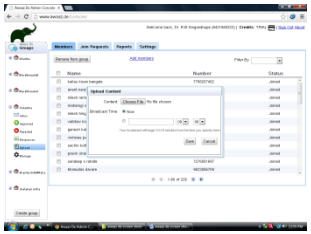
WELCOME



ROLE OF ICTS IN PROMOTION OF BEST COTTON MANAGEMENT PRACTICES AND ENHANCED PRODUCTIVITY

S.M. Wasnik,
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CICR, Nagpur.


ICTs bridge the gap between agricultural researchers, extension agents and farmers thereby enchancing agricultural, production.
ICTs assist with implementing regulatory policies, frameworks and ways to monitor progress.
ICTs widen the reach of local communities, including women and youth, and provide newer business opportunities, thereby enhancing livelihoods.
ICTs improve access to climate-smart solutions as well as appropriate knowledge to use them.
ICTs increase access to financial services for rural communities, helping to secure savings, find affordable insurance and tools to better manage risk.
ICTs provide actionable information to communities and governments on disaster prevention, in real-time, while also providing advice on risk-mitigation techniques.
ICTs help deliver more efficient and reliable data to comply with international traceability standards.
ICTs facilitate market access for inputs as well as product marketing and trade in a variety of ways.
Regulatory & policy
Agricultural extension & advisory service
Promote environmentally sustainable farming practices
Disaster management & early warning system
Enhanced market access
Food safety & traceability
Financial inclusion, Insurance & risk management
Capacity-building & empowerment
Role of ICTs in Agriculture
Source: FAO, ITU

ICT's potential

The country has the huge potential of ICT and knowledge can produced, processed, stored, retrieved and disseminated to different stakeholders in agriculture

- e-Mails
- Expert Systems – Information system
- Decision Support System and Crop Doctor
- Video Conferencing
- Interactive multimedia
- Web search tools
- Social media
- Pedia
- Video
- Mobile Phones

ICT-Based Agricultural Extension Programs

Mechanism/Project	Type of Information (Prices, Techniques, Inputs, Buyers/Sellers, General)	Country	Mechanisms (Voice, SMS, Internet)
Agricultural Commodity Trade Platform	Prices, buyers, sellers	Pakistan	Voice
Allo Ingenier	General Techniques	Cameroon Bangladesh	Voice Voice
Banana Information Line	Techniques (bananas)	Kenya	Text-to-speech
China Mobile – 12582	Prices, techniques	China	Voice, SMS
Southern Africa Development Q&A Service	General	South Africa	Voice
National Farmer's Information Service (NAFIS	General	Kenya	Voice
T2M (Time to Market)	Prices, supply	Senegal	Voice, SMS, Internet
Millennium Information Centres and Community Parliaments	General	Kenya	Voice, SMS
Question and Answer Service (QAS) Voucher System	General	Uganda	Voice (ask question) radio, internet
IKSL Agri Hotline	Techniques	India	Voice and SMS
KRIBHCO Reliance Kisan Limited	General	India	Voice, SMS, internet
Kenya Farmer's Helpline	Market prices, weather	Kenya	Voice
iKisan	iKisan	India	Internet (kiosks)
Warana	General	India	Internet (kiosks)
Gyandoot	General	India	Internet
Agrovision	Techniques	Nigeria	Internet

ICT-Based Agricultural Extension Programs

Mechanism/Project	Type of Information (Prices, Techniques, Inputs, Buyers/Sellers, General)	Country	Mechanisms (Voice, SMS, Internet)
KISSAN Kerala	General	India	Voice, SMS, Internet
TNAU AGRITECH Portal	General	India	Internet
e-Krishi	Market	India	Internet
EID Parry- Indiagriline	General	India	SMS
Indiancommodities.com	Market	India	Internet
Mahindra Kisan Mitra	General	India	Internet
IFFCO Agri-Portal	General	India	Internet
M.S. Swaminathan Research Foundation (MSSRF)	General	India	Text , audio
Kissan Call Centres	General	India	Voice
Lifelines India	General	India	Internet , telephony
IFFCO Kisan Sanchar Limited	General	India	Voice
Fisher Friend	General	India	Voice
vKVK	Weather, markets	India	audio
IMD (Indian Meteorological Dept)	Meteorological	India	Text
e- agriculture	Weather, market	India	Text, Audio

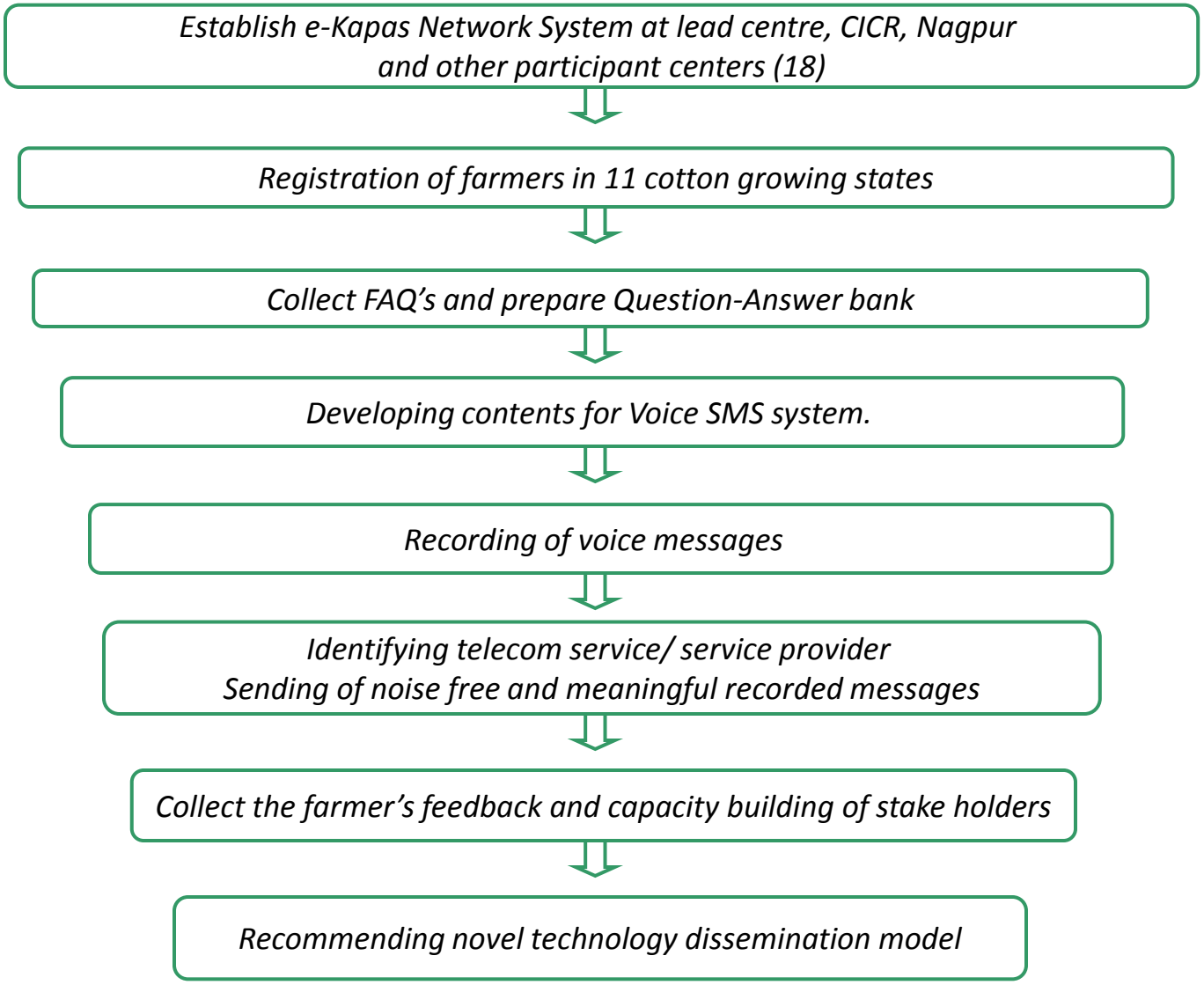
Challenges in cotton Extension

- Information gap between research system and end users
- Reaching 12 million hectare farms in ten states cotton technologies spread through extension personnel of the Department of Agriculture
- Diversity of agro-ecological situations in all these ten states
- Knowledge required to address them is beyond the capacity of the grass root level extension functionaries
- Information and Communication support during last 65 years has mainly been conventional
- Indian cotton sector facing a serious challenge of retaining top position in acreage and second position in production at world level
- India emerged as the world's second largest mobile market globally only after China
- Bridging up this knowledge gap will certainly boost the profitability
- To tap vast potential medium of increased penetration of mobile phone networks and handsets in India, CICR has introduced these tools for cotton advisory services to the farming community
- 'e kapas' network was initiated by CICR nationally from 2012 under Technology Mission on Cotton, Mini Mission I.

CICR 'e- Kapas' initiative

'e- Kapas' an initiative of utilization of information and communication technologies (ICTs) for delivering appropriate cotton technologies to farmers aiming to improve the efficiency of current manual system by saving time, money and making technologies available 'anywhere & anytime' to users using mobile phones and to connect cotton growers for profitable and sustainable cotton farming in India

Flow chart of e-Kapas network project



Telecommunication subscribers Fixed & Mobile Phones

(Figures in millions)

Sr. No.	Subscribers	Wireless	Wire line	Total
1	Urban subscribers	525.30	23.50	548.80
2	Rural subscribers	342.50	6.71	349.92
	Total subscribers	867.80	30.21	898.02

(Source: ITSP Indicator (Oct-Dec), TRAI 2013)

Mobile phone have the advantages of additional services

- *Standard voice function such as SMS for text messaging*
- *email*
- *Packet switching for access to the Internet*
- *Gaming*
- *Bluetooth*
- *Infrared, camera with video recorder*
- *MMS for sending and receiving photos and video*
- *The voice SMS option in the mobile phones facilitates the illiterate farmers to get the information without any difficulties*

Lead Center & participating Centers

Farmers registration- database

- *Publicity made through newspapers, Krishi vasant/ Mela/Agril Expo, Department of Agriculture, Grammin Banks (Rural Banks) etc. to register names & mobile numbers for e-kapas advisory services*

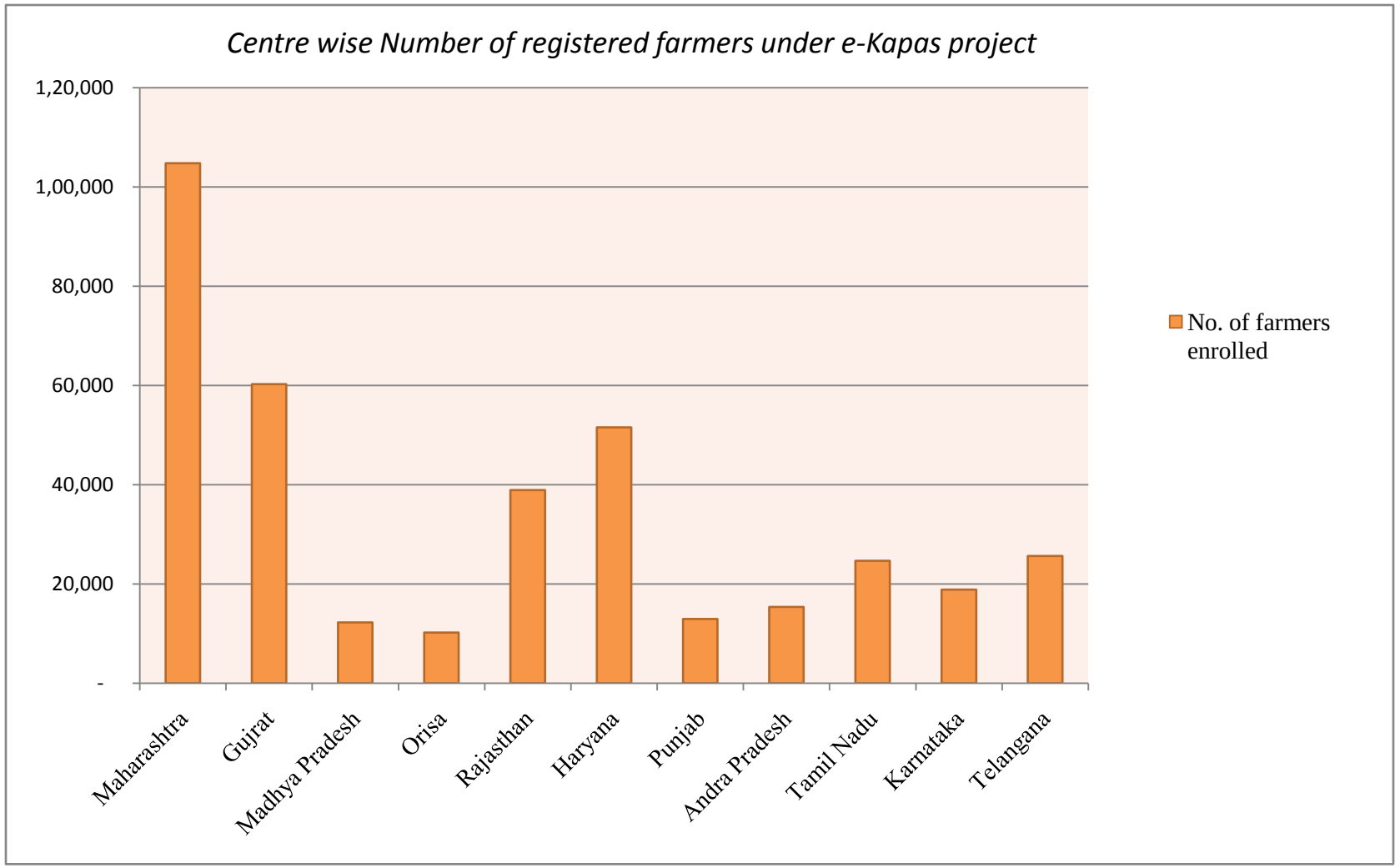
Registration of Cotton Growers under 'e-kapas'

- Overall 3,75,462 farmers registered as e-Kapas beneficiary from the 18 participating centres

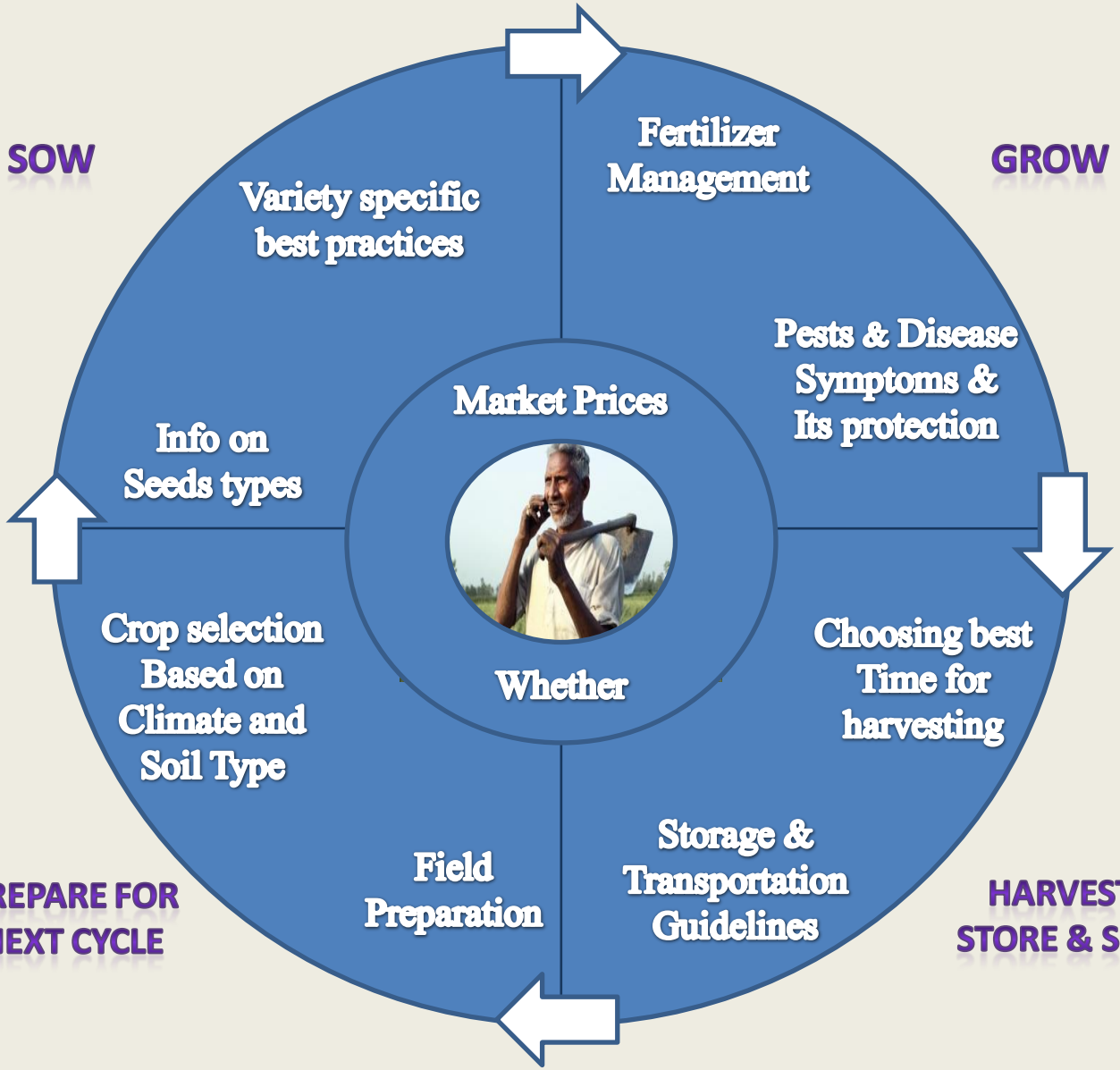
Farmers registered under e-Kapas project

SN	Name of Centres	No. of farmers enrolled year wise				Total
		2013-14	2014-15	2015-16	2016-17	
1	CICR, Nagpur (M.S.)	14200	5562	8401	37291	65454
2	Dr. PDKV, Akola (M.S.)	2125	1196	0	0	3321
3	VNMKV, Parbhani (M.S.)	4064	7	2553	638	7262
4	MPKV, Rahuri (M.S.)	5000	0	4624	19145	28769
5	JAU, Junagadh (Guj.)	7000	0	6626	40583	54209
6	NAU, Surat (Guj.)	1700	4139	197	2	6038
7	RVSKVV, Khandwa (M.P.)	1064	0	0	11205	12269
8	OUAT, Bhawanipatnam, (Orrisa)	9586	0	601	0	10187
9	SKRAU, Sriganganagar (Raj.)	7000	5226	8994	13980	35200
10	ARS, Banswara (Raj.)	1191	1818	608	84	3701
11	CCSHAU, Hisar (Har.)	9000	15116	2344	698	27158
12	CICR- Regional Station, Sirsa (Har.)	10000	618	12492	1264	24374
13	PAU, Faridcot (Punjab)	1753	3434	1290	6496	12973
14	ANGR, Agril. University, Guntur (A.P.)	1190	445	5872	7860	15367
15	CICR- Regional Station, Coimbatore (T.N.)	6066	986	3991	13639	24682
16	UAS, Dharwad (Kar.)	1208	2161	6609	5235	15213
17	UAS, Raichur (Kar.)	1031	0	767	1828	3626
18	IIOR, Hyderabad (Telgana)	0	25659	0	0	25659
	Total	83,178	66,367	65,969	1,59,948	3,75,462

State Wise Farmers Database



Advisory covers entire crop cycle



CICR

Co-created with a strong ecosystem

Content development for cotton advisories

Collection of information on recent FAQs (Frequently Asked Questions) through Focus Group Discussion and Kisan Call Centres (KCC) & prepared question bank for providing instant solutions to the farmer's problems with meaningful & short length voice messages on best cotton management practices

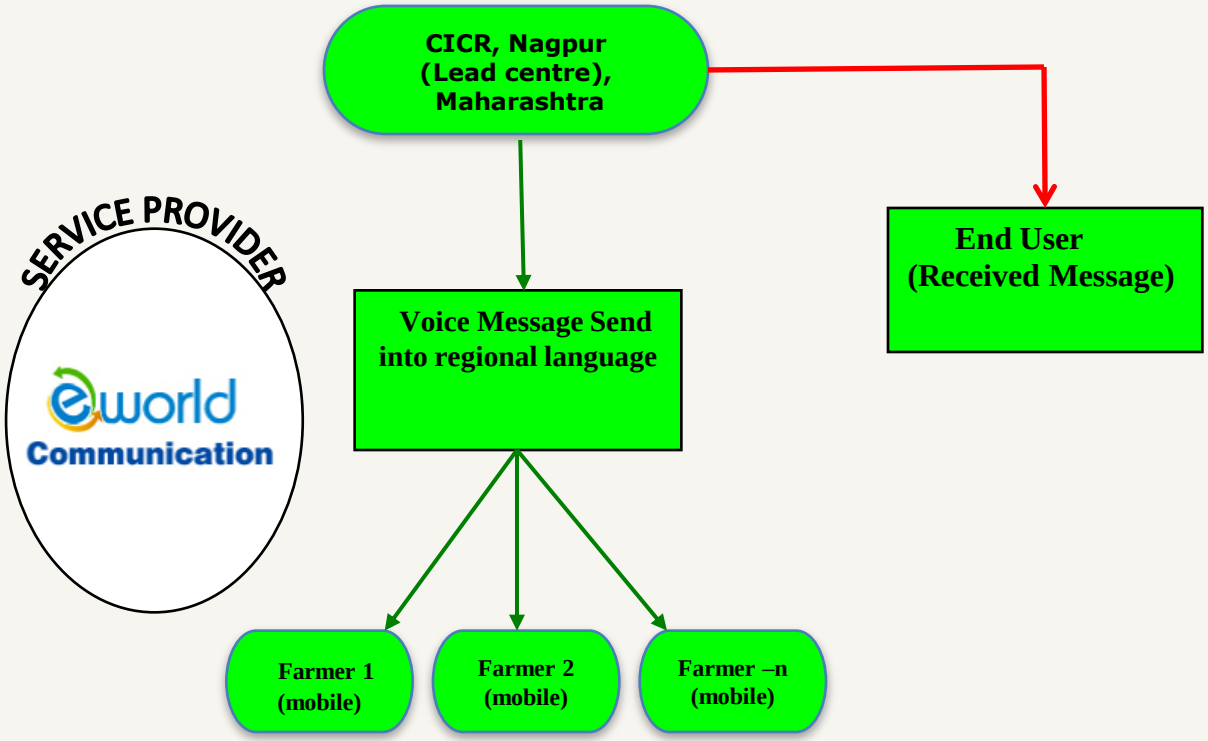
- ✓ *Varieties//hybrids for early sowing/early maturing/HDPS in rainfed condition*
- ✓ *Weed management*
- ✓ *Seed treatment*
- ✓ *Fertilizer basal application*
- ✓ *Gap filling*
- ✓ *Use of trap crops*
- ✓ *Intercultural operations*
- ✓ *Draining out excess water from fields*
- ✓ *Top dressing of fertilizers*
- ✓ *Foliar spray to recover from the effect of water logging*
- ✓ *Foliar spray for shading of squares and flowers*
- ✓ *Foliar spray to ensure proper Cry1Ac expression*
- ✓ *Foliar spray to overcome micronutrient deficiency*
- ✓ *Irrigations in Bt cotton*
- ✓ *Control of sucking pests*
- ✓ *Diseases control*
- ✓ *Control of bollworms and other pests*
- ✓ *Use of pheromone traps/ IPM in cotton*
- ✓ *Pickings*
- ✓ *Storing, marketing*

Recording Voice Messages

Recorded noise free and timely messages from scientist voice

कोरडवाहू परिस्थितीत, कपाशीचे चांगले उत्पादन मिळवण्यासाठी, लवकर येणा–या संकरीत बिटी वाणाची, त्वरीत पेरणी करावी.
कपाषी लागवडीसाठी, जमीन तयार करताना पेरणीआधी, ग्लायफोसेट हया तणनाषकाने गवती तणांचा नायनाट करावा.
एक किलो कपाषीच्या बियाण्याला अझॉटोबॅक्टर 25 ग्रॅम आणि स्फूरद विरघळणारे जिवाणू खत म्हणजेच पी.एस.बी 20 ग्रॅम हे जिवाणू खते लावून पेरणी केल्यास फायदेषीर ठरेल.
बि.टी. कपाषी भोवती नॉन–बि.टी. कपाषीच्या दोन ओळी लावायला विसरू नका.
कपाषी पेरणीनंतर बी उगवण्याआधी पेंडीमिथॅलीन हे तणनाषक अर्धा लिटर प्रती एकर प्रमाणे फवारून तणाचा नायनाट करा.
पेरणी वेळेस कपाषीला षिफारसीत खत मात्राच दया. नत्राचा बेसल डोज दयायला विसरू नका.
कपाशी उगवणीनंतर 3 ते 5 दिवसांनी नांगे भरा.
कपाषी पेरणी वेळेस, खते देतांना बियाण्याच्या दोन इंच दूरून दयावीत.
नत्र खतांची मात्रा पेरणीच्या वेळी, तसेच पाते आणि बोंडे लागण्याच्या वेळी ओलाव्याच्या उपलब्धतेनूसार विभागून दिल्यास, अन्नद्रव्याची उपलब्धता आणि कार्यक्षमता वाढेल.
कपाषी भोवती सापळा पिकाच्या दोन ओळी लावा. मका , चवळी , झेंडू आणि एरंडी ही सापळा पिके होत.
कपाशी उगवणीनंतर 15 ते 20 दिवसांनी विरळणी करून प्रती एकरी झाडांची अपेक्षीत संख्या ठेवा.
कपाशी उगवणीनंतर तण नियंत्रणासाठी पाइरथिओबॅक सोडीअम (डिटविड) हया तणनाषकाची 250 मीली प्रती एकरी फवारणी करा.
उगवणीनंतर 15 ते 20 दिवसांनी पहिली डवरणी करा आणि पूढील 15 ते 20 दिवसाच्या अंतराने 2 ते 3 वेळा डवरणी करावी.

Information Delivery through Mobile based Voice Messages



Drain out excess water regularly from field wherever essential to ensure good aeration and proper growth of crop

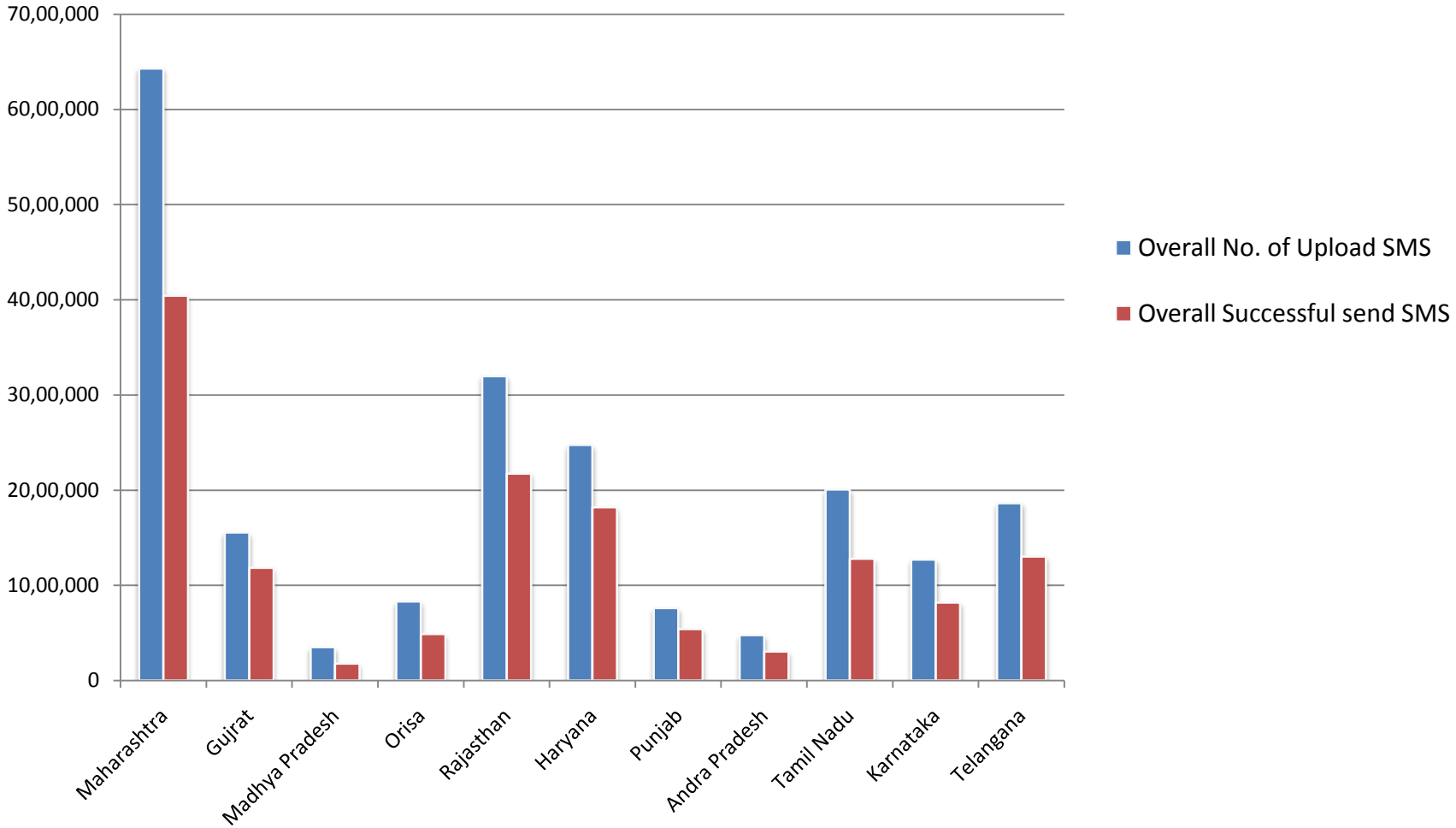
A farmer receiving voice messages from CICR, Nagpur

Voice SMS delivered & Successful messages (CICR) 13-17

Fig. Sending Voice messages

Overall 2.12 crores voice messages uploaded across country in local languages in , out of 1.41 attempted successfully

State Wise message uploaded and sent successfully



Percentage Gained in knowledge level in cotton practices

Voice advisories/messages	Knowledge level (%)		
	Before	after	gained
Varieties//hybrids for early sowing/early maturing/HDPS in rainfed condition	32.78	75.74	42.96
Weed management, Intercultural operations	40.74	68.52	27.78
Control for sucking pests	31.48	87.0	24.04
leaf reddening control	40.74	83.33	42.59
Use of pheromone traps/ IPM in cotton	31.48	94.4	62.92
control of pink boll worm & Diseases control	48.15	64.81	16.66
Foliar spray for shading of squares and flowers	40.74	53.70	12.96
INM	12.96	96.30	83.34
Foliar spray to recover from the effect of water logging, to overcome micronutrient deficiency	33.33	59.26	25.93
Use the non-Bt seed as refugia, gap filling, draining out excess water from fields	37.04	75.0	37.96
Mean	34.94	75.81	37.71

Yield gains due to voice messages delivery as expressed by farmers

voice messages delivery	Seed cotton Yield (Kg/ha)	Net Yield gain (Kg/ha)
Before voice messages delivery	1358	592
After voice messages delivery	1950	

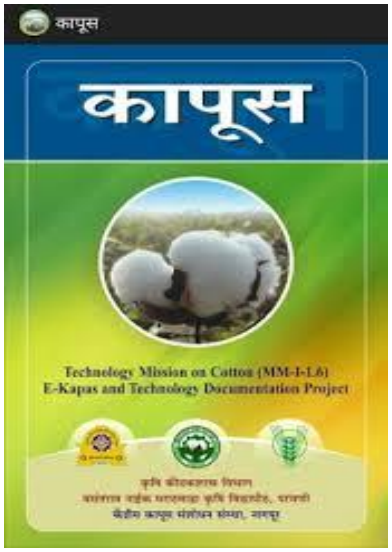
Reason for unsuccessful attempt

- DND (Do Not Disturb) registration done by majority of the farmers with their mobile service providers
- Few have given invalid numbers unknowingly
- Ring timeout & congestion
- No answer from user
- Network busy/user busy
- Switch off

Effectiveness of Mobile phone based network

- *Majority acknowledge the receipt of timely, relevant and quick cotton information*
- *Need based & location specific information*
- *Save time, money & easy to understand available information*
- *Service relevant for people who are not on the internet or not comfortable with text messaging*
- *Service is of a great use to illiterate farmers*
- *Source for strong linkage with research station*
- *Majority believed that voice messages received on mobile phones reduced their costs for accessing information on cotton*
- *More than one third stated that they had demonstrated new technologies heard through voice alerts*
- *Around half respondents agreed that there were changes due to voice alerts*
- *Farmers preferred also toll free call back facility to contact the officers and scientist*

Mobile App



- *under e- Kapas Network project an application for android mobile on cotton cultivation in Marathi for Maharashtra developed by participating centre VNMKV, Parbhani which can be downloaded from Google Play Store by searching 'Cotton (Kapus) VNMKV, Parbhani'.*
- *Users gave huge response and more than 5000 users downloaded & installed the application on their mobile.*

COTTON PANCHANG (Cotton Calendar)

- *Kapas Panchang which covers month wise information as daily guide for the whole year was developed under e-kapas by centres Sriganganagar, Junagarh, Bhavanipatnam and Banswada in local languages*

CONCLUSION

- *The study thus tried to explain the importance and usefulness of the new ICT model for benefit of cotton growers.*
- *Information, advice, knowledge and relevant content that have hitherto been inaccessible to farmers made available through the voice messages on their mobile phones in local languages in cotton growing district of country.*
- *The information has allowed cotton growers to make more informed economic decision, ultimately increasing cotton production & productivity*
- *e- kapas ICT could make a difference as the agro- advisories had helped the farmers to gain and enrich the knowledge regarding best cotton management practices*
- *Further it was observed that a substantial percentage of farmers who received the advisories readily shared with fellow farmers*
- *Data obtained through the study, proved that 'e-Kapas' voice messages delivered as new ICT's tool is effective in delivering timely cotton production & protection information among farmers at anywhere and anytime.*
- *On the basis of these findings it can be recommended that the e-kapas programme should be equipped with more facilities as voice messages services are considered as reliable source of information*
- *Replicating the success of the mobile based cotton extension model in other crops & other cotton growing countries of world for sustainable and profitable cotton farming*


Thank you...