



ORIGINAL ARTICLE

Factor Analysis of Potentials of ICT in Marketing of Agricultural Products by Tehran Province Agricultural Experts Point of View

Shokoufeh Baghermanesh, Farhad Lashgara*, Maryam Omid

Department of Agricultural Extension, Science and Research Branch, Islamic Azad University, Tehran, Iran

*Corresponding author: f_lashgarara@srbiau.ac.ir

ABSTRACT

The current study has been done to identify the potentials of information and communication technology in the marketing of agricultural products. This study is an applied, descriptive and inferential statistics study and was done by fulfillment of questionnaire. Surveyed statistical population consisted of 450 experts of Tehran province Jihad Agriculture Organization that based on Morgan's table, the sample size of 208 persons were obtained. Validity of the questionnaire was obtained based on professors ideas, and after any necessary adjustments, the reliability of questionnaire was reported 0.92, using Cronbach's alpha coefficient. Factor analysis results could be divided to potentials in six factors including marketing information, productivity, customer satisfaction, product optimization, facilitating interaction, and knowledge of climatic conditions that explained 41.16% of the variance.

Keywords: Information and communication technology, marketing, marketing of agricultural products

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INTRODUCTION

Today, human life is dependent on agricultural products and agriculture is one of the world's most common types of employment. Therefore, an appropriate management action in this section is mandatory. Marketing of agricultural products is of categories in agricultural production areas that have complexities and especial importance. It seems that the marketing of agricultural products in Iran due to encountering with failure, and fundamental and institutional behavior difficulties could not reach to its necessary efficient. With regard to actual and potential capabilities of Iran agriculture sector such as having about 37 acres of arable land, 118 billion cubic meters of recoverable resources, 14 diverse climatologically conditions, and employment of this section in providing of 36% of GDP, 25% of employment, 26% of non-oil exports, 80% of food needs, and 95% of the country's need for protein, it is essential to analyze the problems and deficiencies in the agricultural sector, including the marketing of agricultural products, so that by recognizing these problems, efforts for solving them initiate and make marketing system more efficient [1].

Agricultural products marketing system in Iran has major problems including farmers poverty, lack of competitive advantage, weaknesses in the transportation, handling and storage, inadequate investment and high risk in the agricultural sector, weakness in packaging and its high cost, no trademark for most agricultural products, weakness in the pricing of agricultural products and in the system of agricultural information [2].

Most experts give an important role for ICT in marketing. Some of them count ICT as a main and fundamental change in the marketing [3]. In point of view of some experts, ICT is like a catalyst for new marketing.

Results of Noori and Sadeghi in 2009 stated that ICT enables accessing to policies and market-related update information and assists farmers in making the best decision to obtain higher profits by reducing the expensive cost of interventions [4]. Lashgarara et al in 2011 concluded that shortage of skilled work force for conducting rural ICTs projects, lack of clear policies and clear programs and procedures for the use of ICTs development in marketing and lack of appropriate hardware and software, were of challenges for the use of ICT [5].

In a study of Sadeghi et al in 2009, it was concluded that ICTs provides access to policies and updated information related to market and help farmers in making the best decision to reduce expensive costs of intervention, to obtain higher profits. Blommesten in 2006 concluded that ICTs by increasing awareness of producers of market opportunities, improve agricultural skills, facilitate contact between the seller and the producer and enhancing market potential can lead to improvement of farmers life [6].

Kauffman and Ajay in 2005 in their study found that purchase of products directly (online shopping) due to lack of intermediates has especial importance [7]. Noori' research in 2003 showed that ICT could play an important role in the development of rural markets, short-handed due to the increase in net income in rural areas [8]. The main aim of this study was to identify the capabilities of ICT in the marketing of agricultural products.

MATERIALS AND METHODS

The present study, in case of purpose is an applied study, in case of degree of oversight, control of variables is non-experimental, and in terms of data analysis is descriptive and correlation study. To collect data in the field, questionnaire was used as the main tool. To assess the validity of the instrument, after collecting the opinions of professors and experts, the necessary corrections were made. To evaluate the reliability of the survey, 30 questionnaires were completed by experts and the Cronbach's alpha coefficient was calculated ($\alpha=0.92$). Survey statistical population consisted of 450 experts of Tehran province Jihad Agriculture Organization that based on Morgan's table the sample size of 208 persons were obtained. Data from the questionnaires were analyzed using SPSS version 19. In descriptive statistics, frequency, percentage, means and in inferential statistics, factor analysis methods were used.

RESULTS AND DISCUSSION

Efficient of information and communication technology (ICT) in the marketing of agricultural products The findings of the study indicated that 84.6% of the experts, counted the efficiency of information technology and communications (ICT) in the marketing of agricultural products in medium level.

The ranking of items based on the coefficient of variation showed that among ICT tools, three technology including mobile phone, the internet and electronic media with the lowest coefficient of variation were placed in the first to third priorities, respectively. Three technologies including conference and seminar, videotapes, and charts and graphs with the highest coefficient variation were placed in three last priorities.

The results showed that among three groups of completely new technologies, old technologies, absolutely old technologies, and effectiveness of completely new technologies in marketing were in higher positions.

Factor analysis to identify the potentials of information and communication technology (ICT) in the marketing of agricultural products

To summarize a set of data, factor analysis method was used. In this study, 46 items regarding the capabilities of information and communication technology (ICT) in the marketing of agricultural products were investigated. In order to evaluate the correlation matrix and identifying the suitability of data for factor analysis, two indexes of KMO and Bartlett test were used. Table 1 shows the KMO and Bartlett's test results. Bartlett's test significance at the level of 1% and the appropriate value of KMO index indicated that the internal consistency of the data was appropriate.

Table 1. The value of KMO and Bartlett's test result for correlation matrix

Significant	df	no.	Type of test
-	-	0.830	KMO
0.000	1035	2963.22	Bartlett

According to the Kaiser criterion, six factors were extracted. Table 2, shows the number of extracted factors, Eigen values and percentage of variance for each factor. As can be seen, these factors totally identified the 41.16% of the total variance of identifying capabilities of information and communication technology (ICT) in the marketing of agricultural products.

Table 2. To label and variance percentages of extracted factors

variance percentages of extracted factors	Labeling	Factor
9.051	Marketing information	First factor
7.735	Productivity	Second factor
6.924	Customer satisfaction	Third factor
6.676	Product optimization	Fourth factor
6.619	facilitating interaction	Fifth factor
4.157	knowledge of climatic conditions	Sixth factor
41.161		Total

The results of factor analysis to identify the potentials and capabilities of ICT in the marketing of agricultural products showed that six elements including marketing information, productivity, customer satisfaction, product optimization, facilitating interactions, knowledge of climatic conditions, totally stated 41.16% of the total variance.

The first factor as marketing information had the highest percentage of variance in (9.051) and this is accordance with the results and opinions of Sadeghi *et al* [4], Abadi and Nejad [9].

The second factor, regarding the nature of the variables as productive factor, consisted of 7.735% of the total variance. This finding is in line with the earlier researches including Azmi and Ghadiri [10]. Given the findings of this study to detect capabilities of ICT in the marketing of agricultural products, the following suggestions are offered:

- According to the results of the factor analysis, marketing information was the most important capability of ICT and it is strongly recommended that sites in connection with the marketing be set up. - Considering the fact that not having enough knowledge about the use of ICT tools, it is recommended that by publishing books, articles and electronic media in order to increase the knowledge of experts and farmers on how to use ICT tools to address gaps in information actions to be taken.
- It is recommended to reduce the cost of access to information, infrastructure and technical infrastructure related to ICT, cheaper services to be done and more accurate planning to be provided. - Due to the fact that farmers because of the intermediaries cannot easily communicate with customer products, it is suggested that experts with training classes urged farmers to use virtual methods such as using the Internet to sell their products.
- It is recommended to held conferences and seminars in order to more acquaintance of experts and farmers to create greater interaction and cooperation between farmers, and to be aware of the latest developments in their field of production.

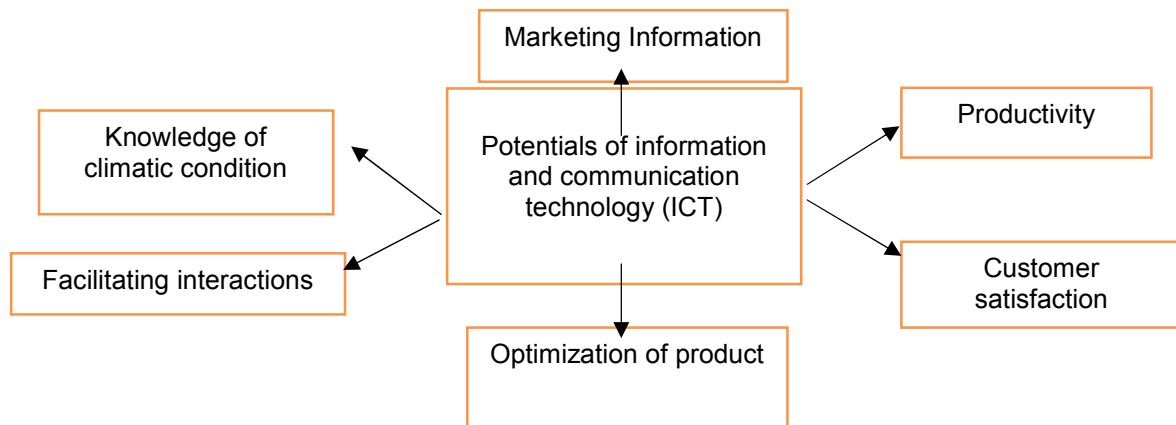


Fig 1. ICT capabilities in agricultural marketing

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