Research Article

THE USE OF ICT BY FARMERS TO ENHANCE THEIR PRODUCTIVITY AND MARKETING THEIR PRODUCE IN INDONESIA, THE PHILIPPINES AND THAILAND

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Received: 2018-10-06
Revised: 2018-12-01
Accepted: 2018-12-12

ABSTRACT

The use of Information Communication Technology (ICT) in farming and the marketing of produce is slowly increasing, though the progress has been uneven across different nations. The aims of this study were to determine (1) How the farmers use ICT; (2) How ICT is used by the farmers enhance their Productivity; and (3) How ICT is used by farmers to improve their marketing strategies. The study employed in-depth interviews with farmers in Indonesia, The Philippines and Thailand using interview guidelines by means of closed ended and open-ended questions. The data collected were analyzed using both descriptive and quantitative methods. The research found that farmers in the three countries are integrating ICT in their lives, the level of ICT used to enhance productivity and marketing ranges from low to high in Indonesia, The Philippines and Thailand respectively. The findings further revealed that the farmers still use traditional methods and traditional media to gain information about cultivation and to manage their markets. The study reflected that more farmers are using ICT to help with their cultivation and marketing. Using ICT helps farmers to gain information to develop their produce, reduce the role of middleman and create chances for the producers and the consumers to meet and learn about supply and demand. Organic and high-quality produced farming attracts buyers directly to farms

Keywords: farmers, ICT, ICT literacy, marketing

INTRODUCTION

UNESCO's "Using ICT to Develop Literacy" (Meleisea, 2006) defines ICT as a type of technology that mediates in the transmission, storage, and sharing of information. The book states that ICT relates to high-tech devices, such as computers, and software and conventional technology such as radio television and telephone. ICT literacy allows people to express their ideas, engage in effective learning, participate in communication and exchange information with others. These technologies allow the users to create a knowledge-based society and lifelong learning. In rural areas, ICT can support social and economic development. As the ASEAN Economic Community (AEC) started its integration in 2015 and began to face new and more complicated regional opportunities and challenges, became necessary for the people in the region to gain knowledge of ICT literacy. To address this need, educational and other institutes in South East Asia must improve digital literacy of people both in and outside the formal education system.

Even though, the major income sources in South East Asian countries are shifting from agriculture to manufacturing and services. Still, they rely heavily on agricultural production, since agriculture is one of the most significant drivers of ASEAN countries' economic growth. Moreover, ASEAN countries rank in the top worldwide exporters of produce such as rice, fruit and vegetables. Statistically, Indonesia has the largest agriculture land area following by Thailand. Vietnam was classified as top in rice producer in 2014, followed by Thailand and the Philippines. (A Euromoney Institutional Investor Company)

With cheaper and more available communication devices like smart phone and other communication devices, ICT has become an advantageous tool to deliver specific needs to people, particularly for those who live outside the city. In developing countries like Indonesia, Thailand and The Philippines, smartphones are the primary device for gaining access to internet services. (GSMAIntelligence, 2014) According to the Mobile Economy Asia Pacific 2014, Indonesian mobile subscribers rank number 4 in Asian Countries. While the Philippines ranked 8th and Thailand ranked 10th place. For farmers in these countries who have

limited access to information, smartphones could open a new phase of their careers. Even though rural farmers do not use ICT that much yet, the younger generations are embracing these platforms quickly and effectively. They can merge their knowledge of ICT with their families' agricultural businesses.

It is the critical role of digital literacy in preparing South East Asian farmers to face the opportunities and challenges of an even more digital regional landscape in the future that provoked the researcher to look into the following: determine (1) How the farmers use ICT; (2) How ICT is used by the farmers enhance their Productivity; and (3) How ICT is used by farmers to improve their marketing strategies. By asking the above questions, the researcher was able to provide a preliminary construction of the use ICT among farmers in Southeast Asia that is likely to play a key role in the success or failure of regional development.

RESEARCH OBJECTIVES

1. How the farmers use ICT;
2. How ICT is used by the farmers enhance their Productivity; and
3. How ICT is used by farmers to improve their marketing strategies.

RESEARCH SCOPE

To study the use of ICT among farmers in Indonesia, Philippines, and Thailand. The location of the study areas was not more than 150 KM. from the capital cities of the selected countries. In-depth interviews were conducted with 8 - 12 farmers in Indonesia, Philippines, and Thailand to find out how ICT facilities enhances their productivity and marketing their produce.

The findings show the outcomes and significance of this research in the contexts of Indonesia, The Philippines and Thailand. The scope of the study was limited to a small number of the samples. As a result, applied to the larger conditions these outcomes may yield different results. However, these findings are relevant to the use of ICT by the farmers in the chosen areas.

The research was undertaken from June to December 2016 in Indonesia, The Philippines and Thailand using in-depth interviews. The results showed different levels of ICT literacy among the farmers in these 3 countries.

Literature Review

ICT in Development Communication ICT plays a major role in the development of communication advantage. It enhances developing countries toward prosperity through the horizontal practice of

communication. (Mefalopulos, 2008) However, there are critical factors to look at before using ICT to approach development of communication which are economic, technological and cultural. (Mefalopulos, 2008) These factors should also be taken into the consideration.

In economic terms, according to (Thussu, 2000 cited in Mefalopulos, 2008) the information gap between the haves and the have-nots is still extensive and the gap has not decreased significantly in recent times. The use of ICT by individuals in developing countries comes at a cost, such as internet accessibility and connectivity, software and hardware, maintenance and updates.

Though, limited access to fixed line internet makes smartphones more important in developing areas, the entry of cheaper smartphones and updates has provided more people the possibility to get online. In developing countries such as Indonesia, Thailand and The Philippines, smartphones are the primary devices for accessing internet services. (Intelligence, 2014) In recent years, prices for mobile services have fallen considerably, determined by a number of factors such as the growth of market competition and the drop-in prices of equipment. (Ericsson, 2014) Affordable mobile phones and services increase access to communication and information for poorer communities in some developing economies in the region, bringing considerable socio-economic benefits in the process. (Ericsson, 2014)

Regarding technology and cultural aspects, there are number of limitations caused by factors such as the level of literacy including in the local dialect or, English and other foreign languages. However, the markets across the region are adopting new technologies at a fast pace, whilst an increasing number of innovative new services and applications are emerging and rapidly building scale. (Ericsson, 2014) As mentioned earlier that ICT enhances users' ability to collect and retrieve information in an instant. In terms of agricultural production, ICT can enhance the farmer's ability to easily gain information on the weather, crop advisory, fertilizer availability, and updates on government policy. (Mefalopulos, 2008) In the broader social and communication environment, ICT can be used to promote a fair and balance flow of information. (Mefalopulos, 2008) In addition, ICT can offer producers information on transportation, packaging, warehousing, logistics or GPS to monitor, and manage workflow and other kinds of business relations.

ICT and Agricultural Marketing

With respect to agricultural marketing, ICT can improve the marketing ability of smallhold farmers. ICT can assist through the marketing process of identifying, communicating with and maintaining relationships with buyers of a producer's produce that can directly affect volume, value and timing of sales. In terms of customer services and buyer's demands, ICT is fundamental. ICT can facilitate in many areas such as database development, website design, market research, translation, direct mail marketing and in the gaining new information.

Using ICT, the producers can find new buyers, build and maintain relationships with current buyers, and access marketing research to manage supply, anticipate demand and establish price. As mentioned earlier, ICT creates horizontal communication, therefore, it can help smallhold farmers to gain access to information related to price or demand that increases their power to negotiate from the use of social network to complex customer management tools.

Through social networking farmers and producers can identify additional buyers and have more buyers available to them. By being able to define the buyers, the producers can charge higher prices for their products, sell higher volumes of produce or offer terms of trade that are more beneficial to the producers. The location pinning app also helps farmers to deliver their produce to non-regular buyers while delivering produce to their regular customers.

ICT and Market Research

Analogous to academic research, ICT plays a crucial role in market research. The research results could be used to help producers choose specific potential customers to advertise to, then provide the right products or services to the people who have a potential interest in those products or services. The farmers' website and a number of other applications also provide a good place to keep public relations information such as, press releases, other announcements, and keep up to date with the customer database.

Using E-marketing tools instead of physical marketing activities reduces the cost of marketing communication, it also allows for more efficient performance of actions. (Radosław Mącik, 2012,) ICT also facilitates a high degree of complex interaction such as "one to one" up to "many to many." ICT can help manage market data correctly and prioritize purchases. (Radosław Mącik, 2012)

For domestic markets E-marketing activities are fast. They are a proven tool

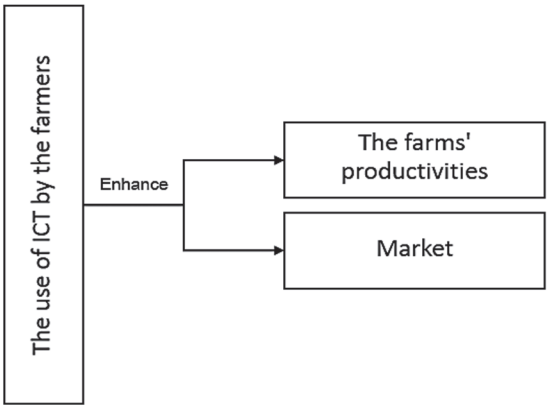
for use in the approach to external markets. Further, ICT connects people to investment opportunities and help improve exporting capabilities. Time, space, and economic barriers can be eliminated allowing for effective and efficient transmission of tacit knowledge.

ICT allows marketing to have extraordinary capability to target specific groups of individuals with precision, and enable mass customization and one-to-one strategies by adapting communications and others elements of the marketing mix to customer segments. This explains the strategic role that marketing plays in the innovation process and demonstrates that cooperation and market intelligence are two of the key factors in the success of distributing products.

Although there are technological barriers like literacy, technology and economic limitations, farmers have grown up with ICT and are familiar with these technologies. In addition, there is an increasing number of simple and free technologies found at places such as schools and public libraries. In Thailand, The ICT ministry also provides free public Wi-Fi for those who have registered to their website. Technology development and the users themselves could provide the solutions to those in the most remote areas and at the most basic levels of agricultural production. In addition, nowadays, smartphones are a technology for smallhold farmers, as even simple applications can be used to enhance their marketing abilities. For the farmers that are not literate or numerate, visually-driven smartphone apps make them accessible and usable. In the case of South East Asian countries, the number of people who use mobile phones and social networks has been increasing rapidly. Smartphone and new communication technologies for users has given access to cheaper or even free access to communication and information. Rural farmers may not yet use ICT, but the younger generation, are adopting these platforms quickly and eventually social networks will have a large impact on farmers in rural areas. These trends are worth observing as they have reached the lower ends of the income spectrum and into more rural areas.

CONCEPTUAL FRAMEWORK

The conceptual frame work for The Use of ICT by farmers to enhance their productivity and marketing their produce in Indonesia, The Philippines and Thailand is as the framework below.



METHODOLOGY

In order to satisfy the objectives of the research, the study was designed as a descriptive qualitative study. The main characteristic of qualitative research is that it is mostly appropriate for small samples. Its basic advantage, which also constitutes its basic difference with quantitative research, is that it offers a complete description and analysis of a research subject, without limiting the scope of the research and the nature of participant's responses. (Collis and Hussey, 2003)

Since the research questions primarily look into the 1.) How the farmers use the ICT; 2.) How ICT facilities used by the farmers to enhance their families' careers; and 3.) How ICT facilities used by the farmers to improve their socio-economic, the most appropriate design is clearly qualitative.

Sampling

The farmers in Indonesia, Philippines, and Thailand. This study looks into ICT use in general and ICT literacy of the farmers with ICT literacy-related subjects. Because the study engages the farmer, 8 to 12 farmers were selected from the chosen countries for in-depth interview.

Research Methods and Corresponding Instruments

Document Analysis. To study related documents on ICT literacy among the farmers in the selected countries. The other documents are ICT and Development Communication and Marketing.

Interview. To arrive at an idea of the profile of the discussants, a survey of ICT use and literacy was conducted with reference to the indicators identified by Higgins (2003), specifically noting most of the areas on knowledge and skills.

In-depth Interview. To get in-depth knowledge of how the farmers use of the ICT to enhance their Productivity and Market their products, the in-depth interview was seen as the best method. The in-depth interviews engaged the participants as the interview guides. Then with the In-depth interview the researcher used the interview guideline to explore how the farmers use the ICT to enhance their families' career; and market their products. The study is a qualitative study that will relied on narratives to serve

the research objectives. The collected data will be analyzed using content analysis.

RESEARCH RESULTS AND DISCUSSION

Research Results

Demographic Data

Due to the limited budget, time constraints and the countries varied physical landscapes, the sample size from each country were different. With the Thai researcher, the majority of the samples were Thai 26 (56.52%). The data sample from Indonesia were 11 (23.91%) and collected by the researcher with local translators. While samples from The Philippines were 9 (19.57%) collected by a Research Assistant (RA).

Education

In terms of education, the majority of participants from Indonesia are high school and primary school graduates 3 (27.27%). While 1 (9.09%) of them does not have any formal education and 1 (9.09%) was purely educated by a mosque. The majority of the participants in the Philippines have bachelor's degree 4 (4.44%), 3 (33.33%) have high school diploma. 1 (11.11%) each graduated from vocational school and primary school. Majority of Thai participants have bachelor's degree 12 (46.15%), 5 (19.23%) have high school diploma and only 1 (3.85%) has vocational school diploma.

Arable land usage

Majority of the participants from Indonesia 5 (45.45%), The Philippines 9 (100%) and Thailand 9 (34.62%) grow rice. For Indonesia and Thailand the variety of plantations range from agronomy to horticulture.

The Use of Communication Devices

All the participants use mobile phone. 4 (36.36%) of the Indonesian participants, 4 (44.44%) of the Philippines participants and 17 (65.38%) of the Thai participants use both telephones and computers.

The Use of Communication Devices

Basic knowledge in using mobile phones, the majority of the participants in the Philippines 6 (66.67%) and Thailand 21 (80.77%) are able to use Wi-Fi to send and receive information from and to other devices.

The majority of the Thai participants 21 (80.77%) use social networks such as Facebook, Instagram, Line, Skype and Twitter while 3 (33.33%) of the Philippine participants use Facebook and 2 (18.18%) of the Indonesian participants use twitter, Facebook and Instagram.

Less than 50 percent of the Thai participants use ICT to e-market their produce while a smaller number of the

participants from Indonesia 1 (9.09%) and 2 (22.22%) from the Philippines respectively use e-marketing.

Discussion

Demographic Data

The number of the male respondents in Indonesia and the Philippines were significantly higher than female. When conducting the field research in Indonesia, it was noticeable that there were more male farmers than the female. This may due to the patriarchal society of the country. For Thailand, the number of the male and female informants was equal.

Education

The farmers' minimum education level in The Philippines and Thailand was to primary school. This may be as a result that primary school level was compulsory in both countries in the past. Now the compulsory level of education in the two countries is to high school or vocational school. In Indonesia, one participant did not have any formal education, just mosque teachings and one participant had no formal education at all. The research found that there was a mosque education system that replaced the formal one. If mosques or other non-school institutions take on the digital training role for their members, there would be a more digitally educated population. In terms of farming, mosques and non-school institutes can also be centers to exchange information on crops advisory and marketing techniques to the farmers.

Arable land usage

According to a Euromoney Institutional Investor Company, the major produce of South East Asian agriculture production are rice, cereal and rubber. Even though agriculture production in South East Asian is moderately diversified: however, the areas are predominated by rice cultivation. (A Euromoney Institutional Investor Company) While 9 (100%) of the Philippines participants grow rice, the farmers in Indonesia and Thailand's cultivation ranged from agronomy to horticulture.

The Use of Communication Devices

Even though some of the participants only use their phones to make phone calls, providing ICT literacy to the farmers should be easily done since they are familiar with the devices. In regard to the participants in Thailand, they use communication devices in many ways in accordance to their life styles, such as doing homework, academic work, gathering information, e-banking, cloud funding, seed bank operations. Some also indicated that they use the devices for public relations and selling products on line. (Ericsson, 2014). If the younger generation of

farmers can market their families' produce it would increase their market share and their incomes. The interactive aspects of social network like; Facebook, Instagram, Line, and others allow direct contact between the producers and the buyers to negotiate product deals and prices.

While a small number of the participants in Indonesia 3 (27.27%) can use Wi-Fi to send and receive information. However, one Indonesian participant stated that his friend has helped him communicate with his customer in the Middle East to sell a large amount of his ornamental trees. Even though, digital and language literacy are important for e-commerce, the Indonesian close-knit society allows farmers who are not equipped with the said knowledge to sell their produce on line. According to the participants after discussing the price and quality of the produce, the buyers have to see the produce and meet the sellers in person before they will purchase it. Even though ICT is so advanced these days, meeting in person and checking the produce first-hand is still important.

None of the participants in Indonesia and the Philippines have their own website or use any Web Design tool, while only few Thai participants have their own website or use Web Design tools. This is in accordance with Supatana Sukrat's study (2015), Supatana investigated the business direction of e-commerce for local entrepreneurship and found that after utilizing e-commerce, the percentage of profit increased by less than 5 percent. She also discovered that the trend of use for e-commerce for OTOP is reducing because the sellers are not computer iterated. (Supattana, 2015) With the advancement of Social Networks, the number of the participants in the three countries use all kind of Social Networks to promote and sell their products, either through personal channels or business-oriented ones. Websites are important in creating trust with the customers, with the ease of web creation, the younger generation should be trained to develop them. Kaewta Krungwong (2013) suggests when teaching the trainees to operate the internet media literacy the trainers should continuously assist the trainee to use the applications on mobile phones.

Regarding the participants who run organic farms, they identify their buyers via the organic community. Online communications are also used by the Thai participants to identify their buyers. However, the short shelf-life and the weight of the agricultural produce which make delivery very difficult and expensive. Interestingly, one of the

farmers explained that when he delivers his rice to his major customers, he would inform the other customers via Facebook and pin his drop points for the other buyers on google map. Facebook and websites are also use to match the buyers with the produce. It is quite notable that the buyers would come to unique farms to buy organic or high-quality produce to buy the specific produce. The farmers for this kind of farming have constant income and do not have any economic problems.

In Indonesia the distributers have played an important role in dealing with the customers. Having distributors to work with marketing communication is convenient for the farmers however having middleman prevents direct contact between the producers and the buyers. The farmers then lose their power to negotiate prices and promote their produce directly to their customers. Therefore, knowing the buyers' demands is impossible. One farmer expressed the opinion that because he deals with the customers via distributers he cannot build his own brand. Adding to that anticipating demand and negotiating price, in case of crops price like rice and rubber, the prices are fixed from the world market or governments in each country.

For Marketing Communication (MC) such as advertising, public relations, discount, free shipping/free returns, flash sales, buy more get more, product giveaways/branded gifts, loyalty points, coupon giveaway, and the likes, the majority of the participants use personal communication to market their products. Some Indonesian farmers do not market their products indicating that the distributors do the entire process for them. Farmers from The Philippines market their products together with the other farmers through telephone and the internet. Beside personal communication the Thai farmers market their product via MC tools like package design, gift set and prize reduction to their customers and exhibit their products at trade exhibitions. Facebook Fan page is also used to promote their products.

The majority of the Indonesian and Thai participants conduct market research. Participants from the three countries carry out informal research through asking the buyers via personal communication, telephone and the internet. Market testing and product testing are also conducted. The Thai farmers who conducted formal research, cooperated with higher education institutes. Researchers at the higher education institutions should do research with the farmers in their locations and apply the research results to the farmers' real lives.

All the organic farmers from the

3 countries use organic communication to get information about crop advisory. For Indonesian farmers, BULOG also gives advice on rice cultivation to farmers. Telephone and the internet are also used for ginning information about crop advisory. In this respect, some of the Thai and Indonesian farmers are experts in this area. Some have graduated from the faculty of Agriculture and some of them are trainers for other farmers. If these experts use ICT to broadcast their knowledge, their message could be conveyed to a larger audience and educate more people.

BULOG gives information about fertilizer to the farmers in Indonesia. For all 3 countries, the suppliers play an important role in giving farmers information about fertilizers. This allows the suppliers to control the farmers by dictating what fertilizers they should use on their farms. With ICT assisting farmers to access to more information, ICT should be used to empower farmers to make their own choices about fertilizing their farmland. For organic farms, they do not need any advice from others as they just use organic fertilizer.

SUGGESTIONS AND RECOMMENDATIONS

From the research in Indonesia Government Rice Organization (Badam Usaha Logistic (BULOG)) has played an important role in assisting the farmers in almost all areas of the cultivation process. BULOG have supported their farmers in contacting the Buyers, providing information on Crop Advisory, Government Policy, Transportation, Packaging Design, Warehousing and Logistics. Consequently, the farmers do not need to search for information themselves.

The distributors in Indonesia also do considerable work for the farmers namely; communication with the buyers, keeping the customers database, maintaining relations with the customers, and designing package. This reduces the chance of the producers meeting with the consumers. E-farmers do not know the market trends and as one farmer expressed in the interviews, that he cannot build his own brand. The study also found that if a farmer runs a unique farm like organic or high quality produce the buyers come directly to their farms and that cut the line of distributors or the middleman. Direct contact provides opportunities for the producers to

meet the consumers. Concerning organic farming, the farmers do not have to rely on government policy and chemical fertilizers, pesticides nor herbicides for their farms. Organic farmers' networks also help the organic farmers in finding customers and advise on operating the farms.

Since this paper studied the use of ICT among the farmers in Indonesia, The Philippines and Thailand to enhance their productivity and market their produce. The literature review focused on the use of ICT in these countries. It was found that the governments are trying to apply ICT in the national curriculum, however in the remote areas there are still problems with budget, electricity, and ICT literacy, including how to maintain both computer hardware and software. Other institutions like mosques, churches and temples should provide informal ICT knowledge to the locals. The higher educational institutions in agricultural areas should provide academic knowledge to the locals by conducting co-research and running lifelong ICT projects with the farmers.

With the advancement of mobile phone technology and other devices, and easily useable applications, more people, especially the young generation, can gain access to ICT applications. According to the Mobile Economy Asia Pacific 2014, Indonesian mobile subscribers rank number 4 in Asian Countries. While the Philippines ranked 8th and Thailand ranked 10th place. For South East Asian mobile phone market such as Thailand, Malaysia, Indonesia and Vietnam, smartphones have the highest utilization and penetration rate among people in the region. Even if rural farmers do not yet use the ICT, the younger generation is adopting the devices more effectively and quickly and accessing social networks. Applying ICT to farming and marketing of produce should cut out the middleman. ICT can help producers gain the necessary information, so they can develop their products and logistics, meet with the consumers, evaluate the demand and negotiate prices.

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