

Original Article

# Use of Information and Communication Technologies among Farmers and Extension Workers and Its Relevance to the Agricultural Development in the Province of Northern Samar

Ricardo A. Obed

Faculty, College of Agriculture, Fisheries and Natural Resources, University of Eastern Philippines, University Town, Northern Samar, Philippines  
Master of Arts in Education, Major in Physical Education

**Abstract** - This study attempted to determine the use of information and communication technologies among farmers and extension workers and its relevance to agricultural development in the Province of Northern Samar. Specifically, it aimed to determine the socio-demographic profile of the extension worker-respondents and the farmer beneficiary-respondents. Moreover, it determined the different modalities being used in extension services as to training, technology, and information and communication technologies and their level of effectiveness. This ascertained if there is a significant correlation between the socio-demographic profile of the farmer-respondents and the level of effectiveness of the different modalities in delivering extension services. In addition, this study identified the facilities available and used by the extension workers and the problems that the extension worker-respondents encountered in the delivery of modalities. Finally, the researcher proposed an extension program based on the findings of the study. The study utilized a descriptive-correlational research design. Seventeen 17 municipalities in Northern Samar and 108 extension workers, and 174 farmer-beneficiaries participated in the study. Complete enumeration was used for the extension workers, while a purposive sampling technique was used for the farmer beneficiaries. A survey questionnaire was used as the primary instrument to gather data. The study used frequency counts, percentages, ranking, weighted mean, and multiple regression analysis as statistical tools. The findings of the study revealed that most of the extension worker-respondents belonged to the age group of 56 to 60 years old, earned a monthly income of P 20,001 to P 25,000, and had 1 to 5 years of service. A majority of them were male, and a greater number were married and college graduates. As to the socio-demographic profile of the farmer beneficiary-respondents, most of them belonged to 41 to 46 years

old, high school graduates, earned below P 5,000 monthly, and have been in the farming sector for above 25 years. A greater number were male and married, and a majority used cellular phones. The extension worker-respondents and the farmer beneficiary-respondents identified and assessed the different modalities used in extension services in the province of Northern Samar as "much useful" with regard to training, technology, and information and communication technologies. The level of effectiveness of the different modalities in delivering extension services in the province of Northern Samar as assessed by the extension worker-respondents and the farmer beneficiary-respondents in terms of training, technology, and information and communications technologies was "much effective". Regarding the relationships between the socio-demographic profile of the farmer beneficiary-respondents and their assessment on the level of effectiveness of the different modalities in delivering extension services, it found out that age, sex, civil status, educational attainment, monthly income, number of years as a farmer, and different ICTs used were not significantly related to their assessment on the level of effectiveness of the different modalities in delivering extension services in the province of Northern Samar in terms of training, technology, and information and communication technologies. The facilities available and used by the extension workers in delivering extension services in the province of Northern Samar were farming, planting, and vegetable productions tools and materials, ICT materials, multimedia, and new technology, and technical personnel services. The conduct of extension services in the province of Northern Samar faced problems according to the extension workers, i.e., the insufficient allocation for travel expenses, availability and completeness of facilities, and lack of transportation facilities. An extension program was proposed to update and upgrade agricultural



*development, most especially in technology-based farming practices in the province of Northern Samar.*

**Keywords** - *Information, Communication Technologies, Agricultural development, Relevance, Level of effectiveness*

## I. INTRODUCTION

Considering its value in poverty alleviation, information has proven itself to be an asset for development. Being so valuable, the nation's economies are now rolled into a dichotomy of classes – the information-rich and the information poor. This dichotomy of classes is incessantly aggravated by a global gap that is shared among rich and poor countries and also between wealthy and underprivileged individuals. This gap is termed the digital divide.

In an attempt to bridge the digital divide and erase the fear of exacerbating the already existing economic gap between technological "have's" and "have not's", various information and communications technologies (ICTs) for development projects were launched. These projects were aimed at reaching the information-poor regions of the world. ICTs tools (referring to new media and gadgets like computers and cellular phones, among others) were integrated into the fields like agriculture, education, health, social justice, and commerce, among others, to make them usable, especially for the people living in developing countries.

Although current literature is replete with information on the potential benefits of ICTs, Michiels and Crowder (2002) argued that there is still a lack of empirical evidence or analyses of actual experiences of applying ICTs locally and their impact upon poor people's economic and social livelihood. Accordingly, some community-driven, locally appropriated ICTs initiatives and projects do exist. The problem, however, is that only very few projects pay attention to monitoring and evaluation of ICTs outcomes, especially about the local impacts of technologies. Thus, guidelines for effective ICTs deployment and appropriation at the local level are missing (Alviola, 2007).

The Global Information Technology Report 2012 of the World Economic Forum raises constant awareness on several factors that drive the capacity of countries to transform and benefit from the multiple impacts that ICTs can bring about. The report is a comprehensive survey on the determinants to leverage ICTs for increased competitiveness of nations. In this report, Philippine performance is disappointing – it just rated No. 86, Indonesia No. 80, Vietnam No. 83, and Singapore No. 2. The Philippine efforts in using and promoting ICTs remained timid.

In the light of the many reported shortcomings, the economic and social impact of ICTs on the country is necessarily limited.

Information and communication technologies (ICTs) are valuable tools that can be used for the economic development of the country. And in a region where other countries are already ahead in using ICT to their benefit, the Philippines is still struggling to make effective use of it. A government-level commission on ICT was formerly created, which was later merged with the Department of Science and Technology (DOST).

In the Philippines, ICT is now being used by the government as a strategy to advance agricultural extension and communication programs. The potentials of technologies in information dissemination are being utilized to bring relevant information to every farmer. One example of a program that tries to use ICTs for development is the Techno Gabay (Technology Guide) Program (TGP). As one of the banner programs of the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), the TGP is designed to bring science-based information and technology services to the end-users in the agriculture forestry, and natural resources sectors. In Eastern Visayas, it is implemented through the Visayas Consortium for Agriculture and Resources Program, which is based at the Visayas State University (VSU) in Baybay City, Leyte (Alviola, 2007).

ICT is one of the four component modalities of TGP. This project component facilitates storage, retrieval, and exchange of information through computers and cellular phones to provide an immediate response to current problems and frequently asked questions of farmers. It provides opportunities for capability enhancement through ICT training and Internet link, offering unlimited chances to participate in e-commerce through quick information access (Alviola, 2007).

Since the coming of the era of information and technology, ICTs have played a great role in society. The information and communication technologies (ICTs) revolution has brought huge implications in both social and economic development in the world.

Agriculture, just like other sectors, has benefited from the ICTs revolution, and the latest innovation in ICTs has expanded the development of the agriculture sector in a different form. In large part of the world over millions household own TV and mobile phone which are used as the source of information to people in the village and in the big cities, the use of ICTs in agriculture range from advanced modern technologies, such as GPS navigation, satellite communication, and wireless

connectivity, to older technologies such as radio and television.

It is clear that ICTs have brought to the fore new ways of doing things. There is the realization that ICTs should be integrated to be effectively used in agriculture development as facilitating tools to boost its impact on the lives of farmers. Information and communication technologies (ICTs) have shown evidence for easier access to markets and information resources. The role of ICTs to stimulate agriculture, enhance food security, and support rural livelihoods is increasingly recognized and was officially endorsed at the World Summit on the Information Society (WSIS) 2003-2005. The computers, internet, geographical information systems, mobile phones, as well as traditional media such as radio or TV stimulates participation enhances value to productivity. Evidence of the contribution of ICT to agricultural development and poverty alleviation is becoming increasingly available.

However, the rural people still lack basic communication infrastructure in accessing crucial information in order to make timely decisions. The application of ICTs in agriculture generates possibilities to solve problems of rural people and also to promote agricultural production by providing scientific information timely and directly to farmers.

Farmers now need information about trends and technology needed in farming so as to produce more and participate effectively in setting the price of their product. To make all this possible huge utilization of ICTs must be taken as the first priority.

Thus, the researcher was prompted to conduct this study to determine the use of information and communication technologies (ICTs) among farmers and extension workers and their relevance to agricultural development in the province of Northern Samar. Specifically, this will assess the awareness of the farmers and the extension on ICTs, the commonly used ICTs, their appropriateness or adaption, and the problems encountered.

## II. OBJECTIVES OF THE STUDY

This study attempts to determine the use of information and communication technologies (ICTs) among farmers and extension workers and their relevance to agricultural development in the province of Northern Samar.

Specifically, it aims to:

1. determine the socio-demographic profile of the respondents in terms of:
  - 1.1 age
  - 1.2 sex
  - 1.3 civil status
  - 1.4 educational attainment
  - 1.5 monthly income
  - 1.6 number of years working/in the service
  - 1.7 number of seminars and training attended related to ICTs

2. determine the awareness of the farmers and the extension workers on ICTs;

3. know the different ICTs used by the farmers and the extension workers;

4. identify how the ICTs are being appropriated or adapted by the respondents to fit their day-to-day activities;

5. identify problems that the respondents encountered in using ICTs;

6. determine the relevance of ICTs on the agricultural development in the province as perceived by the respondents;

7. find out if there is a significant correlation between the socio-demographic profile of the respondents and their awareness of the ICTs;

8. ascertain if there is a significant difference between the awareness of the farmers and the extension workers on the ICTs; and

9. ascertain if there is a significant difference between the perception of the farmers and the extension workers on the relevance of ICTs to the agricultural development in the province.

## III. METHODOLOGY

This study will be conducted in the province of Northern Samar.

Northern Samar is a province located in the Eastern Visayas region. Its capital is Catarman and is located in the northern portion of the island of Samar. Bordering the province to the south are the provinces of Samar and Eastern Samar. To the northwest, across the San Bernardino Strait, is Sorsogon; to the east is the Philippine Sea and to the west is Samar Sea.

Northern Samar is one of the three provinces comprising Samar Island (the other two are Samar and Eastern Samar provinces). It ranks 37th in size among the 80 provinces of the Philippines and accounts for practically 1.2 percent of the total land area of the country. It is located at the eastern edge of the archipelago with an area of 369,293 hectares. About 52 percent of the total land area is covered by

forest, and 42 percent is classified as alienable and disposable.

Northern Samar is classified as a second-class province. Based on the 2010 National Census, the province has a total population of 589,013.

Catarman is the capital town of the province where most political and economic activities take place. It is the seat of administration and the center of trade and commerce as well as industry.

The province is considered a very rural area, with 65% of its people residing in the countryside.

Northern Samar is divided into three (3) major geographical areas, namely: the Balicuatro area, Central area, and Pacific area, including Catubig Valley – the province's rice granary. It comprises 24 towns or municipalities with 569 registered barangays. The province is divided into two legislative districts, the first district, covering the Balicuatro and most part of the Central Area, and the second district, covering some part of the Central Area, the Pacific Area, and the Catubig Valley.

Northern Samar has a very rugged terrain with restricted pocket plains and valleys. River valleys are low-lying and are often interrupted by hills, while the remaining portion is rolling, hilly, and mountainous. The interior of the mainland consists of highly dissected hills and mountain peaks. Low-lying hills are found between the coastal plains of Palapag, the river valley of Gamay, and Catubig Valley.

The province is composed largely of low and extremely rugged hills and small lowland areas. It also has small and discontinuous areas along the coasts, and its rivers are usually accompanied by alluvial plains and valleys. The province is endowed with relatively rich and fertile soil that most crops can grow on it.

Most people speak Ninorte-Samarnon, a variation of Waray-Waray, though Cebuano is also widely understood, being spoken in the municipality of San Isidro and the island municipalities of San Antonio and San Vicente. A third language Inabaknon is spoken on the island of Capul. Northern Samar is further sub-classified into Balicuatro, Central and Pacific speakers.

Northern Samar has a lot of tourism potentials that are still undiscovered and unknown by many tourists. One can find famous old churches, beautiful falls, rivers, caves, virgin forests, beaches, and other secret places.

Three of these "secret" places are the islands of Biri, Capul, and Dalupiri (San Antonio), all off the coast of Northern Samar. Remote and desolate, and

definitely off the normal tourist track, forgotten Northern Samar evokes powerful images.

Among the last frontiers in the country, its rugged coastline of limestone cliffs along the Pacific Ocean is a historical landmark. During the Spanish colonial era, Samar Island was the first Philippine landfall seen by the Manila galleons as they approached the end of their long voyage from Acapulco.

Entering the waters of the Philippine archipelago, the galleons called at the fortified island of Capul off Samar, offered thanks for a safe crossing at the Jesuit church, and then negotiated the rough waters of narrow San Bernardino Strait toward Manila, their final destination.

Capul also became the last stop on Philippine soil of the departing galleons before the long, often treacherous trans-Pacific sail to Acapulco in Mexico.

Specifically, this study will be conducted in the top 10 municipalities, which a totality of area devoted for agricultural productions according to the Bureau of Agricultural Statistics of Northern Samar. The 10 municipalities selected in this study are Bobon, Catarman, Catubig, Gamay, Laoang, Las Navas, Lavezares, Mondragon, Pambujan, and San Isidro.

#### IV. FINDINGS

The findings of the study revealed that most of the extension worker-respondents belonged to the age group of 56 to 60 years old, earned a monthly income of P 20,001 to P 25,000, and had 1 to 5 years of service. A majority of them were male, and a greater number were married and college graduates. As to the socio-demographic profile of the farmer beneficiary-respondents, most of them belonged to 41 to 46 years old, high school graduates, earned below P 5,000 monthly, and have been in the farming sector for above 25 years. A greater number were male and married, and a majority used cellular phones.

The extension worker-respondents and the farmer beneficiary-respondents identified and assessed the different modalities used in extension services in the province of Northern Samar as "much useful" with regard to training, technology, and information and communication technologies.

The level of effectiveness of the different modalities in delivering extensions services in the province of Northern Samar as assessed by the extension worker-respondents and the farmer beneficiary-respondents in terms of training, technology, and information and communications technologies was "much effective".

Regarding the relationships between the socio-demographic profile of the farmer beneficiary-

respondents and their assessment on the level of effectiveness of the different modalities in delivering extension services, it found out that age, sex, civil status, educational attainment, monthly income, number of years as a farmer, and different ICTs used was not significantly related to their assessment on the level of effectiveness of the different modalities in delivering extension services in the province of Northern Samar in terms of training, technology, and information and communication technologies.

The facilities available and used by the extension workers in delivering extension services in the province of Northern Samar were farming and agricultural productions tools, materials, and equipment, ICT materials, multimedia, and new technology, and training handouts, materials, leaflets.

As to the problems encountered by the extension workers, these were insufficient allocation for travel expenses, in availability and completeness of facilities, and lack of transportation facilities.

Based on the findings of this study, an extension program was proposed to update and upgrade agricultural development, most especially in technology-based farming practices in the province of Northern Samar.

In the light of the findings of the study, the following conclusions and implications were drawn:

The extension workers in the province of Northern Samar possess enough personal and professional qualifications to be efficient and effective extensionists of their respective municipalities. This implies that they are professionally and educationally qualified to initiate and deliver effective extension activities to the farmer-beneficiaries for agricultural development.

The farming sector in the province of Northern Samar is dominated by adult, male, family-oriented, and educated farmer-beneficiaries. Moreover, they earn enough to support the needs of the family, have been farmers for over 25 years, and use a cellular phones.

The modalities are much useful in extension services conducted in the province of Northern Samar in terms of training, technology, and information and communication technologies.

The different modalities are much effective in delivering extension services in the province of Northern Samar as to training, technology, and information and communication technologies. This implies that the different classifications of technology-based farming practices adopted and used in the province are efficient and useful enough to deliver extension services for agricultural development.

The test of a significant relationship between the socio-demographic profile of the farmer-beneficiaries and their assessment on the level of effectiveness of the different modalities found to be no correlation with each other, it can be implied that the sense of dedication and responsibility towards work was not considered as a barrier/hindrance on the effectiveness and efficiency of the delivery of modalities in extension services.

The facilities available and used by the extension workers in delivering extension services in the province of Northern Samar are farming and agricultural production tools, materials, and equipment, ICT materials, multimedia, and new technology, and training handouts, materials leaflets.

The conduct of extension services in the province of Northern Samar faces problems according to the extension workers, i.e., the insufficient allocation for travel expenses, availability and completeness of facilities, and lack of transportation facilities.

An extension program is proposed to update and upgrade the agricultural development in the province of Northern Samar by enhancing the knowledge and skills of the farmer-beneficiaries in using technology-based farming practices. Moreover, a series of instructional plans or courses of activities will be done.

As a result of extensive and thorough analysis, the researcher came up with the theory "Reinforcing Information Communication" in farming practices for agricultural development.

This theory states that the application of technology-based farming practices through information and communications technologies (ICTs) in agriculture is increasingly important. Utilizations of technology-based farming practices enhance agricultural and rural development through improved information and communication processes.

Using the grounded theory approach, a theoretical model was developed to describe how ICTs are used by farmers and extension workers to fit their day-to-day farming and extension activities in Northern Samar. Using ICTs for agricultural purposes will lead the farmers to save money and time, instant information and communication, convenience and easier access to information increase knowledge, improved livelihood, make jobs easy and lessen worries, and increase clients' demands.

Thus, the farmers in the province of Northern Samar construct meanings of the technologies through their interaction or communication with each other or with other people. This further presupposes that the

meanings attached to technology, in some ways, influence their use and adaption of it to their day-to-day activities. Their experiences in using technology may later lead to the reconstruction of meanings or change in the way they understand it, and so on. Thus, to gain insights on how to effectively use technology for agricultural development purposes, there is a need to understand the meanings people attached to it, as well as the processes through which local appropriation of technology is made possible.

## V. RECOMMENDATIONS

In the light of the findings and conclusions of the study, the following recommendations are hereby presented:

1. The Provincial Agriculture Office should encourage farmer-beneficiaries and extension workers to attend more relevant seminars, training, and workshops related to technology-based farming practices and methods for them to be equipped with the latest trend in agricultural development.
2. The extension workers in the province should intensify and strengthen their usage of the different modalities in agricultural extension services conducted in the province in terms of training, technology, and information and communication technologies for an effective and efficient deliverables of services to the farming beneficiaries.
3. The farmer-beneficiaries in the province should be encouraged to use other latest information and communication technologies for them to be equipped on the latest technology development.
4. The provincial government should provide available and complete facilities and equipment for the delivery of extension services to the different municipalities in the province.
5. There should be a sufficient allocation for travel and transportation expenses and facilities to the extension workers.
6. An assessment should be done periodically on the work performances and satisfaction of the extension workers so that remediation will be prepared to address weaknesses and flaws in the delivery of extension services.
7. Farmer beneficiaries should be encouraged to participate in all extension services by explaining to them the importance of such activities for their own benefits.
8. It is also recommended that the Provincial and Municipal Agricultural Offices, through its extension

units, consider the adoption of the proposed extension program.

9. It is recommended that a follow-up study should be conducted with a wider scope and perspective in terms of respondents and objectives so that higher treatment of effectiveness of the different modalities in the delivery of extensions services will be made and also explore and include other variables that might be significant.

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