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Effectiveness of Rural ICT Centers: A perspective from west of Iran

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Abstract

Rural Information and Communication Technology Centers (ICT Centers) play an important role in rural development through improving e-governance in rural areas. The main purpose of this survey research was to investigate the effectiveness of rural ICT Centers for developing e-governance in the rural communities of the Kermanshah Township, located in the west of Iran. The data were collected in two phases. The first stage utilized a Delphi technique, carried out by the participation of ICT experts to determine the effectiveness indicators. The second phase employed a structured interview using a questionnaire. The majority of people did not use internet services despite its availability in the ICT Centers. The ICT Centers also had low effectiveness in improving rural households' income, employment rate, diffusion of agricultural information among farmers, and e-commerce. They are to some extent effective in decreasing the migration of rural people to urban areas, their daily trips to near cities, and postal requirements as well as improving e-governance in rural areas.

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1. Introduction

We are living in the world that brings together people from different contexts. In this situation, people may learn from one another, but they also need basic access to and understanding of information and communication technologies (ICTs) [3]. This is also especially important in rural areas. Not only do rural people need to understand the rapid evolution of new ICTs, they also need to catch up with the rapid changes imposed on the social structure at work, and at home. It is indeed necessary to shape the Iranian rural information by harnessing the key information and communication technologies and skills required for the socioeconomic development of rural communities. This understanding needs to take shape within the context of the realities of the country in terms of information literacy. If rural areas do not become a major player in using or sharing ICTs, rural development may face a new challenge, an information gap in a very rapid changing world.

ICTs can enable rural communities, particularly in developing nations with an opportunity to meet development goals such as poverty reduction, basic health care, and education far more effectively than ever before. Using ICTs in rural areas for enhancing agricultural production is suggested to be immensely beneficial as most of the poor live in rural areas [7]. Moreover, ICT application in rural areas can give them a voice and improve their employment.

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Some studies show that ICTs have directly improved economic and social situation of the rural people, which can lead to enhanced rural communities' livelihoods. This related to the main strategy of rural development, consisting of poverty alleviation, better livelihood opportunities, provision of infrastructures through innovative programs of entrepreneurship and self-employment.

The ICT centers are public places where people can use computers, the internet, and other media; get training; and obtain a variety of other communication-related services. The ICT centers were also to create an enabling environment for research and tele-working to increase employment opportunities [9].

ICT centers are able to influence a wide range of development issues such as business and education development to the extent to which information and communication is important to individual users [9]. Some studies have emphasized the assessment of these centers in the world. .

IDRC has supported a variety of Telecenter experiences in Asia, Africa and Latin America. Some of them were the result of collaborations with ITU, UNESCO, and other partners. a number of studies and efforts have been conducted and developed regarding systematic and useful evaluation frameworks and methodologies in Africa and Latin America. Gomez and Hunt in their assessment regarding the IDRC interventions explored in depth the challenges and opportunities of telecenter evaluation in Latin America, Asia and Africa [2]. They also investigated emerging evaluation frameworks and methodologies as well as the needs and resources available for telecenter baseline evaluation, monitoring, impact assessment, and to identify salient issues affecting telecenter performance. They identified that of the Hawaii Telework Center had a very positive result. The researcheres suggested telework centers as feasible entrepreneurial environments. Furthermore, the large-scale use of such centers would result in substantial transportation benefits for the State of Hawaii [2].

Based on the Nykvarn Neighborhood Work in Sweden, the employers seemed more willing and less skeptical than their U.S. counterparts to allow their employees to work away from the office [9]. Another assessment is related to the ITU Evaluation of Multipurpose Community Telecenter Pilot Projects Case. One objective of the program is to evaluate the social, economic and cultural impact of providing access to such facilities and services and thereby sensitize policy makers to the needs and cost-effectiveness of providing such tools for development. Another objective is to assess the needs and demand for ICT in rural and remote areas. This Case presents a common framework for evaluation of rural telecenters projects including research questions to be answered, indicators and tools. Moreover, the preliminary evaluation of Telecenter Pilot Projects in South Africa was directed in indexes including accessibility, functionality, service usage, sustainability, operational costs, expenditure and income.

The other project is Sustainable Access in Rural India (SARI) which has been widely acclaimed for its efforts to provide comprehensive information and communication services through computers and internet in rural areas in the Tamil Nadu state in India .

Detailed interviews with the kiosk users and operators revealed that the kiosks seemed to be reaching only 4-8 percent of the village population. This indicates that only a very small fraction of the village households have benefited from the kiosk. However, the detailed field study revealed a number of other important factors which are relevant to make an accurate assessment of the social and economic impacts of the kiosks.

Almost 34 percent of Iranian population lives in villages. The government intends to facilitate ICTs to most of these villages. The experience of Iran show that Iran's rural ICT network began to be developed in 2000, when the village of Shahkoooh in the north opened the country's first multi-media center. Two well-equipped ICT centers were opened in the nearby villages of Gharnabad and East Livan in 2004. Then Iran developed its National Rural ICT Strategic Plan to provide communities with access to the internet and applications such as e-government, e-commerce, e-learning, e-banking and other e-services.

The geographical delimitation of this study is the Kermanshah Township in west of Iran. At present, there are 22 ICT centers in rural areas of this Township that is center of the Kermanshah Province in west of Iran [5].

2. Purpose and objectives

The main purpose of this study is to assess the effectiveness of ICT centers located in the villages of the Kermanshah Township.

The objectives are: 1) to assess ICT center effectiveness based on achieving their goals and based on benefits received by the households and communities, and 2) to assess the accessibility of these centers.

3. Methods and Procedures

The study's design is a descriptive survey, which focuses on a population of 6218 rural household heads (based on the Agricultural Jihad Organization in the Kermanshah Province) in the Kermanshah Township in the West Iran. A sample of 367 rural household heads was selected through a stratified random sampling. The data were collected in two phases. The first stage utilized a Delphi technique in 15 ICT experts to identify indicators needed for determining effectiveness of rural ICT centers. Delp, Thesen, Motiwalla and Seshadri (1977) have described the Delphi technique as a group process used to solicit, collate, and direct expert responses toward reaching consensus [1]. Helmer (1966) has also described this technique as a method of securing and refining group opinions and substituting computed consensus for an agreed-upon majority opinion [3]. Stufflebeam, McCormick, Binkerhoff, and Nelson (1985) have noted that the Delphi technique is especially effective in obtaining consensus from a purposively selected group of experts [7].

The study employed a series of three self-completion postal questionnaires. The first round used a questionnaire with this open-ended question: "What are the major indicators for assessing effectiveness of rural ICT centers?" This question produced a wide array of response categories. Responses were then categorized in 28 categories to produce items for the second round questionnaire, in which respondents were asked to rate the items identified in round one using a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree). The responses of this step produced a list of categories, which were reduced to 25 items. In the last step of Delphi technique, the participants were asked to provide a dichotomous indication of whether they agreed or disagreed that each of the items listed could be the indicators for measuring the effectiveness. The results showed a consensus on 22 statements

The second phase utilized a structured interview using a questionnaire developed from on the findings of the first stage using the Delphi technique. The purpose of the second stage was to determine the effectiveness of rural ICT centers. To establish the content and face validity of the survey instrument, a panel of experts containing the academic staff of the Faculty of Agriculture in Razi University was established, in which they revised the instrument. The reliability of the instrument was also measured by selecting a sample of 30 rural household heads that were later excluded from the study. The Cronbach's coefficient alpha for the instrument (for the variables related to the effectiveness construct) was measured to be 0.77, which meant a reliable construct for measuring effectiveness. The data were then coded and analyzed using the Statistical Package for the Social Sciences (SPSS).

4. Findings

The first phase of this research sought to identify the major indicators for assessing the effectiveness of rural ICT centers. Table 1 contains a summary list of indicators identified in round three.

As showed in table 1, the panel's members agreed that 22 items constituted the major indicators for assessing the effectiveness of rural ICT centers. The highest level of agreement was reached on e-Commerce (88.2%). Over 80% of the panel's members agreed that six additional categories were also important indicators for measuring the effectiveness of ICT centers. These six indicators were: filling leisure times of rural youth, improving postal services, reducing trips to urban areas, improving employment opportunities via job searching, increasing access to telephone, and official registrations through internet. Additional indicators are also listed in table 1.

Table 2 indicates the data on the perceptions of the sample of rural household heads regarding the effectiveness level of rural ICT centers. Overall, rural people perceived ICT centers to somewhat effective ($M= 2.55$, $SD= 0.87$).

The rural respondents perceived that rural ICT centers were only effective in terms of two indicators. These indicators were increasing access to telephone (Mean = 4.21; on a scale where 5 = very effective and 1 = not effective), and official registrations via internet (Mean=3.58). As identified in Table 2, the effectiveness level of ICT centers was perceived to be very low in the areas such as changes in household income, e-commerce, access to information about agricultural input and output prices, the awareness of national events, increasing value of agricultural sales, growing the number of community business, business services, developing crop insurance, access to agricultural weather information, access to information concerning agricultural inputs, access to information about agricultural markets, access to rural cooperatives information, and improving employment opportunities via job searching. These centers were to some extent effective in remaining indicators (Table 2).

Table 1. Delphi technique- Round One: level of agreement with effectiveness indicators (n=15)

Indicator	Agree (%)
E-Commerce	88.2
Filling leisure times of rural youth	87.1
Improving postal services	84.2
Reducing trips to urban areas	83.6
Improving employment opportunity via job searching	82.3
Increasing access to telephone	81.8
Official registrations by Internet	80.2
reduction in rural-urban migration	78.8
Developing crop insurance	77.1
Business services	76.2
Growth in the number of community businesses	75.5
Access to improved health and hygiene information	73.2
Access to rural cooperatives information	72.5
Increasing value of agricultural sales	71.4
Access to information about agricultural markets	69.8
Access to information about agricultural inputs	67.5
Access to agricultural weather information	66.1
Awareness of events in the country	65.5
Reduction in monetary cost to obtain information and communication	65.4
Reduction in time to obtain information and communication	64.9
Access to information about agricultural input and output prices	46.1
Changes in household income	63.9

Table 2. Effectiveness level of ICT centers as perceived by rural household heads (n=367)

Indicator	Mean	SD
Increasing access to telephone	4.21	0.89
Official registrations by Internet	3.58	0.97
Reducing trips to urban areas	3.38	0.99
Improving postal services	3.22	0.87
Reduction in monetary cost to obtain information and communication	3.19	0.98
Reduction in time to obtain information and communication	2.99	0.87
reduction in rural-urban migration	2.75	0.84
Filling leisure times of rural youth	2.73	0.78
Access to improved health and hygiene information	2.68	0.86
Improving employment opportunities via job searching	2.42	0.84
Access to rural cooperatives information	2.41	0.88
Access to information about agricultural markets	2.31	0.87
Access to information about agricultural inputs	2.28	0.99
Access to agricultural weather information	2.27	0.89
Developing crop insurance	2.23	0.86
Business services	2.13	0.88
Growth in the number of community businesses	1.96	0.78
Increasing value of agricultural sales	1.93	0.85
Awareness of events in the country	1.88	0.85
Access to information about agricultural input and output prices	1.84	0.84
E-Commerce	1.83	0.99
Changes in household income	1.79	0.89

Scale: 1=not effective, 2=of little effectiveness, 3=somewhat effective, 4=effective, 5=very effective.

5. Conclusions and Recommendations

Establishing rural ICT centers has been one of the main national policies of Iran in order to provide information and communication technology services to rural communities. Therefore we conducted this research to analyze the effectiveness of these ICT centers. We tried to identify the most important indicators for assessing the effectiveness

of rural ICT centers. Overall, the rural communities and households have assessed these centers to some extent effective. However, this effectiveness has been mostly related to a few services, such as increasing access to telephone and internet official registrations rather than many services considered by the authorities in the Ministry of Information and Communications Technology. For example, from the rural households' point of view, these centers have made little impact on household income changes, e-commerce, and access to information regarding agricultural input and output prices.

Rural ICT centers need to be enabled for undertaking other duties in the process of rural development, for example e-commerce, providing and disseminating information needed by rural communities and farmers. They can also be empowered to provide information concerning agricultural production and marketing, agricultural subsidies, cooperatives, insurance, finances, and public credits. Providing relevant training courses to the staff of rural ICT centers and rural households prior to and after their establishment can improve their effectiveness. For instance, training courses can be in the subjects such as the philosophy, purpose, and the nature of ICTs; the types of services that these centers can provide; and even their cultural and social consequences. Rural communities and households should involve in participatory planning and management of rural ICT centers, which include both financial investment and decision making. Further and continuous evaluation studies can help policy makers understand the social and economic outcomes of rural ICT centers.

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