

Full Length Research Paper

Identifying appropriate information and communication technology (ICT) in improving marketing of agricultural products in Garmsar City, Iran

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One of the most important factors for agricultural development is marketing of agricultural products. Information, as the most important facilitator and main core of the marketing system, has an effective role in increasing the marketing system efficiency. Today, farmers need access to updated and exact information in order to improve the quality and quantity of the agricultural products marketing. Information and communication technology (ICT), by accelerating the information delivery, have a key role in agricultural products marketing. This study, for this reason, is aimed to identify ICT capabilities in marketing the agricultural products of Garmsar city. This is an applied study and the research methodology is correlation. The main research tool was questionnaire and dependent variable was the agricultural products marketing. The statistical population of the study was 109 agricultural experts and extension agent working in agricultural service centers. After data collection and extraction, statistical analysis was done through SPSS Version 16. Descriptive results show that the situation of agricultural products marketing is fairly desirable. ICT also have a moderate role in the improvement of agricultural products marketing. Regression analysis results indicate that computer, electronic journals, website and mobile determined about 14% variance of agricultural products marketing.

Key words: Information and communication technology (ICT), ICT tools, agricultural products marketing.

INTRODUCTION

Agriculture, in most developing countries, is the major industry. More than 50% of the labor is working in this sector and its industrial and commercial branches. In these countries, also more than 50% of the households' incomes are spent for low quality and value foods; inefficiency of the agricultural products marketing system is the starting point of these problems. Today, in most developing countries, more production of agricultural products is only a part of the agricultural sector's mission and the other mission is the agricultural products' marketing because distributing the agricultural products is the marketing system's duty. Agricultural products marketing system, by having more abilities, in one hand, can increase the producer and consumer welfare and, in the other hand, can create new job opportunities. According to the ICT capabilities in the economical, social

and cultural development of the rural societies, it is considered by the global organizations as one of the most important tools for reducing poverty in villages, increasing the services and expanding the rural industries (Mohammadi et al., 2007).

Different strategies exist for improving agricultural marketing; the use of information and communications technology is one of these strategies. ICT consist of various collections of resources and technical tools that are used for connecting, spreading, storing and managing information. In other words, ICT represents the collection of hardware and software that is used for producing, preparing, transferring and storing data via devices such as computers, radios, televisions, etc., and it includes an extensive scope of traditional and modern media (Lashgarara et al., 2010). In general, ICTs can be classified into three groups:

1. New ICTs: this group consists of computers, satellites, one-on-one connections, wireless phones (mobile), the

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internet, e-mail, the web, internet services, video conferences, CD-ROMs, personal computers (PC), distance control systems, informational-geographical systems, global positioning systems (GPS), electronic cameras, databases, etc. The hidden concept behind these technologies is that they are not automatically considered to be new, but their common and inexpensive availability has resulted in them being regarded as new.

2. Old ICTs: this group consists of radios, televisions, telephones, telegraphs, audio and video cassettes, films and slides. This group of technologies has been used for several decades.

3. Very old ICTs: this group of technologies has been used for several centuries and includes newspapers, books, photo albums, posters, theater, human interactions, markets and plays (Lashgarara et al., 2009).

Using ICT causes fast accessibility to the market, increasing selection power, improving communication, identifying markets, saving time and energy, improving marketing, and reduces business costs (King et al., 2003).

Generally, according to the given definitions of agricultural products marketing, there are two clear viewpoints. The first one, which is between the producers centers on the consumption. The second one indicates that the agricultural products marketing starts at the time in which farmers plan for their products. Agricultural products marketing, in this study, is a set of services from producers to consumers including produce design, crop products and harvest, packing, transportation, processing, distribution, sale, and transferring data from the products area to the market and visa versa (Alimoradian and dehyouri, 2006). The main agricultural products of Garmsar are wheat, barley, melon, olive and cucumber.

The results of Indonesia's participatory video project have been considered to help with clientele needs (Norad, 2002)

The findings of the research of Van Crowder and Fortier (2000) about the electronic diffusion of agricultural information projects in rural communities of Kenya can improve the ability for individuals to acquire information.

The research of Gerster and Zimmermann (2003) focused on a radio program project aimed at improving financial decisions and increasing food production. Rasouli Azar (2004), in his study titled "evaluating the rate of IT application and usage in the Iran's farmers system", signified that the educational level and the weekly mean number of hours spent for using the computer have a positive and significant relationship with the professional information. Oshunloye (2009) found that mobile and email is the most usage tools of ICT in marketing. Jelassi and Enders (2004) presented that mobile is more suitable than tools such as email and internet for farmers.

The main factor of the marketing success is market analysis which depends on the market information's reality, objectivity and inclusively; it can be said that

information is the core of marketing success and the best way for information access is applying ICT. Iran's agricultural actual and potential capabilities such as having about 37 million acres cultivatable lands, 118 billion m² accessible water resources, 14 various climates, providing 26% GDP, 25% employment (in this sector) and 26% non-oil export, has an important and critical role in the country's economy (Anonymous, 2005).

Thus, evaluating the deficiencies of the agricultural sector like agriculture products marketing system is necessary so that problems would be solved through this evaluation. This study is aimed at identifying appropriate ICT and role of ICT in improving agricultural products marketing.

MATERIALS AND METHODS

This is an applied study. The analysis used in this study involved a combination of descriptive and quantitative research and the main methodology is descriptive (non-experimental) and correlation. The total population for this study comprised 105 agricultural experts from Garmsar and were gotten by census. The main tool of study is questionnaire. Content and face validity were established by a panel of experts consisting of faculty members and some specialists in the Ministry of Agriculture. Minor wording and structuring of the instrument were made based on the recommendation of the panel of experts. A pilot study was conducted with 30 persons who had not been interviewed before the earlier exercise of determining the reliability of the questionnaire for the study. Computed Cronbach's alpha score was 87.0%, which indicated that the questionnaire was highly reliable.

The dependent variable of this study is agricultural products marketing which were measured by perception of respondents with about 66 statements. The independent variables in this research study were tools of ICT. In order to prioritize statements, the mean statistic was used and for measuring the study, hypotheses and relationship between independent and dependent variables, correlation coefficients and stepwise multiple regression analysis were used; after data extraction, statistical analysis was done by SPSS version 16.

RESULTS

Results show that 70.5% of the respondents were male, 69.6% of the experts had E-mail, 63.8% had the ICDL skills, 34.3% were bachelors, 22.9% of them had MS degree and 37.1% of the respondents had 7 to 12 years work experience.

Based on the collected information, most of the respondents (38.1%) showed that the current situation of the agricultural products marketing is relatively favorable. Table 1 illustrates the agricultural experts' point of view on the situation of agricultural products marketing.

Table 2 illustrates the role of ICTs in agricultural products marketing from the agriculture experts' point of view. Most of the respondents (25%) believed that ICTs have a moderate role in the improvement of agricultural products marketing.

Most of the respondents (50.5%) believed that in

Table 1. Agricultural experts' point of view on agricultural products marketing (n = 105).

Situation	Frequency	Percentage (%)	Valid percentage (%)
Undesirable	17	16.2	28.3
Fairly desirable	40	38.1	66.7
Desirable	3	2.9	5.00
Non respond	45	42.9	100
Total	105	100	100

Mode: fairly desirable.

Table 2. Role of ICT in improving agricultural products marketing (n = 105).

Role	Frequency	Percent	Valid percent
Low	9	8.3	12.3
Moderate	27	25.0	37.0
Much	20	18.5	27.4
Very much	17	15.7	23.3
Non respond	32	30.5	100
Total	105	100	

Mode: moderate.

Table 3. Prioritizing tools of ICT in agricultural products marketing.

Types of ICT	Mean	Technology (tool)
New ICT	4.67	Mobile
	4.48	DVD/CD
	3.9	Computer
Old ICT	4.4	TV
	3.8	Radio
	3.3	Audio-video cassette
Very old ICT	4.1	Agricultural exhibitions
	3.8	Workshop
	2.9	Conferences

1: Very unsuitable, 2: unsuitable, 3: moderate, 4: suitable, 5: very suitable

agricultural products marketing, new tools of ICT such as mobile, DVD/CD and computer are more suitable than other ICT, 70.5% of the respondents believed that the old tools are very suitable for agricultural products marketing and selected TV, radio and audio-video cassette as the best tools, whereas most of them (36.2%) believed that the very old ICT tools such as agricultural exhibition, workshop and conferences have an important role in agricultural products marketing (Table 3). In order to prioritize statements, the mean statistic was used.

For identifying ICT tools in agricultural marketing multiple, regression analysis was used. A regression analysis result shows that computers are the most important tools in determination of marketing. This

variable could determine 4.5% variance of agricultural marketing. Electronic journals, website and mobile determined about 14% variance of agricultural products marketing (Table 4).

According to the results shown in Table 3, the regression equation according to B and β quantities were, respectively: $Y = 0.228 + 0.927 x_1 + 0.585x_2 + 0.744x_3 + 0.906 x_4$ and $Y = 0.243 x_1 + 0.313x_2 + 0.336x_3 + 0.389 x_4$.

DISCUSSION

This study, was aimed at evaluating the ICT role in Garmsar agricultural products marketing, and showed

Table 4. Stepwise regression of agricultural products marketing.

Variable	B	Beta	R Square	Significance
Constant	0.228	-----		0.000
Computers (X ₁)	0.927	0.43	0.045	0.049
Electronic Journals (X ₂)	0.585	0.313	0.081	0.019
Website (X ₃)	0.744	0.336	0.097	0.010
Mobile (X ₄)	0.906	0.389	0.136	0.002

R square: 14%.

that the situation of Garmsar marketing is fairly desirable but ICT have a moderate role in improving agricultural products marketing.

Amongst the new ICT, old ICT and very old ICT, mobile, TV and agricultural exhibition is the most suitable ICT tool, respectively. The findings of Van Crowder and Forteir (2000), Norad (2002) and Gerster and Zimmermann (2003) approved these results.

Computers are the most important ICT tool for improving agricultural marketing. In total, improvement in agricultural products marketing is partly related to the tools such as electronic journals, website and mobile. The findings of Jelassi and Enders (2004), Abdollahi (2007) and Oshunloye (2009) approved the results of this study.

Computer, because of the access to required and new information is a suitable option in marketing. Electronic journals have this capability to meet the information needs. Website by providing information in different contexts of marketing, the last price of products, introducing new markets and advertising agricultural products, can help in marketing improvement. Today, as majority of people use mobile, there is opportunity for user to send off-line messages and be well informed about agricultural products price.

In this relation, computer education to the farmers and how to apply it in marketing, providing electronic journals for increasing their knowledge about marketing policies, establishing websites for introducing commodities, products price and finally, more use of mobile for providing information about suitable time of harvest, agrometeorological and pests outbreaks for improving agricultural marketing are suggested.

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