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## **E-readiness of Rural ICT Offices for Rice e-marketing in Rasht Township, Iran**

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### ABSTRACT

Applying Information and Communication Technology (ICT) in different economic sectors, especially the agricultural sector is increasing in developing countries. Rural ICT offices in Iran have an important role in decreasing the digital divide by representing internet, post and bank services; however they are not yet active in agricultural services. The present study seeks to survey the electronic readiness of 68 rural ICT offices in the rural area of Rasht in Guilan province, in the northern part of Iran. A five-point Likert type scale questionnaire was prepared, to survey socio-cultural, legal, connection and back-up services indices. Results indicated that intention to adopt, and legal aspects, required development, but the socio-cultural index had a better situation in comparison with others, and receptivity to agricultural electronic commerce (e-commerce) showed a high percentage among respondents. So this points to the necessity of creating an integrated website for rural offices to represent agricultural services. Also, the level of education and age of managers did not show any significant influence on receptivity to e-commerce, but internet skills and farmers visiting the offices have been important factors in receptivity to e-commerce.

**Key words:** E-readiness, rural ICT offices, e-marketing, Rasht

### IZVLEČEK

#### **PRIPRAVLJENOST PODEŽELSKIH IKT SVETOVALCEV ZA E-MARKETING RIŽA NA OBMOČJU MESTA RASHT, IRAN**

Uporaba informacijske in komunikacijske tehnologije (IKT) v različnih gospodarskih sektorjih, še posebej v kmetijstvu, se v državah v razvoju stalno povečuje. Podeželski IKT svetovalci imajo v Iranu pomembno vlogo v zmanjševanju digitalne pregrade tako, da posredujejo internetne, poštno in bančne usluge, niso pa še aktivni pri posredovanju elektronskih uslug za kmetijstvo. Predstavljena študija želi preučiti pripravljenost 68 podeželskih IKT svetovalcev v območju provinc Rasht in Guilan v severnem Iranu. Pripravljen je bil vprašalnik s petstopenjsko Likertovo lestvico s katerim smo ocenjevali kulturno-sociološke, pravne, povezovalne in podporne storitvene kazalnike. Rezultati kažejo, da namen za sprejetje storitev in pravna vprašanja zahtevajo dodatni razvoj, medtem ko imajo kulturno- socialni kazalniki, v primerjavi z ostalimi, višje vrednosti, kar velja tudi za sprejemljivost elektronsko trgovanje v kmetijstvu. To nakazuje potrebo po oblikovanju celovite spletne storitve za kmetijstvo, ki jo bodo podeželski svetovalci lahko uporabljali. Stopnja izobrazbe in starost podeželskih svetovalcev ni pokazala nobenega statistično značilnega vpliva na njihovo pripravljenost za elektronsko trgovanje, obratno pa velja za poznavanje interneta in pogostnost obiskov kmetov.

**Ključne besede:** E-pripravljenost, podeželski IKT svetovalci, e-marketing, Rasht

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## 1 INTRODUCTION

The world has witnessed the birth of a new era - the information age, a global wave sweeping through all corners of the world (Ifinedo, 2005). Information and Communication Technology (ICT) consists of some latest technologies such as the computer, internet, cell phone and satellite. Older technologies like radio, television, telephone and technology centers, employers, and investment are also in this zone (Dada, 2006, ITU, 2010). E-readiness (electronic readiness) assesses the quality of a country's ICT infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit. According to APEC (1999) e-readiness is the degree to which an economy or community is prepared to participate in the digital economy. McConnell International (2000) defines e-readiness as the capacity to participate in the global digital economy. In 2010, e-readiness was renamed as the digital economy (EIU, 2010).

In 2006 a study attempted to critically assess the concept of e-readiness (electronic readiness), and suggest ways to bridge the limitation of this tool, with a special focus on developing countries. Results showed that there were both positive and negative aspects of such measures. It was discovered that although e-readiness measures provide a useful overview of the environmental situation, they do not completely reflect the possibility of achieving development from ICT in developing countries. However, there are implications for further research in this area (Dada, 2006).

Ramayah et al. (2005) studied SME e-readiness in Malaysia. They reported that SMEs in Northern Malaysia are ready to go for e-business, e-commerce and Internet in general. They also showed that in general top management commitment and infrastructure and technology have significant impact on

SMEs' e-readiness. However, human capital, resistance to change, and information security do not have significant impact or contribution on e-readiness in SMEs.

The government of Zimbabwe commissioned an e-readiness survey in 2005 in conjunction with the National Economic Consultative Forum (NECF) to assess the country's readiness to embrace ICT. Such findings will later inform a broader national policy. However it does not explain whether in the absence of a national ICT policy, there were sector specific policies, as having such a policy is imperative. In order to bridge the digital gap, Zimbabwe needs to build the infrastructure to allow ICT to be accessible. There is a need to consider non-quantifiable variables, such as poverty and social justice. The other factor is the need for Zimbabwe's government to address current political and economic problems, as this isolation would impact heavily on the need to be interconnected (Mhlanga, 2006).

In a survey about digital development of rural areas in the USA, Maleki (2003) noted that Information Technology (IT) could be very efficient. However this efficiency is based on two factors which do not usually exist in rural sections-economies of scale and end-to-end service capability. He mentioned that investment in infrastructure would be the first step, and rural areas have been less considered in this issue. Not only investing in communication systems is important for rural development, but also educating villagers and local leaders. Information technology could develop rural business, and could be effective in job-creation (Maleki, 2003).

Case study evidence from various developing countries suggests that use of ICTs – especially mobile phones – is increasing among rural enterprises, and makes a positive

contribution to enterprise growth in rural areas. In the case of small farmers, diverse information needs can be identified along the value chain in connection with their primary and support activities;

- Inbound logistics - information concerning the sourcing and purchasing of seeds for a specific crop.
- Operations - information concerning seeding, preparing, planting, growing and harvesting.
- Marketing and sales - information that helps identify customers for the output. It is also important for the farmer to know when, and in which, markets to buy and sell.
- Outbound logistics - information concerning packaging, storing and transport.
- After-sales service - feedback from customers.
- Support activities - information on access to extension services, credit and insurance.

Information needs in rural enterprises directly linked to the poor can be considerable. A study of the value chain of poor vegetable farmers in Sri Lanka measured the information search costs for all core enterprise operations, such as land preparation, growing and harvesting, as well as for seed purchase and selling. It found that the relative proportion of information search costs in the total costs of production were highest in the early decision stages and the latter selling stages. Overall, information search costs amounted to 70 per cent of all transaction costs, and the transaction costs themselves were recorded as fifteen per cent of the total costs incurred. There is growing evidence that enhanced access to ICT has helped farmers address some or all of these needs. In many instances, this has been achieved through the spontaneous uptake of mobiles by farmers; in other cases information supply has improved as a result of deliberate assistance by government or other actors. There are also many examples of ICT initiatives aimed at improving relevant information that have failed to produce the desired results (UNCTAD, 2010).

In 2004 a study was conducted to evaluate the e-readiness of non-profit organizations (NPOs) in the Western Cape. The assessment of 100 NPOs, spread throughout the province, helped to identify the constraints to greater ICT adoption among NPOs, and also to determine if geographic location - inside or outside the City of Cape Town Municipality - has an influence on NPO e-readiness. Based on the results of the survey, appropriate recommendations were made to the government for its ICT enablement programs (Vosloo and Paul, 2004).

The Hawaii Department of Agriculture in a study called, "the feasibility of a farmer based e-commerce market", studied factors such as farmers' computer skills, internet structure and the way of delivering the product to the market, and then a website was designed. Farmers could deliver products to farm businesses, and then a central company would deliver the products to the customer (Hawaii Department of Agriculture., 2006).

FAO reported some examples of using rural ICT at different countries, in a report named 'Electronic Agriculture'.

Egypt VERCON (Virtual Extension and Research Communication Network) - Government researchers and extension workers in institutes and rural villages are now actively using a web-based portal system to exchange critical information with district offices and Ministries in Cairo. Researchers and extension workers presently access information resources such as extension brochures, statistical databases, decision support systems, and can participate in special interest forums, online discussions, news and events. An online query system called 'Farmer's Problems' answers technical questions raised by smallholder farmers.

FoodNet - This network in Uganda comprises a national system that was established to gather and disseminate agricultural market

price information via newspapers, the Internet, radio and mobile phones (SMS). FoodNet is a typical example of an agriculture application that can be found in many countries, showing how small-scale farmers in rural communities can overcome their marginalization through a mix of media including ICT based information access.

Rural Radio, ICTs and Food Security - for billions of people in rural areas, where illiteracy rates are high and access to electricity, phones and Internet is marginal to say the least, radio is still the most accessible, economical, and popular means of communication. FAO is working with the World Association of Community Broadcasters, AMARC, an international community radio network, and the Developing Countries' Farm Radio Network (DCFRN) to enhance networking and sharing by assisting radio stations to use the Internet to access alternative information on a range of subjects of interest to rural communities, including health, education, credit and local projects (FAO, 2005).

Establishment of rural ICT offices in Iran began in 2004 in villages with more than 150

families, and it developed from 963 rural offices in 2005, to 10,000 offices in 2010. Agriculture has the highest percentage of employment in Guilan province. It seems necessary to use the capacities of rural ICT offices to help with agricultural activities. The number of villages in Guilan province is more than 2600, of which 533 villages are equipped with ICT offices. Also the Rasht Township area has 292 villages, of which 92 have rural ICT offices. These offices have concentrated on areas of internet services, bank services and postal services in villages (Iran Statistics Centre, 2010).

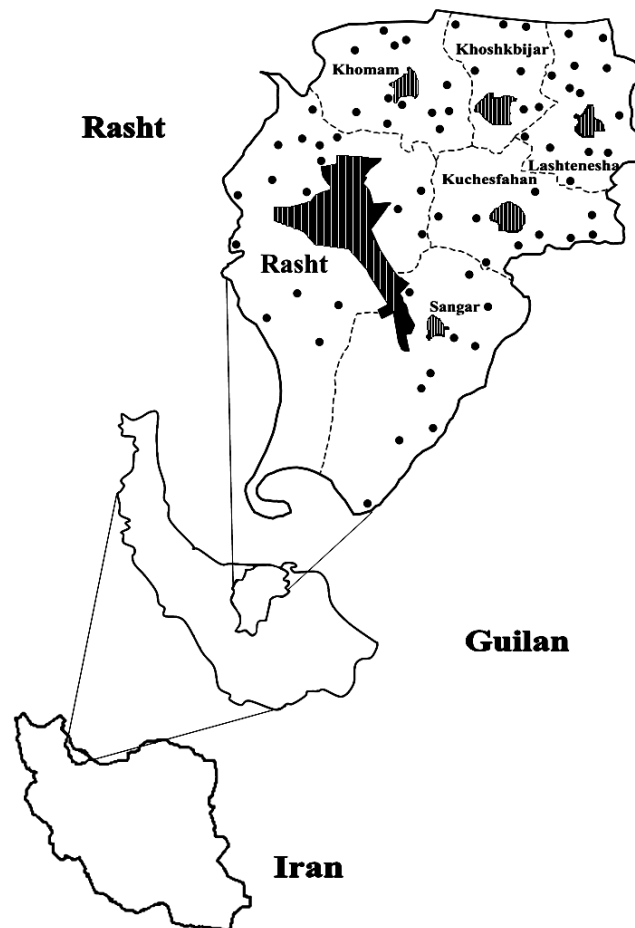
The main purpose of this study was to determine the e-readiness of rural ICT offices for rice e-marketing in Rasht Township, Iran. For this the following objectives were considered:

- 1 - Identifying the e-readiness of rural ICT offices.
- 2 - Identifying the effective factors in adoption of electronic marketing.
- 3 - Identifying attitudes of ICT office managers toward agricultural e-marketing.
- 4 - Identifying attitudes of ICT office managers about the e-marketing network.

## 2 MATERIALS AND METHODS

The Rasht Township is located in the north of Iran in Guilan Province and has six urban districts (the hachured areas in Figure 1). At the time of this study, 24 rural ICT offices among 92 offices were not active, and 68 offices rendered services which are shown in black points on the map. All 68 offices were

interviewed. As can be observed, these offices have a wide dispersion in the area of villages. Establishment of these offices has simplified accessibility to communication services for villagers, so decreasing their traffic to urban areas.



**Figure 1:** Site of study and dispersion of rural ICT offices

The researchers used survey research methods in which data was gathered by the questionnaire. Respondents were selected from rural ICT offices in Rasht Township. Distributing 68 questionnaires related to rural ICT management was achieved in three forms; thirty-five offices by fax, 22 offices by e-mail, and eleven offices by post. Before the questionnaires were sent, managers were called by phone and some details about the purpose of the survey were offered. To determine the validity of the questionnaire, ICT experts' comments were used. To

measure questionnaire reliability, ten of them were distributed to rural ICT offices, which were randomly selected, and finally, its reliability was established at 0.83, through the use of Cronbach's alpha coefficient. Data were collected from February to May, 2011, and coded and entered onto an Excel spreadsheet, imported into a PASW Statistics 18 data file, and analyzed using PASW Statistics 18. Calculations were of frequencies, percentages, means, standard deviations, cross-tabulations, Kurskal-Wallis test, and correlations.

### 3 RESULTS

Table 1 shows that among managers of ICT families were engaged in agricultural offices, most (60.3 per cent) were aged activities. between 20 to 30. More than 70 per cent of

**Table 1:** Personal characteristics

Age:	frequencies	percent
20 – 30	41	60.3
31 – 40	19	27.9
41 – 50	6	8.9
≤51	2	2.9
Farmer family:		
Yes	49	72.1
No	19	27.9
Level of education:		
High school diploma	26	38.2
2 years college	17	25.0
Bachelor's degree	25	36.8

#### 3.1 Identifying the level of e-readiness of rural ICT offices

To identify the level of e-readiness of rural ICT offices in Rasht Township, three indices with six questions in 5-point Likert type were asked from ICT officers. In the socio-cultural index and in the sub-index of adoption of electronic marketing, 77.9 per cent of managers had a good and very good tendency to cooperate with electronic marketing. Even in the sub-index of Internet skills, the condition was acceptable, and more than 50 per cent of managers reported 'good' and 'very good' status for their internet skills (table 2). Also, about level of education as a sub index of socio-cultural index, 38 per cent held a high school diploma, and 62 per cent held an academic degree (table 1).

Regarding the legal index related to electronic commerce and banking which was asked respondents to show their answers regarding the level of current laws to support e-marketing, 45.6 per cent of respondents reported at 'moderate' level and 23.5 per cent reported at 'good' situation.

In the back-up services index there was three sub indices. In the sub-index of e-banking education, 44 per cent of ICT offices managers reported an 'average' education. In post services, 69 per cent reported a condition between 'moderate' to 'good' situation. In addition, half of respondents reported a 'moderate' to 'good' condition for technical services (table 2).

**Table 2:** Socio-cultural, Legal, Backup services

index	Sub index		Very good	Good	Moderate	Weak	Very weak	M	SD
Socio-cultural	Adoption	frequencies	20	33	11	1	3	3.97	0.96
		percent	29.4	48.5	16.2	1.5	4.4		
	Internet skill	frequencies	10	27	26	4	1	3.60	0.86
		percent	14.7	39.7	38.2	5.9	1.5		
Legal	e-commerce legal	frequencies	1	16	31	19	1	2.95	0.79
		percent	1.5	23.5	45.6	27.9	1.5		
Backup services	E-banking education	frequencies	2	7	30	20	9	3.58	0.94
		percent	2.9	10.3	44.1	29.4	13.2		
	Post services	frequencies	9	20	27	9	3	3.33	1.01
		percent	13.2	29.4	39.7	13.2	4.4		
	Technical services	frequencies	3	8	29	20	8	2.64	0.94
		percent	4.4	11.8	42.6	29.4	11.8		

Most offices have ADSL broadband internet, and bandwidth in 50% of offices is 64 kb/s.

Also, approximately 90% of offices are connected to a banking network (table 3).

**Table 3:** connectivity Index

Variable	Internet:	
	frequencies	percent
Connectivity	DIAL UP	10 14.9
	ADSL	56 83.6
	WIMAX	1 1.5
	Bandwidth:	
	64 Kb/s	33 50.8
	128 Kb/s	24 36.9
	256 Kb/s	8 12.3
	Banking Network:	
	Yes	61 89.7
	No	7 10.3

### 3.2 Identifying the effective factors in receptivity to electronic marketing

Age, level of education and e-banking education of ICT officers had no effect on

receptivity to e-marketing, but three factors had effects on receptivity. These were, 'experience in offering internet services to farmers' ( $p = 0.04$ ), 'internet skill' ( $p = 0.01$ ) and 'connectivity' ( $p = 0.04$ ) (table 4).

**Table 4:** The Kurskal Wallis test - effective factors in receptivity to e-marketing

Factors	Chi-Square	df	p-value
Level of education	4.31	3	0.22
Age	4.04	3	0.25
Internet skill	12.28	4	0.01 *
Experience in offering internet services to farmers	15.64	4	0.04 *
E-banking education	2.45	4	0.65
Connectivity	15.24	4	0.04 *

### 3.3 Identifying Attitudes of ICT Office Managers towards Agricultural e-marketing

Managers of ICT offices believe that agricultural e-marketing may have the most efficiency to decrease the role of the middleman. However, the option ‘price

reduction’ had the least mean among respondents ( $M = 3.58$ ,  $SD = 0.88$ ). The score for option ‘very weak’ was one, and the score for option ‘very good’ was five. The mean of 68 managers’ response for each question is represented in the table 5.

**Table 5:** Identifying agricultural e-marketing

Role of E-marketing in		Very good	Good	Moderate	Weak	Very weak	M	SD
Middleman decrease	frequencies	23	36	7	2	0	4.17	0.73
	percent	33.8	52.9	10.3	2.9	0		
Ease in acquisition	frequencies	29	25	11	3	0	4.17	0.86
	percent	42.6	36.8	16.2	4.4	0		
Sale increase	frequencies	22	35	10	1	0	4.14	0.71
	percent	32.4	51.5	14.6	1.5	0		
Demand increase	frequencies	17	35	13	3	0	3.97	0.79
	percent	25	51.5	19.1	4.4	0		
Price reduction	frequencies	9	29	25	3	2	3.58	0.88
	percent	13.2	42.6	36.8	4.4	2.9		

### 3.4 Identifying Attitudes of ICT Offices Managers to the e-marketing network

Table 6 shows that 70.6% of respondents choose rural ICT offices for agricultural e-

marketing as the best among three possible networks, including public offices network, rural offices network and rural cooperatives network.

**Table 6:** Agricultural e-marketing network

Network	frequencies	percent
Public offices network	2	2.9
Rural ICT offices network	48	70.6
Rural cooperatives network	18	26.5

## 4 DISCUSSION AND CONCLUSION

Conclusions of some studies have shown that awareness and receptivity to electronic agriculture enjoys a better condition in Asia in comparison to Europe/North America. EAWG,

or the e-agriculture Working Group (2007) studied 4000 people in 135 countries worldwide, in cooperation with FAO and several other world organizations in a poll



titled, 'Familiarity with the term e-agriculture'. In a question related to respondents' familiarity with electronic agriculture in Asia, the percentage of those who were familiar with e-agriculture was more than in other continents, as 37 per cent of responses were positive. However in North America 29 per cent and in Europe 32 per cent of answers were positive. Shehata *et al.* (2006) interviewed 147 managers of cooperatives in a study of feasibility assessment for cooperative e-commerce. Conclusions of the polls showed that approximately 46 per cent are interested in e-commerce (Shehata, 2006), while receptivity to e-commerce was 80 per cent in this study. Postal service for the fast sending of goods from rural offices to other areas has a moderate status, while e-marketing required postal services with minimum time. Twelve per cent of rural offices have a fast internet

speed (256Kb/s), 37 per cent of them have an acceptable internet speed, (128Kb/s), but 51 per cent need to develop their internet speed (64Kb/s) to begin e-commerce. At the present time, rural ICT are managed with a proper dispersion in areas of villages by personnel who are from farming families and have a suitable capacity to help agricultural activities through internet, post and bank services. It is considered necessary to create an integrated system of rural ICT offices.

Rural ICT offices network could be a proper pattern in this regard. Farmers should refer to ICT offices where they live and represent specification of their products so that office operators register the information after they enter the rural office site. They would send products through that office and the post after customer purchase and receiving orders.

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