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Role of E- Agriculture, E-Government, E-Learning, E- Commerce in Rural Areas

Priya Katre[1], Neelam Jaiswal[2] and Nikeeta Tiwari[3]

Theme: Computer Science Engineering

Asst. Professor (Horticulture) Shri Ram College of Agriculture, Rajnandgaon, IGKV (C.G)

Asst. Professor (Agril. Extension) Shri Ram College of Agriculture, Rajnandgaon, IGKV (C.G)

Asst. Professor (Entomology) Shri Ram College of Agriculture, Rajnandgaon, IGKV (C.G)

Abstract

E-Agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (ICTs) in the rural domain, with a primary focus on agriculture. People around the Globe from few years from now will be carrying a handheld computer connected to the Web to get the information about the World at their fingertips. E-Agriculture is an emerging field focused on the enhancement of agricultural and rural development through improved information and communication processes. E -government is an important facilitator of good governance. E- Government is the use of Information and Communication Technologies (ICTs) to transform government by making it more accessible, effective and accountable. ICTs allow better interaction among the government, its institutions and people. By using ICT, the role of government changes from direct involvement to a more limited involvement, thereby empowering citizens (Yu and Fang, 2005). e-learning is, however, not an alternative to investment in education generally; the two should be seen as being complementary. Integrating e-learning programs into existing educational systems can promote, however, a transformation. Implementing a comprehensive e-learning program would mean changes to the curriculum, infrastructure, teacher professional development, textbooks, and exams. A major benefit of integrating e-learning into governmental educational systems would be, however, a long-term commitment to growing and maintaining the program, with fewer e-learning initiatives ending when donor funding stops. E-Commerce has transformed the way business is done in India. With attractive and convenient shopping options at the core of the consumer facing business, the e-Commerce industry offers the power to create innovative, sustainable, consistent and seamless shopping experience across all channels. In the last 4 years, while the e-Commerce B2C segment has grown significantly leading to creation of many Unicorns, the focus of the Investors going forward seems to have shifted to profitable growth to achieve a stabilization of the economic model.

Keywords: *e-Agriculture, e- government, e-learning, e- commerce*

INTRODUCTION

Agriculture sector in India is facing lots of Challenges. 50% of the population engaged in agriculture are still illiterate and just 5% have completed Higher Secondary education. The Education & Incomes of agricultural laborers very low. During 1982 families operating farms below 1 hectare was 56% which has become 70% in 2003[1]. Information and Communication Technologies (ICT) plays a vital role in Development & Economic growth of the Developing countries of the World. Political, Cultural, Socio-Economic developmental & behavioral decisions today rests on the ability to access, gather, analyze and utilize information and knowledge. ICT is the conduits that transmit information and Knowledge to individual to widen their choices for Economic and social empowerment. ICT also has an impact on a country's development and growth. Recent World Bank study shows that a 10% increase in mobile phone subscribers is associated with a 0.8% increase in economic growth while 10% increase in high speed internet connections is related with a 1.3% increase in economic growth. ICT infrastructure development attracts foreign direct investment, generates fiscal revenues, and creates employment opportunities. Local information technology service industries generate exports, improve a firm's productivity, and offer equalizing job opportunities, especially for youth and women. Mobile phones and other ICTs can provide a broad range of public and social services to the poor in remote areas and they have become an essential as well as an essential utility for the poor. Farmers in remote villages use mobile phones to access the most current crop prices and migrant workers use mobile banking services to transfer money to relatives back home. Increasingly, land registration, education, health care and voting are being conducted electronically using ICT. ICT is the conduits that transmit information and knowledge to individual to widen their choices for Economic and social empowerment. By integrating technology into development, more effective and speedy solutions can be found for sustainable human development & economic

E-leaning focuses on usage of technology in the field of education and learning. E learning refers to the use of advanced technology of information communication in the learning process where the advanced technology comprises of electronic media. In the current scenario, the rapid growth of information and communication technology has led to the alphabet "e" becoming the symbol of this latest age of information technology. The alphabet "e" is used as abbreviation for electronics. Thus, words prefixed with "e" are currently emerging in every second field, like e- learning, e - health, e-business, e government and many more. In the current scenario, where the world is being dominated by globalization, networking and information technology has reached its peak, e-learning plays a vital role in the field of education.

In the field of agriculture, according to Nelson, "Today, farmers feed 6 billion people. However, some 800 million people go to bed hungry every night and 166 million children are malnourished. At the same time, current agricultural practices are responsible for dead zones at the mouths of the world's rivers and rapid species extinctions. By 2050, the human population will grow by two to three billion. The challenge for agriculture is not only producing more food but producing it in a sustainable manner while raising living standards for the poor, many of whom live and work in rural areas. All this must be done while dealing with the uncertain consequences of global warming and geopolitics. The solutions will include new policies, new technologies, and new production practices" (Nelson 2006)

Over the last ten years, the way of buying and selling of goods and services has been changed by the Internet. E - commerce is transforming the shopping experience of Indian customers. The introduction of electronic data interchange spreads into producers, retail traders, stock market operations and travel reservations etc which resulted in a higher growth of the economy. The term 'E-commerce' means doing online business with the help of computer, fax, e-mail and telephone. It has been come out from the term 'Email'. In 1972, the term 'E-commerce' used by IBM for the first time [1]. In 1973 with the invention of computers, the first successful transaction was carried out between the European Union and the USA. In 1995, the introduction of internet in India marked the beginning of e- Commerce in the country. Internet and Mobile Association of India states that Indian online retail market is expected to grow at the rate of 52 % and will reach USD 36.7 billion in 2020.

The role of e-Agriculture

1. Ensure the systematic dissemination of information using ICTs on agriculture, animal husbandry, fisheries, forestry and food, in order to provide ready access to comprehensive, up-to-date and detailed knowledge and information, particularly in rural areas.
2.Public-private partnerships should seek to maximize the use of ICTs as an instrument to improve production (quantity and quality).
3.Global Positioning Systems (GPS) to locate and define spatial features or activities that contributes to the quality of site-specific practices;
4. Variable Rate Technology (VRT) allowing targeted, site specific input applications; and
5.Yield monitoring for recording crop productivity as an historical database for crop management

ICT in support of rural poverty elimination and food security

In August 2003, the Overseas Development Institute (ODI), the UK Department for International Development (DFID) and the United Nations Food and Agricultural Organization (FAO) joined together in a collaborative research project to look at bringing together livelihoods thinking with concepts from information and communication for development, in order to improve understanding of the role and importance of information and communication in support of rural livelihoods.

The policy recommendations included:

- Building on existing systems, while encouraging integration of different technologies and information sharing
- Determining who should pay, through consensus and based on a thorough analysis of the costs
- Ensuring equitable access to marginalised groups and those in the agricultural sector
- Promoting localised content, with decentralised and locally owned processes
- Building capacity, through provision of training packages and maintaining a choice of information sources
- Using realistic technologies, that are suitable within the existing infrastructure
- Building knowledge partnerships to ensure that knowledge gaps are filled and a two-way flow of information allows knowledge to originate from all levels of the network and community.

The importance of ICT is also recognized in the 8th Millennium Development Goal, with the target to"make available the benefits of new technologies, especially information and communications technologies (ICTs)" to the fight against poverty

Some Rural e-government projects in India

1. E-Choupal: Agriculture is the backbone of India. Indian farmers have to depend on many agents, right from the process of procuring raw materials to selling their produce. Each agent will add his/her profit margin, thereby increasing the cost of

product. Some agents even try to block the market information. To protect farmers from such practices, the International Business Division of Indian Tobacco Company (ITC-IBD) came out with an e-government initiative called e-Choupal (which means a village meeting place). E-Choupal is useful not only to the agricultural products but also for selling home appliances and consumer goods. Each e-Choupal is equipped with a PC, internet connection, printer and Uninterrupted Power Supplies (UPS). In
case the power supply is erratic, a solar panel is provided and if internet connectivity is not up to the mark, then a Very Small Aperture Terminal (VSAT) connection is provided along with another solar panel to support that.

2. Drishtee: Drishtee is a rural model of distribution and promotional network for consumer goods and basic services. Information is provided to the users in the form of services via internet (Government of India, 2003). Drishtee made a presence in Dhar, Seoni and Shahdol districts in Madhya Pradesh, Sirsa district in Haryana and Jalandhar district in Punjab. A village entrepreneur is trained to handle the software that works on MS SQL Server at the back-end and runs on ASP, Java script, VB Script at the front-end. The hardware includes a web server, a district server, kiosks and dial-ups. The district server regularly gets connected to the web server and performs updates. The database of kiosk gets updated whenever the kiosk gets connected to the district server or the web server. So centres have been established to cater to 25–30 surrounding villages and buildings of Gram Panchayats.

3. Akashganga : Akashganga uses ICT to facilitate rural milk producers by integrating all the operations of rural co-operative society right from milk procurement to accounting. First pilot model of Dairy Information System Kiosk (DISK) is currently under implementation at Uttarsanda Dairy Cooperative Society in Gujarat. Each farmer is given a plastic identification card. When farmers arrive at the Raw Milk Receiving Dock (RMRD) counter, his/her identification is updated in the PC. The milk is emptied out in a steel trough kept over a weighbridge and the weight of the milk is displayed as well as entered into the PC. One operator is required for filling of cans and another for measuring fat content and updating the PC. The infrastructure used to carry out these operations includes weighing balance, microprocessor, printer, milk analysers and a display.

The potential of e-learning

e-Learning is a broad term that encompasses many teaching approaches, types of technologies and administrative practices. A challenge in analyzing e-learning is that the technologies and their educational applications are developing extremely rapidly. An additional challenge is that its newness and the excitement around their utility are leading to many suggestions for how to use technologies in and outside of the classroom. Nevertheless, the paper summarizes some e-learning solutions that have been applied and tested in developing countries. Some of the important potential contributions of e-learning programs in such educational systems include:

1. Addresses the shortage of teachers, especially science and other specialty teachers. It can do this by providing high quality teaching materials, such as videos, interactive software or information from a “cloud” on the Internet or a local computer. In a distant classroom or video conferencing approach, the number of students who receive live instruction from teachers in specialty subjects can be much larger.

2. Addresses the shortage of learning material such as textbooks for students. The material could be made available on hand-held devices such as e-readers or mobile phones. Interactive features such as quizzes or games could improve the level of learning and understanding.

3. Improves the quality of education by providing improved informational content and learning approaches. Interactive, communicative e-learning may promote the development of skills in students (so called “21st Century Skills”) such as critical thinking and problem solving, communication, collaboration and creativity.

4. Provides students information and communications technology skills. The graduates will be better equipped to contribute to the knowledge-centered globalized economy of their counties.

E-commerce

A. *Mode of E-commerce:*
E-commerce can be categorized into three modes or segments based on the participants involved in the transaction. 1) Consumer-to-Consumer (C2C): It finds innovative ways to allow the consumer to interact with each other and by doing so they can sell goods or services to each other. 2) Business-to-Consumer (B2C): B2C transaction is conducted over the internet between a business and a consumer. E.g. an online publisher may sell his book to a customer and receive payment without meeting him/her. 3) Business-to-Business (B2B): It refers to a situation in which one business make a transaction with other.

B. ***Overview of the e -commerce retail supply chain***

E-commerce retail supply chain consists of several stages such as procurement, bar-coding, quality checking, storage of goods, packaging, dispatch and return to vendor. First four stages are known as first-mile delivery. Figure 1 shows the overview of a supply chain of e-commerce.

CONCLUSION

There is great potential for e-agriculture applications in developing countries however; e- agriculture applications such as precision agriculture and e-commerce in agriculture can only work in an environment where there is a good ICT infrastructure. Precision agriculture requires expensive advanced technologies, which are only viable in intensive farming systems. Participation in e-commerce activities requires that both buyers and sellers have access to the Internet, and that they are able to use the required hardware and software effectively. Unfortunately, in most developing countries, there are many constraints blocking the development of e-agriculture. These include lack of sustainable ICT infrastructure, absence of appropriate skills among potential users of ICTs (farmers, rural communities, extension staff and researchers etc), lack of appropriate content, and lack of access to ICT facilities. For e-agriculture to benefit rural communities in developing countries, the rural digital divide must be bridged. Locally relevant digital content has to be developed or adapted; and access to ICTs should be made affordable for rural populations. Otherwise e-agriculture applications will remain beyond reach of rural communities, and will merely exacerbate the existing rural digital divide - leading to an ever-widening knowledge gap between information “haves” and “have-nots”.

In the e-government projects described most projects were designed adequately until the last phase (customisation) of design, while only a few reached the last phase of implementation (i.e. transact phase). This suggests that future projects should be designed and implemented with incremental approach in order to realise full benefits. Further, there is little evidence of involvement of citizens in government decision-making (Marchionini et al., 2003). Future e-governance applications may consider e-voting and email campaigns, so that citizens can express opinions on public policies on food, transportation and environment. Employment of new technologies will enable governments to provide the above services more meaningfully. However, governments should carefully devise their regulatory procedures so that competition is encouraged and innovation is stimulated (Choudrie and Papazafeiropoulou, 2006).

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