

Thai farmers' information needs and seeking that lead to mobile phone application development for production and marketing promotion

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Abstract

Purpose – The purpose of this paper was to study the information needs and information-seeking among Thai farmers that lead to the development of a mobile phone application for the purpose of production and marketing promotion.

Design/methodology/approach – The qualitative research was performed by in-depth interviews, observations, field notes and content analysis. The 48 primary informants were the best-practice farmers around Songkhla Lake Basin.

Findings – The results demonstrate the farmers' need for information on the following topics: increasing production, developing quality, reducing costs, manufacturing products, increasing marketing and sales channels and changing to short-lived crops. The farmers acquired information directly targeted to their needs and behaviors by making inquiries, exchanging ideas and joining study trips and training, which resulted in production and marketing promotion and, hence, higher incomes.

Originality/value – As a result, their farming will yield high-quality products, bringing them more income and a better standard of living. When the lives of the farmers, who are the majority of the Thailand population, are improved, the holistic conditions of national economic development will in turn be good, leading to security, wealth and sustainability.

Keywords Information-seeking, Information behavior, Information need, Mobile phone application, Production and marketing promotion, Thai Farmers

Paper type Research paper



1. Introduction

The world society and the Thai society itself are stepping into an era of a knowledge-based economy, an era requiring knowledge as the most important capital among other capitals (Drucker, 1993), whether natural capital, labor or machinery, to propel socio-economic development. This is evidently reflected by the economic growth of the world's leading countries, such as the USA or Japan, or even of Singapore, the city state without abundant natural resources but with a highly advanced economy. These countries have become successful owing to the emphasis they place on knowledge accumulation, development and utilization, which have led to the formation of new concepts, new products and new processes (Tanit and Kokkiatkul, 2006). In Thailand, as well as entering the knowledge-based economy, we are also stepping into the digital economy era, in which the economy progresses through the increase in productivity by means of information technology (IT) or digital technology. Work outcomes are increased with less time spent, and values are added to products and services, making them internationally competitive. At present, smart devices are available for use, particularly the smart phone and tablet, with communication via wireless broad band, such as 3G or 4G networks. These devices are much simpler to use than a computer and hence are widely used, including by those who have never used a computer or the internet before (Office of Electronics Transaction Development, 2015). With the ease of use and portability of smart phones and the highly efficient networks and speed now at 4G, such devices are widely used by many people, most of whom use online applications for social media and entertainment, to read news and read e-books and to search for information.

People today rely on up-to-date news and information to stay up-to-date and to gain advantages in certain areas. Formerly, news and information were printed matters; they now have been transformed to digital signals for convenience in receiving, sending and computing. People in this era are therefore living in a digital society. Those who do not learn how to use digital technology or who do not accept its usage will lose an advantage. This can be seen in the work of Seenuankaew and Vongprasert (2015), which clearly explained that farmers who are keen to learn will search for knowledge to add value to their production and marketing. Online sites such as Facebook or Line can be relied on if farmers want to add value to their production and marketing, for these social media sites assist in branding, creating uniqueness and quality and resulting in advantages. There are several channels for advertising and building product brands to increase incomes for farmers and their families.

The major cause of poverty among farmers is a lack of knowledge to administer capital and infrastructure, especially subsistence land use, land development and water resources, which are inadequate. These are the factors behind tardiness among farmers in improving their standard of living. Poverty is still an unsolved problem for many Thai farmers, and most of them are in debt, notwithstanding the fact that Thailand ranks first among the world's rice exporters. The problem has arisen mainly from the change in farming patterns to single-crop farming or trading. Thus, external factors play a prominent role in the farmers' lives, including, for instance, machinery, seed varieties, chemicals and fertilizers. As a result, the farmers have lost the power to control production inputs. The globalization trend has led to the farmers' adoption of new behaviors that depend on modern technologies. On the one hand, these increase production costs; on the other hand, multiple problems arise, for example, from the use of chemicals that impact the environment, more debts, increased costs, unfair product prices, lack of negotiating power, lack of group organization and loss of self-reliance. These problems have caused governmental organizations working on agricultural development and extension to turn to promoting sustainable agriculture by supporting farmers in learning sustainable rice cultivation.

2. Problem statement

There have been few studies of Thai farmers' information needs, and most of those that do exist have focused on the needs of farmers in general and not particularly on rice paddy farmers. The results are not sufficient indicators of what is needed for the development of smart phone applications. An important primary issue is the fact that the existing information does not correlate to the needs of farmers for improving their production and marketing. Instead, the information involves daily living or information for survival (Patt and Gwata, 2002). The farmers, in fact, need information to solve their immediate farm problems and to respond to their farming queries (Munyua and Stilwell, 2010; Irvwier, 2007; Orathai, 2003). The study of Thai farmers' information and information-seeking needs would encourage them to use the information they need to learn sustainable rice farming. This study emphasized the means to acquire the right information through convenient and quick access to it, which suits the general characteristics of most farmers. In general, farmers sought information by using mobile phones to talk to or ask knowledgeable people, asked their relatives or joined training programs or study trips (Seenuankaew and Vongprasert, 2015). The study of Thai farmers' information and information-seeking needs is thus another means to improve farmers' ability to obtain access to their required information, which would ultimately lead to the promotion of the farmers' production and marketing.

The development of an application for farmers' quick and easy access to necessary information on smart phones should be one way to support the farmers in learning sustainable farming. As the present Prime Minister said:

The majority of the population own a mobile phone. If they can use the available applications, they will be able to know themselves, know the diseases, know their rights, know the soil, know the water, know the weather, etc. All have access to this basic information. Farmers will know the prices of their products. They will know which official place to contact. People may know what disease they have or whom to go to [. . .]

It is thus necessary to enable farmers to use knowledge from various relevant sources to develop their occupation and solve the poverty problem.

From the background and significance discussed, the following research query arose:

How can farmers be encouraged to use a mobile phone to access information and knowledge that will lead them to promote production and marketing based on their information needs?

There was an expectation that the application developed would lead to an upgrade in production quality and an increase in sales channels for the farmers and would ultimately enable farmers to earn more income, have a better quality of life and live happily with their family members in a strong community, which would also make the country more secure, wealthy and sustainable.

3. Literature review

The conceptualization of information needs by Savolainen (2012) demonstrated three different contexts that influence information needs:

- the situation of action;
- task performance that is related to job procedures, problem-solving and working roles; and
- dialogue, which is the question-negotiation process in the interview referenced in that study.

The information needs described by Savolainen are similar to those described by Seenuankaew and Vongprasert (2015), who found that information needs result from occupational pressure, for instance, low product prices, exploitation by middlemen, natural disasters, etc. Such occurrences

stimulate farmers' information needs, and the outcomes ultimately lead to the improvement of production quality and the addition of production and marketing values. [Case \(2012\)](#), on the other hand, showed that when information needs arise, they force a person to find an answer, reduce uncertainty, make sense and build a spectrum of motivations. These behaviors are adjusted and exhibited in four situations: personal situation, motivation to search for information, specific activities and information types and surroundings.

The study of farmers' information concerns revealed that farmers need information that contains various methods of farming practice, for example, planting, plot management and marketing. Such information assists in their occupation. This can be seen from the research work of [Seenuankaew \(2014\)](#) on the topic of farmers' information-seeking behavior. The research showed that farmers seek information related to the production processes which comprise preparation of plots, preparation of varieties, daily plot management and post-harvest plantation management. Information related to marketing and selling process is also required. The findings from the work are consistent with the work of [Orathai \(2003\)](#), who found that farmers require information for the use of organic fertilizers, prevention of rice pests, soil management and pre- and post-harvest management, preparation of plots and preparation of varieties. The findings are also consistent with the research study by [Benard *et al.* \(2014\)](#), which showed that farmers need information regarding marketing: weather condition, agricultural credit/loan, new seeds, storage methods and planting methods. Additionally, studies conducted by [Sabo \(2007\)](#), [Lwoga \(2009\)](#), [Meitei and Devi \(2009\)](#) and [Mtega and Benard \(2013\)](#) indicated that farmers' needs for information cover: pest and disease management, pesticide and fertilizer application, best time to plant, planting method, storage and seed treatment, improvement of seed varieties, marketing, loans or credits, weather condition, irrigation, information on soil fertility, control of animal diseases and irrigation practices. Thus, it can be seen that farmers require knowledge of multiple farming approaches, marketing information and agricultural loans, all of which comprise their occupation.

Information seeking is connected to needs, awareness of the needs and objectives. In addition, it is related to the concepts of decision making, relevance, pertinence, salience, selective exposure, browsing, serendipity, knowledge gaps, information poverty, information overload, information avoidance, information encountering, information anxiety, entertainment and collaborative information sharing ([Case, 2012](#)). It can be said that information seeking is related to the user or the searcher, sometimes called the information seeker. According to the information-seeking concept, an information seeker is considered to be different from general users in his or her clearer needs and awareness of the needs before searching for information from various sources ([Large *et al.*, 2001](#)). In information-seeking, the user cannot avoid relying on an information searching system. Therefore, information service providers should consider developing a convenient and simple system for information-seeking. This concept correlates to that of [Wilson \(2004\)](#), who said that normally, an information service provider must think that an information user will use a simple strategy to search for information, or else the provider should provide a response process through which complicated needs can be expressed. There are two major concepts of information-seeking: one is occupational, described by [Leckie *et al.* \(1996\)](#) as the needs arising from occupation and duties, and the other is everyday life information seeking (ELIS), which involves information related to daily living or daily problem-solving that is not related to work or regular occupations, for example, recreation, consumption patterns or hobbies ([Savolainen, 1995](#)).

The study of related literature reveals that farmers in general access information mainly by watching television. Their second channel is through areal governmental officers and neighbors. The radio and the internet are rarely used ([Zhao *et al.*, 2009](#)). Many other research reports have mentioned similar findings, i.e. farmers receive information via radio, television, newspapers, telephone conversations and various technologies such as the internet or email. Farmers are found to use knowledge gained from courses at agricultural training centers, training with

experts and learning from other farmers to improve their occupation (Munyua and Stilwell, 2010; Lwoga *et al.*, 2011; Seenuankaew and Vongprasert, 2015). Learning and sharing through communities of practice is considered an important tool for farmers to obtain knowledge. As Wenger (1998) said, "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly." It can be seen from the discussion above that if there is no support from an information institution in providing appropriate information services, farmers will mainly use their former knowledge and experience. Similarly, Demiryurek *et al.* (2008) said, "The lack of information support from the institutional sources resulted in the development of personal information sources to exchange information and diffuse technology among the farmers themselves".

Additionally, an interesting issue has been found that those seeking information from various sources and having a higher frequency in pursuing related activities to test and confirm that information obtained better organic products than those pursuing traditional production methods (Demiryurek *et al.*, 2008). Hill (2014), in research on using farmers' information-seeking behavior to inform the design of an extension, also found that dairy farmers collected information from various sources when they needed to make decisions. The information sought depends on where each farmer is in his decision-making process, which is related to general work conditions, prices, production outcomes and needs. This demonstrates that the information-seeking behaviors of farmers lead to decisions for implementation that enable the farmers to use the information to develop themselves and their occupation.

4. Methods

In this research, 48 farmers were interviewed on their need for information to promote the production and marketing of their enterprise. In-depth interview questions were used as the research instrument for data collection. The questions were classified into six key categories, namely, method to increase productivity, quality improvement, reduction of costs, manufacturing of products, increase of marketing and sale channels and changing to short-lived crops that require less water. The answers to these categories of questions led to theoretical interpretation according to the qualitative research method. In addition to the interview, observation was also performed to increase the reliability of the data collected through the interviews. The environmental contexts of the farmers, their facial expressions, eye indication, manners and the residential surroundings were observed, as they all reflected the validity of the research reliability.

This article is part of research project "Development of Applications on Smart Phones to Promote Farmers' Production and Marketing." The research and development method that was applied involved collecting data regarding the present situation and the information needs and information seeking of farmers, followed by analyses, a system design and the development of applications for smart phones. The Systems Development Life-Cycle (SDLC) process was applied. This research is divided into three phases:

- (1) *Stage 1:* Study the information needs and information seeking of farmers. The results of this stage would lead to development of applications that meet the needs in next stage.
- (2) *Stage 2:* Analyzing and designing applications on mobile devices.
- (3) *Stage 3:* Developing of mobile device applications for use in promoting production and marketing.

This article presents the first stage, the objective of which was to study the information needs and information seeking of farmers. The stage was carried out based on the qualitative research method as follows.

4.1 Selection of the study site

Principally, the site should correlate to the research objectives, research questions and research conceptual framework. Hence, the following areas around Songkhla Lake Basin were selected purposefully so that only the farmers living there became the research participants. The areas covered three provinces:

- (1) Songkhla Province, covering the following 11 districts: Muang, Hadyai, Sadso, Rattaphum, Ranod, Satingphra, Kuanniang, Krasaesin, Namom, Bangklam and Hoykhong;
- (2) Pattalung Province, covering the following 11 districts: Muang, Kongra, Khao Chaison, Kuankanun, Tamod, Pakpayun, Pabon, Papayom, Sirbanphot and Srinakaran; and
- (3) Nakhon Srithammarat, covering two districts: Cha-uad and Hua-sai.

4.2 Selection of key informants

The key informants were selected from the best-practice rice farmers based on the following inclusion criteria:

- the farmers are recognized as best-practice and award-winning at the sub-district, district, provincial or national level;
- the farmers are capable of using smart phones;
- the farmers possess leadership skills and play key roles in propelling rice farming development through their searching of information via smart phone applications;
- the farmers are desirous to learn; and
- the farmers were 45 years of age or over.

The farmers at this age range have knowledge, expertise and experience in farming. Their ability to use smart phones is adequate. If farmers younger than 45 years of age were selected, they would not possess as much experience as older rice farmers; consequently, their familiarity with technology would have no real beneficial impact. Farmers older than 55 years of age were not considered suitable to be research informants; they might possess a lot of knowledge of rice farming, but they have little ability to use smart phones. Hence, 45 is the most appropriate age range for the chosen informants. Of primary importance to the makeup of the research sample group was the accuracy and reliability of the information gathered prior to the development of the application. Knowledgeable farmers with expertise in farming and sales processes of farm produce would provide accurate and reliable information for the interview. The information was then synthesized and analyzed systematically.

It is certain that smart phone applications could be used to reveal the behaviors and potential for the use of smart phones for farming concerns. The information obtained would be analyzed with regard to consistency of usage behaviors before design and development of the applications is implemented. Importantly the researcher selected key informants who are able to use smart phones, as this is the primary skill that facilitates the use of applications on cell phones. The use of smart phones will enable farmers to access information that assists them in improving product quality and promoting sales. More importantly, through the use of smart phone applications, farmers will be able to share methods for information retrieval with other farmers for their benefit. Therefore, it was important to select farmers who are knowledgeable in farming, selling, marketing and in the use of smart phones as key informants in this research so that the

information obtained will be correct, valid and could lead to application use that promotes productivity and marketing.

After setting the inclusion criteria above, the researchers proceeded to ask for recommendations in selection of key informants from agricultural scholars from the district agricultural office, who then recommended farmers with the said characteristics. The key informants selected comprised two farmers from each district, totaling 48 farmers who possess rich information adequate for developing relevant applications for cell phone use; or at least sufficiently adequate to explain the phenomena and who could serve as good representatives to provide the information. Thus, only key informants were selected from one district as good representatives of the population.

4.3 Data collection and data analyses

The qualitative research technique of in-depth interviews was applied in the collection of data. The questions were developed from the research objectives and conceptual framework. These questions were tested on a group of farmers who had characteristics similar to those of the key informants and who lived outside the research site to verify the questions against the objectives. The test results were used to improve the questions and interview approaches to obtain good information coverage for the research objectives.

- Data collection was performed through the in-depth interviews, observations and field note-taking.
- Analyses of the data collected from the interviews and records were compiled in categories to verify the completeness and coverage based on the research objectives. The data were also confirmed to answer all the research questions. Next, the researchers synthesized the data into a descriptive version to best reflect the farmers' information needs that lead them to use information for production and marketing promotion.

4.4 Validation of reliability

The researchers validated the reliability of the methodological triangulation, which was based on different methods of data collection. In this research, there were in-depth interviews, observations and field notes. Recordings of the interviews and complete transcriptions verified that the data collection was complete. Another verification was through conversation with the key informants regarding the categorized transcriptions of the interview protocols. During these interviews, the key informants were able to add any information that might have been omitted due to forgetfulness. Thus, the accuracy of the data could be confirmed, and the triangulation justified the reliability of the data according to the qualitative research method.

5. Findings

5.1 Situations or stimulants behind information needs

The drought crisis, which has been a continual problem since the flood in 2011, has had the greatest impact on the agricultural sector, especially rice farming, where the shortage of water has been severe. Farmers have had to stop planting a second rice paddy and grow other crops that need less water. In addition to the drought, low rice prices and exploitation from middlemen exacerbated the already difficult situation. These factors have stimulated the farmers to need information, with the expectation that such information would assist them and their families to survive the critical conditions.

5.2 Information needs

With the data collected from the key informant groups and the categorized data from the in-depth interviews, six major subjects of the farmers' information needs were identified as the means to increase productivity, develop quality, reduce costs, manufacture products, increase marketing and sales channels and change to short-lived crops requiring less water. The details are as follows.

5.2.1 Means to increase productivity. It is certain and normal that all of the farmers want higher productivity. In this respect, they need information related to rice farming, such as areal/plantation management, production promotion and use of good varieties, soil improvement, management of the water system, pest management and investigation of good agriculture practices (GAP) and good manufacturing practice (GMP) standard. A farmer said:

For rice farming, if we have good soil, enough water and good care, we will get good productivity. But for everything to be good requires knowledge in production. If we don't seek knowledge, or don't know how to choose the good varieties, the expected rice quality cannot be attained even though the soil and water are good.

5.2.2 Means to develop quality. The farmers need information to produce rice that meets GAP and GMP standards, which indicate good production practices. This is the quality assurance system for food production to ensure safe consumption and confidence among consumers. Such information needs lead to an ability to produce rice that meets different standards. The farmers need information from the preparation of their rice paddy to planting to harvesting. During the start of rice planting and the preparation of their plantations, the farmers are aware that they do not have enough knowledge for planning. For example, they need information regarding whether the characteristics of the plantation meet GAP standards. They are aware of the GAP criterion that the water must be from a source with no hazardous contaminants or microorganisms. The area must contain no hazardous materials or microorganisms that will remain in the products, or the plantation must be a certain distance from pollutant-producing sources such as factories or hospitals, etc.

5.2.3 Means to manufacture products. In general, when the farmers sell their unmanufactured rice or rice with husks, the price is low, e.g. 1,000 kg of rice sells for only 5,000 to 7,000 baht per ton. After processing, for example, to make brown rice or half-polished rice, 1,000 kg will sell for 23,000 to 25,000 baht per ton. For these reasons, the farmers need information to process their rice into products that range from half prepared rice products such as rice porridge to frozen prepared dishes, such as fried rice. In addition, they need information for processing rice through fermentation processes into products such as *Khaomak* (sweet fermented rice) or *Khanom jin* (fermented rice noodles). Manufacturing adds values to rice products and increases the farmers' incomes.

5.2.4 Means to reduce costs. The farmers need information for good practices of rice cropping that will reduce the costs for soil preparation, variety preparation and care. A farmer reported:

I want to know what is better between sowing 25 kilograms of variety seeds per rai and planting only 10 kilograms per rai. Which method will give higher yields? I can save 35 baht per rai on the variety seeds.

Another farmer said:

It is difficult to raise profits from rice farming at present because everything is expensive, weed killers, fertilizers [...] I want to find a way to reduce costs, [...] at least 10% is fine.

5.2.5 Means to increase marketing and sales channels. The farmers need information related to sales to be able to manage their production from upstream to midstream to downstream. The need denotes the necessity of establishing a community enterprise. The study of this phenomenon also shows that the farmers need information related to founding an enterprise to manage rice production and sales by their own community. A farmer explained “I asked how a community enterprise can be established. They explained and told me the number of committee members. I also asked what the enterprise can do”.

Additionally, it was found that the farmers need information about the places where they can sell their rice, sales channels, how to advertise their rice products and the price of processed rice in the market. All of this information is useful for their market planning and sales. A farmer related, “Now our community enterprise has many channels to sell rice. Customers can buy directly at the enterprise; order on the phone or via Line.” Another farmer said, “Many customers made their orders by phone and paid via the bank. I sent the products by mail. But I still want to know if there are other ways to sell rice”.

5.2.6 Means to change to short-lived crops that require less water. The drought that impacted a wide circle of farmers forced them to change from rice farming to other crops. The interviews show that the farmers need information related to cultivating plants that need less water: short-lived plants, drought-resistant plants and plants that grow for a short period before harvest. Such information will prepare them for drought and help them survive other crises that arise.

5.3 Information-seeking

The farmers seek information in two ways, namely, active seeking and passive seeking. These different approaches are both common in terms of the use of information for solving the farmers' occupational problems and survival in critical situations. The details are discussed below.

5.3.1 Active information seeking. The farmers seek information to meet their own needs; the seeking is horizontal and bottom-up. They ask their farmer counterparts who have been successful in farming and ask agricultural academics and talk to and exchange information with local farmers and farmers from other areas.

In addition to these methods, the farmers in the study site use various types of information and communications technology (ICT) such as computers, the internet and mobile phones. The ICT most widely used is the mobile phone. They exchange information with and distribute information among people both in and outside the community. The study shows that 100 per cent of the key informants use mobile phones. This assessment was proven by the fact that all the farmers were contacted via mobile phone to request an interview. The reason behind the preference for this technology was its cheap price, flexibility, absence of infrastructure, absence of complexity, convenience and, more importantly, the fact that no special skills or capacity are required to use it. In addition to using mobile phones for communication, the results show that the farmers use social media via the internet system on the mobile phone. For example, they use Line to communicate and exchange information. Using mobile phones, the farmers are able to share and distribute news and information within the community and across communities. It can be said that access to information via this technology can do away with some limitations, namely, they do not have to pay for transportation to the information sources, and they obtain information quickly and in time. Therefore, the ICT use of the farmers here is scoped down to mobile phones only. Moreover, owing to the fact that most of the farmers completed only an elementary school education, their skills and capabilities are not adequate for them to access information from the Internet by other means.

The final approach in active information-seeking is seeking from mass media. Most of the farmers reported that they enjoy television more than reading newspapers or listening to the radio. It can easily be seen that the lifestyle of a farmer does not allow them to read or to listen. Television can be watched in the evening after work, mostly for recreation. They watch news, weather forecasts and after-news dramas. They also follow national happenings and agricultural programs, the information which can be applied in their occupation. Thus, the reception of agricultural information is both intentional and by chance, as one farmer reported, "I like watching Tid Buan Chuan Khuy on Channel 11," and another said, "I like watching boxing live, and they have advertisements of fertilizers, weed killers which I bought and tried. They are good." The reception of information from television can be immediate, convenient and free; hence, it is another means to obtain information for increasing product quality.

5.3.2 Passive information-seeking. The farmers receive information in the passive format through the transfer of knowledge by academics from governmental organizations. This can be explained as the top-down transfer of information. Farmers can receive such information from academics from governmental organizations, from successful farmers or from by attending training and study trips, as described below.

Knowledge transfer by academics from governmental organizations involves officers from the following organizations:

- *Land Development Station:* This organization provides suggestions regarding soil problem solutions, soil improvement, so that soil becomes fertile and provision of soil improvement inputs. The farmers who receive the information improve their plantations for cultivation.
- *District Agricultural Office:* This organization trains farmers in cultivation, variety improvement, variety expansion, consultation and demonstration.
- *Phattalung Rice Research Center:* The center gives advice and transfers information for selecting seed varieties through training and advising farmers to change the rice varieties to increase productivity, reduce costs and pass GAP certification. One farmer said, "The officer told me to change the variety every two years. If we don't change, then the variety will be mutated and will not be GAP certified."
- *Provincial Commerce Office:* This office provides information regarding the development of a rice product market and the solution of rice product problems. It also provides a place for community products to be sold. Usually, the farmers obtain this information through training programs.
- *District Community Development Office:* This organization's duties cover consultation and training for farmers to increase productivity and to increase their income from farming and household industry; for example, it instructs farmers in how to produce goods for the One Tambon One Product (OTOP) standard.

OTOP stands for "One Tambon (meaning sub-district) One Product." It is a local entrepreneurship stimulus program which aims to support the unique locally made and marketed products of each Thai tambon all over Thailand.

The farmers were found to acquire information transferred from successful farmers. The farmers choose to ask questions of and talk to successful farmers, because their familiarity with each other and common experiences enable them to know and understand the emerging problem well. Moreover, they obtain the information needed to solve a problem quickly and directly. Most of the information they need involves crop care and techniques that lead to

higher productivity. “I asked an elderly lady who produced 800-1,000 kilograms per rai what method she used and how she managed crop care. For me, I only make 350 kilograms”.

Training/study trips are also popular among the farmers for improving the quality of their crops, increasing productivity and reducing costs. For example, they attend training for manufacturing rice germs or desserts. There are two ways to have access to information by means of training: first, relevant academics organize training for the farmers through the community or an organization; second, the farmers form a group and ask an academic to come train them.

The last type of passive information-seeking is a study trip outside the community to learn and acquire new information with the expectation of applying the knowledge in cropping development. Study trips are made to real venues, for instance, to study rice production at other sub-districts’ enterprises or at the demonstration plantations of a governmental organization. As shown in Table I, situation and reasons for the information needs, information need and information seeking.

6. Discussion

The results of the research indicated that the farmers need information containing various methods of farming practice, from planting, plot management and care to marketing. This kind of information is required for them to have a good understanding of the processes in their occupation. This is consistent with the research study by Seenuankaew (2014) whose study was on farmers’ information-seeking behavior. The research results showed that the farmers need information in production processes which include preparation of plots, preparation of varieties, maintenance and management and post-harvest management. Farmers also need information related to marketing and selling processes. The findings are consistent with the research by Orathai (2003), who found that farmers need information related to the use of organic fertilizers, protection against rice pests, soil management and pre- and post-harvest management, preparation of plantation and preparation of varieties. In addition to research studies in Thailand, the results are consistent with research studies overseas even though the climate, physical and geographical characteristics differ. The common information needs of farmers are related to: marketing, weather condition, agricultural credit/loan, new seeds, storage method, planting methods, pest and disease management, pesticide and fertilizer application, best time to plant, planting method, storage and seed treatment, improved seeds varieties, marketing, loans or credits, weather condition, irrigation,

| Situation and reasons for the information needs | Information need | Information seeking |
|---|---|---|
| Lack of water | Increasing production | <i>Active information seeking</i> |
| Low of product prices | Improving quality | Linear (talk and exchange ideas) |
| Middlemen setting low prices | Processing products | Bottom to top (asked their best practice farmer, asked their agricultural specialists |
| | Reducing costs | Using ICT (computer, internet and mobile phone) |
| | Varying marketing and sales channels | Mass media (TV) |
| | Implementing planting ephemeral plants using a minimum of water | <i>Passive information seeking</i> |
| | | Transformations from a successful farmer |
| | | Transformations from specialists of government organizations |
| | | Participating in a training workshop |
| | | Visiting site |

Table I.
Situation and reasons for the information needs, information need and information seeking

information on soil fertility, control of animal diseases and irrigation practices (Benard, Dulle and Ngalapa (2014), Sabo (2007), Lwoga (2009), Meitei and Devi (2009) and Mtega and Benard (2013). The reasons behind the above information needs are survival in terms of occupation and upgrading of quality of life, which are similar to Thai farmers.

The needs for information of farmers are mostly oriented toward their occupational support. This finding agrees with the concept proposed by Leckie *et al.* (1996), who found that a person needs information related to his or her occupation and job responsibilities. These needs drive a person to develop appropriate information-seeking behavior. The farmers are forced to seek information that assists them in productivity and marketing promotion, for instance, approaches to increase productivity, develop qualities, manufacturing, approaches to increase marketing and sale channels. The research results are consistent with the study conducted by Seenuankaew and Vongprasert (2015), who demonstrated that farmers need information to solve their occupational problems and to develop their occupation owing to the changes of consumers' behaviors nowadays, which are more health-oriented. There are also other situations propelling farmers to upgrade the qualities of their products based on the standards that have been set. If their products do not meet the standards, it means lowered prices and lower income, a situation that could force them into indebtedness and in turn lowering their quality of life. The situation forces farmers to find solutions for improvement of their production qualities, and one possible and simple way to do that is to acquire information that will lead to marketing and production improvement. Another compelling situation is the need to survive, for at present farmers frequently face pressures from the government's action, natural disasters, exploitation of middlemen, lowered agricultural produce prices, etc. The situations provoking farmers' needs of information are consistent with the concepts of Savolainen (2012), who suggested three contexts that have an impact on farmers' information requirements: situation of action, task performance and the context of dialogues. In addition, correlation was found between the findings of this research and that of Case (2012), who showed that information needs arise when answers to problems are required to reduce uncertainty, make sense and as the spectrum of motivations. This research found two patterns of information usage: for individual situations and toward motivations to seek information. However, Case suggested four information usages arising from: individual situations, motivations to seek information, specific usage behaviors and information types and the surroundings. The reasons behind the needs include the fact that individual farmers do not have workload or clarified roles governing their occupation. Information needs therefore emerge from the individual situations, and the motivations stem merely from the need for survival through socio-economic changes.

The farmers, however, have altered their information-seeking behaviors from human resource-based to internet resource-based by means of accessing ICT, i.e. Facebook and Line, through smart phone applications. These channels provide them greater access to information. The research findings therefore differed from the concept of Wilson (2004), which stated that the new generation of farmers seek information through electronic systems and that their information-seeking behaviors are based on access to existing instruments. In our research, the farmers are not defined as members of the new generation but rather belong to the age group of 45 and over. They access electronic information in greater amounts than in the past as electronic technology allows for convenient, quick and immediate access to information. In addition, cell phones are cheap, and the farmers themselves have acquired skills for the use of information technology. Moreover, owing to the Thai cultural trait of patronage, farmers usually exchange information or mutually transfer knowledge with regard to the use of smart phones for farming concerns. Additionally, the tendency for Thais to live in extended families with more than two generations under the same roof provides for the possibility of younger generations within the household to train older generations in the use of smart phones and their applications.

7. Conclusions

This research study of information needs and information-seeking was conducted to promote farmers' production and marketing concerns in circumstances where farmers lack sufficient knowledge and skills to access information available to assist them in their farming endeavors, particularly when it comes to accessing information via electronic devices such as smart phones. In-depth interviewing of skilled farmers was performed to collect holistic, accurate and reliable information for constructing a new body of knowledge and innovations to assess farmers' information-seeking behaviors, particularly, with the use of smart phones as a communication tool. These are important as a means prompting farmers to apply the developed innovations to respond to their needs; in other words, access to information sources could be had conveniently, rapidly and easily.

Although, at present, certain relevant information is available directly to farmers' to meet their needs, such information exists in multiple sources and through several organizations, making the process of information-seeking laborious. More importantly, the information available to farmers is rather general, not specific to their needs, notwithstanding the fact that there are a higher number of rice farmers in Thailand than other farmers. Thus, this system will compile and screen information from multiple sources so that it will provide information which directly meets farmers' needs based on the research results discussed above. This knowledge and information will be incorporated in the system. Just a tap on the smart phone will allow a farmer to promptly access the required knowledge and information, which will be updated regularly by researchers via related URL ready to link to the required website.

References

- Benard, R., Dulle, F. and Ngalapa, H. (2014), "Assessment of information needs of rice farmers in Tanzania; a case study of kilombero district, Morogoro", *Library Philosophy and Practice (e-Journal)*, pp. 1071, available at: <http://digitalcommons.unl.edu/libphilprac/1071>
- Case, D.O. (2012), *Looking for Information: A Survey of Research in Information Seeking, Needs, and Behavior*, 3rd ed., Emerald Group Publishing, Howard House, Wagon Lane, Bingley.
- Demiryurek, K., Erdem, H., Ceyhan, V., Atasever, S. and Uysal, O. (2008), "Agricultural information systems and communication networks: the case of dairy farmers in Samsun province of Turkey", *Information Research*, Vol. 13 No. 2, available at: <http://InformationR.net/ir/13-2/paper343.html> (accessed 18 June 2016).
- Drucker, P.F. (1993), *Post Capitalist Society*, Harper Collins Publishers, New York, NY.
- Hill, M. (2014), "Using farmer's information seeking behaviour to inform the design of extension", *Extension Farming Systems Journal*, Vol. 5 No. 2, available at: https://science.csu.edu.au/__data/assets/pdf_file/ (accessed 18 July 2016).
- Irivwieri, J.W. (2007), "Information needs of illiterate female farmers in Ethiopia east local government area of Delta state", *Library Hi Tech News*, Vol. 9 No. 10, pp. 38-42.
- Large, A., Tedd, L.A. and Hartley, R. (2001), *Information Seeking in the Online Age: Principle and Practice*, K.G Saur, Munchen.
- Leckie, J., Pettigrew, E. and Sylvain, C. (1996), "Modeling the information seeking of professionals: a general model derived from research on engineers, health care professionals and lawyers", *Library Quarterly*, Vol. 66 No. 2, pp. 161-193.
- Lwoga, E.T. (2009), "Application of knowledge management approaches and information and communication technologies to manage indigenous knowledge in the agricultural sector in selected districts of Tanzania", available at: <https://researchspace.ukzn.ac.za/xmlui/handle/10413/502> (accessed 15 July 2016).

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- Lwoga, E.T., Stilwell, C. and Ngulube, P. (2011), "Access and use of agricultural information and knowledge in Tanzania", *Library Review*, Vol. 60 No. 5, pp. 383-395.
- Meitei, L.S. and Devi, T.P. (2009), "Farmers information needs in rural Manipur: an assessment", *Annals of Library and Information Studies*, Vol. 56, pp. 35-40.
- Mtega, W. and Benard, R. (2013), "The state of rural information and communication services in Tanzania: a meta-analysis", *International Journal of Information and Communication Technology Research*, Vol. 3 No. 2, pp. 64-73.
- Munyua, H. and Stilwell, C. (2010), "A mixed qualitative-quantitative participatory methodology a study of the agricultural knowledge and information system (AKIS) of small-scale farmers in Kirinyaga district Kenya", *Journal of Library Management*, Vol. 31 Nos 1/2, pp. 5-18.
- Office of Electronics Transaction Development (2015), "Digital economy", available at: www.eta.or.th/digital-economy.html (accessed 1 July 2016).
- Orathai, S. (2003), "Training needs on organic rice production of farmers in Changwat Surin", working paper, Faculty of Agriculture, Khon Kaen University, Khon Kaen.
- Patt, A. and Gwata, C. (2002), "Effective seasonal climate forecast applications: examining constraints for subsistence farmers in Zimbabwe", *Journal of Global Environmental Change*, Vol. 12 No. 3, pp. 185-195.
- Sabo, E. (2007), "Agricultural information needs of women farmers in mubi region Adamawa state", *Journal of Tropical Agriculture*, Vol. 45 Nos 1/2, pp. 69-71, available at: <https://blogs.uprm.edu/ingl3201foragriculture/files/2011/07/needs-of-women-farmers-RP8.pdf> (accessed 15 June 2017).
- Savolainen, R. (1995), "Everyday life information seeking: approaching information seeking in the context of 'way of life'", *Library and Information Science Research*, Vol. 17 No. 3, pp. 259-294.
- Savolainen, R. (2012), "Conceptualizing information need in context", *Information Research*, Vol. 17 No. 4, available at: <http://informationr.net/ir/17-4/paper534.html> (accessed 15 June 2016).
- Seenuankaew, U. (2014), "Information behavior model of farmers", working paper, Faculty of Humanities and Social Sciences, Khon Kaen University, Khon Kaen, 27 October.
- Seenuankaew, U. and Vongprasert, C. (2015), "Information behaviors in value adding of farmers' production and marketing in Thailand", *New Library World*, Vol. 116 Nos 3/4, pp. 227-242.
- Tanit, C. and Kokkiatkul, C. (2006), *Intellectual Property: Management Innovation for Manager*, Corporate Image Promotion National Innovation Agency Ministry of Science and Technology, Bangkok.
- Wenger, E. (1998), *Communities of Practice: Learning Meaning and Identity*, Cambridge University Press, Cambridge, MA.
- Wilson (2004), "Information seeking behaviour and the digital information world", available at: www.informationr.net/tdw/publ/papers/2004ISBandDigitalInfo.html (accessed 19 June 2016).
- Zhao, Y., Zhang, R. and Klein, K.K. (2009), "Perceived information needs and availability: results of a survey of small dairy farmers in Inner Mongolia", *Information Research*, Vol. 14 No. 3, available at: <http://informationr.net/ir/14-3/paper411.html> (accessed 10 June 2016).

Further reading

- Electronic Transaction Development Agency (2012), "Digital economy", available at: www.eta.or.th/digital-economy.html (accessed 18 May 2016).

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