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Problems Faced by Farmers Using Digital Tools in Agriculture in Central Zone of India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The purpose of India's Prime Minister's Digital India initiative was to increase the technological literacy and connect rural areas to high-speed Internet networks, which was introduced on July 1st, 2015. Digital Infrastructure as a Utility to Every Citizen, Governance & Services on Demand, and Digital Empowerment of Citizens are the three key areas that make up the vision of the Digital India

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Programme, which seeks inclusive growth in the areas of electronic services, products, manufacturing, and job opportunities etc. The present investigation was carried out to discover the challenges faced by the Indian farmers during adopting the digital Extension and primary data were gathered in 2019-20. In Rewa district of Madhya Pradesh, where the problems in using digital tools were found to exist with the farmers. It was recorded on the basis of results of problem faced index (PFI) that Inadequate government digital service centers and facilities ranked first followed by Quality of Information, Lack of awareness towards benefits of ICT in Agriculture, Lack of knowledge on e-Agriculture, Lack of Training, Expensive to use, Inadequate ICT Experts, Lower Internet Speed and Apathy towards new were ranked second, third, fourth, fifth, sixth and seventh respectively.

Keywords: Digital extension; agriculture; problems; empowerment; assessment and digital tools.

1. INTRODUCTION

Farmer's incomes in India are very low and efforts have to be made to enhance their incomes. For this, increasing the efficiencies of agricultural production processes and the entire value chain is important. Digital Agriculture is emerging as one of the way to increase efficiencies and enhance income in agriculture globally. The "Digital India" project was started to give residents online access to services linked to their livelihood and government services, among other things. The initiative is made up of three main parts: digital services, digital infrastructure, and digital literacy. The chosen delivery method is via mobile phone, with an emphasis on m-Governance and m-Services. Out of the seven elements included in m-Services, the m-Agriculture and m-Gram Bazar have a direct impact on agricultural extension and marketing services. The government is taking highly proactive measures to boost farming activities with the help of the Digital India Program [1-3].

Digital India programme was established in order to improve digital literacy and connect rural areas to high-speed Internet Networks. The government of India focuses specifically on nine pillars, including the Broadway Highway, Public Internet Access Programme, Universal Access to Mobile Connectivity, e-Governance, Revolutionizing Government through Technology, e-Kranti, Digital Delivery of Services, Information for All, Electronics Manufacturing, IT for Jobs, and Early Harvest Programs. Other recent digital services offered by the Indian government include the National Scholarship Portal, e-Health, e-Education, and Digital Locker. Both front-end and back-end digitization technologies are present in government online services. Digital Infrastructure as a Utility to Every Citizen, Governance and Services on Demand, and Digital Empowerment of Citizens are the three main pillars of the Digital India program's vision of inclusive growth in the areas of electronic services, products, manufacturing, and job opportunities, among other things [4].

There are facilities to digitally empower citizens and especially to farming community like Digital Locker that will help farmers to store important personal documents. e-Sampark, a vernacular e-mail service where e-mail services are provided in vernacular language is among the many. On the training front- PM Gramin Digital Saksharata Abhiyan launched with an outlay of Rs.68 crores with an objective of making 6 crores households digitally literate by March 2019 [5-7].

Each farmer's farm products value system needs agricultural services like agricultural advisory, financial services, agricultural marketing, and risk transfer, and India is fortunate to have access to about 400 farm products value system. Various national programmes, including "Make Digital India 2015, Startup India 2015, Stand Up India 2015, and Skill India 2015 have encountered operational challenges due to their influence at the agricultural and farmer levels, particularly at the level of small and marginal farmers" [8].

India's digital story is one of an ICT - led development by use of technology that is affordable, inclusive and transformative. The Digital India Programme aims to transform India into a knowledge-based economy and a digitally empowered society. The digital India Programme is a flagship programme of Government of India with a vision to transform India into a digitally empowered farmer and knowledge economy [9,10].

"Digital Extension is component of Digital India. It is a flagship programme of Government of India with a vision to transform India into a digitally

empowered farmer community and knowledge economy. Under this program various projects e.g. Open Data, Soil Health Card, mKisan (mFarmer), Farmer Portal, Agri-market app, etc. have been launched for farmers. Other programs e.g. Kisan Suvidha, e-Pusa Krishi, AgriApp, KrishiGyan, Agropedia, e-krishi, e-chaopal etc. based on digital information for farmers have been started in India" [11].

Agriculture's electronic extension services are referred to as digital extension. It is a network of organizations that offers traders and farmers more effective information for the agriculture, fishing, and natural resource industries. The ICAR mandates for KVKs in India include the provision of agricultural advisories using ICT and other media on a variety of topics of interest to farmers.

"Digital delivery of services has been strengthened with the help of 3.47 lakh Common services Centre's (CSCs), spread across 2.3 lakh Gram Panchayats in the country that provides digital access to over 350 services especially in rural areas at an affordable cost. These centres have also led to empowerment of marginalized sections of the society by creating jobs for over 12 lakh people and by promoting rural entrepreneurs including women VLEs. CSCs have also undertaken Stree Swabhiman initiative to create awareness about menstrual health and have set up over 204 sanitary pad units" [12].

"In many countries today, leaders see lagging (or no) growth, sagging employment and rising underemployment. While they recognize that the Internet is not a magic bullet, these leaders believe that the Internet, and its associated digital technologies (products and services that facilitate the creation, storage, analysis and sharing of data and information), might be a potential economic savior" [13].

Digital technologies can also enhance human welfare. The World Bank found that "rapid penetration of digital technologies is changing the lives of the poor." "These technologies have empowered small farmers to search and sell in more markets and to interact with government without travelling long distances, visiting multiple government offices or paying bribes" [13].

"Agricultural extension services delivery in India have limited scale, sustainability, and its impact. On an average public extension services only reach 6.8 per cent of farmers" [14]. "NSSO, 2014 has indicated that of the 40.6 per cent households who received extension assistance, only 11 per cent of the services came from physical government machinery extension agents, Krishi Vigyan Kendras and agricultural universities. This gap needs to be filled through exploring other options of alternate agricultural extension service delivery mechanisms. Information and Communication Technologies (ICTs) can deliver agricultural extension information with greater ease, more rapidly and with higher accuracy" [15,16,17]. "These technologies are reviving agricultural extension and advisory services around the world" [17]. "ICT based applications in agriculture have varied from web portals, telecentres, mobile telephony and hybrid projects (ICTs with traditional extension elements)" [18]. "Mass media including internet is now the second most important source of useful information to agricultural households in India" [19]. "Social media is yet another ICT based tool, which once used purely for entertainment, has great potential to be used for knowledge sharing and collaboration even in agriculture" [15].

The existing farm extension system needs to broad based problem oriented as depicted, to help farmers overcome their "point of no return "difficulties. ATMA and KVK are the two eyes of the present extension system which further require a "third eyes" for problem resolution, may be ICT enabled Agricultural Polytechnics for bridging the emerging gaps in development of human resources for farm level functionaries [8].

"Physical stores, online stores have many advantages: They are convenient and time saving and no more travelling and waiting in lines is needed. They are open in all time and they are accessible anytime and anywhere. These stores provide consumers with free and rich information about products and services. They also have some online tools to help consumers compare and make purchase decisions among various products and services" [20].

The farmers benefit through Digital India in many ways such as agriculture consultation, digital green, online agriculture markets to trade across the nation. Without much paper work the government services are rendered to farmers through Digital India Program. By 2019, it is assumed that the two way platform will be created between Farmers and Buyers.

The common problems in the adoption of digital tools in rural areas are ICT illiteracy, availability

of relevant and localize contents in their own languages, easy and affordable access and other issues as awareness and willingness for the adoption of new agricultural technologies among the rural peoples, etc. Keeping in these points a study was carried out to analyse the problems faced by the farmers during using of digitals tools in central zone of India.

2. METHODOLOGY

The present study was confined with the farmers using digital inventions i.e. android application in the year 2019-20 and the ex-post facto research design was adopted. The Rewa district of Madhya Pradesh was selected purposively due to the presence of reputed institutions like Agriculture College, KVK and IFFCO etc. Out of nine blocks of Rewa distrct; two blocks namely Rewa and Naigarhi were selected purposively on the basis of higher number of registered farmer's friend under ATMA, Farmer welfare and Agriculture Development Department. Six villages from each selected blocks namely; Bajrangpur, Gadhwaha, Kanauja, Laxmanpur, Dihi and Khaur from Rewa block and Dubaha, Chapgawan, Tatiharakhurd, Purwa, Devrisinger and Barroha from Naigarhi block were selected randomly. Further, 10 respondents from each selected villages were selected randomly. Thus, a sample size of 120 respondents was obtained for the present study. The primary and secondary data were gathered with the help of pre-tested well structured schedule. Weightage was given to different items with regards to their relative position in the five point scale and scoring was done accordingly. Further, the gathered data were analysed, tabulated, interpreted with the help of suitable statistical tools and techniques. Measurement of Problem Faced Index (PFI) was done using following formula;

$$PFI = (4 \times f_v) + (3 \times f_h) + (2 \times f_m) + (1 \times f_l) + (0 \times f_n)$$

Where,

f_v = Number of respondents who faced very high problem
f_h= Number of respondents who faced high problem
f_m= Number of respondents who faced medium problem
f_l= Number of respondents who faced low problem
f_n= Number of respondents who faced no problem at all

In order to make comparison among the problems, a rank order of problems were constructed in descending order. PFI ranged from 0 to 480, where 0 indicated no problem at all and 480 indicated very high problem faced.

3. RESULTS AND DISCUSSION

Constraints faced by the farmers using digital tools.

Table 1. Constraints faced by the farmers using digital tools

N=120

S.N.	Problems	Extent of Problems					PFI	Rank Order
		Not at all	Low	Medium	High	Very High		
		(0)	(1)	(2)	(3)	(4)		
1.	Apathy towards new technology	1	11	48	49	11	252	IX
2.	Expensive to use	1	11	47	53	8	278	VI
3.	Lack of knowledge on e-Agriculture	4	14	47	47	8	281	IV
4.	Inadequate government digital service centers & facilities	3	9	53	46	9	289	I
5.	Inadequate ICT Experts	10	4	53	45	8	277	VII
6.	Lack of awareness towards benefits of ICT in Agriculture	5	10	53	41	11	283	III
7.	Lack of Training	8	7	49	49	7	280	V
8.	Quality of Information	4	9	52	46	9	287	II
9.	Lower Internet Speed	5	14	50	43	8	275	VIII

It is apparent on the basis of PFI score from the Table 1 that the constraint “Inadequate government digital service centers and facilities” (PFI 289) was ranked first and the constraint Quality of Information (PFI 287) was ranked second whereas the constraints Lack of awareness towards benefits of ICT in Agriculture (PFI 283) ranked third. Further, the constraints Lack of knowledge on e-Agriculture (PFI 281) ranked forth followed by Lack of Training (PFI 280), Expensive to use (PFI 278), Inadequate ICT Experts (PFI 277), Lower Internet Speed (PFI 275) and Apathy towards new (PFI 252) were ranked as fifth, sixth, seventh, earth and ninth respectively. So far, the present study discovered the aspects of the factors which changed significantly due to the problems faced by the farmers in using digital tools. Some basic resistance such as need for availability, accessibility, knowledge, interest and some others are keeping the growth of digital tool usage low among the farmers of the study area. Reddy and Ankaiah [21] Rashid and Islam [22] Chandra [23] and Darshan and Meena [24] revealed the similar finding in their studies.

4. CONCLUSION

The study's findings showed that different types of farmers encounter constraints to varying degrees. On the basis of PFI it was observed that Inadequate government digital service centers and facilities ranked first followed by Quality of Information, Lack of awareness towards benefits of ICT in Agriculture, Lack of knowledge on e-Agriculture, Lack of Training, Expensive to use, Inadequate ICT Experts, Lower Internet Speed and Apathy towards new.

5. RECOMMENDATIONS

All these constraints could be overcome through proper implementing suggestions by farmers like; proper and improved infrastructural facilities at the village level, providing relevant information time to time and skill development updating with training, creating awareness regarding use of digital tools for educational and agricultural purpose. Evidently, more work needs to be done to reach the expected rate of ICT-led solutions for the promising agriculture in Rewa District.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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