



Research Article

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR DIFFUSION OF INFORMATION TO THE FARMING COMMUNITY-A SUCCESSFUL CASE IN VIZIANAGARAM DISTRICT, INDIA

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Abstract: There is a shift in information needs of the farming community with the socio-economic and technological development taking place in India. To withstand and complete the farming community in their occupation, they should adopt modern improved technologies in farming timely to save the cost of production and improve the farm income. Therefore, the ANGRAU, DAATTC, Vizianagaram implemented various information and communication methods viz. IIDS-AKPS for readymade solution to meet the information needs, information sharing with the farmers and line department officers through whats app on pest and disease management, timely good agricultural practices, weather forecasts, market information and extension activities. The information services were provided to the farmers by direct text and voice messages on timely agricultural practices, weather forecasts etc., gathering of feedback while direct interaction with farmer. The data was collected from a random sample of 180 farmers who are the part of this ICT initiative.

Keywords: Information services, ICT, Pull and push messages, IIDS-AKPS

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Introduction

Agriculture is continuously reinventing the increasing challenge of feeding an ever-growing population on one hand and declining arable land, erratic weather parameters on the other hand. Changing consumer preferences since last two decades, agricultural industrialization leading new value chains and lack of actionable information are challenging the farming community. There is also a shift in information needs of the farming community with the socio-economic and technological development taking place. On the one hand, there are many improved technologies are generated by the research system in Agricultural Sciences as well as the information technology and on the other hand, all the required technologies are not reaching to the door step of the farming community. To withstand and compete the farming community in their occupation, they should adopt modern improved technologies in farming timely to save the cost of production and improve the farm income. The Asia Pacific region, comprising 44 member countries of FAO, is characterized by high level of diversity in size, population, agricultural and economic development. The region is home to the two countries in the world with populations higher than 1 billion (India and China), on the other hand, the region comprises numerous small Pacific islands with a population less than 1.0 lakh [3]. In this regard, use of information and communication technology is the better alternative to diffuse the information on improved agricultural technologies among the farming community. Application of contemporary Information and Communication Technologies (ICTs) for rural and agricultural development is taking place rapidly. ICTs in rural development includes hardware, software and application of digital content generation, management and presentation, knowledge management and sharing. About 146 National and 73 international ICT based projects are providing information to the farmers directly and indirectly [1].

Materials and Methods

With this background, ANGRAU, DAATTC, Vizianagaram used ICT initiatives to reach the farmers with need based actionable information. The ICT initiatives like IIDS-AKPS Programme, live TV Programme, dial out conference, vivo video conference and sending SMS through what app groups. Interactive Information dissemination system (IIDS) is a direct answer to the farmer's query by the scientist interactive mode and sending voice and text messages on major crops. The farmer gets more relevant and needed actionable information as the scientist who answers the query is very familiar with the crop, agro ecosystem, type of soil and other parameters of the farmer. Data can be transmitted through voice, text, images and small videos from both ends (farmers to expert and back). The IIDS is an integrated system using Web, IVRS and Mobile Technologies for dissemination of farm and farmer specific advices at user desired mode and time. The system provides the options to the farmer to subscribe for the various services. The system is connected to a centralized database, which have information of farm, farmer and previous transactions. The experts at back end (web application) have access to the database of the farmers while responding the farmer's queries. The major applications are-Mobile based application, Web based application and IVRS based application. About 3060 respondents were registered in this model includes all the stake holders of agriculture viz. 40 middle level functionaries of department of agriculture, 184 grass root level extension functionaries, 90 input dealers, 13 NGOs in addition to the 2733 farmers were registered in this system. The scientists of the ANGRAU as level 1 experts answers the farmers queries at district level and pushes the information as text and voice SMS as per the needs of the farmers. This project was started under NAIP with partners of Media Lab Asia, Ministry of Electronics and Communications, GOI, NIRD, ANGRAU, CAU and PJTSAU during 2009.

Table-1 Content analysis of the information sent by different ICTs and reach of Information to the clientele

Content	IIDS Calls	Telephone calls	Live programme	Dial out programme	Vivo video conference	SMS	Whats app SMS	Average
IPM	47.5	46	50	48	32	38.7	38.5	42.95
INM	21.5	24	28	23.5	25	9.6	19.5	21.58
Varieties of crops	10	13			12	8.2	12	7.88
Weed management	10	9	14	17.5	26	14.51	10	14.43
Cropping systems	4.5	1				8.2	9	3.24
Weather forecasts	4	4	8	7	4	16.4	8	7.34
Market information	2.5	3		4	1	4.9	3	2.62

Table-2 Spread of ANGRAU Technologies and Financial implications of ICT initiatives in the district

Technology	Area spread in ha	Net income before in INR Lakh /ha	Net income After in INR Lakh /ha	Net benefit in INR Lakh /ha	Financial benefit over all in INR Lakh /ha
ICM Technology in paddy	950	0.525	0.7375	0.2125	201.875
ICM in Maize	1210	0.5625	0.846	0.2835	343.035
Zero tillage Maize	495	0.5625	0.695	0.1325	65.5875
Total					610.4975

Further live TV Programmes on cable TV, dial out programmes and video conferences via vivo were organized with the support of Reliance foundation. Live TV programmes on cable were organized as an interactive session with the farmers with in the vicinity of local cable channel for 1 hour during crop season. Dial out audio conference is the interaction of a scientist with the farmers situated remotely one after another on hired line. The video conference between two locations, in which scientist sit in the laboratory and interacts with the farmers on field problems by using vivo software.

Further, a study was conducted to know the impact of ICT initiatives of ANGRAU, DAATTC, Vizianagaram with the following objectives

- To know the extent of information reach to the farmers by ICT modules and Spread of agricultural technologies.
- To study the impact of these technologies on socio-economic status of the farmers and the financial implications

A random sample of 180 respondents who are the part of these ICT initiatives were selected for the study. The sample includes middle level extension functionaries, grass root level extension workers, input dealers, NGO representatives and farmers proportionately. The field extension study was conducted in Vizianagaram district, Andhra Pradesh, India with constructed questionnaire.

Results and Discussion

86.67% of the respondents preferred to get text messages because they can be utilized at convenient time and storable, can also be disseminated. Most of the respondents preferred to get messages on plant protection, weather forecast and market information as first three ranks followed by nutrient management. 70% of the respondents do not prefer voice SMS because they create disturbance as they are untimely and repeatedly. They need more information on weather forecast and market information timely with more precision. 70% of farmers immediately adopted plant protection measures and 30% of farmers use the weather information for transplantations. 43.33% of farmers and all the extension functionaries spread the information to fellow farmers of 5-8 each message. 18.50% Farmers faced a difficulty to contact the scientists in few times because of bad networks, when the scientists are busy and does not lift the call. The analysis [Table-1] indicates that there is slight deviation in pulled and pushed message. In pulled calls the farmers are interested to know more information on pest and disease management, INM, weather forecasts, market information, and Weed management in rank order. Where as in push messages the scientists give more information on Pest and Disease management, INM, weed management, varieties of crops followed by Weather forecasts. Three technologies were taken for study to know the extent of adoption, spread and financial implication of the technology [Table-2]. Among them the ICM practices of Maize since from the date of sowing to the other management practices spread to an area of 1210 ha in sample area with INR 343.035 lakhs financial benefit in terms of saving the cost of cultivation and increase in yield. The ICM Technology in paddy spread to an area of 950 ha in sample area with INR 201.875 lakhs financial benefit in terms of saving the cost of cultivation and increase in yield. The Zero tillage Maize practice spread to an

area of 495 ha in sample area with INR 65.5875 lakh financial benefit in terms of saving the cost of cultivation and saving time.

Constraints and Opportunities for ICT Use

The availability of broadband Internet, 3G and 4G connectivity is available in rural areas and the prices of smart phones are decreasing and they are becoming affordable. The most critical constraint now is appropriate agricultural content.

Way forward

With this back ground results and the global trends of information technology generation and utilization of mobile and internet technologies there is a need to upscale these technologies to the wider area with more applicability to reach the farming community in specific to India and on the globe. Here would like to bring a success story of Mr. Donaka Niranjana who is a tribal farmer and lives 110 km from the district headquarters in a remote tribal village where most of the people speak the local dialect. He is a young tribal farmer, studied up to high school education who has registered in IIDS-AKPS Programme and a regular caller and one of the highest callers in this ICT initiative and he adopted the ICM practices of Maize time to time by the advice of the ANGRAU, DAATTC scientists. He has recorded 135 q/ha maize yields with the net income of INR1.34 lakh and now he is able to give quality education to his children in nearby town.

Global mobile market

The growth of the mobile market and subscriber penetration [2], is one of the opportunities to utilize by the Scientists, development departments, NGOs and IT specialists to spread the information by ICT initiative and mobile technology at a cheaper cost.

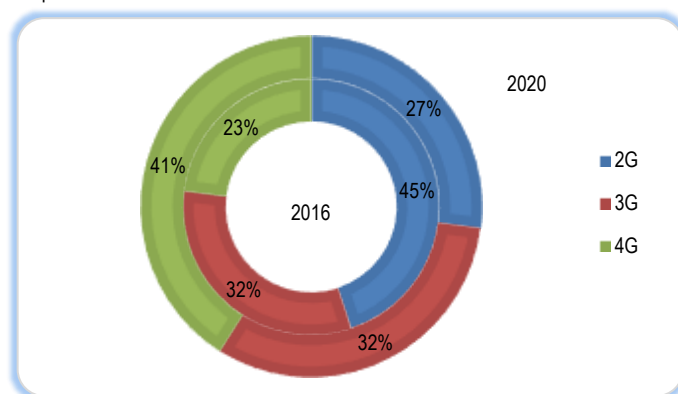


Fig-1 Technology mix and spread of mobile technology

Subscription penetration	2016	2020
65	73	
Smart phone adoption	51	65

As per the projection of GSMA Intelligence [Fig-1], by 2020 about 41 % of global mobiles will be occupied with the 4G technology and by 2025 there may be 1.1 billion 5G mobile phones on the globe. Further the subscriber penetration and smart phone adoption is increasing and by the end of 2020 there may be 65 % mobile subscribers with smart phone.

Mobile market growth in Asia pacific

The growth of the mobile market and subscriber penetration is one of the opportunities to utilize by the Scientists, development departments, NGOs and IT specialists to spread the information by ICT initiative and mobile technology at a cheaper cost. Further in this regard there is a need to think about the sharing of cost of these initiatives. Is it by the farmer, the Governments, or by twin sharing the cost as the Asia pacific is the land of diversity in socio economic status of the farming community.

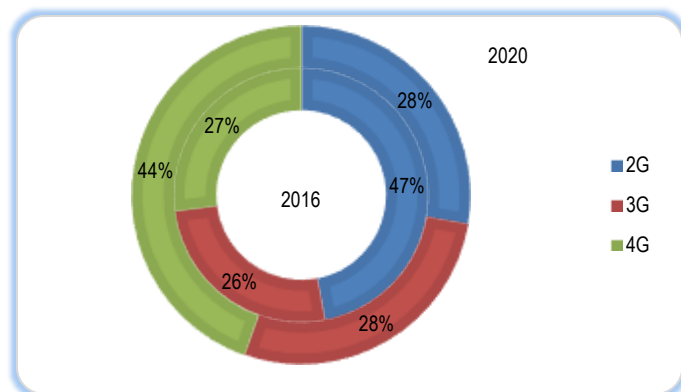


Fig-2 Technology mix and spread of mobile technology

Subscription penetration

65 → 76
2016 → 2020

Smart phone adoption

51 → 63
2016 → 2020

As per the projection of GSMA Intelligence [Fig-2], in line with the global trend, by 2020 about 45 % of global mobiles will be occupied with the 4G technology. Further the subscriber penetration and smart phone adoption is increasing and by the end of 2020 there may be 63 % mobile subscribers with smart phone. This is the great opportunity to the policy makers, scientists, development departments with the support of information technology further strengthening of mobile based ICT initiatives can be taken to reach the greater number of the farmers with cheaper cost of Extension.

Conclusion

The study indicates that among the different Information and Communication technologies, IIDS-AKPS is one of the most useful tools for dissemination of Agricultural information to the registered farmers at user desired mode and time and thereby play a greater role in enhancing efficiency of extension services. The results of the study showed that majority of the respondents preferred text messages over voice SMS. The growth of mobile market and subscriber penetration is an opportunity to the scientists, development departments, NGOs and IT specialists to diffuse the information by ICT initiatives and mobile technology at a cheaper cost. Hence, there is every need to scale up these technologies with more applicability.

Application of research: Research can be utilized to know the farmers reaction and feedback on ICT Use for transfer of agricultural technology to the farmers.

Research Category: Extension education

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Cultivar / Variety / Breed name: Nil

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Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

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