

ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN AGRICULTURE FOR RURAL DEVELOPMENT***R. P. BAIN¹, D. P. RAI¹ AND SIDDARTH NAYAK²**¹Krishi Vigyan Kendra, KATNI

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Email : rp_bain@rediffmail.com**Received : 28.02.17; Accepted : 26.04.17****ABSTRACT**

If we want to convert our rural population into knowledge driven, progressive, self sufficient, self reliant, sustainable society, the role of Information and Communication Technologies (ICT's) cannot be ignored. Timely availability information is considered as most important factor in Indian agriculture. At present ICT is the technology of this millennium. Transferring the developed technology to all end users is time-consuming and tiresome task and is often not completed due to paucity of resources and lack of manpower. In India, agriculture and rural development has gained significantly from ICT due to its widespread extension and adoption. In this era of internet, ICT is committed to provide real, timely accurate authentic information to the farmers and rural peoples.

Figure : 01

References : 20

Table : 01

KEY WORDS : Agriculture, Information and Communication Technologies (ICT's), Krishi Vigyan Kendra, Resource technology, Rural development.

Introduction

Information development, information generation and information sharing in the format in which it can be profitably utilized by its end, user are utmost important issues. Technological development is at its peak but still in India the end is far behind the technological advancement, possibly due to diverse nature of end user. The bane of Indian agriculture is not lack of technologies research and development efforts but inadequate and inefficient dissemination of relevant information to the farming sector⁴.

In the coming generations the future of agriculture will be decided and will be dependent upon the successful adoption and implementation of information and communication technologies (ICT's). Information is very useful in decision

making, its availability enables the individuals, groups or organization to make rational decisions and reduce their level of uncertainty and information generally can be categorized into hard and soft information¹⁷. Whereas worker⁸ confirmed that information is a commodity and is a requirement for economic enhancement and development in rural communities. Thus there is need for the provision of regular information to farmers in a format that would be comprehensible to them¹. Rural dwellers must be empowered through information on what to do, how to do it and when to do it⁹.

The role of ICT's should be sustainable, understandable, positive and profitable in the long run. Report on our nation (India) accounts for almost 17 per cent of the world's population and a majority of these live in the rural sector, and are dependent

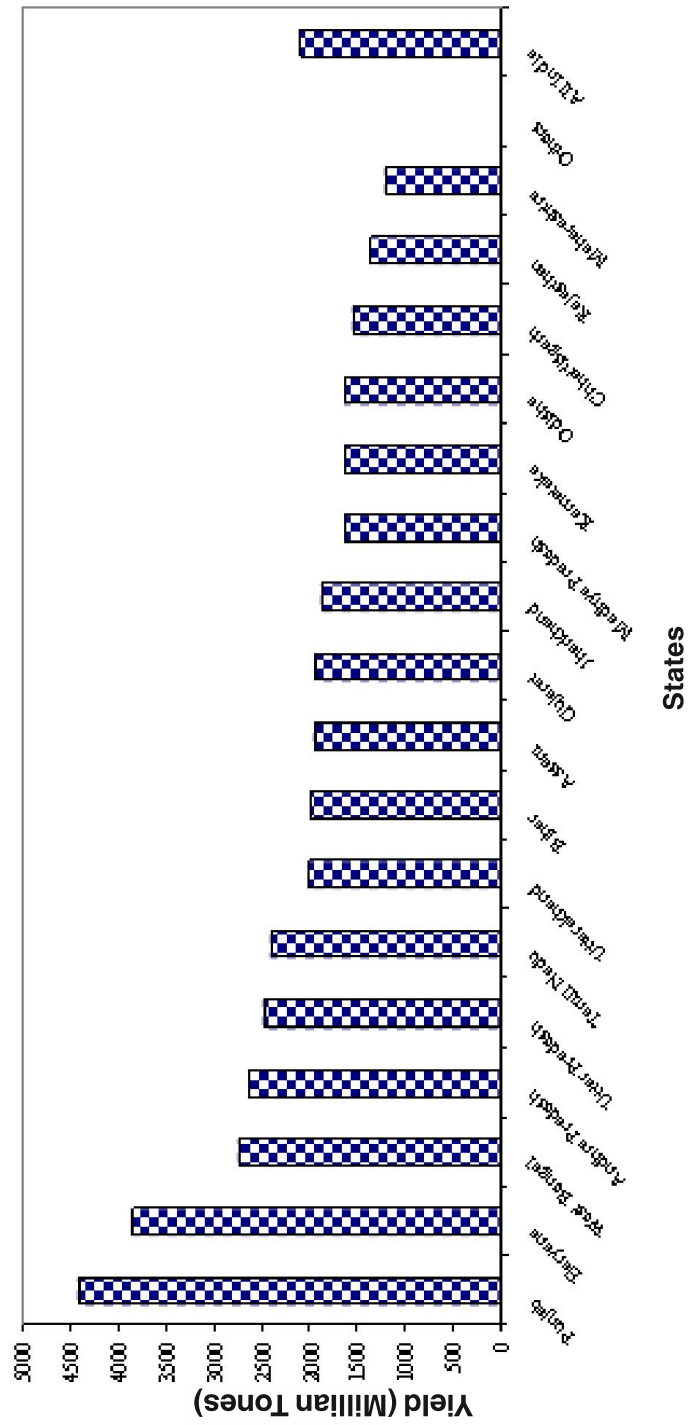


Fig. 1 : Statewise productivity

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on agriculture as their main livelihood^{5,20}. Scientists¹⁸ reported Madhya Pradesh and Bihar are among the four most backward states in India. The ratio of the farmers to the extension worker in India is 1000:1, which is really very less¹². The fact that ICT's are an effective tool in rural development should not be ignored. For overall development deployment of ICT in the Indian rural sector is essential. Current evidence from individual farmers and fishermen in India supports the conclusion that ICT can improve incomes, reduce price volatility and provide better quality of life the poor living in rural areas^{7,11,15}. In rural areas, ICT can raise rural households' income by increasing agricultural productivity and introducing income channels other than traditional jobs¹⁴.

As far as Madhya Pradesh is concerned (Table-1) provides the area, production, yield and per cent area irrigated in food grains in different states of India where Madhya Pradesh has emerged as significant producer in recent years³. The productivity of Madhya Pradesh is 24.24 million tonnes which is less only from two states; Uttar Pradesh (50.05) and Punjab (24.24), million tonnes respectively. On the other hand the productivity (Fig. 1.) of Punjab is 4409 kg/ha where as Madhya Pradesh is far behind on the XIIth position with a productivity of meager 1622 kg/ha. This shows that there is tremendous scope for Information and Communication Technology (ICT) encroachment in farmers mindset for the goal of increasing production and productivity and elevating the status of farmers and ruralites.

Information and Communication Technology (ICT) is a broad term that includes all technologies for the management and communication of informations¹⁶. Whereas ICT is an integration of the technologies and the processes to distribute and communicate the desired information to the target audience and making the target audience more participative in nature¹². ICT's offer the ability to increase the amount of information provided to all participants in the agricultural sector and to decrease the cost of disseminating the information. If somehow we are able to provide timely information¹³ to the farmer and rural people there is an assurance that it will aid to increase in productivity. ICT initiates to encompass all sects of people for benefit of each and every one, but there is a poor engagement of women farmers in ICT projects and this is an area

where much work remains to be done to improve gender participation in rural ICT projects¹⁸.

How ICT services can reach rural areas

This is one of the most important and crucial aspect for dissemination of agricultural technology to farmers. At present in India the public-sector extension system is seen by the Government of India as the main way to bridge the yield gap that exists between agricultural research outputs and farmer fields⁶. Development and advancement in agricultural technology is of little significance, unless it extensively and expansively broadcasted among farmers and is accepted, used and propagated further. Many steps are involved for enabling ICT for making it to reach farmers, some of them are enlisted below:

1. Creation of rural internet centres at village level
2. Understanding rural and farm information needs and designing such ICT based products which suit the rural and farm needs.
3. Development of user friendly, user understandable content and its familiarization.
4. Strengthening internet and WIFI facilities at rural level
5. Promoting use of android based mobile for value added services and information dissemination.
6. Establishing KIOSKS for user based services
7. Increasing number of users of ICT
8. Increasing uses of ICT
9. Examples of some of the ICT based initiatives are TCS mKRISHI, e – choupal, e- arik, eSagu, Helpline hello Uttam, Fisher Friend project, Kisan Call Center, AGRISNET, Warana, Pravara, iKisan etc.

The information disseminated facilitates the farmers to decide what and when to plan, how to cultivate, when and how to harvest, what post-harvest management practices to follow, when and where to market the produce etc¹⁹. Mobile phone has proved to be a cheaper source of getting information about agricultural production, marketing, market selection for output selling, etc¹⁰. Telecommunication and specifically mobile phones have the potential to provide solution to the existing information asymmetry in the sectors like agriculture¹⁵. It is in the interest of the nation to promote mobile based applications for the benefit of farmers and rural people.

TABLE- 1: Area, production and yield in food grain in 2013-14 and the proportion of area under food grains irrigated in 2011-12

State	Area (m. Hectares)	Percent of India(%)	Production (million tonne)	Percent of India	Yield (kg per hectare)	% Area irrigated (2011-12)
Madhya Pradesh	14.94	11.85	24.24	9.15	1622	50.5
Uttar Pradesh	20.23	16.05	50.05	18.9	2474	76.1
Punjab	6.56	5.2	28.9	10.92	4409	98.7
Andhra Pradesh	7.61	6.04	20.1	7.59	2641	62.5
Rajasthan	13.42	10.64	18.3	6.91	1364	27.7
West Bengal	6.24	4.95	17.05	6.44	2732	49.3
Haryana	4.4	3.49	16.97	6.41	3854	88.9
Maharashtra	11.62	9.22	13.92	5.26	1198	16.4
Bihar	6.67	5.29	13.15	4.97	1971	67.4
Karnataka	7.51	5.95	12.17	4.6	1622	28.2
Tamil Nadu	3.55	2.81	8.49	3.21	2396	63.5
Odisha	5.15	4.09	8.33	3.15	1617	29.0
Gujarat	4.29	3.4	8.21	3.1	1917	46.0
Chhattisgarh	4.95	3.93	7.58	2.86	1532	29.7
Assam	2.53	2.01	4.94	1.87	1952	4.6
Jharkhand	2.24	1.77	4.19	1.58	1874	7.0
Uttarakhand	0.89	0.71	1.78	0.67	2001	44.0
Others	3.26	2.59	6.38	2.41	-	-
All India	126.04	100	264.77	100	2101	49.8

Source : Anonymous (2015). Raising Agricultural Productivity and Making Farming Remunerative for Farmers. An Occasional Paper, NITI Aayog, Government of India, 16 December 2015

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Benefits of using ICT's in India

1. Use of ICT's is affordable in long term
2. Real time problem solving is possible
3. Virtual interaction in the form of audio, video, multimedia is possible
4. Multi-directionally huge number of people can be addressed at the same times
5. Information can be stored and retrieved later on with flexibility in information search
6. Multitasking is possible
7. Resource sharing is possible
8. Multiplication and duplication of same work can be identified and avoided
9. Geographical barriers can be surmounted
10. Transparency can be promoted and maintained
11. The potential of cloud computing can be realized and harvested.
12. Sustainable, profitable, economical, judicial and qualitative improvement is possible only through use of ICT's
13. Productive, profitable, effective and efficient integration of agencies and stake holders is possible.
14. Precision farming, laser leveling, variable rate of application of fertilizers, précised application of pesticides forewarning etc, is possible only through use of ICT's
15. Market intelligence and climate change mitigation is possible only through use of ICT's

Constraints in ICT's Expansion in India

Prior to implementation and adoption of any technology is essential to analyze its constraints so that scientist² have suggested that inadequate ICT infrastructure would hamper economic growth. Some of the constraint in ICT expansion are enlisted below:

1. ICT-related infrastructure is not well developed.
2. Internet connectivity is slow and irregular, bandwidth is not consistent.
3. Electricity uncertainty and lack of power in rural and remote areas
4. Updation is not regular and continuous.

5. Upgradation is not timely.
6. Due to multiple languages and dialects translation is time consuming.
7. Illiteracy poses a barrier in bidirectional communication, understanding and individual operation of ICT gadgets and tools
8. Lack of concrete result giving ICT policies for agriculture and rural sector.
9. Poor funding and budgeting infrastructure
10. Improper linkages among coordinating, facilitating and information providing agencies.
11. Untimely completion of projects and their implementation.
12. Improper feedback mechanism
13. Creditability, reliability and authenticity issues
14. Lack of real time problem solving
15. Software and hardware compatibility issues
16. Problems of hacking, data theft, bugs, viruses etc
17. Poor quality of software
18. Unavailability of experienced trainers
19. Irregular, unorganized, insufficient and ill-timed training programmes
20. Lack of technical support
21. Validation, standardization process is not judicious
22. Long waiting time /queue
23. Gender biasness, caste dominance in rural areas and absence of privacy
24. Lack of region specific information consistency and supply of same information to same user by multiple resource provider

Conclusion

With increase in availability of resources and expansion of ICT's and agricultural technology there is an ample opportunity for people living in rural areas to get benefit from it, there is high scope to harvest economic benefit from technology. Government is promoting use of ICT's and is further expanding its horizon at all levels. ICT's can reach ruralites very fast and it's easy to use and understand

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