

## **A COMPARATIVE STUDY OF INFORMATION-SEEKING BEHAVIOR AND DIGITAL INFORMATION NEEDS OF FARMERS IN TURKEY AND SWEDEN**

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### **—Abstract —**

Individuals use information as and manage information which make them evolve as part of the globalization process in today's global and virtual world (Marchionini, 1995). Information is a practical tool facilitating the life flow of individuals. This tool is used by individuals in order to resolve the problems, uncertainties and chaotic situations in their life. A series of attitudes in target-oriented resolution process is called information seeking behavior (Singh & Satija, 2007). Information seeking behavior and information are interwoven tools creating a circulation serving the target of various information user groups. Farmers are one of the sub-groups using information to contribute to the constitution of a green world. The information they seek in their occupational life will facilitate the daily running of their occupation and certain digital information from different resources are also increasingly becoming available for their use.

In our study, information seeking behavior and information needs of the farmers in Fethiye, a county in Turkey as a developing country, and Gothenburg in Sweden as a developed country, were analyzed. 60 farmers in Turkey and 60

farmers in Sweden were included within the scope of our study. What kind of information they seek and what kind of searching tools (internet, journals, books, asking people, applying to the reference desks in the public libraries) they use will be analyzed further in our study, where a descriptive method was used. A questionnaire was used as a data collection tool. Our target group was chosen randomly among the farmers in Fethiye and Gothenburg. It is a comparative study in which findings acquired in two different countries shall be handled taking the country development criteria into consideration. In accordance with the country development criteria, findings will be compared and recommendations are provided. Based upon the acquired findings, recommendations are given about the development of information literacy services and programs for the farmers.

**Keywords:** *farmers, information seeking behavior, information needs, Turkey, Sweden, e-Government*

**JEL Classification:** Q10, O39

## 1. INTRODUCTION AND BACKGROUND INFORMATION

In the post-modern era we live in, information is a key tool used by all society. It is the factor enriching the society. In the changing world, people need different kind of information to keep up with the recent developments and follow worldwide trends. Information can be handled as a tool demanded by different users. Characteristic of information can be determined according to the type of need demanded by certain professional groups. Namely, each professional group working on a certain theme needs specific information to contribute to the well-running of the work process and keep up with the recently-demanded popular professional trends. Among different professional groups, farmers are one of the key groups who need agricultural information in everyday life. Farmers and farmer groups are as vital as other stakeholders such as authorities in municipalities, businessmen, traders, non-governmental organizations, etc. in a rural community. Farmers have a capacity and power to control their environment. They all need and share information about politics, finance, market, technology and in relevant fields. This information cycle is sometimes free of charge; sometimes comes at a price. The information exchange process is an essential part of a farming system. It is important to comprehend communication

networks, environmental situation and changes in the market place in order to understand a farming system where there are lots of sources of innovation and progress. Researchers at Wageningen Agricultural University in Netherlands developed the notion of agricultural knowledge and information systems (AKIS) towards the end of 1980s as reported in EU SCAR (2012). AKIS model, different from other information systems in most technology-based national agricultural research systems, describes a two-way flow of information flow among research, extension organizations and farmers. As the AKIS system promotes a two-way exchange of information, it makes learning process easier for researchers, farmers and other related staff (Ramirez, 1997). On the other hand, one way flow of information has generally practiced through radio and television to transmit basic ideas. However it is not interactive, but very monologic and didactic. Therefore, two media are insufficient in terms of meeting the information needs of farmers while mass media is good at making them aware of innovations (Opara, 2008).

Agricultural productivity and yield can basically be enhanced through information (Opara, 2008). For agricultural and rural development, information is an inevitable element. Farmers need information if they want to succeed. Herein, farmers need other farmers' experience and knowledge, which is called "indigenous information." When farmers face a similar situation that their colleague has already overcome, they may adapt and copy their problem solving methods (Adomi et al, 2003). For instance, in a research conducted in different rural areas of Philippines, it was found out that most common information source of farmers about new seed varieties was other farmers. Agricultural technicians lacked the necessary support that they were supposed to provide the farmers with (Ramirez, 1997, p.6). It is important for them to get the proper, meaningful, familiar and reliable information in time for their competitiveness (Opara, 2008).

Field acquisition, agricultural inputs (seeds, pesticides, agricultural equipment, weather conditions, harvest technology etc.), agricultural technology, agricultural credit (eg. terms of loans), agricultural marketing, food technology can be the main headings for information needs of farmers (Meitei & Devi, 2009). Moreover, the most common sources for farmers to get related and necessary information that they require is through publications (magazines, books etc.), other farmers, family members and friends, community libraries with adequate agricultural sources, visits to organic farms, possible attendance at seminars and regional meetings, audio-visual sources for farmers with lower literacy level (Padel, 2001).

In places where economy is mostly based on agriculture, it is crucial to meet the information needs of farmers for national development (Meitei & Devi, 2009). According to a research conducted in Manipur, India, daily information need of farmers is not met due to several reasons like lack of infrastructure, limited manpower to disseminate information in remote areas, lack of an agricultural information center and non-availability of proper information and communication network systems. Considerable work and effort is required for information support for constant agricultural development with the application of emerging information and communication technologies in rural farming community (Meitei & Devi, 2009). Similarly, in rural areas of Nigeria, agricultural information is available; however, the access to this kind of information is limited due to low literacy level of farmers, the lack of infrastructure in rural community and the inadequate number of extension officers who may disseminate such information to farmers (Adomi, Ogbomo & Inoni, 2003, p. 388).

In daily routine, they work with the special purpose of producing more fertilized and healthy products. Their another key mission is to contribute to the greenization process of the world we live in. In their efforts for turning the farms into green and high-quality one, they use practical and theoretical farming tools and methods basing upon their experiences in the farms. In their agricultural activities, they encounter problems such as unfertilized crops and products which leads to the negative fluctuations in the economy, dying plants due to the misuse of pesticides and wrong irrigation methods. Routinely-faced problems in the agricultural working field leads to the loss of motivation and efficiency in the professional-based daily activities of the farmers. Professional efficiency and motivation of the farmers can be enabled with the satisfaction of the information need of farmers.

With the unique purpose of providing practical solutions for the farmers, their information need and information seeking behavior can be analyzed and addressed. According to the addressed need and information behavior, municipalities and farming associations can provide farmers with information that may be beneficial in the daily-based work routine.

Internet is actually a significant source of information for the farmers. In addition, it also provides various services for their benefit. For instance, in Turkey E-Government-Gateway (EGG) provides various services for Turkish farmers. For instance, Turkey E-government-Gateway enables users to access to services of

Ministry of Food, Agriculture and Livestock. It has subtitles such as Evaluation Services of Agricultural Lands, Agricultural Services (Farmer Registration System), Services of Loss and Income (Query for Loss and Income Payment), Land Consolidation Services, Agricultural and Livestock Support Services, which are given in Turkish below. People can use this system for their agricultural activities from their own personal account.

EGG aims to offer access to all public services for all stakeholders from a single point in a secure, speedy, high quality, user friendly and uninterrupted manner through information and communication technologies. (<https://www.turkiye.gov.tr/non-citizens>). Among the specific services for farmers are access to Farmer Record System (Çiftçi Kayıt Sistemi) and different query services under the jurisdiction of the Ministry of Food, Agriculture and Livestock (Gıda, Tarım ve Hayvancılık Bakanlığı). Some of these services are interoperable with Geographic Information Systems (GIS), enabling users to view map information with respect to their queries.

Number of these services can be increased considering other government agencies in charge of related matters and the services they provide. Furthermore, there are also other related projects for improving farming, including certain mobility initiatives. For instance, tablets were distributed to farmers in 2014, as part of Tarbil Project (Agriculture Monitoring and Information System Project (Agriculture Monitoring and Information System Project).

In our study, we have addressed the information needs of farmers who work in general farming activities and live in Western Sweden which is regarded as a developed country according to the Sweden Human Development Report (2010, 2011, 2012, 2013) (HDR, 2015) and newly-introduced sex-disaggregated Human Development Index (2014 Human Development Report) (HDR, 2015), (Västra Götaland) and Fethiye, a county in Turkey, regarded as a developing country according to Turkey Human Development Report (2011,2012, 2013, 2014) (HDR, 2015). Findings from two different HDI (Human Development Index) background will be shared in the comparative base in our study. Reports of Human Development Index were chosen as it is a statistical tool to measure a country's overall achievement in its social and economic dimensions (Economic Times, 2016) and which provides an alternative to the still common practice of evaluating a country's progress in development based on per capita national income (Stanton, 2007).

### **1.1. General Information about Western Sweden**

Farming in Western Sweden (Västra Götaland) has been research object in fields such as botanic science (Jonsson, Sall & Bryngelsson, 2000), agroecology (Gustavsson, 1998) first attempt to explore the information needs of farmers working in this administrative area, which is one of Sweden's twenty-one counties. Western Sweden has a County Administrative Board, which is a coordinating national authority with supervisory responsibilities. According to its policies, in line with national and EU guidelines, "the agriculture shall be competitive and sustainable while organic farming increases and valuable natural and cultural landscapes are preserved" (Länstyrelse i Västra Götaland, 2015a). In the county, 1,5 million inhabitants live corresponding to the 17 percent of Sweden's population. Its largest city, Göteborg has a population of more than 500,000 dwellers (Länstyrelse i Västra Götaland, 2015b). According to the latest official statistics available, there were 9,285 women and 11,923 men with employment in the agricultural sector in Western Sweden during year 2013, whilst the average income for this sector was 385 100 Swedish crones per household under the same time period (Zhao, Zhang & Klein, 2009). With regard to the impact of Western Sweden universities on the farming sector, Chalmers University of Technology belongs to the research network Food Science Sweden, whose projects often include farming-related outcomes (Food Science Sweden, 2015).

### **1.2. General Information about County, Fethiye in Turkey**

Fethiye is one of the thirteen counties of Muğla, which is an Aegean city, but Fethiye is situated in Mediterranean borders. Fethiye is composed of five municipalities, which are Merkez, Yeşilüzümlü, Eşen, Kemer and Seki Municipalities. It has a population of 183. 184 inhabitants with villages and municipalities. Percent of rural population is 60, 7%, which renders Fethiye appropriate for agricultural activities. Other reasons why Fethiye is appropriate for agricultural activities is that it has greenhouse cultivation (Southern Aegean Development agency, 2015)] and fertile soils. In addition to greenhouse cultivation and gardening agriculture, production of cotton has an important contribution to the county economy. In annual base, approximately 250.000 tones

of greenhouse tomato and field tomato are produced and they are presented to the domestic and abroad markets. Good weather conditions of Fethiye enable the fertile and effective production of the products (Fethiye Chamber of Commerce and Industry, 2015).

## 2. DATA COLLECTION AND ANALYSIS

Our research is a descriptive study. Questionnaire was used as a data collection tool. Questionnaire was adapted from the surveys of Bachhav (2012), Elly & Silayo (2013) and Babu, Glendenning, Asenso-Okyere and Govindarajan (2011). The same questionnaire was applied both in Sweden and Turkey. Turkish version of the questionnaire was - translated into Swedish. In the survey, random sampling was used (2013). In Sweden, details of appropriate respondents were retrieved by using the contact details directory *Eniro* ([www.eniro.se](http://www.eniro.se)), publicly available on the web as not always the farmers' full contact details were available. In many cases e-mail addresses or telephone details were missing as the street address is the type of contact detail typically reported by this directory. In order to facilitate the farmers' response to our questionnaire, combined data collection strategy was employed. Online version of the form was sent to informants via e-mails. A link to the online questionnaire was also embedded into posts and messages sent to farming-related Facebook groups (Grieve, Witteveen & Tolan, 2014) relevant for the Western Sweden area. Through the aforesaid collection channels we received seventeen filled online questionnaires. A print version of the questionnaire (identical to the online form) was also sent to 50 farmers working in Western Sweden, all amongst those not having already participated in the online survey. Number of print questionnaire was limited to 50 because of time and economic constrains. 15 forms were returned filled. Data from the online version of the questionnaire was merged with those from the print version. A total number of 32 filled forms were reached through both the online and the mail-based data collection. The dynamic nature of Facebook made it quite difficult to define with exactness the non-response rate for the online questionnaire. In some cases, the respondents stated the reasons why they could not participate to our study: "having left the farming sector", "being out of the scope of the questionnaire" (but formally belonging to the farming sector), "being too busy", "the lack of economic incentive for filling in the questionnaire". The response rate for the print questionnaire was 30 percent. We processed the data using the statistic

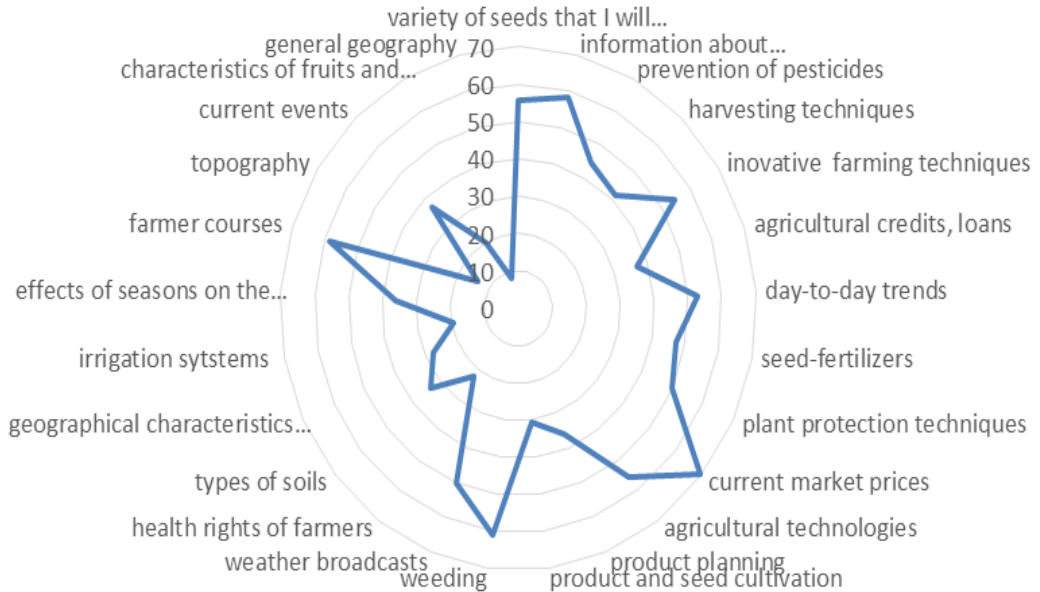
software SPSS and performed descriptive statistical analyses. In Turkey, prior to the application of the questionnaires, an interview was made with the required farming associations in Fethiye and the farmers were contacted during their field work and phone conversations were made with them. They were requested to fill in the forms on the phone with question-answer technique. 38 farmers accepted to answer the questionnaire questions in Fethiye, Turkey.

### **2.1. Results from Western Sweden**

Out of the thirty-two surveyed farmers, nine were female and twenty-three male. The most common level of education attainment was secondary education (nineteen farmers). Four farmers had a BSc-level degree and as many had achieved post-graduate education. According to a Likert scale (Swigon, 2014) with attitude values one (strongly disagree) to five (strongly agree), our survey detects as key information need the one related to current market prices (31.3 percent of the informants attributed value five and 37.5 percent value four). Information on market prices as a major concern in farmers' daily life is also one of the findings in Aina's (2012) survey. From our data collection, information about agricultural technologies emerged as a significant information need as well, (15.6 percent for value five and 37.5 percent for value four). Technical aspects of farming such as harvesting technique, agricultural equipment, variety of seeds, seeds fertilizers and plant protection techniques were also stated by our informants as daily-life information needs, though on a minor scale. Even more levelled attitude values accompanied the statements about product planning, health rights of farmers and types of soil. Most of the surveyed farmers did not feel in need of more information about pesticides. In his/her answer to one print questionnaire a farmers stated with irony that the vendors make sure that they do not miss any information about this topic. Information about topography, geographic characteristics of the lands and general geography did not result as being priorities at all, at least according to those farmers exposed to our survey. The same can be said with regard to information about irrigation systems and characteristics of fruit and vegetables.

On the subject of life-long learning, our survey has shown a demand for farmers' professional courses, at least amongst our informants (twenty-three out of thirty-two farmers attributed values three to five to this specific information need).



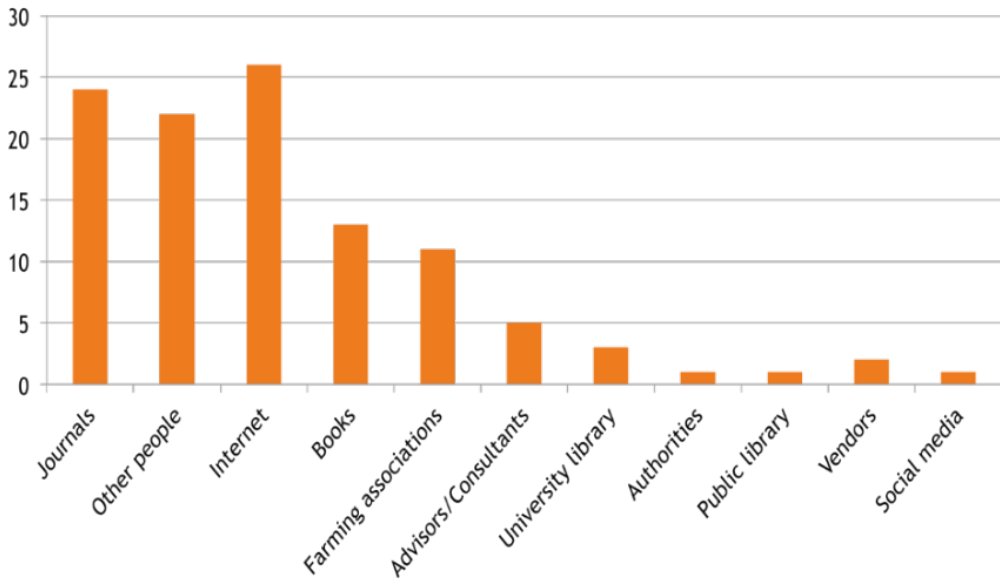
**Figure-1: Information Needs of Farmers in Western Sweden**

*Fig. 1* above illustrates what kind of information sources the farmers involved in our survey normally use in their daily life. The prominence of journals and Internet as information sources shows a similar tendency as according to Aina's (2012) study on information needs and behavior of agricultural stakeholders in Botswana. A significant difference between our findings and those of this previous study is the fact that this tendency applies there to agricultural researchers and students rather than to farmers. Our informants named also other information sources in addition to those listed in the questionnaire such as social media, trade union publications, vendors, advisors/consultants and authorities relevant for the farming sector. More traditional mass-media such as television and radio were not named at all as information sources, which is contrary to what found by earlier studies on farmers' information behavior (Aina, 2012; Nyareza & Dick, 2012; Sverige officiella statistik, 2013).

As can be inferred from our findings that tendency of the farmers to have information need about innovative farming techniques reflect the inner desire of the farmers to keep with the recent technologies. Innovation-based tendency of the farmers can be said to be resulted from the developed structure of the country.

High rates of day-to-day trends, agricultural technologies, farmer crops, variety of seeds, agricultural equipment (modern, technical and traditional equipment), and plant protection techniques can be said to be resulted from the fact that farmers feel the need to improve themselves and to adapt to the newly-introduced methods and knowledge in the farming field. Higher tendency of the farmers to get information about weather broadcast can be said to be resulted from their concern about the bad effect of the weather conditions on the products.

**Figure-2: Farmers' information sources (Western Sweden)**

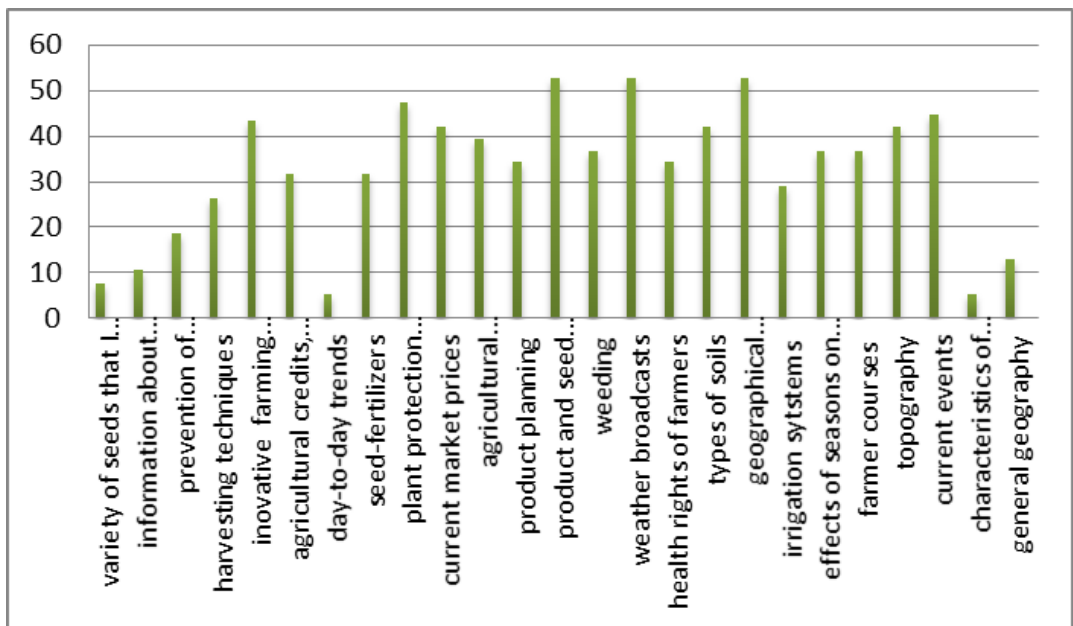


## 2.2. Results from Fethiye, Turkey

Totally, thirty eight participants answered the research. Thirteen of them are female and twenty five of them were male. 34. 2 % of the participants were illiterate, 52. 6 % of them were graduates of primary school and 13.7% of them were graduates of primary school. When findings are analyzed, tendency of farmers to have information need regarding plant protection techniques, agricultural technologies, product and seed cultivation, innovative farming techniques can be said to reflect the inner desire of the farmers to improve their farming skills and gain knowledge regarding their field. This may be associated with the tendency for professional development. Higher tendency of the farmers

to get information regarding weather broadcast and geographical characteristics of the land and effects of the season on crops, topography can be associated with their concerns about the possibility of infertile products, fruits and vegetables. It may be put forward that farmers are getting afraid of economic slowdown in farming marketing. Possible infertile products may lead to this critical situation. If farmers get further information about possible negative weather conditions or appropriate weather conditions, they can arrange their farming plan according to this. Low tendency of the farmers to get information regarding agricultural equipment (modern, technical and traditional) can be said to be resulted from their traditional attitudes on farming equipment. They may get used to use the same equipment or same type of equipment for years and they may not be aware of the current characteristics of the used equipment.

**Figure-3: Information Needs of Farmers in Fethiye, Turkey**



In addition to the information needs of farmers, information seeking behaviors of farmers have been investigated. As identified from our findings of information seeking behaviors of farmers in Fethiye, 86.8 % of the farmers stated that they ask other people while seeking information. 7.9 % of them stated that they use books, 14.6 % of them state that they use Internet while seeking information 2.7%

of them state that they ask farming associations. When compared with data collected in Sweden, farmer respondents in our survey use Internet and books less than the respondents in Sweden. Use of public library and university library has not been observed among Turkish farmer respondents. When data collected from Turkey and Sweden is taken into account, option of “ asking other people” is quite common among farmers in both countries. Asking farming associations (Turkey) and relevant authorities, vendors (Sweden) has low rates in both countries.

### **3. RECOMMENDATIONS AND CONCLUSION**

When findings of Sweden and Turkey are compared and contrasted, farmers in both countries are in the high tendency of seeking for innovative farming techniques, plant protection techniques which can be said to put forward their desire to follow the recent trends in the farming field and improve themselves in their farm field. Farmers of the both countries, which cannot be undervalued in terms of percentage, state they have information need about credits and loans which may be associated with low-budget of farmers in both countries despite the HDI values. In both countries, it can be seen that farmers are in the tendency to ask others while seeking information. In Turkey, tendency of farmers to find the information in the books is quite low, while this rate is higher in Sweden. This situation may be said to be resulted from the higher reading level of Sweden. When Internet use rates are compared and contrasted, the rates in Sweden are seen to be higher, which may be associated with the more familiarity of the Swedish farmers with Internet when compared with Turkey. Based upon these findings, farmers in Turkey can be provided with basic Internet literacy courses, which will enable them to gain skills in Internet search and information literacy. Farming associations and libraries can provide the agricultural books for farmers. Local government can undertake more significant roles. Travelling libraries can visit small villages and provide the farmers with required information and ecology books, resources periodically. Farming companies are also recommended to provide electronic and printed resources about recent farming techniques, irrigation methods, tools, characteristics of the seeds they provide and sell.

Also, rates of using journals are higher, which may be associated with the higher awareness level of the farmers while seeking information when compared with Turkish farmers as we couldn't get any answers relating to journals in Fethiye, Turkey. Also, rates of using farming associations as an information source are

higher in Sweden than Turkey. This may be associated with the higher awareness level of farmers in Sweden while seeking information and their conscious ideas about the activities of the farming associations. When findings of information seeking behavior of Swedish farmers are examined, they are seen to ask public libraries and university libraries. This can be said to reflect the fact that farmers prefer to use public library and university library in their farming activities even though the rate of using public library and university library is low. Non use of library in Turkey may be associated with the lower awareness level of the farmers and or fewer adverts relating to library activities. What is more, this lower rate may be stem from the absence of information or materials, farm-related collections of the libraries or less-introduced library services.

When the low rates of using library in Sweden and non-use of library regarding agricultural information are taken into consideration, both university and public libraries can develop routine-based agricultural courses for the farmers in order to raise their awareness. Both agricultural-themed and computer-based courses had better be given by the public libraries. This is believed to enable them to gain consciousness and information literacy skills. When they have moderate level of information literacy skills, they can access to information they need both using their personal computers and shared common computers in public libraries or any other kind of libraries, which can be said to attract their attention towards library activities. Libraries can be recommended to provide special information package relating to farming activities. Green spaces can be designed in public libraries that will attract the attention of both farmers and other people who need this kind of information. Farmers can also be provided with environmental literacy courses that will help them to gain practical and theoretical awareness about greenization of environment and taking careful steps in agricultural activities. Farming-related information can be provided according to the addressed need of the farmers. Farm-related needs may vary according to the region farmers live, therefore, specific field surveys or need analysis peculiar to a specific agricultural land or geographical region is recommended as part of this study. Moreover, farmers associations and chambers can play significant roles; therefore, they can analyze the needs of farmers and provide them with the required information. What is more, use and utilization of E-government services and projects can be beneficial for the farmers. Thus, specific training could be given to improve their awareness and digital literacy skills using e-services in relevant portals.

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