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Challenges and Roles of Extension Workers on Cyber Extension as Information Media

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Abstract.
Agriculture has been developing, which attracts more attention from all aspects of the economy. Besides, the industrialization of agriculture is the process of transforming agricultural production towards a comprehensive industrial direction in all aspects such as implementing livestock industry or agricultural mechanization, modernization of farming process, production in the form of modern farming (intensive farming, increasing crops, fertilizing in cultivation, and animal production). Thanks to the application of science, technology, and technology in the agricultural sector, agriculture activities have improved their productivity. Agricultural products include cattle, fish, poultry, and crops. The methods include economic institutions (economic laws such as supply and demand, value, competition) and legal, political institutions. One of the methods to implement agriculture extension is a cyber extension or using the power of online networks, computer communications, and digital interactive multimedia. The paper aimed to provide an overview of cyber extension in the context of agriculture development.

Keywords: Cyber extension, agriculture extension, adoption, agricultural development

1. Introduction

Agricultural and livestock extension played an essential role in shaping the progress of agricultural production. Statement of [1] that agricultural extension is an important mechanism for providing information and advice to modern agriculture. Information and communication technologies (ICTs) are a compilation of digital technologies that are versatile, adaptable, empowering, and effective in transforming organizations and redefining social ties when converged in new configurations.

The phrase "cyber extension" is already a part of phraseology. The advances in Info Communication Technology (ICT) positively contribute to providing increased accessibility and extension facilities. ICT's position in education is also becoming tangible [2]. The emergence of phrases such as distance learning, online teaching, and thus the virtual classroom, illustrates the effect of ICT on education. A similar pattern in the

context of cyber or virtual extension is also seen in the reality of Extension education. Computers and the internet are expected to help technology transfer aims and increase awareness among rural farmers about market situations [3].

Currently, agricultural extension is one of the key drivers of rising agricultural development in Indonesia. Various models and systems have been applied with the technology transfer method to be significant components in growing the products of priority local/domestic animal production. As trainers, facilitators, and motivators, agricultural extension agents play a critically vital role. They distribute agricultural technology information at the provincial level from the Institute for Agricultural Technology and disseminate technology packages that meet farmers' specific needs. The introduction of ICT into Indonesia's agricultural extension framework has become a potentially crucial ten-year complement to what extension has traditionally been provided in recent years. In 2009, throughout the Indonesian agricultural extension called Cyber-Extension, the Indonesian government initiated an ICT-based extension system program [4].

2. The role of cyber extension

The use of the agricultural and rural cyber extension is beneficial in growing animals for farmers, as well as in consulting researchers on agriculture activities. It helps to improve the learning of society in certain nations. It will help not only researchers and farmers but also the entire stakeholders through the use of internet networking, computers and modern immersive multimedia.

The information media acts as a medium that empowers farmers. The media also promote the involvement of the population and provide avenues for agricultural/animal sector improvement. The government-launched cyber extension program is intended to facilitate the economic growth of rural areas. In the process of transition, media communication has an important function. According to Wilbur Schramm, the role of the media in development involves advising, leading and participating in development [5].

Overall, ICT has helped change the dynamic between extension staff and society through the use of information technologies. In the contact process, adolescents become willing members. Smartphones for accessing the internet are more available than a computer. It makes it much more fun to browse the internet on your mobile. Via the features of social media, smartphones have modified the notion of social connections. Many people use smartphones to chat, express thoughts, beliefs and ideas [6].

3. The advantages and disadvantages of cyber-extension

Cyber extension communications have several advantages such as providing sustainable information, connection to global support, focusing on the user's convenience, attributing to personal qualities, and giving a fast and efficiency cost. Cyber-extension has been acknowledged as the most applicable in the communication model. Cyber-extension is considered as a strategic instrument to enhance the accessibility of information to farmers, extension workers, researchers, suppliers and other stakeholders [7]. Besides, [8] also debated that there were several advantages and disadvantages in applying cyber extension in agriculture:

In the contemporary extension practices, taking advantages of the digital application is regarded as the most innovative method in the agricultural extension. By using the technology developed by other countries, the user's convenience will increase as it can be distributed to the local farmers speedily. As a result, rural farmers will not be left behind and ultimately connected to the world.

The most visible change resulting from the touch of digital technology is that farmers grow into computer-literate. The farmers will rely much on the use of computer application and also internet facilities. The internet will be a rich source of education and information for them. By receiving much information from outside their circumstances, farmers attain psychological benefits such as confidence, honoured, and motivation to participate in extension programs.

Cyber-extension also suggests a particular way to educate farmers about agricultural technologies in comprehensive activities by seeing, hearing and watching the demonstrations directly. As its quick transfer to another part of the world, the latest issues on the agriculture might be informed to farmers within minutes only. Subsequently, farmers can quickly identify the weather forecast, their harvest and also market trends. By reading the news on the websites, farmers will know about the price trends in the market. Besides, the internet supports farmers to create derivatives of their excess agricultural production.

Cyber-extension will influence how the involvement of the young generation in agricultural activities. Today, young people tend to be more familiar with internet technology than older people. Their mastery in technology is a resource to develop agricultural innovation.

Extension officers also attain benefits of cyber usage for its simplicity. They are not worried anymore of the time and cost to travel to rural areas. Their work is much more efficient as they can record their demonstrations and present it later to the farmers.

Furthermore, the extension officers can use online technology to create progress reports done by farmers.

Despite its great benefits, cyber-extension also has some disadvantages such as its uneven distribution to rural areas. Not every village has cyber extension facilities, so the farmers have to go to other places to access it. In addition, not every village can adapt to technology development because of its lack of infrastructures such as limited electrical power and poor internet connection. Highly remote areas will be challenging to cope with the technological barrier. Adding to a rapid transition in technology, the vast streams of information on the internet contribute to a state of "information overload" that may overwhelm farmers.They will face difficulty in selecting the best and most appropriate method for their agricultural activities. Moreover, farmers may access false information and fake facts that will be harmful to their agricultural activities. This false information is also a threat for the extension officer as they may accidentally or intentionally use it on their report.

Being computer-literate is not easy. It also depends on how the farmer's literacy. Most of the rural farmers are still unable to read and write. Illiteracy will constraint the development at any level and section, including technology usage. Therefore, the initial stage to start the cyber extension is to ensure the community's literacy.

There always be a different level of understanding of the material delivered through conventional extension or digital facilitation. The education and information obtained through free access to the internet may have lower quality than if the extension officers directly transfer it. The availability of reciprocal communication is always a suitable method of transferring knowledge to people. Besides, information about technology from other countries are usually delivered in different languages with the farmers. This gap also contributes to the level of farmer's understanding of the information.

All data in the cyber extension system is recorded digitally. It means that if there is an error in the system, there will be a risk of losing the information. Therefore, back-up data in the form of printing or place it in another cloud storage may be needed. The data provided by the cyber extension system is not always given free access to farmers. They should register and sometimes pay the bill for accessing some information.

4. The adoption and the strategies for doing agricultural extension based on a cyber extension

Communication technology was introduced to Indonesian agricultural sector since the implementation of ICT was pioneered in agricultural development through several

projects such as Microsoft Community Training and Learning Center (CTLC-Microsoft), Partnership for e-Prosperity for the Poor (Pe-PP), Poor Farmers' Income Improvement through Innovation Project (PFI3P), Farmers' Empowerment through Agricultural Technology and Information (FEATI), and the Center for Agricultural Information [9] [10]. This technology approach depends highly on the extension agents' abilities to deliver to farmers. They play a crucial and vital role as educators, facilitators, and motivators by distributing agricultural technology information from BPTP at the provincial level and disseminating packages that suit farmers' demands.

According to [9], ICT's implementation in Indonesian rural development is a means to new strategies which were launched along with some projects including CTLC-Microsoft, PFI3P with Asian Development Bank (ADB), and FEATI. Several types of research [11] [12] [10] [13] informed that lacking equipment was the most significant challenge in implementing Cyber-Extension. ICT requires a computer and electronic devices, which are very limited to access to, that can hinder Cyber-Extension application. It is forecasted that the extension agents would independently access to website using personal electronic devices. However, some of them may not own those devices due to financial difficulty.

5. Problems / Obstacles to Development and Utilization of IT-Based Information Systems

The development of Cyber Extension in agricultural development cannot be separated from problems or obstacles. The obstacles found are as follows:

1. The paradigm still tends to be linear and lacks of convergence in communication (interactive / relational)

2. Management, particularly management commitment at the level of stakeholders is low, especially in isolated areas where really needs it, it is not supported by the availability of signals (infrastructure), thus, hardware, network connections, and access points are limited and the cost is expensive.

3. Human resource management, particularly, the limited capacity of the human resource of farmers and other cyver extension users in IT applications,

4. Socio-culture, particularly the culture of sharing and managing information based on IT is not cultured yet.

5. The content, in particular, the information presented in the cyber extension is often inappropriate, out-of-date, often repetitive, not timely and has not addressed issues in this area yet

6. Challenges related to future development of cyber extension in agricultural development include:

1. Achieve consistent application of the Paradigm: the convergence of communication (interactive/relational) by overcoming obstacles to communication among agricultural development stakeholders.

2. Extension agents act as facilitators and motivators for groups or farmers in building promotional blogs.

3. The extension worker acts as a companion to farmer groups (local institutions) in testing new technology and bridging the process of resolving stakeholder problems.

4. Extension institutions play a role as a motivator for improving the capacity of extension agents in the IT-based innovation dissemination system, particularly the management and utilization of information. Site management training and repackaging of information accessed via the internet or various sources, for extension agents to keep abreast of developments in their strategic environment.

5. Local institutions have functions: (1) as a media forum, (2) as a filter for information from the internet, (3) as an innovator in implementing innovation trials, and (4) as a source of valid and up-to-date information.

6. Local institutions have the function as liaison and communication network developers with relevant stakeholders, especially in the marketing of agricultural products.

The Role of Extension Institutions in the Information Technology-based Agricultural Innovation Dissemination System.

1. Developing Information Technology-based information service programs (social networks and via mobile phones)

2. Developing websites (online information sources)

3. Develop information sources (library services by providing printed and electronic materials for users)

4. Providing facilities for management including the reprocessing of information accessed from various sources as information technology-based extension materials

5. Capacity building for field extension officers, freelancers or daily workers and institutional administrators

6. Liaison between farmers / local institutions with relevant stakeholders in developing marketing networks / other economic activities

7. Provision of facilities for the development of training in cultivation and post-harvest technology

8. Development of technology show windows and superior products

9. Giving rewards in a professional manner to field extension officers and freelancers or daily workers in the process of disseminating information technology-based agricultural innovations

The Role of Local Institutions in the Dissemination of IT-based Agricultural Innovations

1. Filtering information from various sources (national and global) that can be accessed via the internet.

2. Forward information that is useful and valid to group members so as to avoid useless and even harmful information

3. Media for sharing information and knowledge

4. Media that can assist farmers in the process of testing technology accessed through information technology

5. Liaison with related stakeholders

6. Managing information accessed through IT to be packaged in simple media that can be used as a means of sharing (for example for community radio broadcast materials / materials)

7. Conclusions

Cyber-extension is necessary equipment to support the extension functionaries. Animal production, marketing, and farmers are the essential stakeholders of agricultural extension systems. Cyber-extension using ICT instruments addresses the connectivity barrier

between these components. Collaborative efforts are indispensable for ICT programs to be effective and viable in the long term. The improved and smooth coordination between these elements of the system results in the overall growth of the agricultural system of the country.

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