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ICT Model (*e-Kapas Network*) for Dissemination of Cotton Agro-Advisory for Vidharbha region

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ABSTRACT

Information and communication technology in agriculture (ICT in agriculture), also known as e-agriculture, focuses on the enhancement of agricultural and rural development through improved information and communication processes. Mobile Phone has emerged the scenario of communication. It is a fast and reliable source of communication for dissemination of Information related to new innovation or alter for upcoming calamities. Recent year the mobiles are becoming affordable and useful tool for farming community. Poor accesses to agricultural information are the major constraints in the growth of agricultural productivity in India. In this context *e-Kapas Network Project* under Technical Mission on cotton (TMC MM-1.6) ensures the availability of right information at right time at the doorstep of clients. ICAR-Central Institute for Cotton Research, Nagpur has introduced the novel extension mechanisms *e-Kapas Network* project nationally since April 2012. The AICCIP center of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola was also one of participating center of this project with specific assignments to be completed in the various stages. These ICT Model were succeeded as the opportunities to the cotton growers to get relevant, location specific, timely agro-advisory services along with powerful platform for cotton scientists deliver appropriate cotton technologies to farmers to improve the efficiency of current manual system by saving time, money and making technologies available '*anywhere & anytime*' to users. AICCIP, Akola under Dr. PDKV, Akola center has actively registered their participation by registering about 15,930 farmers from Vidharbha region along with document with fifty two FAQs and developed the script for documentary on rainfed cotton cultivation. The favorable attitude of farmers towards ICT as an effective and efficient information support tool would lead to stronger conviction and efficient extension programme planning in changing agri-rural environment.

Keywords: *ICT, E-Kapas, Agro-advisory, Cotton growers, Voice mails and Vidarbha*

Introduction

Cotton is the livelihood for an estimated 60 million Indians including six million farmers, mostly of small and marginal holdings. Cotton cropping provide 60% of the fiber used in our textile industries, supplies more than one million metric ton of cooking oil, and another million metric ton of quality animal feed and 40 million metric tons of biomass in the form of cotton stalks. Given the facts that India hosts over 1/3rd of the cotton area under cultivation; produces over 1/5th of the world's cotton; and around 6 to 9 million bales of cotton in excess of domestic consumption (second largest exporter); India is destined to play a much larger major role in the next decade [1].

Global 2018-19 cotton area and production are projected at 33.4 million hectares (82.00 million acres) and 121.7 million bales, which were nearly 2 and 1 percent less than that of 2017- 18 estimates respectively. Cotton production in most of the major producing countries except Brazil and Pakistan is expected to decline. India is projected to produce 28.7 million bales of cotton in 2018-19, which was 1 percent less than the production in 2017-18, but still one of the country's largest crops on record. Although yield is expected to rebound above the 5-year average, a 4 percent reduction in area is forecast in 2018-19 [2].

Agriculture is the most vulnerable and sensitive sector affected by climate change because of its dependency on local climate parameters like rainfall, temperature, soil health etc., [9]. Before looking at ICT solutions, it was important to assess what kind of reach ICT had amongst farmers. A combination of wireless telephony, better signal processing and innovations from Indian telecom operators changed the picture dramatically [6] Information and Communication Technology (ICTs) has been a significant contributor to growth and socio-economic development in business sectors, countries and regions where they are well adopted and integrated. Nearly 40 percent of the global population has access to the Internet, and among the bottom fifth of the poor, seven out of ten households have a mobile phone [14]. The large adoption and integration of ICTs has reduced information and transaction costs, improved service delivery, created new jobs, generated new revenue streams and saved resources.

ICT can revolutionize Indian farming sector and can benefit all farmers including small landholders. Agriculture is the most important sector with the majority of the rural population in developing countries depending on it [7]. The introduction of mobile phones is a major achievement in communication revolution. Within a short period mobile phones have increased manifold. Now it is affordable to farmers as well as extension workers. The cost factor in face-to-face information propagation at the right time has also created urgency to popularize the mobile advisory for farmers [4].

The E-kapas project is communication based to disseminate the technology related to cotton cultivation to the farmers through voice messaging system, with practical difficulties of transmission of technical advice through mobile service. The ICT based agricultural technology dissemination focusing on cotton growers through mobile phones has been initiated by AICCIP Main Center, Cotton Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola 444104 (MS) during period from 2012 to 2016 as a participating component in TMC-MM 1.6 activity with ICAR-Central Institute for Cotton Research, Nagpur concentrating on the farmers of University jurisdiction involving major cotton growing districts of Vidarbha region.

The project implemented with involvement of scientists of eighteen participating centres in eleven cotton growing states of the country including three centres of CICR viz. Nagpur, Coimbatore & Sirsa and fifteen AICCIP- SAUs centres including Dr. PDKV, Akola with following three objectives as mentioned in technical programme viz,

- (1) To register the farmers with their mobile numbers for providing voice messages,
- (2) To developed the documentary on rainfed cotton cultivation; and
- (3) To developed the audio-visual aid for cotton farming community.

Methodology:

The E-kapas Network and Technology Documentation is the project implement at cotton research Unit in Dr. P.D.K.V., University jurisdiction as per the technical programme finalized by CICR, Nagpur. The proposed work plan for scheduled activities of Dr. PDKV, Akola center is summarized in Fig. 1

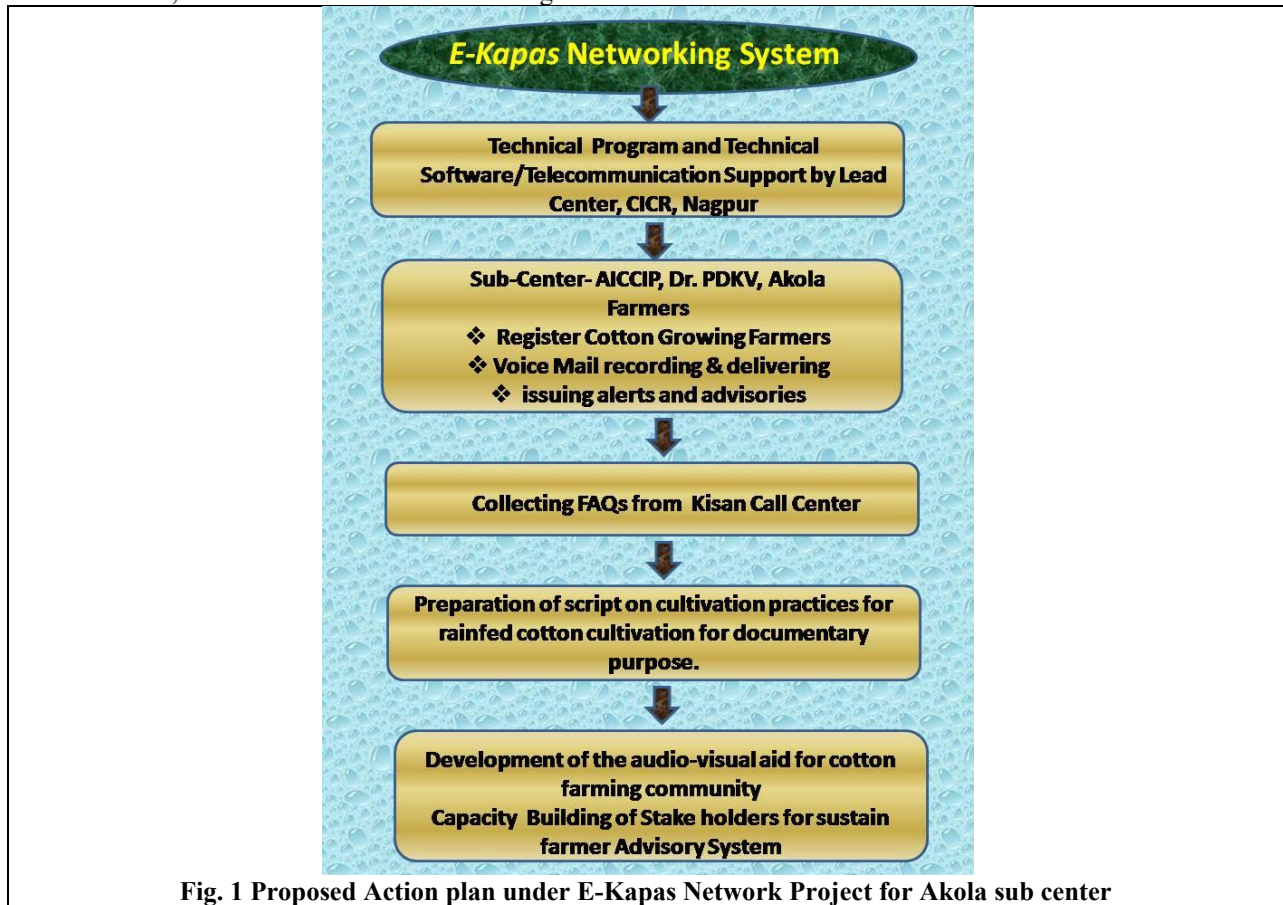


Fig. 1 Proposed Action plan under E-Kapas Network Project for Akola sub center

The use of mobiles for conveying the message to farmers is a prime objective of the project. It was observed that the text messaging is difficult task to understand farming community as English as language commonly used for text messaging, whereas the Marathi fonts are not user friendly and compatible with mobile handsets. In view of this, the voice mail is more efficient system to disseminate the message to farmer easily [12].

Accordingly the farmers were registered along with their mobile numbers for providing voice mail service. The farmers either personally visited this office or farmers participated in various extension activities carried out by this office viz., *Shivar Pheri* (Annual Field Visit), *Sheti-Din* (Field days), *Shetkari Prashikshan* (Farmers training), diagnostic visits, field visits etc., (Fig.2). According the Voice mail service has been hired through local Service providers by implementing authority, Nagpur.



Fig 1 (a) Farmer voluntarily registering for voice mail service



Fig 1 (b) Farmers approach during shivar-pheri (Annual Field visits) for registering the service



Fig. 1 (c) Farmers from tribal area (Sadrabadi, Melghat) voluntarily registering for voice mail service during farmer training program (15.03.2015)



Fig 1 (d) Farmers appealed through local news paper for registering the service

Result and Discussion:

This section discussing the activities performed by the officer-in-charge and his team of AICCIP, Cotton Research Unit, Dr. PDKV, Akola in implementing the assigned chronological tasks as per the proposed frame work of project with an esteem objective of the welfare of cotton growers of Vidharbh region. The system has become crucial in generating, disseminating and utilization of value added information for cotton related activities. The components of e- Kapas includes farmers' database, FAQs (Frequently Asked Questions) on cotton , content development & recording of voice messages, information delivery as voice calls on mobile numbers, kapas panchang and cotton apps. Information and knowledge delivery platform voice mail was used to provide agro-advisories to registered farmers on their mobile phones

The AICCIP, Dr. PDKV, Center has registered 2215 famers (2013-14), 5158 farmers (2014-15) and the total 15930 farmers (2015-16) involved in cotton cultivation prominently in Vidharbha region under this project during period (Fig.3) through various channels as mentioned in methodology.

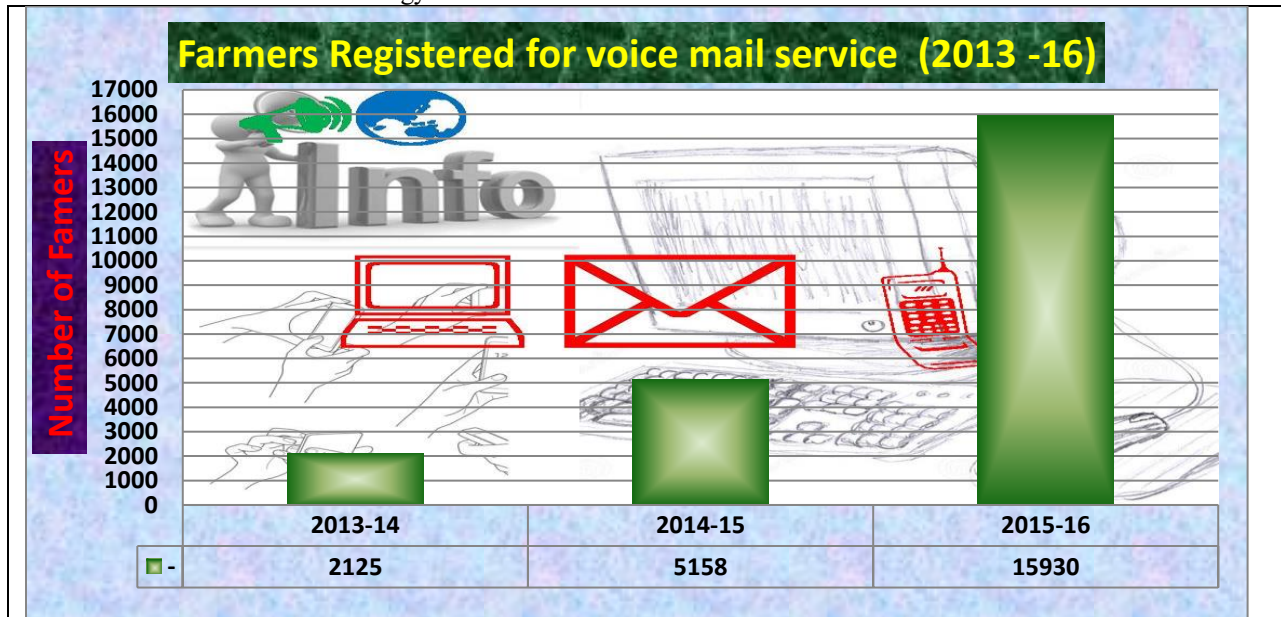


Fig. 3 Cumulative progression of registering farmers for voice mail service through project

The need based and the voice-messages guiding cotton farmers regarding cultivation practices, contingency planning in respect of erratic and unpredictable weather conditions, pest and disease control were recorded by the implementing officer along with technical persons (SRFs) appointed for the work at Akola center.

The database of 52 Frequently Asked Questions (FAQs) related to cotton cultivation and subsequent management issues were developed during the tenure of the project. The questions were collected from farmers from their actual issues faced on farm. The FAQs were sorted from frequent queries received to this office or to the concern scientist during the course of time i.e. 2012-13 (10 FAQs), 2013-14 (25 FAQs), 2014-15 (47 FAQs) and totally 52 FAQs upto 2015-16 (Fig. 4). The messages were generally concerned regarding management practices of cotton, weed management, contingency planning in dry spell due to irregular rains, insect-pest particularly in Non-Bt cotton management, post harvest etc., .

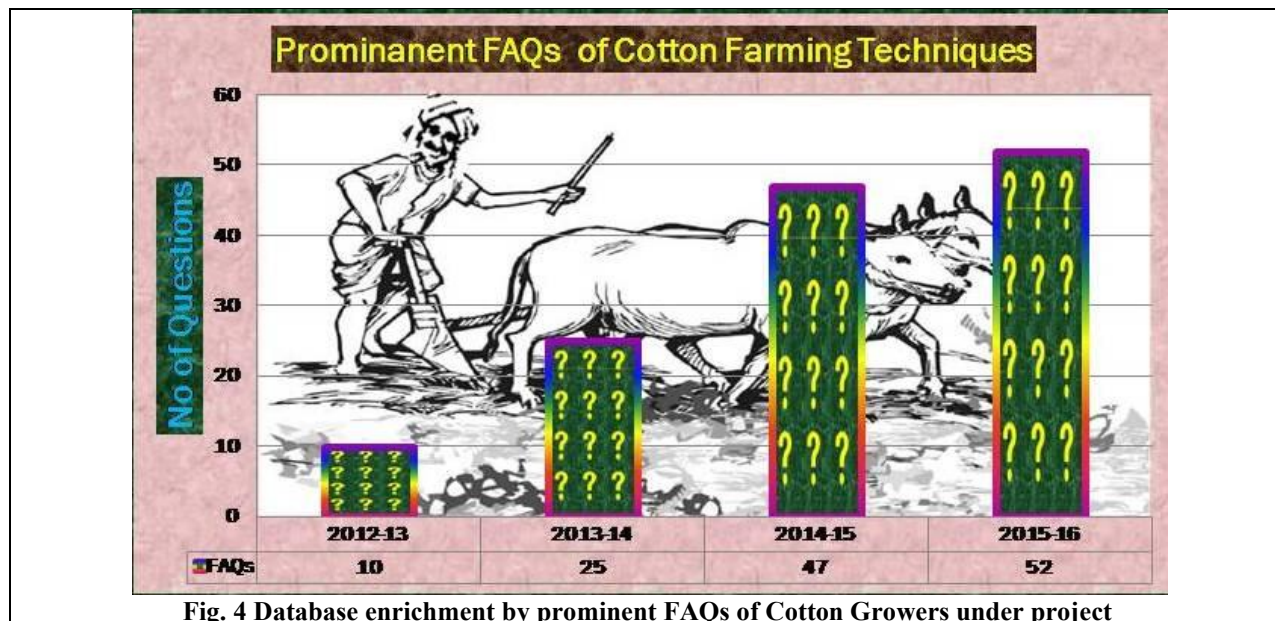


Fig. 4 Database enrichment by prominent FAQs of Cotton Growers under project

Beside these, a script for documentary on ‘Rainfed Cotton Cultivation’ was submitted to Principle Investigator, ICAR-CICR, Nagpur as one of the assigned component for this center under the project. In the developing world, ICT applications are crucial in reducing information and coordination costs [5]. The spread of mobile phones in rural areas has already led to important changes in the agricultural sector despite of limited literacy coupled with rapid successful spread and adaption of mobile technology in rural India.

The case study of Tamilnadu women farmers is a little something for anyone doubting that technology can change things up for the better. In Tamil Nadu, it has helped over a thousand women come together and launch their own company. These women are known as (and proudly declare themselves to be) “voicemail farmers”. Starting in year 2000, these mostly uneducated women began using voicemail through their mobile phones to get scientific tips on goat-rearing. Their technique has improved, as has the health and quality of their livestock [13]. Similar kind of case, to make ICT model based services more farmer-friendly, *Direct2Farm* sends out voice messages in local languages and different dialects too. For example, when talking about rice, the voice messages use the term *jiri* in Haryana and *dhaan* in Bihar. Information like changes in sowing patterns, the use of the right kind of fertilizers, different seeds, rain forecasts and other such crucial information is sent through these voice messages. The Unique feature of this case was if due to any circumstances, a farmer has missed listening to the voice message, he or she can again hear all the eight messages of the month by giving a missed call to a toll free number provided by *Direct2Farm* [10].

Dissemination of newer crop production technologies among growers is the major bottleneck in the existing extension system [11]. Audio or voice-based question and answers services may overcome the limitations of text-based platforms. Short Message Service (SMS) can be effective for simple price or weather information, but to facilitate and revolutionize learning and make knowledge widely accessible, especially in the context of adapting agriculture to climate change, other methods and modes will be necessary [5]. Reducing these costs in the context of developing countries characterized by poor infrastructure, promotes market access, facilitates financial inclusion and risk management, contributes significantly to early warning, and can be central in revolutionizing agricultural extension by timely transfer of information/technology. In coming years, the Value Chain Stage Technology Intervention needed in sectors viz., availability of agriculture inputs directly on phone, Weather forecast through weather apps/telecommunication services, decision support solution for farmers like selling crops at appropriate rates, pest management solution and nutritional management, artificial intelligence based sowing advisories, harvesting (picking) and transport along with market statistics etc., Further, it was observed that almost all the farmers were very satisfied with the mobile voice messages as they had effective audio quality and comprehensible content of agricultural information. Further, the language used to relay the information in the voice message was very simple and easy to understand by the farmers. On the basis of the findings in this study, it is recommended that there should be a further improvement by enriching the database under ICT Models also strengthening the technical documents for updated voice messages on cotton farming and practical difficulties of growers.

Conclusion: It has been found through the evidences suggests that in many circumstances ICTs, specifically mobile phones, are thought to increase access to both information and capacity-building opportunities for rural populations specifically related to farming activities. This kind of model can brings tangible benefits in life of farmers who is said to be in distress. The ICT may be built-up having multiple components based on inputs, cultivation, protection, marketing, processing along with value addition related to cotton crop may help the farmers. The attached farmers can achieve higher crop yields, as they get access to timelier and better-quality information on products and inputs as well as weather and market related situation based information through such crop specific ICTs

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