

## The Development of Adopting Innovation on Entrepreneurship Status of Madura Cattle Farmers

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### ABSTRACT

Developing of Madura cattle should be focused on the base of Madura cattle, that is able to scale up farmers' profits. Expansion obstacle of livestock sub-sector closely related by adopting innovation. Farmers require entrepreneurship skills in responding to technology development. This research aimed to analyze factors affecting adopting innovation steps and how the adoption can be influenced in forming entrepreneurship status of Madura cattle farmers. This research was conducted in Madura Island. The data used is primary data obtained from respondents of 92 farmers of Madura cattle. The data were analyzed descriptively and quantitatively using PLS-SEM analytical tools. The research showed that characteristics of entrepreneurs and communication process affected adopting innovation of Madura cattle farmers. Adopting innovation is able to be affected on shaping entrepreneurship status of Madura cattle farmers namely socially responsible entrepreneurs.

*Keywords: innovation, Madura cattle, socially responsible entrepreneur*

### INTRODUCTION

The agricultural sector is a strategic sector that continues to be developed by the government of Indonesia. However, agricultural sectors do not contribute equal proportions in their sub-sectors. Agricultural sector contributes 13.6% on Gross Domestic Products. One of the agriculture sub-sector which has low contribution on Gross Domestic Products of agricultural sector is livestock that is only about 1.6% (BPS 2017). This low contribution of the sub-sector also is counterbalanced by the local livestock sub-sector competitiveness especially domestic meat production. Domestic beef production is dominated by small farmer who have small scale of production and difficult to develop due to their resource limitations. However, Ministry of Agriculture programs in controlling beef import is followed by increasing domestic beef production. Developing local cattle is a solution for escalating the total national beef production. This choice is because of the local cattle is more suitable to survive and live in the natural habitat condition of Indonesia compare to both import and crossbreeding cattles. Many risks will be undergone by government of Indonesia when local cattle is not the main meat domestic sources, such as: (1) the disappearance of one adaptively sustainable development goals (SDG) property; (2) disruption of a main income of farmers; (3) hampering the availability of SDG for developing beef cattle; (4) interrupting biological circulation chain in farming areas; (5) unavailability of cattle with proper weight

according to market demand. Reciprocally, obstacles in developing local beef germplasms as SDG is not managed well yet, that there is not much benefits derived from it, and even consequence lost and constraining in developing it.

East Java is a province becoming a center of beef cattle in Indonesia with its beef cattle population exceeds 4,534,660 heads or about 28.17 percent of national population (Dirjen PKH, 2017). Madura beef is local cattle of East Java that is the most populated in Madura Island. The existence of this germplasm should be cultivated by local farmers of Madura. Hartono (2012) states that developing Madura cattle has to be focused in the area of Madura cattle basis, that is able to increase local farmers.

Obstacles faced in developing livestock sub-sectors are closely related to adopting innovation. The technology is constantly changing, means its need innovation of technology in the agricultural sectors and its sub-sectors in order to be able to progressing. Without continuous technological innovation, agricultural sector development will be obstructed. Un-targeted and inappropriate technological innovations will be very unhelpful. So, it is needed participation of all parties to adopt technology. Farmer as an entrepreneur actor in livestock sector is a main pillar in constructing livestock sector and absorbing renewable innovation. To scale up farmers welfare, the farmers have to adopt the innovation in their businesses.

Cattle farmers need entrepreneurship skills in responding to technological development. According to Onyebinama (2010), information dissemination of introducing new technology in agricultural development programs needs entrepreneurship as a benchmark of technical controlling and farming management. The entrepreneurship positively affects the adoption of technological innovation (Dahan *et al.*, 2014). So, the successful in adopting technological innovation needs the characteristics of Madura cattle farmers. Mardikanto (2006) states that a successful of adopting innovation is influenced by characteristics of farmers. The characteristics of entrepreneurs is very decisive how the adoption of innovation proceeds.

Media in delivering information is an important factor affecting the adoption of an innovation (Mardikanto, 2006; Sarwono & Hadi, 2013). Delivering information to the farmers can be conducted through an appropriate communication process. Communication process throughout communication channel is a messaging toll that is aimed to convey messages from sources to recipients (Rogers 1983). The effectiveness of communication channel is able to predispose how decisions of those farmers about adopting innovation (Rushendi, 2016).

Adopting innovation steps can determine local cattle farmers entrepreneurship status. This status is important to be analyzed about how far the entrepreneurship activities that have been undertaken by those farmers based on applying innovation. Implementing innovation of Madura cattle farmers specifies whether those farmers are on economically oriented entrepreneurship level, and/or the entrepreneurs who care about their surrounding environment, and/or traditional entrepreneurs, and/or new entrepreneurs, and/or questionable entrepreneurs (Lauwere *et al.* 2002 in Mcelwee 2006). The existence of entrepreneurship status is needed to decide the most suitable innovating strategy that can be referred to those farmers. Therefore, this research was aimed to analyze factors affecting the adopting innovation steps and how the adoption can be influenced in forming entrepreneurship status of Madura cattle farmers

## METHODS

This research was conducted in the origin place of Madura cattle namely Madura Islands which consists of three most populated cattle regencies such as Bangkalan, Pamekasan, and Sumenep. The type of data used was primary data derived from respondents of 92 farmers of Madura cattle (Table 1). Data were analyzed quantitatively using Partial Least Square analysis (PLS)-SEM (structural equation model) analytical tools.

Data analysis was carried out through two analytical methods, i.e. descriptively statistic analysis and Partial Least Square analysis. Descriptive analysis is a method in investigating group status, human, an object, a set condition, a thinking system, as well as a class of events recently (Nazir, 2005). This method explains about distributing value of respondents' description generally, respondents' characteristics, and score dis-

persion in each variable. Data from questioners were tabulated in table and analyzed descriptively.

Analysis of affecting factors on adopting innovation and farmers' entrepreneurship status used Partial Least Square (PLS). The PLS is a part of Structural Equation Modelling (SEM) which is based on variance. Latent variable is based on estimated indicator weight that maximizes explained variance for dependent variables. PLS is a powerful analytical tool due to it is not based on many assumptions. Data should not be distributed normally multivariate (indicators with nominal scale, ordinal, interval, ratio that are able to be utilized in the same model). Required samples are not too much that start from 30 to 100 samples. PLS also specifies indicator model reflectively and formatively (Ghozali 2008).

Ghozali (2008) states that analysis using PLS has some test steps such as:

### 1. Outer Model Analysis

Outer model examination is a test conducted to seek a relationship between indicator block and other latent variables. The test was started by conducting validity test such as using loading factor with 0.7 standard. If there were any loading factors below 0.7, they must be expelled out from the model.

$$AVE = \frac{\sum \text{Standardized loading}^2}{(\sum \text{Standardized loading}^2 + \sum \epsilon_j)}$$

Therefore, analyzing about convergent validity value was conducted that is noticed from an Average

Table 1. Characteristics of Madura cattle farmers

Characteristics of farmers	Frequency	Percentage (%)
Age		
≤42 years old	33	34
43-61 years old	48	50
>61 years old	15	16
Sex		
Female	20	21
Male	76	79
HMT Ownership		
Narrow (<12.67 m <sup>2</sup> )	20	21
Medium (12.67-25.336 m <sup>2</sup> )	10	10
Large (>25.36)	66	69
Ownership of Own Cattle		
Small (<6) heads	93	97
Medium (7-13) heads	2	2
Large (>13) heads	1	1
Ownership of mixture cattle system		
Don't have any cattle	84	88
Small (1-2) heads	10	10
Medium (3-4) heads	1	1
Large (>4) heads	1	1
Profession		
Civil Servants (PNS)	15	16
Merchants	1	1
Stall owners	1	1
Others	79	82

Variance Extracted (AVE) value with its threshold in 0.5. After no problems in convergent validity, the discriminant is carried out. It can be verified by comparing CR square value of AVE and correlation value among constructs.

$$CR = \frac{(\sum \text{Standardized loading})^2}{[(\sum \text{Standardized loading})^2 + \sum \epsilon_j]}$$

2. Inner Model Analysis

Inner model analysis reflects correlations between a latent variable and other latent variables. These correlations are either among exogenic variables or endogenic and exogenic latent variables. The analysis is able to be conducted by calculating GoF (Goodness of Fit). According to Tenenhaus (2004), the GoF small = 0.1, GoF medium = 0.25, and GoF big = 0.38.

$$GoF = \sqrt{AVE \times R^2} \dots\dots Tenenhaus (2004)$$

GoF = 0,483

3. Hypothesis Testing

Hypothesis testing is the last step that has to be conducted in seeking how exogenic latent variables affect endogenic latent variables. Standard that is using in this significant test is either T-value or P-value. If the T-value is bigger than T-table standard, meaning it is significant. Conversely, P-value standard is using, when the P-value is smaller than its significance level means the latent variable is significant. Significance level value used in this research was 5%.

Research model in Figures 1 manifested variables and 4 latent variables. Latent variables can only be explained through manifest variables. Manifest variables can be obtained from respondents through data collection methods. The data are ordinal data taken using Likert scale.

1. Latent variable of entrepreneurship characteristics (X1) consisted of 18 manifests such as Commitment (X11), Drive to achieve (X12), Opportunity orientation (X13), Initiative and responsibility (X14), Persistent problem solving (X15), Seeking Feedback (X16), Internal locus of control (X17), Tolerance for ambiguity (X18), Calculate risk taking (X19), Tolerance for failure (X110), Integrity and reliability (X111), High energy level (X112), Creativity and innovativeness (X113), Vision (X114), Self-confidence and optimism (X115), Independence (X116), Managerial Skill for Entrepreneurs (X117), and Team building (X118).
2. Latent variable of Communication Process (X2) had 5 manifested variables such as Communicating participation (X21), Message (X22), Communication Channels (X23), Noise (X24), and Feedbacks (X25).
3. Latent variable of Adopting Innovation (Y1) had 5 manifested variables such as Knowledge (Y11), Persuasion (Y12), Decision (Y13), Implementation (Y14), and Confirmation (Y15).
4. Farmers' Entrepreneurship Status Variable (Y2) had 5 manifested variables namely Economic entrepreneurs (Y21), Socially responsible entrepreneur (Y22), Traditional grower (Y23), New grower (Y24), and Doubting entrepreneur (Y25).

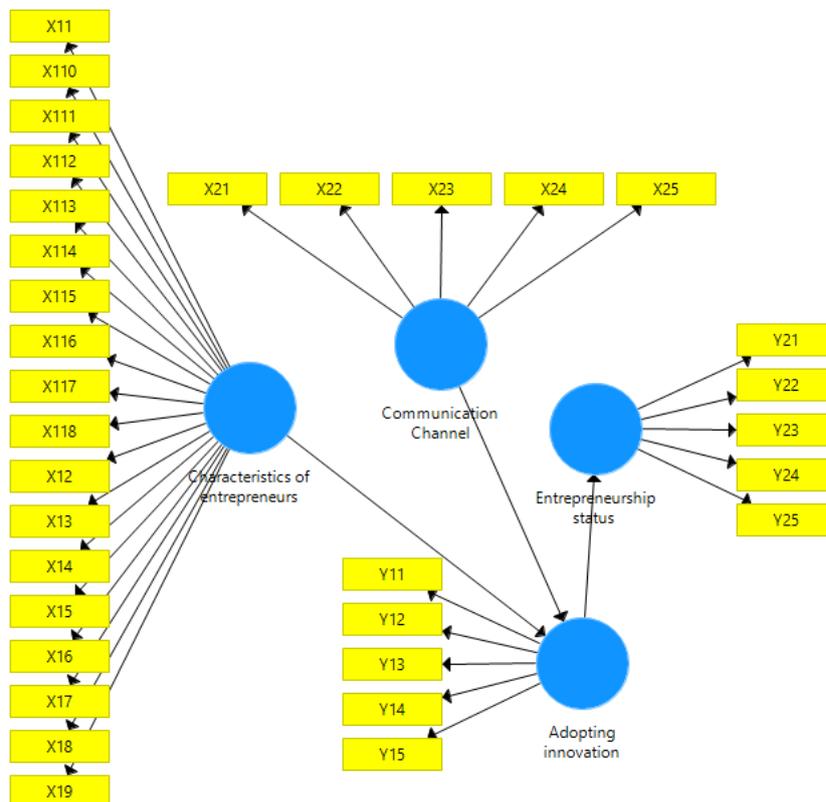


Figure 1. Research Model Using PLS

### Hypothesis

1. Entrepreneurship characteristics are affected in adopting innovation;
2. Communication process is influence in adopting innovation;
3. Adopting innovation is influence in farmers entrepreneurship status.

### RESULTS

#### General Description of Madura Cattle Farmers

Madura cattle farmers in Madura Island has majority age ranged from 43 to 61 years old. Males were dominant in this sector with percentage of about 79%. The HMT (pasture) area that ought to be owned by a cattle farmer was large or about more than 25.36 m<sup>2</sup>. The majority of Madura cattle farmers in rural areas had a small-scale unit which was below 6 cows of ownership. Madura's cow farmers in majority had other works such as civil servants, merchants, stall owners, and others. Majority of respondents had other side jobs with percentage about 82%.

#### Factors Affecting the Steps of Adopting Innovation and Farmers Business Status of Madura Cattle Farmers

Adopting innovation was firstly posted by the theory raising from Rogers. He explains that in an attempt to change someone to adopt a new behavior (innovation) which consists of some steps, one of them is an adopting innovation. This step is where an individual confirms a taken decision for adopting the innovation in first Roger theory. The adopting innovation is not only stop at the step, but also Rogers reaffirmed in 1983 that a decision to take out an innovation had more steps. So, the innovation step had sub-steps such as knowledge, persuasion, decision making, implementation, and con-

firmation. In this research, adopting innovation step was hypothesized by characteristics of farmers entrepreneurship and communication channel.

The result of adopting innovation analysis was used to form the entrepreneurship status of the farmers which had some changes after the innovation was applied. Furthermore, it was hypothesized that adopting innovation was able to influence the entrepreneurship status of Madura farmers. There were linkages among characteristics of farmers entrepreneurship, adopting innovation steps, and entrepreneurship status of Madura cattle farmers, that were analyzed using Partial Least Square.

**Outer model.** Analysis result using Partial Least Square generated initial measurement model that had loading factors distribution as listed in the Table 2 and Figure 2. Value of loading factor that becomes standard was 0.5 and the un-standardized values were below 0.5. Based on the results of analysis, manifested variables that were above the loading factors were  $X_{110'}$ ,  $X_{117'}$ ,  $X_{21'}$ ,  $X_{22'}$ ,  $X_{23'}$ ,  $X_{24'}$ ,  $X_{25'}$ ,  $Y_{11'}$ ,  $Y_{12'}$ ,  $Y_{14'}$ ,  $Y_{15'}$ , and  $Y_{22'}$ . Moreover, the other manifested variables were expelled out from the model and resulted respective model as was shown in Figure 3.

Furthermore, analyzing discriminant validity value was conducted by comparing average extracted (AVE) value with correlation between construct and other constructs in the model. The AVE value had standard above 0.5 and its measurement value showed that overall latent variables met the standard (Table 3). The AVE values reflected the reliabilities of component scores meaning that it was feasible to continue in assessing convergent reliability in the Table 3. The composite reliability values were above 0.6 that imply there was no problem at convergent validity.

**Inner model.** Evaluating inner model can be executed to count Goodness of Fit (GoF) values. The obtained GoF value was about 0.46 and it was categorized into

Table 2. Values of loading factors in initial measurement model

Indicator	Loading factor Value	Indicator	Loading Factor Value
Commitment	-0.037	Calculate risk taking	0.276
Tolerance for failure	0.739	Communicating participation	0.786
Integrity and reliability	0.118	Message	0.698
High energy level	0.167	Communication Channels	0.633
Creativity and innovativeness	0.022	Noise	0.667
Vision	0.232	Feedbacks	0.584
Self-confidence and optimism	0.451	Knowledge	0.58
Independence	-0.141	Persuasion	0.787
Managerial Skill	0.594	Decision	0.299
Team building	-0.242	Implementation	0.73
Drive to achieve	0.233	Confirmation	0.772
Opportunity orientation	0.056	Economic entrepreneurs	0.238
Initiative and responsibility	-0.222	Socially responsible entrepreneur	0.635
Persistent problem solving	0.430	Traditional grower	-0.269
Seeking Feedback	0.186	New grower	0.480
Internal locus of control	-0.122	Doubting entrepreneur	-0.737
Tolerance for ambiguity	0.327		

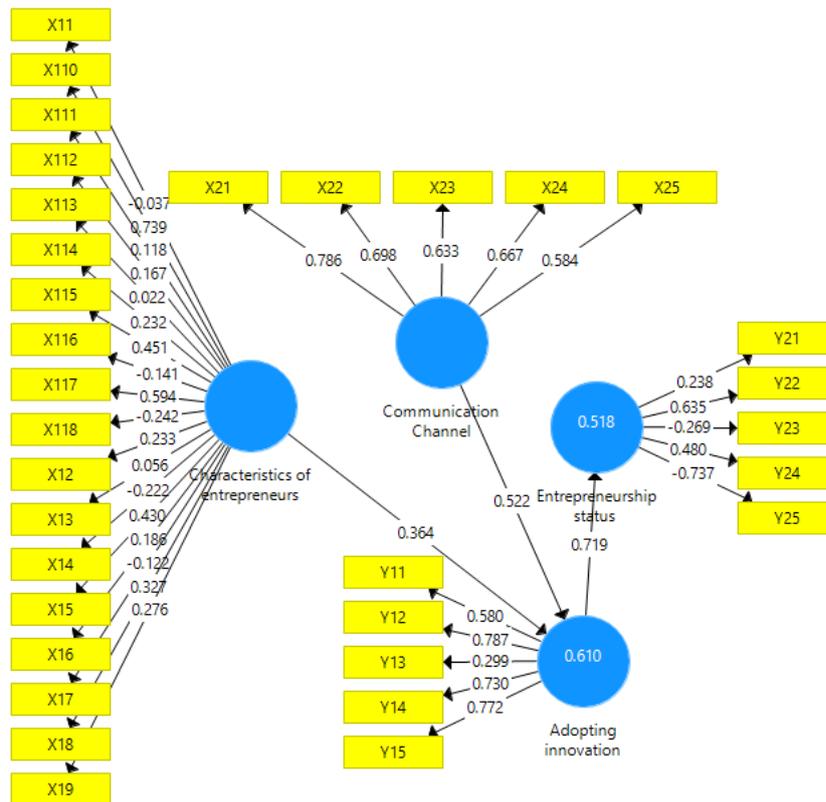


Figure 2. Initial Measurement Model. X11: Commitment; X12: Drive to achieve; X13: Opportunity orientation; X14: Initiative and responsibility; X15: Persistent problem solving; X16: Seeking Feedback; X17: Internal locus of control; X18: Tolerance for ambiguity; X19: Calculate risk taking; X110: Integrity and reliability ; X111: Tolerance for failure; X112: High energy level; X113: Creativity and innovativeness; X114: Vision; X115: Self-confidence and optimism; X116: Independence; X117: Team building; X118: Managerial Skill for Entrepreneurs; X21: Communicating participation; X22: Message; X23: Communication Channels; X24: Noise; X25: Feedbacks; Y11: Knowledge; Y12: Persuasion; Y13: Decision; Y14: Implementation; Y15: Confirmation; Y21: Economic entrepreneur; Y22: Socially responsible entrepreneur; Y23: Traditional grower; Y24: New grower, Y25: Doubting entrepreneur.

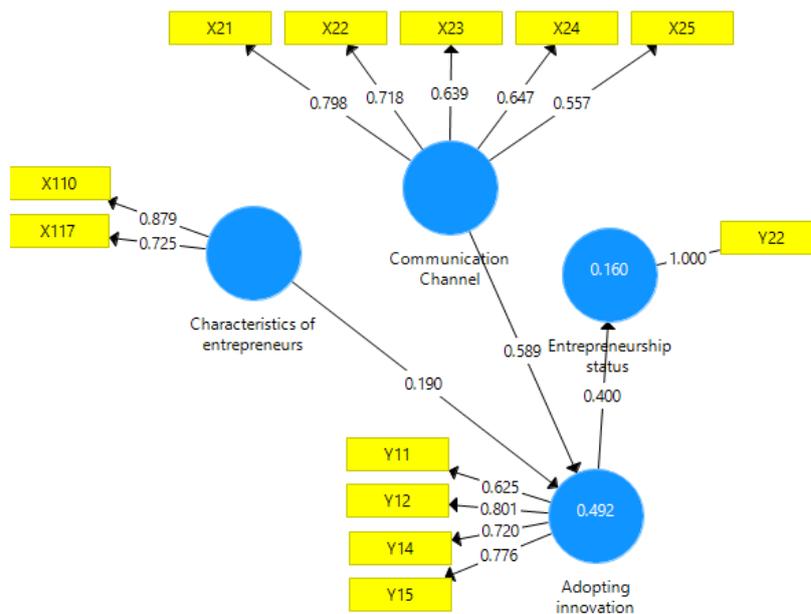


Figure 3. Final model of developing entrepreneurship of Madura cattle farmers. X110: Integrity and reliability; X117: Team building; X21: Communicating participation; X22: Message; X23: Communication Channels; X24: Noise; X25: Feedbacks; Y11: Knowledge; Y12: Persuasion; Y14: Implementation; Y15: Confirmation; Y22: Socially responsible entrepreneur.

big which meant the model was fit and reasonable to be utilized.

**Testing hypothesis.** Testing the hypothesis was undertaken to analyze factors affecting the latent variables. Based on the test, the characteristics of farmers entrepreneurship affected the adopting innovation with P-value 0.00; Communication channel influenced the adopting innovation with P-value 0.016; and the adopting innovation predisposed entrepreneurship status of Madura cattle farmers with P-value 0.000 (Table 4).

**Effects of Entrepreneurship Characteristics and Communication Process on Adopting Innovation**

The characteristics of entrepreneurship had effect on adopting innovation stages (Table 5). This results showed that absorption of innovation at farmers of Madura cattle heavily depend on the characteristics of the entrepreneurs. Based on the measurement results in the Table 5, the characteristics predisposes adopting innovation.

Based on result of PLS analysis showed that communication process influenced adopting innovation. Indicators of communication process that could clarify it variable latent such as participating communication (X21), message (X22), communication channel (X23), noise (X24), and feedback (X25) (Table 5). Innovation of communication process could happen between farmers and farms instructor who gave information about innovation to be carried out. Moreover, communication process among farmers as entrepreneurs about their business also could happen.

**Effects of Adopting Innovation on Entrepreneurship Status**

The adopting innovation was hypothesized to affect entrepreneurship status of Madura cattle farmers. According to the result analysis in Table 6, the adopting innovation had an effect on entrepreneurship status of Madura cattle farmers with T-value was 5.158. The

Table 3. Average extracted (AVE) value and composite reliability

Latent variables	AVE	Composite reliability
Adopting innovation	0.5	0.8
Characteristics of entrepreneurs	0.6	0.8
Communication channel	0.5	0.8
Entrepreneurship status	1.0	1.0

Table 4. Result of hypothesis test

Result of hypothesis test	T-value	P values
Adopting innovation → Entrepreneurship status	5.158	0.000
Characteristics of entrepreneurs → Adopting innovation	2.409	0.016
Communication process → Adopting innovation	8.528	0.000

innovation would be accepted by the farmers/farmers quickly because of there was any entrepreneurship talent of farmers and assigns their entrepreneurships.

**DISCUSSION**

**General Description of Madura Cattle Farmers**

Madura cattle farmers in Madura island had majority aged in the range of 43 to 61 years old about 50%. Age in ranged from 43 to 61 years old was a productive age to administer livestock business with medium category. Farmer' age ensures employment availability which is has capability in conducting cattle business. Madura's cattle farmers in Indonesia was 43 years old (Idris *et al.*, 2009; Siswijono *et al.*, 2014; Jan, 2015).

In relating to human resources and labors in Madura's cattle sector, males were dominated this sector with percentage about 76%. Male farmer tends to do more this kind of business than women. Furthermore, women farmers in majority doing farm activities to help their husbands. Spending of working hours by women exceeded 25.24% or about 723.75 hours in a year to support their husband's cattle business and buttress their successful (Mastuti, 2016).

Ownership of animal green feed (Hijauan Pakan Ternak, HMT) is a kind of investment that should be ascertained its ownership by farmers. It is also being a proper reference or at least those farmers obtaining the program procurement assistance of Madura cow on *Penyelamatan Sapi Betina Bunting Program*. The HMT area that ought to be belonged to cattle farmers was large or about more than 25.36 m<sup>2</sup>. Small ownership of HMT did not affect the farmers spirit in looking for alternative feed that was able to be purchased or requested freely.

Characteristics of cattle farmers in rural areas were formed by two ownership systems namely own owner-

Table 5. Entrepreneurship characteristics and communication process on adopting innovation

Indicator	Indicator name	Loading factor
Entrepreneurship characteristics		
X110	Tolerance for failure	0.88
X117	Managerial Skill	0.72
Communication process		
X21	Participating communication	0.8
X22	Message	0.72
X23	Communication channel	0.64
X24	Noise	0.65
X25	Feedback	0.56

Table 6 Steps in adopting innovation

Variable code	Indicator name	Loading factor
Y11	Knowledge	0.63
Y12	Persuasion	0.80
Y14	Implementation	0.72
Y15	Confirmation	0.78

ship and mixture. Majority of Madura cattle farmers in rural areas had a small-scale unit which was under six cattle of ownership. Average of Indonesian cattle farmers was categorized into small farmers that only afford farm activities in small amount of cattle (1-3 heads) in each farmers household. Just three farmers who raised cattle in mixture system or only 10% in total of all farmers. The mixture pattern is a very often used by farmers for looking after cattle of others and they receive payment of selling price of the cattle. According to Sonbait *et al.* (2011) that mixed raising cattle pattern is an appropriate business to be conducted. The cattle beef program offered benefits in escalating cattle population, employment, and increasing farmers income.

Majority of farmers regarded this profession a side-line for farming and savings which was not balanced with capital and adequate management (Nipsih *et al.*, 2010 & Tumober *et al.*, 2014). Madura's cow farmers in majority had other works such as civil servants, merchants, stall owners, and others. Majority respondents have other side jobs with percentage about 82%.

#### Effects of Entrepreneurship Characteristics on Adopting Innovation

The characteristics of adopters affect the absorption of innovation (Listiyati *et al.* 2013 and Harinta 2011). The entrepreneurship characteristics of Madura cattle farmers were indicated by those farmers had experienced tolerance for failures (X110) and managerial skills (X117). The tolerance was a very dominant factor that points the entrepreneurship characteristics of Madura cattle farmers has the biggest loading factors value (0.88) than others. Innovation needed incredible tolerance to fails due to its high risk traits and unpredictable. Hence, readiness of Madura cattle farmers in facing failures should be high. Majority of the farmers grazed their livestock generation to generation traditionally in Madura Island. Raising cattle could be said as a culture and conserving original commodity of the Island. Forwardness of the farmers in taking on failures is able to be doubted. However, fails in raising cattle such as cattle death still attempt to be countered. Experiences will establish knowledge and viewpoint on failures where the entrepreneur distributes learning on each failure (Singh *et al.*, 2014).

Managerial skills become one of factor that is able to explain characteristics of entrepreneurs aside from tolerance on failure. It had loading factor as big as 0.72 in this research which meant that characters of Madura cattle farmers in managing their business affected the adopting innovation. The skills in managing cattle were handled traditionally and passed as a local wisdom of the island. This result was in line with a research conducted by Shabbir (2016) that small scale entrepreneurs required a good managerial skill in order to be survived. The skill belongs to the farmers or farmers also must be accompanied by business competition and entrepreneurship for being success (Phelan & Sharpley, 2012).

#### Effects of Communication Process on Adopting Innovation

Participating communication needed an actor who participated on the participative communication process. Business actors of Madura cattle in absorbing innovation to promote business needed selectively participating communication among business actors, governments, and farms instructors. Result of this research about participating communication had loading factor of 0.8 that meant the participation was the most indicator which defined communication process variables. Muchtar *et al.* (2014) states that farm-field instructor (*penyuluh*) as a participant in participative communication cycle is categorized high. This result denoted that the instructor was an important actor in participative communication. The important of this instructor in promoting participation of Madura cattle farmers because of his/her contribution as field officer who was intensely corresponding with those farmers directly. Participative communication gives a positive impact in improving knowledge and behavior of farmers and also participation of farmers/farmers in arising ideas (Cahyanto, 2008). Contribution of participatory communication development does not only involve the farmers, but also implicates local government in absorbing the innovation.

Message in communication process forms symbol, meaning, and expression either verbal or non-verbal. Message content is something that is delivered in communication process. Furthermore, it is an important indicator in forming information. In this research, the message content had loading factor of 0.72 which meant it was being an important indicator in communication process with the percentage about 72%. Effectiveness of message in communication process is highly depended on knowledge and experiences in interpreting the message (Kao, 2007). Field-instructors functioned as conveyors of message content to farmers should have knowledge and understand the contents and purposes of delivering messages. Those field-instructors play an important role positively to upgrade knowledge and management of cattle farmers (Saswita, 2013). The message will improve competence of cattle farmers in managing their business.

Adoption of communication channel is an instrument or media to send information for mass or interpersonal. The needs about communication channels is felt crucial to deliver information relating to adopting innovation for farmers of Madura cattle in developing their business. Analysis result in Table 6 indicated that communication channel had a loading factor as big as 0.64 which enlightened communication channel as an indicator that was able to declare communication process. According to Sari *et al.* (2008), communication channel is very good to be used for adopting innovation specially to develop farming. The most often occurred communication channel at farmers of Madura cattle is interpersonal communication. Adopting innovation level of farmers is quicker through interpersonal communication channel that has a strong influence on decision making process of adopting innovation (Cheboi, 2014).

Interpersonal communication channel gives an effect on farmers/farmers in considering their business prospects (Sari *et al.*, 2008). Intensive interpersonal communication channel happens in the farmers group. Farmers group is a medium to perform interpersonal communication among farmers of Madura cattle. Knowledge level of farmers are mounted by multiple communication happening in the groups.

Noise in communication process is absolutely happened among farmers of Madura cattle. Based on analysis result showed that noise was an important indicator in communication process with its loading factor of 0.65. Noise in innovation communication process certainly will inhibit the adopting innovation. Field-instructor as an agent of conveying information absolutely has any noises in their activities to deliver information for farmers/farmers because of their education level which is relatively low (Rasyid, 2012). Any noise that was faced by farmers of Madura cattle was a failure to try an innovation as an impact of limited information. Uncompleted information about innovation also obstructs the farmers in adopting innovation to their business. Furthermore, the low level of internet usage of the farmers was a reason of limited capital to purchase an internet based telecommunication device and knowledge in utilizing the device too. According to Mulatmi (2016), the effectiveness of the Internet as a transmitter of information has not been understood by the farmers.

Feedback in communication process becomes an important indicator for perceiving the effectiveness of communication. It appears as an impact of two-way communication between receiver and transmitter of message. The important of feedback in communication process yielded loading factor as 0.56 meaning that it could explain adopting innovation of communication process on farmers of Madura cattle. The needs of farmers in innovation should be the basis of development strategies, and farm instructor played a role as communication facilitator between farmers and the government. In adopting an innovation, the farmers of Madura cattle would confirm to the innovation source namely the farm-instructor before trying something new. Trust of those farmers on field-instructor is high enough. Moreover, when they want to derive innovation furthermore, the instructor is the first officer who will provide information to them.

### Effects of Adopting Innovation on Entrepreneurship Status

Based on analyzing data, entrepreneurship status of Madura cattle farmers was classified as *social-preneur* which meant that those farmers were business actors who payed attention to their surrounding environments. Social capital was created as an impact of relationships among farmers of Madura cattle. Adopting innovation was very effective to be carried out into farmers groups that became a social capital for Madura cattle farmers.

The first step, **knowledge** on an innovation that would be implemented had a loading factor of 0.63. This stage is the earliest stage in absorbing innovation for farmers of Madura cattle. Ideas of establishing in-

novation are based on an entrepreneur's knowledge (Okpara 2017). Knowledge of Madura cattle farmers are very supportive to the absorption rate of innovation in their business. Madurese cattle farmers who were Socially responsible entrepreneurs had an essential role in the adopting innovation. The knowledge of cow dung processing could be a commercial source and could maintain the sustainability of agricultural land from the threat of chemical fertilizers.

Second step, **persuasion** in adopting innovation, contributed the highest loading factor than the others namely on nominal 0.80. This result pointed that persuasion was a dominant step of adopting communication to form Madura cattle farmers that were on the status of socially responsible entrepreneurs. Confidence arising within farmers in absorbing information would make adopting innovation easier to be happened. Pillis and Reardon (2007) proposes that a strong intention in entrepreneurship is not separated from trusting which they have. Level of trust on innovation ease forming entrepreneurship status of Madura cattle farmers. As socially responsible entrepreneurs, Madura farmers have responsibilities to their surrounding environments. One of output produced by Madura cattle is dung that is utilized for fertilizers. The dung has an economical value which is able to be used by farmers themselves or selling to others as fertilizers. A strong confidence in adopting innovation boots making either liquid or solid fertilizers.

Third step, **decision** was regarded becoming an invalid indicator for the model of adopting innovation development. Hence, the decision-making step was not being a factor taken into account at the entrepreneurship status of farmers.

Forth step was **implementation** where applying innovation will affect the entrepreneurship status of farmers and be able to define this step as an explanation factor with a loading factor of 0.72. Farmers as socially responsible entrepreneurs are required having decision in adopting innovation where the decision is precisely taken. Innovating decision is more considered from the capability of cattle reproduction, innovation appropriateness, and environmental impact on the innovation development. The effect of innovation is huge to entrepreneurship (Hadiyati 2011), then a decision to adopt innovation becomes a determining stage on innovation sustainability. Field-instructor also plays huge roles in decision step of farmers in adopting innovation. Communicatively interpersonal communication on innovation between field-instructor and Madura cattle farmers has significant effects (Indrianingsih 2011).

The last step was **confirmation**. This step had loading factor of 0.78. This step functioned to re-confirm whether the previous decision would be executed or not. Based on the research conducted by Herdiawan *et al.* (2014) states that innovating application of biogas at farmers is established when the farmers ensure or confirm their decision for utilizing biogas as their income source. Herdiawan *et al.* (2014) also states that farmers indeed undergo obstacles to use the biogas for environmental-friendly innovation to their business activities.

## CONCLUSION

Characteristics of entrepreneurs and communication channel affect the adopting innovation of Madura cattle farmers. Adopting innovation is able to be affected the shaping of entrepreneurship status of Madura cattle farmers namely socially responsible entrepreneurs.

## RECOMMENDATION

Developing entrepreneurship of Madura cattle farmers is directed to the adopting innovation base on Knowledge, Persuasion, Implementation, and Confirmation. The most dominant actor in delivering innovation is field-instructor. So, it is required more qualified field-instructors who understand how to raise Madura cattle and their derived products. Intensity of communicatively interpersonal communication toward farmers is expected to be more increased and directed for shaping socially responsible entrepreneurs.

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