c. Quite often	14	
Decision on innovation:		
a. Disagree, innovation is not in accordance with the beneficiaries	0	
b. Doubtful / Disagree, not suitable for beneficiaries in the work area	2	
c. Agree, suitable to beneficiaries in the work area	21	

The results showed that there were several respondents' behaviors in responding to online agricultural product marketing innovations. In general, they accepted the innovation of marketing agricultural products online for the beneficiaries. The reason they accept this online marketing of agricultural products is that it is relevant to current technological developments, more efficient in terms of cost, time and place efficient, makes it easier for farmers to market their products, shortens the marketing chain, in the hope that farmers get a better income. A small number of extension workers are still unsure as they consider online marketing of agricultural products is not suitable for the beneficiaries in their working areas. This is due to the characteristics of farmers, and the complexity of using online agricultural product marketing applications.

*C. Identification of factors influencing the adoption of online agricultural product marketing innovations from the perspective of agricultural extension workers*

Identification of factors influencing the adoption of online agricultural product marketing innovations from the perspective of agricultural extension agents can be grouped into several factors: a) Characteristics of farmers, (b) Characteristics of farming, (c) Characteristics of the innovation, (d) Counseling intensity, (e) Supporting Facilities or Infrastructure.

The factors influencing the adoption of online agricultural product marketing innovations by farmers from the perspective of agricultural extension workers are presented in Table 8.

Table 8. Factors influencing the adoption of online agricultural product marketing innovations.

No	Influential Factors	Influential Elements	%
1	Characteristics of Farmers	a. Old Age	12.1
		b. Direct Selling	
		c. Education	6.1
		d. Low Internet Skill	3
		e. Smartphone Possession	48.5
			30.3
2	Farming Profile	a. Little/ Limited Production	40
		b. Product Quality	40

3	Characteristics of Innovation	c.	Dependence on whole-seller	20
		a.	Difficulty in operating smartphone	40
		b.	Difficulty in operating application	16
		c.	Additional Internet Fee	8
		d.	Unsuitable with farmer skill	52
4	Extension Intensity	e.	Unsuitable with the farmer core business	20
		a.	Low online marketing skill	76
		b.	Lack of digital marketing training	24
5	Supporting facilities / infrastructures	a.	No internet connection	76
		b.	No smart phone	24

The results showed that the characteristics of the beneficiaries; relatively old age, farmer education, android ownership, low ability to use applications, and the attitude of those who prefer to buy and sell directly (conventionally) are obstacles for extension agents in conveying agricultural product marketing innovations online. This is because in order to be able to market agricultural products online, they must have a smartphone, and use certain applications, which are quite complicated for the elderly. The results of research by Han et al [4] state that in general, younger individuals tend to be more innovative, open to change, willing to try things they are not familiar with, and they are more prepared with skills in new social media applications. This extension assessment is in line with the results of research by Shodiq et al [8] which showed that the individual characteristics of food farmers that dominantly had a significant effect on the level of utilization of Commercial Farming was formal education, whereas in the horticultural farmer group, it is the ease of application.

The characteristics of beneficiary farm products also influence the application of online marketing innovations. According to several extension agents, the farmers who become their partners produce horticultural products, the quality of which is not in accordance with consumer tastes, and the amount of production is limited, so that when there is an order, there is no product ready to be sent to consumers. Perishable products also become obstacles in shipping to consumers. Another problem considered by extension workers to be influential in implementing online agricultural product marketing innovations is the bond between farmers and whole-sellers in marketing their agricultural products before harvest.

The results of Shodiq et al.'s research [8] show that the individual characteristics of the produces are dominant and significant in the level of utilization of commercial farming, namely formal education, while in the horticulture farmer group, it is easy to apply (Shodiq et al, 2019). This extension perspective is also supported by research by Mwangi et al [6] which states that farmer education is considered to positively influence farmers' decisions to adopt new technologies. It was further explained that the level of education of a farmer will increase his ability to acquire; process and use information relevant to the innovation it adopts.

The limited knowledge factor of farmers and extension workers in adopting online agricultural product marketing innovations is in line with the results of Asriani's research (2011) which states that the most obvious obstacle encountered in utilizing internet marketing is the limited knowledge of website managers about website content as it is considered valuable for all web user website group [2]. The availability of supporting facilities or infrastructures is another aspect that influences the adoption of online agricultural product marketing innovations. This is in line with the opinion of Johnson et al., (2010) in Sugandi stating that the lack of ICT infrastructures (eg poor internet connection, software, hardware, etc.) is a barrier to IT adoption.

#### **IV. CONCLUSIONS AND RECOMMENDATIONS**

The results of this research show that in the process of adopting online agricultural product marketing innovations, some agricultural extension workers went through several stages, namely, acknowledging the existence of online agricultural product marketing innovations, seeking information and knowledge about online agricultural product marketing, assessing the suitability



of online agricultural product marketing innovations with farmers circumstances in the extension working area, trying and testing the innovation on a small scale and implementing online marketing innovations. However, these stages are only passed by a small number of extension workers.

Several factors influencing the adoption of online agricultural product marketing innovations according to agricultural instructors can be grouped into: farmer characteristics, innovation characteristics, extension intensity, and the availability of supporting facilities or infrastructures for online agricultural product marketing innovations.

In order to improve the knowledge and skills of agricultural extension workers in using agricultural product marketing innovations online, training facilitated by agricultural extension institutions or universities must be provided.

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