

The Role of Extension Workers in the Development of Agriculture Information Network through Cyber Extension in Lampung Province

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Keywords: The role of cyber extension, information network, cyber extension

Abstract: Mechanism of development of information network system of agricultural development through cyber extension need to be developed by extension workers so that farmer requirement of agriculture information can be fulfilled. This study aims to analyze (1) the role of extension workers involvement in agriculture development information network system through cyber extension, (2) Factors related to extension workers involvement in information network system of agricultural development through cyber extension. The research was conducted in areas with potential to develop food crops and horticulture, namely in South Lampung District and Metro District. The study was conducted in four sub-districts and eight villages. The research was conducted by census, all of the extension workers which have the target area in Jati Agung Sub District, Natar Sub District, Metro South Sub District and West Metro District. The number of respondents are 44 people. Data were analyzed descriptively and inferentially by Mann Whitney's different test and Rank Spearman correlation test. The results of the research show (1) The involvement of extension workers in agricultural information network system through cyber extension is characterized by different age, extension workers income, and the use of cyber extension between extension workers which is civil servant and extension workers which is still honour, (2) Factors related to the involvement of extension workers in information systems of agricultural development through cyber extension are age, extension workers income, motivation, level of cosmopoli and extension workers performance.

1 INTRODUCTION

The agricultural development approach that has so far relied on increased production and productivity, is instructional, static, mechanical, and linear, makes farmers as tools for implementing government policies. This approach does not make independent farmers run their farms, even tends to be static. Therefore, we need an approach. One approach to agricultural development that can now be done is with a mechanism that supports the development of information systems for agricultural development. This needs to be done to ensure that indicators of success of extension are measured by the dissemination of information on agricultural technology equally (Badan Koordinasi Penyuluhan Pertanian, Perikanan, dan Kehutanan Provinsi Lampung, 2012). The process of decimating information on agricultural technology can be accelerated with the use of Information and Communication Technology (ICT).

Agriculture sector in Lampung Province should be developed by considering challenges in economy globalization era such as AFTA (Asean Free Trade Area) and APEC (Asia Pacific Economic Cooperation). In line with this, Indonesia position information and communication technology (ICT) as one of main focuses in science and technology development.

Communication and information technology (ICT) development provides wide opportunities for farmers to obtain real time agricultural information according to their needs. Cyber is a new media in the form of various communication technologies that share the same characteristics. Cyber is also possible with digitalization and its wide availability for personal use as a communication tool. New media is very diverse and not easily defined, but in its application new media enter the realm of mass communication or directly and indirectly have an impact on "traditional" mass media. The main focus

of attention is on collective activities called the internet.

The meeting point between one's need and information obtained from media can be explained with the theory of *Uses and Gratification*. This theory suggests that active people choose and use a particular media to fulfill a particular need. Horticulture farmers see the internet as a tool to fulfill needs of agricultural information. Internet has limited influences because the horticulture farmers are able to select and control it. This *Use and Gratification* theory focuses on a question of: what does one do with the media?. This theory provides a working frame to fulfil when and how horticulture farmers will be more or less active in searching agricultural information (Yagane et al., 2011).

Extension worker behaviors in using information sources based in information and communication technology (ICT) in rural areas are so much required, because rural areas have rights to enjoy accessing facilities and using information through ICT. The existence of internet used to save, process and access information can affect agricultural information necessity fulfilment which is able to cause changes in many life aspects.

ICT roles are required in agricultural sectors to improve agricultural business productivity. Farmers need varying agricultural information such as government policies, research results from multi discipline sciences, experiencers of other farmers, current information about market prospects related to production equipment and agricultural products. ICT use can overcome lack of information access about agricultural innovations used to be obtained from conventional information sources. Using ICT can replace some of conventional communication forms.

Agricultural extension agents as a bridge between agricultural information sources and information users are required to be always ready to know and apply information on agricultural technology and innovation. The readiness of extension workers in accessing and implementing information on agricultural technologies and innovations strongly supports agricultural development in the region which will have an impact on improving the welfare of farmers. The mechanism of the extension system based on Information and Communication Technology (ICT) called cyber extension needs to be improved by extension workers to solve one of the information gap problems felt by farmers.

Although cyber extension has a very important role to increase the capacity of farmers, but until now

farmers have not fully utilized cyber extensions to find agricultural information. The results of Gultom and Sumaryo's research (2017) concluded that cyber extensions are needed by both farmers and PPL in carrying out their farming, but the use of ICT-based information sources is still limited and their management is still individual. The ability of farmers to collect, process and utilize agricultural information is very limited, so it needs to be done in groups so that farmers are motivated and mutually reinforcing in processing information. However, there is no institutional farmer that has the function to increase the use of cyber extensions in Lampung Province. Therefore, this study emphasizes the importance of agricultural information networks in the implementation of food crops and horticulture through the farmers' internet group. The dissemination of agricultural information through an information network system can help find human resources that have the potential to develop cyber extensions.

The role of Information and Communication Technology (ICT) is indispensable in the agricultural sector to increase the productivity of farming produced. Indonesia places ICT as one of the main focuses of the development of science and technology. The development of ICT provides a great opportunity for farmers to be able to obtain agricultural information on time and in accordance with their needs. Farmers need a variety of information in the field of agriculture to manage their farms, such as: government policies, research results from various disciplines, experience of other farmers, as well as up-to-date information on market prospects related to production facilities and agricultural products. They can get these sources of information by accessing the internet. Farmers can get various information about agriculture by accessing the internet. Farmers can also find the latest information about international market prospects related to agricultural products and production facilities. Utilization of ICTs can overcome the problem of lack of access to information about agricultural innovation. ICT in agriculture can prepare agricultural information needed by farmers on time and as needed.

Fulfillment of agricultural information needs is still dominated by face to face communication. This communication approach has a limited nature, requires a lot of time and cost (Saleh 2006; Tamba 2007; Ardu 2007). To overcome this, all ICT-based agricultural information sources are used, especially

the internet. The presence of the internet has had a significant impact on human life (Arja and Seppanen 2014; Vivek 2011; Sian et al. 2014; Shana and Holmer 2015).

The fulfillment of information needs from research shows that the development of ICT in Asia has led to various changes in various fields such as industry, religion, organization and work, all of which have an impact on social change between interpersonal relationships (Alampay 2009). Arja and Seppanen's research (2014) say information technology can be used to create and regulate life in remote areas. Most farmers in remote areas use computers to find information, online banking, communication with family, friends and relatives. The use of information technology can replace some forms of traditional communication that have been done before, and can cause a person to leave the community if they do not use the technology. The use of information technology is closely related to age.

The results of research in West Java so far, the ability of extension workers to share agricultural information through cyber extensions is very diverse and highly dependent on extension agents (Sumandjo, et al, 2010), Darojad P (2016), Helmi Z (2013). Lampung Province has a demographic and farming system similar to West Java Province, but there has not been much study on the use of ICT by extension workers in carrying out their functions and duties as a bridge connecting information technology and agricultural innovation. Therefore it is interesting to do research to analyse:

- (1) Performance of extension workers involvement in agricultural development information network systems through cyber extension,
- (2) Factors related to the involvement of extension workers in the agricultural development information network system through cyber extension.

2 RESEARCH METHODS

This study uses quantitative research methods (Sugiyono, 2013). Data collection were carried out with census method using questionnaires. The study was conducted in South Lampung Regency and Metro Municipality. Background on the location of research based on the potential for developing food crops and horticulture. South Lampung Regency is represented by JatiAgung District and Natar District.

Metro Municipality is represented by Metro Selatan Subdistrict and Metro Barat District. From sub-district is taken by two villages. (Table 1)

Table 1. Research area data

No	Distrik	Sub Distrik	Village
1.	South Lampung	Natar	Pancasila Krawang Sari
		JatiAgung	Marga Agung Marga Karya Mulyosari
2.	Kotamadya Metro	Metro Barat	Ganjar Agung Rejomulyo
		Metro Selatan	Sumber Sari

The population and sample of the study were all extension workers that met the target area in the study. The data used in this study are primary data and secondary data. Primary data collection is done through:

1. Interview using a questionnaire. Questionnaires were prepared based on a number of questions related to research variables. Questions have closed and open answers. The questionnaire has an ordinal and ratio scale. Data that has an ordinal scale measurement will be transformed to an interval or ratio scale for the benefit of testing statistical data (Riduwan and Akdon 2007).
2. In-depth interviews (in-depth interviews) are more detailed questions and answers to farmers and stakeholders related to the dissemination of agricultural information about variables and other matters related to research. In-depth interviews use questionnaires and aim to strengthen and deepen the results of interviews.
3. Focus Group Discussion (FGD) or focus group discussion is a discussion conducted to obtain data or group views about issues related to research. In this FGD, everyone is given the freedom to express their opinions and thoughts about the material being discussed.
4. Observation is direct observation by researchers on the daily lives of farmers, especially those related to the process of meeting the needs of agricultural information

Data were analyzed descriptively and inferentially. Ridwan and Akdon (2007) said that for the sake of data analysis, the data that have ordinal scale measurements are transformed into an interval scale with the Method of Successive Interval (MSI). Inferential data analysis is done by using Mann

Whitney test and Rank Spearman correlation test (Dahlan, 2008).

3 RESULTS AND DISCUSSIONS

Food crops (rice, corn and cassava) and horticulture (chilli and onion) have the potential in the development research area both in terms of land area and production. Based on the results of the search for secondary data it was found that the harvested area of vegetables in this case is the largest chilli in South Lampung Regency. The sub-district that has the potential to develop chillies and have a good internet network is Natar District, namely Pancasila Village. Besides that, South Lampung Regency, namely Jati Agung Subdistrict, has a wide corn harvest area and has a good network to develop the internet.

Based on Law No. 43, the existence of counseling is under the service of the agriculture department, respectively. The extension agent as functional staff returns to the existing service office. The Agricultural Extension Human Resources Development Agency (BPSDMPP) has the task of updating data. There are those who are in charge of agricultural facilities and infrastructure that supervise the section section including the extension section

Changes to the BP4K status previously at the district level, now the situation is far different. Cyber responsibility is currently in the field of infrastructure and extension facilities which are functional positions. In each sub-district there is the Head of the Agricultural Extension Unit that functions to run the Information and Management System consisting of:

1. 1.Simluhtan where the institutional database of extension from the district to the farmer group. In this section we can find data on counseling at the sub-district to district level.
2. Cyber which contains information, technology and several forms of profiles

At the sub-district level there are operators and administrations consisting of extension agents and non-extension agents.

The agricultural sector plays a high role in the research area. This is indicated by the large percentage of land use (> 60%) used for agricultural businesses. Another thing is the large percentage of the population working in agriculture (> 80%). The research area is located relatively close to the provincial capital and has a good information and communication network. Various telecommunications networks have been running

well and are equipped with adequate facilities and infrastructure.

3.1 General Situation of Respondents

Respondents are extension workers who have working areas in the study area and are classified as extension workers who are civil servants or who are still honorarium. Extension workers who are still in the honorarium are quite a lot in Jati Agung Subdistrict and Metro Selatan District. Education level of extension workers is high. This has the potential to develop methods for using ICT in agriculture. Figure 1 shows the level of education of extension workers who are civil servants is greater than extension workers who are still THL in Jati Agung Subdistrict and Metro Selatan Subdistrict.. Whereas in Natar District and Metro Barat Subdistrict extension workers which are still THL have a higher level of education compared to extension workers who are civil servants.

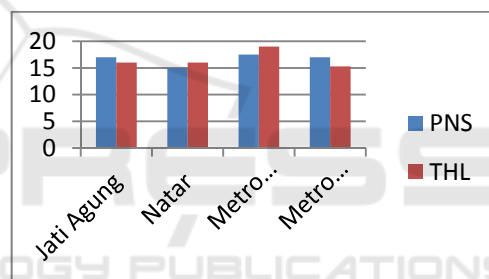


Figure 1. Data on the average level of education of respondents per district.

When viewed in terms of age, the temporary extension workers (THL) is on average younger than extension workers who are civil servants (Figure 2)

Figure 2 shows that in terms of age, extension workers who have the THL status still have the potential to develop their ability to use ICT-based information sources. This is consistent with the results of Dame et al (2016) in Lampung Province which says that the use of cyber extension is mostly done by young farmers.

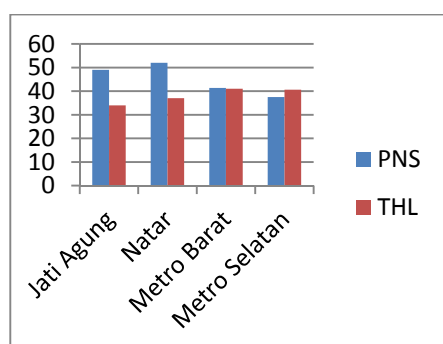


Figure 2. Data on average age of respondents (years) per district

Figure 2 shows that the extension workers who are civil servants have an older age than the Honor Field Extension Officers. This affects the use of cyber extensions. Agricultural extension workers who are still young tend to use cyber more in search of information related to agriculture. This happens because they have a strong desire to try something new.

The research results show that information sources from ICT have commonly been used by younger farmers. The wider the width of field cultivated by the farmer, the bigger agricultural information is needed, so that the farmer will look for needed information from inside and outside of his/her village and this makes his/her cosmopolitan level to be higher (Gultom, 2016).

3.2 Use of ICT-based Information Sources by Extension Workers

As a bridge between agricultural information sources and farmers, the extension expected to equip it self with the latest information and is useful for the survival of extension workers farmers. The rapid development of information can actually help carry out its duties properly, provided that extension workers is ready and able to use all available sources of information. The ability to use this information source is closely related to internal and external factors of extension workers.

Based on the results of the focus group discussion, information was obtained that there were no farmer groups or Gapoktan who already had their own webb. Stake holders in the research area expect cyber available at the village level. The existence of cyber at the village level can expose activities in the area. The material presented is expected to be local specific. The results of the discussion also showed that most PPL did not like writing, so it was rarely found the PPL results. Even though PPL which has

the potential to write gets the money to buy credit and intensive that can be used for promotion.

Cyber existence is currently very much needed considering the obligation of farmer groups and Gapoktan to fill the Definitive Plan of Group Needs online. The needs of farmers for inputs must be poured in on line. The results of the discussion also showed that to get farmers to access the internet in search of agricultural information, it was not easy because the facilities were very limited.

The results showed that the use of ICT-based information sources by extension workers was classified as medium. Most extension workers use mobile phones and computers to search for agricultural information, but their use is not intensive because they are still using personal equipment and sometimes hampered due to limited funds in buying credit. The equipment owned by the office is still very limited as well as the network.

The results of the study showed that there were no differences in the use of ICT-based information sources between extension workers who had been civil servants and those with honorarium (THL). Table 3 lists the results of different tests Mann Whitney uses ICT-based agricultural information source that show the differences of some variabels between that the extension workers who are civil servants have an older age than the honor Extension workers (THL).

This difference occurs because of the individual characteristics of each agricultural instructor such as motivation and desire to improve life. Differences can also be caused by external factors that exist from extension agents such as family support, institutional support and others.

Someone's behavior in doing communication activities comes up because of a motivation coming from inside of this individual in doing an action through interaction with environment according to his/her want. [18] says that some of communication behaviors from individuals are overtly seen (overt behavior) and some others are covertly seen (covert behavior). The work of [18] suggest that the relationship between farmers' characteristics and agricultural business competences are highly connected, but aspects of knowledge, attitude, and skill are independent in assessing many fields in agribusiness.

Table 3. Significance value of different test Mann Whitney on several variables of research

No	Variable research	Significance Value
1	The use of cyber extension	0,031**
1	Age	0,000**
2	Level of formal education	0,085*
3	Revenue from extension workers	0,000**
4	Monthly income	0,588
5	Motivation	1,00
6	Cosmopolitan	0,732
7	Perception of cyber extension	0,664
8	Extension workers Performance	0,503

Table 3 shows Mann Whitney's different test significance values for age variables, extension workers income and cyber extension use are less than five percent and for education level variable is less than ten percent. This means that there are differences in age, income of extension workers and the use of cyber extensions between extension workers who are civil servants and extension workers who are still THL. Other research variables show no difference. Descriptive analysis obtained the use of ICT-based information sources by extension workers who still THL are higher than those who are civil servants. This situation indicates one good strategy in increasing the use of ICT-based information sources is at a young age.

3.4. Factors Related to the Use of ICT-based Information Sources

Analyzing the factors related to the use of ICT-based agricultural information sources can be the entry point for the policy of developing ICT-based agricultural information sources. Table 4 contains the Rank Spearman significance value of the factors related to the use of ICT-based information sources.

Table 4: Rank Spearman's significance value factors related to the use of cyber extension information sources

No	Variable research	Significant Value
1	Age	0,013**
2	Level of formal education	0,217
3	Revenue from extension workers	0,023*
4	Monthly income	0,76
5	Motivation	0,061*
6	Cosmopolitan	0,029**
7	Perception of cyber extension	0,975
8	Extension workers performance	0,029**

Table 4 shows Rank Spearman's significance values for age variables, income from extension workers, motivation, cosmopolitan and extension workers performance are smaller than five percent. This means that the factors related to the use of cyber extension information sources are age, income of extension workers, motivation, cosmopolitan and extension workers performance.

The older a person, the lower the ability is to use cyber extension information sources. Some research results also show such things. The greater a person's income from his position, causing a person to feel valued in their abilities, so that they have the awareness to have good performance. This is also the case with cosmopolitanism. Someone who has high mobility in seeking information, tends to realize that the enormity of information can be accessed and affect its performance. Extension workers as that often come out of their target areas to seek information will have a tendency to continue to explore information through all information sources including ICT-based information sources. The high motivation of extension workers to carry out their job duties will cause extension workers to also use ICT-based information sources. This correlation analysis can be used as one of the reasons for developing cyber extensions in Lampung Province.

4 CONCLUSIONS AND SUGGESTIONS

4.1 Conclusions

- (1) The performance of extension workers involvement in the information system of agricultural development through cyber extension is characterized by differences in age, income from PPL, and the use of cyber extensions between petugas who are civil servants and extension workers who are still THL. There is no difference in the level of education, motivation, level of cosmopolitan, perception of ICT-based information sources between who are civil servants and who are still THL.
- (2) Factors associated with extension workers involvement in the development of agriculture information extension workers work system through extension cyber age, income from extension workers, motivation, and performance extension workers.

4.2 Suggestions

Considering the very strategic role of extension workers as one of the sources of information for technology and innovation users, it is necessary to develop extension workers knowledge and ability in developing ICT-based information source functions. This effort can be done by enriching and mentoring extension workers through the ICT-based Information Sources Literacy Program.

ACKNOWLEDGEMENTS

The author would like to thank all those who have contributed to the implementation of this research and the publication of the results of this study. In particular the awards were presented to:

1. Ministry of Research, Technology and Higher Education of the Republic of Indonesia for the provision of research funds through the Technology Application Research Scheme.
2. Faculty of Agriculture, University of Lampung, with permission and financial assistance provided in carrying out The Second Bogor International Conference of Social Science

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