

INFORMATION & COMMUNICATION TECHNOLOGY: INCOME AVENUES TO RURAL FARMERS

Dr Gopal Kalkoti

By June, 2014, rural India had about 122.4 million (68.32 per cent) households with mobiles exhibiting mobile connectivity has become a basic service in rural areas. Rural mobile subscriber base is growing twice as faster compared to urban subscriber base. As of March 2015, the national teledensity was 79 per cent and rural teledensity 46.5 per cent.

Government's "Digital India" project launched on 1st July 2015 envisions empowering citizens with e-access to government services and livelihood related services, among others. The project comprises three core components.

Mobile phone is the preferred delivery medium with focus on **mGovernance and mServices**. The **mAgriculture and mGramBazar**, out of seven components covered under **mServices**, directly impact agricultural extension and marketing services. The 'National Digital Literacy Mission' will make 10 million people digitally literate in five years and digitally empower at least one person in every family.

The project will benefit small farmers. It seeks to :-

- i) transform rural India into a digitally-empowered knowledge economy
- ii) provide universal phone connectivity and access to broadband in 250,000 villages
- iii) extend timely services to farmers through ICT
- iv) enhance efficiency in agricultural governance through digital literacy and electronic delivery of services.



This article briefly highlights government and private initiatives and suggests the need for harnessing potential of digital India for agricultural development in the light of current agricultural scenario when mobile phone penetration in rural India has been fast increasing.

Harnessing Potential of ICT

Information and Communication Technology has the potential to revolutionize Indian agriculture in terms of raising crop productivity and profitability per unit area and resources. Several apps are now available and many more can be developed to help farmers access authentic, accurate and timely information related to high-yielding variety seeds, production-enhancing and cost-minimizing farming practices, efficient use of water including micro-irrigation system, integrated nutrient and pest management, post-harvest management practices, marketing of farm produce in domestic and international markets and measures to mitigate adverse impact of climate change.

Government's Initiatives in ICT for Agriculture

- The government has proposed a **National Broadband Network**, which will lay out a fibre-optic cable across the country to achieve last mile connectivity and encourage private operators to make services available in hitherto untouched areas. For this, the government has committed about \$4 billion to build the network to connect 250,000 villages.
- Government has put in operation three portals viz. farmer portal, kisan call centre and mkisan portal to help farmers take informed decisions for efficient farming under varying agro-climatic

conditions. Farmers can reach the nearest buyers and sell products directly and minimize post-production wastages and cost. Social media all over the country can connect buyers with sellers directly and remove middlemen.

- **Farmers' portals:** This portal aims at serving as "One Stop Shop" for farmers for accessing information on agriculture. Besides, it facilitates linking the location of the farmer with the concerned National Agricultural Research Project zone to which he belongs. This facilitates him to access crop-specific technical information including package of farm practices, control of pests and diseases; dealer-network for seeds, fertilizers, pesticides, farm equipment, weather advisories etc.
- **Farmers Call Centres:** This initiative aims at providing farmers toll-free information in their local language throughout the country.
- Under the eGovernance program, soil health card software has been standardized and web-based software developed to provide integrated nutrient management recommendations using soil test crop response method for eight states.
- **Strengthening IT Apparatus in States (AGRISNET):** Under AGRISNET, computers are provided up to the sub-district level throughout the country and state-specific software packages have been developed to disseminate information to farmers. Availability of required hardware and locally suitable software package has resulted in quick retrieval of data, dissemination of information to farmers and provision of farmer-centric services.
- **NABARD has also designed agricultural portals for farmers.**

Private sector initiatives

Private sector, NGOs and social groups have also been using ICT in agriculture to supplement Government's efforts for efficient delivery of various services to farmers. Following two, among others, having unique methodologies and content are briefly described to help farmers access desired services for agricultural development.

e-Choupal: It is a business initiative by

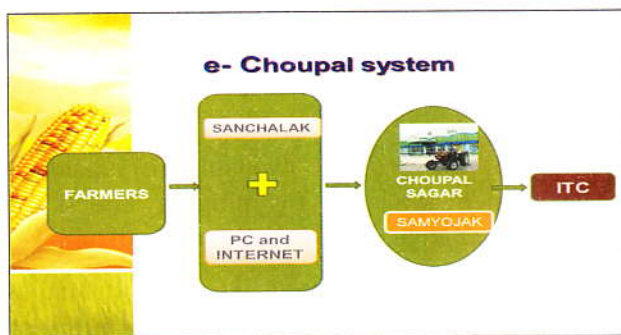
ITC that provides Internet access to farmers. e-Choupal is an innovative market-led business model designed to enhance the competitiveness of Indian agriculture.

e-Choupal leverages the power of Information, digital technology and internet to help farmers access services viz. agricultural knowhow and best practices, timely weather information, supplies of inputs throughout the region, transparent discovery of farm prices. Portal has questions and answers section to enable interaction between farmers and agricultural experts and helps farmers manage risks, such as soil contamination or salinity etc. ITC is, also, partnering with banks to help farmers access to credit and insurance services.

ITC has established "ITC Kiosk" with computer and internet facility in villages managed by a computer-trained farmer (sanchalak) in his house and is linked to the Internet via phone lines or by a very-small aperture terminal (VSAT) connection. e-Choupal system comprises three components viz. internet-enabled computer located at a "focal point farmer," internet connection via phone lines or VSAT and dedicated services through the echoupal.com portal. Each internet connection serves 10 villages in a 5km radius, reaching average 600 farmers. This system improves logistics and reduces transaction costs. Finally, it provides the link to ChoupalSaagars, integrated rural service centres serving 40 e-Choupals each, where farmers can bring their farm produce to sell and buy seeds, fertilizer and consumer goods. The sanchalak bears some operating cost but in return earns a service fee for the e-transactions done through his e-Choupal. The warehouse hub is managed by the same traditional middle-men (samyojaks) but with no exploitation because of streamlined services. These middlemen fulfil critical jobs like cash disbursement, quantity aggregation and transportation.

e-Choupals connect farmers with markets and allows for a virtual integration of the supply chain improving efficiencies in the traditional system.

Farmers earn higher profit margin because they are no longer forced to sell through a middleman. ITC benefits because its simplified and intensified supply chain system increases business



and profits. ITC has 6500 e-Choupals computer stations in 40,000 villages serving 4 million farmers of 10 States.

Reuters Market Light (RML) Information Services: After 18 months of market research prototyping and market trials, RML was launched in Maharashtra in 2007 and in Punjab in 2008. RML delivers customized, localized and personalized agricultural information to farmers from pre-sowing to post-harvest stages including weather, crop prices through SMS on mobile phones in local language. About 1.4 million farmers from about 50,000 villages have been using this service across 18 states.

RML has empowered farmers with such information that enables them to take informed decisions and reduces their production and marketing risks. According to ICRIER study (2009), RML users had 5 per cent to 25 per cent increase in their income. The World Bank study (2010) revealed 8 per cent increase in price realization to farmers selling directly to traders. The USAID study (2011) observed that farmers accessing RML services realized Rs.6-8 more per kg on their produce. Around 80 per cent farmer-users improved alignment of farm output to market demands, ensuring improved productivity and better quality of produce

Low Crop Productivity & Profitability

According to "Situation Assessment of Indian Farmers", only about 28 per cent farmers use any kind of agriculture-related information that is available rather than what they need whereas about 72 per cent farmers do not have any source of information that can help them adopt latest technology and most farmers are unable to access credit, insurance and marketing services from the established institutions. This is primarily

responsible for farmer's low crop productivity and profitability. Despite India has the largest irrigated land and, ranks second in terms of arable land crop-yields are 20 per cent-40 per cent of world's best levels.

The ICAR study showed that integrating agricultural credit with technology and production inputs, farmers can increase wheat production by around 40 per cent and double paddy production at current levels of technology. Efficient agricultural extension agency and support service providers can bridge the existing gap between the actual crop yields at field level and the potential yields. The post-harvest losses exceed 25 per cent annually.

For marketing, small farmers have to deal with multiple layers of middlemen. **For example, farmers sell in village itself 85 per cent of wheat and 75 per cent of oil seeds in Uttar Pradesh, 70 per cent of oil seeds and 35 per cent of cotton in Punjab, and 90 per cent of jute in West Bengal. These middlemen take away about 47 per cent of the price of rice, 52 per cent of groundnut and 60 per cent of potatoes. On an average, Indian farmers realize only 20 to 25 per cent of the value paid for by consumers.**

Promising Mobile penetration in rural areas

India has about 69 per cent rural population. By June, 2014, rural India had about 122.4 million (68.32 per cent) households with mobiles exhibiting mobile connectivity has become a basic service in rural areas. Rural mobile subscriber base is growing twice as faster compared to urban subscriber base.

As of March 2015, the national teledensity was 79 per cent and rural teledensity 46.5 per cent.

Telecom Policy aims to increase rural teledensity to 60 per cent by 2017 and 100 per cent by 2020. Study of the IAMAI revealed 80 per cent using it for communications, 67 per cent for online services, 65 per cent for e-commerce and 60 per cent for social networking. Mobile phones can be effectively utilized for purposes including generating, processing, transmitting, disseminating, sorting, archiving and retrieving critical information and data relating to agriculture. Mobile phones are omnipresent and

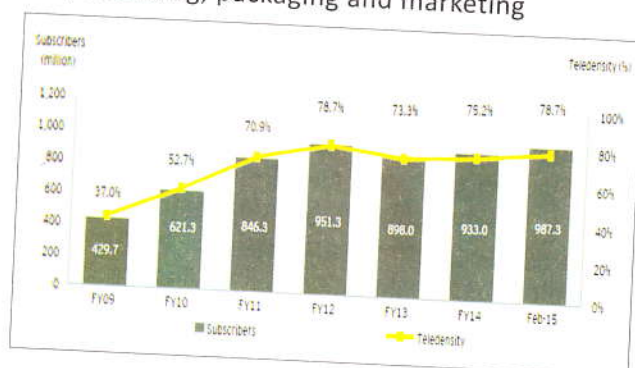
cost effective means to revolutionize agriculture in India. Farmers' timely access to farm output related comprehensive information right from the selection of seeds for planting to marketing of produce in domestic and international markets is a must.

What Farmers Need?

For India, at a time when national, regional and international research institutes have already developed technologies, farmers need motivation and encouragement to adopt these proven yield-enhancing, cost-efficient and environment-friendly technologies. Acknowledging the low impact of the ICT initiatives of the Government and private sector, the digital India project should pay undivided attention to provide accurate information from authentic sources to farmers on time on various aspects as identified by various field studies, viz.

Farmers need ICT-enabled portals for following purposes which can be developed, rigorously field tested and made available to them.

- **Technology:** Production-enhancing proven crop-specific technologies (from pre-sowing to harvesting and post-harvest management) based on soil and water analysis. Separate for dry land and irrigated farming focusing efficient use of seeds, fertilizers, water, pesticides, farm equipment and labour; and reclamation of degraded, saline and alkaline land.
- **Production inputs and farm equipment:** Crop-specific reasonably priced standard quality production inputs (seeds, fertilizers, pesticides, etc) and farm equipment and machinery along with sources of availability
- **Post-harvest services:** Storage, transport, processing, packaging and marketing



- **Institutional services:** Land records, farm credit, insurance, marketing, weather, farmer-producers' organizations, market yards, procurement centres
- **Government facilities:** Availability of subsidies, assistance available to mitigate effects of climate change, drought, floods, earthquake, cyclones

Institutions: State government's department of agriculture, state agricultural universities, Krishi Vigyan Kendras, regional research institutes, farmer-producers organizations, corporate/industrial/business houses and multinational companies (engaged in manufacturing/production and distribution of farm inputs, farm equipment and machinery), rural financial institutions, insurance companies, among others, have a significant role and added responsibility to contribute their professional knowledge to develop digital ecosystem for agriculture and make available to farmers.

Focused Attention:

Immediate need is to conduct a nation-wide[separately for each agro-ecological region] evaluation study to assess the impact of ICT initiatives on agriculture already developed and put in place by the Government and private sector in respect of

- number of farmers regularly receiving and using mobile-enabled agricultural information services
- feedback from users about content, timeliness, utility, satisfaction, changes required, their grievances
- increase in productivity, output and income of benefitted farmers
- increase in price realization in farm commodities sold, direct selling without dependence on middlemen
- reduction in costs of transactions
- mechanism to redress grievances.

The study of the Asia-Pacific Research Centre of the Stanford University on ICT Initiatives under the project "Agriculture and Rural Livelihood" in India concluded that the *usage* of ICT was sparse compared to its significant potential

and substantially constrained by factors viz. illiteracy, inadequate infrastructure (particularly connectivity), low level of awareness of usage, availability of very few digital programmes, central site location, and Government regulations. This suggests the need for coordinated and concerted efforts by all stakeholders to create a national agricultural knowledge repository in digital form which is nurtured daily through feeding, weeding, pruning and enriched and disseminated among farmers.

For successful designing digital ecosystem for agriculture, the system design should have all desired features of higher user satisfaction, viz.

- i) ease of access
- ii) updated content
- iii) layout, design, consistent themes
- iv) easy navigation
- v) higher interactivity
- vi) access through multiple media (particularly voice)
- vii) higher use of non-textual information
- viii) language options
- ix) lower cost of transaction.

A professionally managed ICT platform in public private partnership mode can bring various pieces of agricultural value chain system together and design solutions with 'mobile-first' approach to maximize on-ground adoption and create visible impact.

Regulatory and Development Authority need to be in place to ensure

- i) increase in farmers' easy, timely and reliable access to agricultural information system (as per farmers' needs) throughout the country in a systematic and planned manner
- ii) development of need-based appropriate digital models for agriculture under public and private sector which conform BIS and are available at affordable cost
- iii) improving general/digital literacy, computer skill and digital infrastructure in rural India in line with digital India vision
- iv) prevention of fake models and fraudulent practices

[Author is Associate Professor and Head, Dept of Economics, Nagindas Khandwala College, Mumbai]

Cabinet Approval for Pradhan Mantri Fasal Beema Yojna

The Union Cabinet has recently approved Pradhan Mantri Fasal Beema Yojna, a crop insurance scheme aimed to ensure farmers' welfare. The scheme will offer more insurance with less premium, and lead to rise of purchasing capacity of farmers.

The new Crop Insurance Scheme replaces the existing National Agricultural Insurance Scheme. As per the scheme farmer's share of premium has been substantially reduced and government will provide subsidy on premium. Government liability on premium subsidy will be shared by Central and State Governments on fifty-fifty basis.

The budget for Crop Insurance will be substantially increased from 2823 crore rupees to 7750 crore rupees in 2018-19. Remote Sensing, smart phones and drones will be used for quick estimation of crop losses and early settlement of claims.

The Insurance Portal will be used extensively for ensuring better administration, co-ordination and transparency. Districts will be allocated to Insurance Companies on cluster basis for longer duration to ensure uniformity. Cabinet has approved Unified Package Insurance Scheme, UPIS on pilot basis for 45 districts. It will cover activities like machinery, life, accident, house, and student safety in addition to crop insurance. These schemes will be implemented from Kharif season 2016.