

ICT Avenues in Indian Agriculture: An Analysis

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Abstract: Agriculture has been the traditional occupation and the way of life of people all over the world from times immemorial. Agricultural sector has been growing with the given environment across the world. During the yester years the method being followed was traditional. As days passed by growth took momentum with the introduction of Information, Communication and Technology (ICT) in agriculture sector. Accordingly, modernization in agriculture took place with the development of ICT in most of the European countries. Thus, the agriculture which the countries practice today is entirely different from that they had during the yester years. Growing population across the world would create gap between demand and supply of food grains in impending days, especially it will be made more sound in India and China. As compared to developed countries, the situation is different, in favour of ICT, in these countries where most of the farmers practice traditional method and the less percentage of (only large farmers) farmers exercise the ICT and benefits its fruit (ratio is 1000:1). When lack of information and communication tied with other distress factors like natural hazards, diseases, pests and so forth, leads to a huge loss in the quantity and quality of farm production, which ultimately suffers farmers by the way of offering low price to such good. This paper gives the insight about the accessibility of ICT based services to farm sector development in India.

Key Words: ICT, Agriculture, Cyber-Dhabas, E-Choupal, LAN, Kisan Card.

1. INTRODUCTION:

Even today agriculture is the most desired occupation (58%) in India as well as developing nations. However, the phenomenon intensified that since the last two decades; Indian agronomy has noticed many changes. India's agricultural sector has been undergoing a critical phase during the past few years. The trends in the sectorial contribution to GDP reveals that primary sector steeply going down and contributed a low of 14 percent in 2016-17 (57.52% in 1960-61). Former implies that the Indian economy is shifting away from agriculture, which is a positive sign only if viewed from the point of view of structural changes, but is accompanied by serious negative externality associated factors with the farm sector livelihood. Along with these changes in the agrarian situation wide spread distress in the sector became bare open. Productivity and net real income generated in the farm sector has stagnated in the last decade. This has pushed more farm families under the poverty line. On the other hand, Industry and service sectors widening their scope by briskly utilization of ICT. As regards to above, the situation is completely different in developed nations where very low labour force has been engaged (an average 5 to 10%) in agriculture activities and achieved self-sufficiency in this respect¹. In 1935, there were 6.8 million farms in America, and on an average each farmer used to produce enough food each year to feed 20 persons. In 2002, the number of farmers was 2.16 million and on an average the USA farmer produced food to feed almost to 130 persons. The USA exports about \$60 billion worth agricultural products to other countries, whereas India exports only 8.56 per cent (2012-13) of total agricultural products. In spite of practicing price mechanism, supporting prices, subsidies and so forth, farmers in India are not getting remunerative price to their commodity and evenly committed to suicide. It is worth here to raise the question ourselves that why Indian agriculture sector still back warded one? One of the simple answers is scanty practice of ICT in agriculture sector. Curse

The curse of Indian agriculture is not dearth of technologies and research and development but scanty and insufficient broadcasting of relevant information to the farming sector (Bahl, 2008)². In developing nations, agriculture information has been found out of dated and irrelevant and that is not applicable to farmers (Meera et.al, 2004)³. In agriculture, development of Science and Technology has contributed to better soil nutrient, water, and pest management and to more efficient method of planting, harvesting, storing, processing, marketing, etc. These

¹ Agriculture employs over 1.3 billion people throughout the world of closely to 40 per cent of global workforce in about 50 developing nations half of the population & & in case of under developed nations about 75 per cent , source: www.momagri.org/UK/agriculture

² Bahl, Mela (2008), S&T for Rural India and Inclusive Growth: ICT in Agricultural Marketing , www.nistads.res.in

³ Meera, Shaik N, Anita Jhamtani and D.U.M Rao (2004) , Information and communication Technology in Agriculture Development : A Comparative Analysis of Three Projects from India, Agricultural Research and Extension Network , Network Paper No.135

developments have resulted in better quantity and quality of products. Many farmers now implement a variety of technologies, including processing in agriculture, remote sensing, computer, internet, specialized software etc. Global Positioning System (GPS) is a key technology utilized in agriculture linking to a system of satellites, where a farmer uses a receiver to pinpoint his or her position of location. The information helps the farmer identify precisely where to plant, and when and where to apply pesticides and fertilizers etc.

Agriculture advancements also help much for small farmers selecting in seeds, optimizing agricultural production, in getting competitive prices etc. Many of the high yielding varieties result from advance in genetics and modern biotechnology. In recent days, most of the developed countries agriculture has completely under taken with using information technology. But it is not possible for developing and less developed countries because most of the village people are under literate⁴, small land holders and tradition bound.

2. PAPER SCHEME:

The present, micro level, study provides a brief picture of the Agricultural Information Communication Technology in India. Further, the Paper also presents the types of information systems, advantages of IT in Agriculture Sector. Further, the possible reasons for slow pick up of IT in Indian agriculture are also identified. This study is purely based on secondary data.

3. TYPES OF INFORMATION SYSTEMS:

Agricultural Information can broadly be distinguished as Formal and Informal Information.

3.1 Formal Information

Formal information is typically written and may be divided into data (statistics and other raw information) and processed information that is based on interpretation and analysis of the raw data. In this category NIC (National Informatics Centre) has been conducting various training programmes on IT application on a regular basis from time to time for better organization of agriculture.

Agriculture Information Division (AID) of NIC has taken up various initiatives in bringing IT-led development which includes web-enabled applications, GIS based applications, multimedia applications, Data base applications and e-governance and training in the Ministry of Agriculture. Many of the IT-based services provide information to farmers. Only a few formal IT based services are discussed below.

IFFCO-ISRO-GIS⁵: IFFCO has initiated IT- based services for farmers and societies. This project extends efficient and timely availability of IFFCOs fertilizers to farmers. In addition to GIS- based services, effort is being made to create data base that contain information of interest to the farmers.

Cyber-Dhabas: IT-based Cyber Dhabas are provided with a PC and a telephone communication to connect the data base. The farmers can take the assistance of the operator of Cyber Dhabas for annual changes.

E-Choupal: It is a unique web-based initiative, farmers can access the latest local and global information on weather, scientific farming practices as well as market prices at the village.

National E-Governance Plan (2003-07): It reflects the strategic intent of the Central Government in the right prospective. The political system is keen to use IT to dissemination of information faster to farmers, disburse loans, and improve education and health system in villages.

Mahindra Kisan Mitra: this system access information on weather updates, crop advises, agri-related news and so forth. Further, it also provides information relating to daily market, mandi data base, cold storage and warehouses, loans and so forth.

Local area Network (LAN): LAN was established with the support of the Ministry of Agriculture spread over various buildings namely Krishi Bhavan, Shastri Bhavan, Krishi Anusadhan Bhavan etc. These are all houses providing a farmer favorable information. In additions to video conferencing facilities were projected in the country.

Agriculture Marketing Information Network (AGMARKNET): It was established on turnkey basis by the Directorate of Marketing and Inspection (DMI) improving the prevailing agricultural marketing information system by minimizing the gap between generations and establishes the Computing and Networking facilities in the agricultural

⁴ Now it is not worth to say, absolutely rural people in India are illiterate, but most of them are under literate, they are studying in one language and information has been available in other languages, they do not able to understand the terms used in information even though they are literate one, sometimes they unaware about the scientific terms used in it.

⁵ Indian Special Research Organization, Geographical Information System

marketing sector. It further aims to develop the database information and open the (Portal) marketing information gate to farmers.

Reuters Market Light: It provides mobile phone based customized information on various aspects of agriculture crop, markets and location. The information in local language in respect of over 440 crops and varieties, more than 1400 markets and 2800 weather locations are available across 13 states through SMS.

Computerization : With computerization, the Department of Agriculture and cooperation collects and maintains agriculture statistics such as number, acreage, tenancy, land utilization, cropping pattern and irrigation particulars of different class of operational holdings, regularly and make it timely accessible to the planners and policy makers for decision making. All these shall surely encourage agricultural cultivation, production and marketing system in India.

Digital Mandi: it is an electronic trading spot for farm goods to bring the benefit of ICT to farmers and traders by eliminating geographical barriers and temporal limitations. Further, it is also removing cash crunch through active participation of various financial institutions.

IKSL: the necessary information is provided to the agriculturists on cell phones through five voice messages in local language. Then customized clarifications are provided to the farmers through helpline. The farmers can also speak to the experts on specific subject through special phone –in programme.

Digital green: This system includes a digital video data base prepared for farmers by farmers with the help of experts. The recordings are shown to farmers by using television, television, laptops, and village cable networks.

eSagu: Under this, personalized experts advised in timely manner sowing stage to harvesting stage for small and marginal farmers at their door-step. The farm picture is brought to the experts in the form of digital photography and text information on. The experts' advice after analyzing the situation is prepared and is delivered access to the concerned farmer on the same day or subsequent day.

3.2. Informal Information

Informal information consists of information obtained through conversation and business transaction. Gossip is an important source of informal information.

4. ADVANTAGES OF INFORMATION TECHNOLOGY IN AGRICULTURE:

It is universally accepted that increased information flow has a positive effect on the agricultural sector and individual farms. There is divergence of Indian agriculture, farmers are neither allowed to grow all crops in one region nor market, and generally it creates complexities in farm business (by the way of creating gap between production center and consumption center). Even though the region is suitable for producing certain crop, farmers are not desired to practice because of inadequate marketing information of such commodities. Information promotes the efficiency (qualitative and quantitative) and effectiveness of production and customer service. Information may also increase the level of trust of consumers increased demand for products. Brief account of some of the emerging new technologies successfully developed which have impact on the agriculture in the recent years is given below.

Strengthen the Production: At present about 62 per cent of the population in our society is forced to lead a poor quality life due to lack of purchasing power. To remove this imbalance and to stabilize the economy it is necessary to be self-sufficient in food grain production. IT sector is playing a vital role in the agricultural production. It allows farmers to save time on order and delivery and getting feedback. In the existing competition, there is a need to rapidly attract new customers as well as retain existing customers. Agricultural Development in our country has witnessed four Revolutions in Agriculture (Green, White, Yellow and Blue Revolution). Bio-technological, industrial, information technology and good communication systems are sustain the productivity. Information technology provides answer to a number of questions of farmers.

Improving Marketing Services: Innovation of marketing infrastructure facilities is necessary to agriculture development in modern days. With the entry of the IT sector the agricultural marketing system, results are accurate and reach farmers on time. Marketing information is instrumental in making decisions about future crops and commodities and about the best time and place to sell and buy crops. Typically, marketing price information is collected at the main regional markets and stored in central data base. The information is published on website, to reach a wider audience; information is broadcast via rural Radio, TV or mobile phone, thereby creating a level playing field, between products and traders in a region. In recent days short messages have taken up effectively and reached farmers with the price and trading information.

Capacity –enriched and empowerment: Communities and farmer organizations can be helped through use of IT to strengthen their own capacities. Rural community gets benefit from better access to credit and rural banking facilities. Recent mobile banking initiatives offer further scope to reduce costs and stimulate local trade. The Indian AMUL Programme automates milk collection and payments for its 5, 00,000 members to reduce time.

Access to relevant agriculture information: It is universally accepted that information to sustain and increase agriculture production is spread over different agencies, such as farmers, universities, research institutes, extension services, commercial enterprises, and Non-Governmental Organizations. If the information does not exist, intermediary organizations can help to generate it, make it accessible and influence research agenda.

5. POSSIBLE CAUSES FOR SLOW PICK UP OF ICT IN AGRICULTURE:

Most of the developing and less developed countries' characteristic features stand in oppose adopting the information technology in is adversely affected the adopting the information technology in agricultural sector. Various direct and indirect factors caused for failure of ICTs in agriculture are:

The productivity of a land generally depends upon the knowledge of improved technology of a farmer.

1. Increasing to food grain production is related to the socio- economic condition and cultural and religious feelings of the society.
2. Economic condition of the farmers is main barrier in accepting IT. Most of the farmers in our country are either small or marginal. The Farmer generally cannot hold capital from his annual income of the next year after spending on family maintenance and participating in many social and cultural activities in rural societies. So this critical position may not support application of improved the technology in agriculture.
3. There will be a group of farmers who are not willing to cultivate their lands with improved technology although they are economically sound.
4. If the agricultural market is controlled by a group of dishonest businessmen, the farmer generally does not get proper returns.
5. Farmers' earnings do not match with their expenditure. Why they bother about the IT?
6. It has been observed that technologies do not reach all farmers in villages
7. Illiteracy, poverty, unemployment, lack of willingness other factors cause the failure of ITs in agriculture.

6. CONCLUSION:

Development is always relevant not in one sector but in all sectors. But it should be planned and sustainable. From the above, we can conclude that importance of information technology in the field of agriculture is emerging. New information on seeds, irrigation, nutrients and plant protection etc. are the key inputs for successful farming. Knowledge intensity and precision in farming techniques will be the guiding links for sustainable agriculture in future in India. We should put in more concerted efforts to apply the IT in our agriculture as it is being adopted in the developed countries of the world.

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