

## The Relationship between the Adoption of Innovation and the Communication Channel of Madura Cattle Farmers

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(Received September 24, 2018; Accepted October 10, 2018; Published December 8, 2018)

**ABSTRACT.** Madura cattle are one type of local cattle developed and maintained by some Madurese farmers. The adoption of technology is a concept used to absorb new innovative technologies in relation to the development of Madura cattle breeding businesses. Communication channels hold an important role in delivering information to farmers. Active communication channels can facilitate farmers in absorbing information, so the purpose of this study is to analyze how the relationship between communication channels with the adoption of innovation in Madura cattle farmers in the Madura islands. This research was carried out in August 2018 by using secondary data with the research findings taken were Sumenep Regency, Pamekasan, and Bangkalan. The samples taken are 60 people and processed by using Spearman rank correlation analysis method. The results showed that the communication channel is significantly related to knowledge with a correlation coefficient of 0.314. Beside that, the communication channel is significantly related to the decision with the Spearman correlation value of 0.046. Meanwhile, the stages of implementation, implementation, and confirmation do not have a relationship with the communication channel. The adoption of innovative technology relies heavily on the communication channels chosen to transmit technological innovation. The selection of the right extension agents is directly to demonstrate technological innovation to farmers. Thus, the stakeholders are expected to be able to provide direct counseling to increase knowledge and decisions to adopt innovative technology.

**Keywords :** *cattle, communication channels, adoption of innovation, Madura*

**JEL Classification:** O31, Q12, Q16

### INTRODUCTION

The livestock sector is one that focuses on meat consumption needs in Indonesia. Basically, meat consumption in Indonesia is still very low compared to the other ASEAN countries. Indonesia's low meat consumption is caused by domestic production that cannot meet national meat consumption needs. Until now, there is only 70% of national cattle needs have been met (Rusono, 2015).

The biggest meat needs are contributed by the availability of beef cattle. This livestock business has the potential to be developed as a profitable

business. Beef cattle have long been maintained by some farmer as savings, social asset, and additional labor to agricultural land with traditional maintenance management. Most beef cattle business is in the form of people's businesses to produce seeds or fattening, and the maintenance is integrated with food crops and plantation crops (Suryana, 2009).

Maintenance of beef cattle is also expected to increase national beef production, which until now has not been able to meet the increasing needs of the people. On the other hand, the high demand for beef is an opportunity for businesses to develop local beef cattle so efforts to increase the productivity need to be continued.

A Self-sufficiency is a concept that has the main purpose of supplying local beef. The government continues to increase the population of local cattle.

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ISSN 2615-6075 online; ISSN 2615-6946 print  
@UWG Press, 2018  
OJS <http://publishing-widyagama.ac.id/ejournal-v2/index.php/jsed/>

One of them is breeding of germplasm. Germplasm breeding is needed to restore Indonesian native cattle and produce national beef that meets the market demand. The potential and wealth of local beef germplasm as SDGs have not been managed well, so there are not many benefits that have been obtained, even it causes losses and constraints in its development, and thus, the management recommendation are needed (Aryogi & Romjali, 2014).

Local beef cattle has a high potential to support the supply of national meat needs. This potential has unfortunately not been utilized optimally through an improved maintenance management. Local cattle has several advantages, for instance high adaptability to the local environment, being able to utilize low-quality feed, and enable good reproductive power (Suryana, 2009) .

Madura cattle are one type of local cattle developed and maintained by some Madurese farmers. The system for management of Madura cattle by farmers relies solely on available feed sources in the local area. Madura cattle feed in the rainy season is usually elephant grass, field grass, and leaves. In the dry season the feed given is dry agricultural waste, and dried leaves. The feed with low quality and insufficient quantities can disrupt reproductive processes in livestock. Madura cattle have better reproductive advantages compared to Bos Taurus cattle, which are more resistant to hot weather and tick disease (Hartatik, Mahardika, Widi, & Baliarti, 2009).

The determination of the policy for the development of Madura cattle farms as germplasm is concentrated in the Madura Cattle herd area to increase farmers' income as well (Hartono, 2012) Thus, the farmers' community is strived to be able to access technological innovations to improve their ability in maintaining their livestock business.

The adoption of technology is a concept used to absorb new innovative technologies in relation to the development of Madura cattle breeding businesses. According to Harinta (2011), the very dominant factor determining the absorption of innovation is the characteristics of innovation. The

characteristics of good innovation are expected to be easily adopted by farmers to realize sustainable livestock sector development.

Efforts to increase adoption of technological innovations are a necessity to stimulate farming production. The adoption of the innovations requires a long time and a measured process. Factors that influence technology adoption are the nature or characteristics of innovation, characteristics of prospective users, adoption decision making, channels or media used and qualifications of extension agents. The velocity of adoption is also largely determined by the characteristics or class of farmers. The process of adopting a technology generally through several stages, namely awareness, attention, assessment, trial, adoption and confirmation (Sudana & Subagyono, 2012). Herman, Hutagaol, Sutjahjo, Rauf, & Priyarsono (2006) argue that the factors influencing the actions of farmers to adopt technology are the attitude of farmers, the level of farmer's income, the extent of crop land controlled by farmers and the existence of extension agents

In short, the purpose of this study is to analyze the relationship between communications channels and the adoption of innovation in Madura cattle farmers in the Madura islands

## RESEARCH METHOD

This research was conducted in August 2018 by using secondary data obtained from the Agricultural Statistics of the Indonesian Central Statistics Agency in the Madura region. The research locations taken were Sumenep, Pamekasan and Bangkalan districts which are centers of Madura cattle in the Madura Islands. The samples taken were 60 people, namely breeders who only cultivate pure Madura cattle. The analysis method used was the Spearman rank correlation analysis because the data used a Likert scale, so that rank Spearman is the suitable method to analyze the relationship between communication channels and the stages of technological innovation adoption.

The Spearman rank method is used to analyze the ordinal sample data. The analysis ranked the

data after testing it (Syamsir, 2015). Kriyantono (2014) states that the testing by using rank spearman can find out the relationship between the independent variables and dependent variables. Spearman rank formulation can be calculated based on the following equation:

$$R_s = 1 - \frac{6 \sum D^2}{N(n^2-1)}$$

In which,  $R_s$  (rho) rank-order correlation coefficient and  $D^2$  multiplication of pair differences between two sets of values that have been sorted.

### Variable Definitions

#### 1. Adoption of Innovation

- Knowledge is defined as an increase in knowledge from the respondents due to the adoption of innovation
- Persuasion is determined that the innovation adoption is able to invite respondents to innovate after receiving knowledge
- The decision is a stage where respondents decide to adopt innovation
- The implementation means the respondents implement innovation after making decision
- Confirmation means after the innovation is implemented, it must be confirmed the suitability of the innovation

#### 2. Communication Channels

Communication in the form of counseling or a direct communication channel is considered very effective to improve participatory communication.

majority of farmers are not primary school parks with a percentage of 45%. Their livestock business is a hereditary business, so that the skills to grow the livestock are gotten from non-education. The majority of well-known non-business jobs are those that work as factory workers, washing workers, farm laborers, and others in which the amounts of 91.67%. The average of farmer age is between 41 to 60 years old. Smallholder farmers have a relatively small business scale which has cows below 7 individuals per person.

**Table 1.** Demographic Characteristics of Respondents

Characteristics	Quantity	Percent (%)
Gender		
Male	45	75.00
Female	15	25.00
Education		
Not graduating from elementary school	27	45.00
Elementary School	17	28.33
Junior High School	8	13.33
Senior High School	6	10.00
Bachelor Degree	2	3.33
Occupation		
Coffeshop	1	1.67
Merchant	2	3.33
Government Officials	2	3.33
The other	55	91.67
Age		
20-40	14	23.33
41-60	37	61.67
>60	9	15.00
Business scale		
Small	59	98.33
Medium	0	0.00
Large	1	1.67

The characteristics of farmers or breeders are known to give a role to the adoption of an innovation. On the cocoa farm, Herman, Hutagaol, Sutjahjo, Rauf, & Priyarsono (2006) say that farmer with a higher income, a positive attitude, and a more extensive crop land tends to take action on technology adoption. The similar findings are acknowledged by Sudana & Subagyono (2012) who argue that the determinant of acceleration of adoption of Integrated Crop Management on Rice includes age and education level. The opportunity for adoption of technology is higher if a implementing farmer group is relatively young with a higher level of education. Farmer groups which belong to these categories are generally more visionary and dynamic. Thus, this also guarantees

## RESULT AND DISCUSSION

### The Description of Madura Cattle Breeders

Madura cattle breeders spread in the Madura islands with the majority of their distribution in Sumenep, Pamekasan, and Bangkalan. The majority of the Madura cattle breeders' gender is men with a percentage of 75% and is greater than women. Male farmers are more likely to work in their own cattle compared to their wives.

Meanwhile 25% of women who are livestock breeders are those who are widows or housewives whose husbands work in the non-farm sector. The

a higher opportunity of success in a program. (Sudana & Subagyo, 2012).

### **The Relationship Between The Channels of Communication and The Adoption of People's Livestock Innovations**

The communication channel is closely related to how the information can be distributed to farmers. Communication channels are needed to adopt innovative technology to farmers. Based on the measurement results rank Spearman, it was found that the communication channel is significantly related to knowledge with a correlation coefficient of 0.314. Besides that, the communication channel is significantly related to the decision (decision) with the Spearman correlation value of 0.046. Meanwhile the stages of implementation, the implementation, and the confirmation do not have a relationship with the communication channel.

#### **1. The relationship between communication channels and knowledge**

The communication channel adopted by farmers is through direct communication, television, and radio. However, the intensity of the communication channels most often used by farmers is direct communication channels. The information about farm cultivation is gotten through counseling, so that the information about technology is very efficient through counseling as well. The innovation transfer was carried out by related informants who came from animal husbandry extension, UPT Keswan, and the higher education institutions

which provided technological innovations. Based on the results of the calculations, the communication channel is significantly related to knowledge. This indicates that the stages of innovation adoption are very suitable with the selection of good communication channels.

Improving farmers' knowledge through counseling is an initial step to adopt a technological innovation. The animal health technology innovation, cultivation, and side processing products are simple technological innovations that are most often obtained by Madura cattle farmers. This condition is in accordance with the research conducted by Nur et al. (2016) which states that the most optimal strategy for increasing innovation adoption is to provide continuous information about innovation. Continuous communication will increase the spirit of farmers to be responsive to new knowledge.

Communication in the form of counseling or direct communication channel is considered very effective to improve participatory communication. This strongly supports the effectiveness of raising farmers' knowledge (Cahyanto, Sugihen, & Hadiyanto, 2008). Counseling carried out by various agencies in a group of Madura cattle shows that the delivery through direct communication channels is very effective for increasing the knowledge of Madura cattle farmers. Farmers' knowledge is also greatly influenced by the attitude of farmers in adopting innovation technology (Herman et al., 2006).

**Table 2.** Relationship between communication channels and stages of adoption of innovation

	Stages of Innovation Adoption				
	Knowledge	Persuasion	Decision	Implementation	Confirmation
r (rank Spearman)	0.314	-0.180	0.258	-0.046	0.205
p-value	0.015	0.168	0.046	0.728	0.116
	Significant	Not Significant	Significant	Not Significant	Not Significant

According to Cheboi & Mberia (2014), the most effective communication channel to increase knowledge is direct with friends. This relates to the adoption of technology that will be delivered. Not all farmers are able to access training and

counseling that are outside the area. In this case, the local government usually only sends the representatives of farmers for training outside the region. After the representative was returned, he was expected to be able to provide counseling

directly to other farmers so that his knowledge would increase to adopt the innovation. This condition is considered the most effective one since communication through friends provides better communication opportunities.

According to (Muchtar, Purnaningsih, & Susanto, 2014), the participatory communication is very important to develop among farmers to identify individual needs and decision making so as to raise the enthusiasm and motivation of farmers in the learning process. The participatory communication is an approach that is able to facilitate the community to be engaged in decision making, a process that helps address needs and increases empowerment. The approach to the grassroots community helps to establish familiarity with stakeholders.

## 2. The relationship between communication channels and decisions

Communication channels are significantly related to the decision of the farmer to adopt the innovation technology provided. Based on the measurement results, the communication channel is significantly related to the decision with the Spearman correlation value of 0.258. The effective communication channels can determine farmers' decisions to adopt a technological innovation.

One good communication channel is to use direct practice (demonstration) witnessed by farmers (Cheboi & Mberia, 2014). Giving mentoring, counseling and training programs accompanied by demonstrations about innovation are very appropriate strategies for increasing the adoption of innovation in farmers (Mulatmi et al., 2016). The extension agents are expected to be able to transmit information directly and use good and right communication methods. Muchtar, Purnaningsih, & Susanto (2014) states that the characteristics of extension workers and communication channels significantly influence the decision of farmers to adopt a technology. Farmers' decisions to adopt technology are strongly influenced by the direct benefits of the technology they will adopt (Indraningsih, 2011).

To improve the accuracy of technology adoption by farmers on a technology, efforts need to be employed through increasing the intensity and quality of counseling respect to methods,

techniques and media that are appropriate to the conditions of farmers (Mulatmi et al., 2016)

According to Herman et al. (2006), the factors that influence the stage of change in farmers knowledge are the existence of field schools or training programs, farmers' income levels and the simplicity of technology. Factors that influence farmers in shaping attitudes are knowledge of farmers, the extent of farming area, the existence of farmer groups and the number of family members. Meanwhile the factors that influence the actions of farmers to adopt the technology are the attitude of farmers, the level of farmers' income, the area of crop land controlled by farmers and the existence of extension agent.

To maintain and increase agricultural production, through accelerating technology adoption, requires the support of various government policies and programs. Direct efforts include organizing training programs, providing extension workers who are ready to assist farmer groups, and creating program and technical assistance directly to farmers. Indirect efforts include the provision of infrastructure, empowerment of farmer groups, increase in the number and quality of training programs, and availability of production factors including working capital (Herman et al., 2006)

## CONCLUSION AND SUGGESTION

Communication channels are significantly related to knowledge with a correlation coefficient of 0.314. Besides that, the communication channel is significantly related to the decision (decision) with the Spearman correlation value of 0.046. Meanwhile, the stages of implementation, implementation, and confirmation do not have a relationship with the communication channel. The adoption of innovative technology relies heavily on the communication channels chosen to transmit technological innovation. The selection of the right extension agents is to demonstrate technological innovation to farmers directly. Thus, the stakeholders are expected to be able to provide direct counseling to increase knowledge and decisions to adopt innovative technology.

The policy implication that can be formulated is an increase in direct communication channels to

farmers, so that farmers can absorb innovations optimally. The stages determine the knowledge and decision, so that the role and communication should enhance the two stages. The knowledge step, giving mentoring, counseling and training programs accompanied by demonstrations about innovation are very appropriate strategies for increasing the adoption of innovation in farmers. The decision step will arise due to good communication, so the instructor should improve the communication method.

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