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THE EFFECTIVENESS OF CYBER-EXTENSION-BASED INFORMATION TECHNOLOGY TO SUPPORT AGRICULTURAL ACTIVITIES IN *KABUPATEN* DONGGALA, CENTRAL SULAWESI PROVINCE, INDONESIA

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ABSTRACT

Cyber-extension-based information technology is recognized as a means of communicating agricultural supervision to bring into farmers and their family prosperity. Cyber extension refers to an innovation designed to deliver agricultural information communication to farmers in a quick manner, enabling them to obtain fast, appropriate, and relevant information regarding their needs. This research was aimed at finding out the effectiveness of the use of cyber extension as an information and communication media to support farming activities in Kabupaten Donggala, Central Sulawesi Province, Indonesia. The research employed a survey method which involved 86 farmers as the samples. They represented those who were directly involved in Program Peningkatan Pendapatan Petani Melalui Inovasi (or P4MI, which literally means 'a program for increasing farmers' income through innovations'). The research was carried out in Kecamatan Sindue, a district in Kabupaten Donggala. The selection of the location was done on purpose considering the fact that the district has been establishing an information center called Unit Pelayanan Informasi Pertanian Kecamatan (or, UPIPK, which literally means 'an information service unit for farmers in certain district') as a way both farmers and supervisors access on the information or the market. The data analysis was carried out descriptively and by using tabulation. The research found that the use of cyber extension in supporting farming activities was effective, represented from the supervisors' performance in responding to the farmers' needs as well as the farmers' performance in establishing their farms. In addition, cyber extension could also give an easy access to the farmers to information technology needed by them in a relatively short time.

Keywords: Effectiveness of the use of ICT, Cyber extension, Farming activities

INTRODUCTION

A great deal of change in the life of the society is taking place nowadays as the information and communication technology (hence, ICT) begins to constantly developing, particularly the advancement of cell phones and the Internet. Warner and James (2009) believes that this reality has brough the society into a more decentralized and democratized manner of communication which could hardly be found in earlier days. Thus, it is unsurprising that ICT begins to diversify, leading to the existence of various informing manners. Cees Leeuwis (2009) asserts that the new variations of communication media are integrated with each other, thus the boundaries between those media diminish. For instance, it has been widely recognized that telephones and the Internet begin to replace the mass use of radios and televisions in having interactions with a group of audience. Bringing the benefits of the current development in ICT into agriculture, it turns out to be advantageous to the development of agricultural information system, mainly as the media of communication new innovations in farming works. The use of ICT in the development of agriculture requires certain process of education and capacity building as some technical difficulties and lack of skills to implement it are still shadowing over head (Mulyandari, 2011).

With regard to the development of ICT, nearly all people in the world turn their heads to various kinds of communication technology which work fast and efficiently in the attempt of obtaining pieces of information. Moreover, it seems that people cannot find themselves daily without the sort of technology which they believe as the key factor in getting important information. In the work of agricultural supervision, the so-called *cyber extension* has now been developed; it refers to one mechanism in the development of communication networks to disseminate new innovations in agriculture which is effectively programmed. Cyber extension is beneficial to put agricultural-based research and development organizations and disseminators of innovation (i.e. supervisors), trainers, farmers, and stakeholders all in one place in which every included party brings about its particular needs of different forms of information with a hope that they can synergically work with each other. Furthermore, cyber extension serves as a system that encourages the mechanism of managing, disseminating, documenting, researching, and synergizing agricultural innovations which developers of agriculture need to establish continuous development.

Nevertheless, several problems are ready to challenge the development of agriculture in the global competition as the majority of agricultural works are by farmers with narrow farming area, less capital, and low education. Therefore, several attempts must be made to empower them with regard to their life betterment and well-being. It is in line with the Act number 16/2006 concerning with supervision which states that it is to empower the primary actors for the sake of creating a conducive business environment and increasing their awareness to the importance of information. *Kabupaten* Donggala, through *Program Peningkatan Pendapatan Petani Melalui Inovasi* (hence, P4MI; literally means ‘a program for increasing farmers’ income through innovations’) carried out by *Badan Litbang Pertanian* (Agricultural Research Body), has been developing an information center since 2007, so-called as *Unit Pelayanan Informasi, Pertanian Kecamatan* (hence, UPIPK;

literally means 'an information service unit for farmers in certain district'). The center is equipped with computers and internet connection fo facilitate the flow in agricultural information. The media is expected to reach all farmers within the city with an area of 359,165 ha (BPS, 2012). The P4MI was meant to be an empowerment activity to improve the life of the farmers in *Kabupaten* Donggala, so that they can build their life as they wish. Therefore, the establishment of UPIPK represents a hope for the farmers to obtain information directly from the primary sources, then learn and implement the information with regard to the characteristics and needs of their respective farming activities.

RESEARCH METHOD

The present research was carried out in *Kecamatan* Sindue, a district in *Kabupaten* Donggala, Central Sulawesi Province. It employed a survey method with 86 farmers as the samples. The samples were selected through the purposive sampling technique from a pool of farmers who were directly involved in the farmers' empowerment program through the use of internet-based telecenter. The data collected comprised primary and secondary data. The former data were obtained from a structured interview with the respondents by using a questionnaire and Focus Group Discussion (FGD), while the latter data were gathered from other sources to support any intended information. Singarimbun and Efendi (2008) suggest that the key of sampling is representativeness of the population, that is, the extent to which the samples well represent the real situation or characteristics of the population. Moreover, Sugiyono (2009) states that samples are a part of the number and characteristics of the whole population. The data analysis was carried out descriptively by using a tabulating table.

FINDINGS AND DISCUSSION

Farmers' Characteristics

The farmers' characteristics refer to unique features which are naturally attached to their individual life and closely-related with their aspects of life, such as age, educational background, the farming area ownership, the information technology ownership, motivation, and network availability. Table 1 describes the farmers' characteristics as well as the distribution of their frequency of answers.

Table-1. Distribution of Respondents' Answers to the Farmers' Characteristics

Characteristic	Criteria	Frequency	Percentage (%)
Age	< 30 years old	14	16.28
	30-40 years old	51	59.30
	41-50 years old	19	22.09
	> 50 years old	2	2.33
Edu. Background	Primary school	17	19.77
	Junior high school	44	51.16
	Senior high school	22	25.58
	Univ. graduate	3	3.49

Characteristic	Criteria	Frequency	Percentage (%)
Farming area ownership	< 0.5 ha	3	3.49
	0.5 - 1 ha	61	70.93
	1.1 - 2 ha	22	25.58
	> 2 ha	0	0.00
ICT ownership	No media	26	30.23
	Have 1 media	42	48.84
	Have 2 media	16	18.60
	Have 3 media	2	2.33
Motivation	Very low	19	22.09
	Low	36	41.86
	Intermediate	15	17.44
	High	16	18.60
Availability of networking	Unavailable	10	11.63
	Poorly available	40	46.51
	Available	30	34.88
	Excellently available	6	6.98
Total		86	100

Table 1 shows that 59.30% of the respondents (farmers) range in age, from 30 to 40 years old. This indicates that the age of the farmers at the time the present research was conducted belongs to productive age. In terms of their formal educational background, 51.16% of them are graduates of junior high school, picturing the relatively low educational background of the farmers. In general, those who can use the access to the ICT are graduates of senior high school or those who managed to continue to higher education. This is supported by Mulyandari who asserts that farmers who can use the information technology have higher education since the technology is relatively novel to the rest of them which needs better knowledge to access.

On the basis of the ownership of farming area, it was found that 70.93% farmers owned an area of 0.5-1 ha. This signifies that such an area is considered narrow for farming activities, resulting in a limited number production of commodities. In terms of the ownership of ICT such as cell phones, telephones, and computers with internet connection, there were 48.84% farmers who had one ICT facility, i.e. cell phones. These tools were beneficial for the farmers to communicate with other farmers or the supervisors when information was in need.

The farmers' motivation to make use of cyber extension is considered low as there were only 41.86% farmers who used the techonlogy. The reason for this is the low ability of the farmers to access the ICT due to the lack of skill and knowledge on it. This condition brings to the importance of skills and knowledge on the technology in order to obtain needed information. Meanwhile, the availability of information networks is low, as confirmed by 46.51% of the respondents, meaning that the availability of networks is so limited to support the farming activities that more equipments are desperately needed.

The Interaction between the Farmers and the Supervisors in Using Cyber Extension

Interaction is depicted as any activities which are related to exchange of information among farmers or between farmers and supervisors when a decision in farming activities is about to make. Newcom *et al.* (1978) asserts that a good interaction occurs when all the parties gather around together to discuss and solve problems as well as to reach a consensus regarding common objectives. This research saw the interaction from four aspects, namely, the interaction in cooperating/synergizing to use cyber extension, the interaction in using the ICT, the interaction in selecting information media, and the interaction in selecting relevant information. Table 2 shows the interaction of the farmers in using cyber extension.

Table-2. Interaction between farmers and supervisors in using cyber extension

Indicator	Average Score
the interaction in cooperating/synergizing to use cyber extension	2.57
the interaction in using the ICT	2.26
the interaction in selecting information media	2.37
the interaction in selecting relevant information	2.44
Average	2.41

*) 1.00-1.75 Difficult, 1.76-2.50 Medium, 2.51-3.25 Easy, 3.26-4.00 Very Easy

According to Table 2, the interaction between the farmers and supervisors in using cyber extension as a means of communication is easy when it is about to use the technology and select appropriate materials for farming activities. The average score, 2.41, indicates that the existence of cyber extension as a means of communication is beneficial in the interaction or communication between the farmers and supervisors or among the farmers themselves to obtain information. One of the benefits is that both parties do not have to see each other as the cyber extension can deliver the information relatively fast.

The Farmers' Perception on the Use of Cyber Extension

Perception refers to an opinion or a subjective measurement on a certain object. Van and Hawkins (1999) suggest that the principles of perception are twofold: relativity, meaning that an object must represent certain values despite the fact that it is nearly impossible to make an exact measurement on it; selectivity, which deals with the ability of five human senses to receive stimuli from the surrounding. Throughout this research, the farmers' perception is seen from the advantages of the information media which consist of six indicators, that is, the relevancy of information with the farmers' needs, the easiness of understanding information obtained from cyber extension, the easiness in selecting information, the proper time to select information, the information applicability, and the appropriateness with local culture. Table 3 displays the farmers' perception on the use of cyber extension.

Table-3. Farmers' perception on the use of cyber extension

Indicator	Average Score
The relevancy of information with the farmers' needs	2.65
The easiness of understanding information obtained from cyber extension	2.64
The easiness in selecting information	2.62
The proper time to select information	2.42
The information applicability	2.64
The appropriateness with local culture	2.67
Total	2.63

*) 1.00-1.75 Very Poor, 1.76-2.50 Poor, 2.51-3.25 Good, 3.26-4.00 Very Good

Based on Table 3, it is revealed that the perception of the farmers towards the use of cyber extension is good enough, evident from the average score 2.65. That is to say, the society is welcome the application of cyber extension as a means of communication or dissemination of information. The farmers' perception on cyber extension are best reflected from the appropriateness of information and easiness in selecting information which will be needed to support their activities. In addition, the information provided by cyber extension is easily understandable, and it does not take long to access the information. Then the most important finding is the fact that the existence of cyber extension at the research location does not disturb the local culture as the kind of information being accessed is the one needed to improve the farmers' activities. Overall, there is a positive correlation between the farmers' perception and their behavior with regard to the use of cyber-based communication media.

The Effectiveness of Cyber Extension

The effectiveness of the use of cyber extension is measured on the extent to which it brings appropriateness and quick as well as easy access for the sake of supporting the farmers' dry land activities. Zuliyanti (2005) define effectiveness as: 1) the ability to adapt with the surrounding due to the fact that human being is so limited in nature that cooperation with other humans is needed; 2) work achievement, referring to the achievement level in doing tasks on the basis of one's ability, experience, hard work, and time duration; 3) work satisfaction, being a happy and satisfied emotion regarding one's work, best reflecting one's feeling on their work. This research regards the effectiveness of cyber extension as the supervisors' performance during supervision, the farmers' performance in doing farming activities, the appropriateness of information, the level of satisfaction towards the obtained information, the proper time for getting information, and the appropriateness of supervising methods. Table 4 shows the effectiveness of the use of cyber extension.

Table-4. The effectiveness of the use of cyber extension

Indicator	Average Score
The supervisors' performance during supervision	2.84
The farmers' performance in doing farming activities	2.66
The appropriateness of information	2.67
The level of satisfaction towards the obtained information	2.84
The proper time for getting information	2.42
The appropriateness of supervising methods	2.85
Average	2.71

*) 1.00-1.75 Ineffective, 1.76-2.50 less effective, 2.51-3.25 Effective, 3.26-4.00 highly ffective

According to the displayed findings in Table 4, the use of cyber extension is considered effective to enable the farmers to obtain fast, appropriate, and relevant information, as shown by the overall average score 2.71. The effectiveness is also reflected from the work of supervisors in responding the needs of the farmers, in this case the information technology. Moreover, the farmers' performance is improved as they could select agricultural technology which is in line with the market demands, leading to the farmers' satisfaction on the information they have obtained. One benefit the farmers feel is that it is relatively easy to obtain information, and the information is relevant to their needs in taking care of their daily activities.

The use of cyber extension as a means of communication to support agricultural activities at *Kabupaten* Donggala is considered effective. This is in line with Adekoya (2007) which confirms that the use of IT within the supervision system provides various information services to the farmers. Mulyandari *et al.* (2012) agrees with the statement. The same value is also relevant with the farmers' perception on cyber extension, particularly in terms of the appropriateness of information and easiness in selecting which information is mostly needed at a certain time. Zhao (2008) believes that the Internet positively contributes to the productivity of agriculture with the increased accessability of farmers to relevant technology and the easiness to exchange information.

CONCLUSIONS AND RECOMENDATION

Based on the findings and their discussion above, several conclusions can be made as follows.

- The use of cyber extension as a means of communication is considered effective to support agricultural activities as evident from the farmers' interaction and perception on cyber extension having been displayed in the findings of the research.
- Cyber extension can provide information for both the farmers and supervisors on the basis of specific needs at a particular location that it accelerates the time to deliver supervising materials to the farmers.
- The development of cyber extension may keep the flow of information fast, so that it increases the farmers' accessability to obtain needed information. In addition, cyber extension can serve as the center of data service and supervision information to the

farmers.

- The advancement of ICT, particularly the Internet, may bridge the gap between those with abundant of information and knowledge with those who are not, to increase the society's direct participation, and to create networks and access to open information and business opportunities.

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