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Promoting Women Agripreneurship through Crop-Livestock-Fisheries Technologies

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Digital Technologies: A Way Forward for Developing Gender Sensitive Agripreneurship

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As we all know that Agriculture sector is facing multiple challenges of different kind e.g. production, natural resources, climate change etc. The fourth industrial revolution (i.e. Industry 4.0) may be a solution for larger extent. To implement the industry 4.0 India has a lot challenges in form of literacy and digital divide. Digital literacy in urban and rural areas are not same. According to household-level figures from the 75th round (2017-2018) of the National Sample Survey (NSS), only 4.4 percent of rural households own a computer, compared to 23.4 percent of urban households. In terms of internet access, 42 percent of urban households have access to the internet, whereas only 14.9 percent of rural households have access. Due to lack of implementation intelligent technology like IoT, Cloud Computing, Edge Computing and Unmanned Aerial vehicles, agriculture domain still have many pitfall, in terms of technology. The subsequent sections describe the challenges in digital agriculture and possible solutions for it.

Digital divide in India

There is a vast gap in the digital eco-system between rural and urban India. The covid pandemic had exposed the previously unexposed data related to the digital divide. For example only 15% children in rural India have access to internet. For a state like Uttar Pradesh that has a huge shortage of teachers and does not have the requisite facilities for running computers or the internet-based classes, e-learning was going to be a problem; a nightmare even. In UP, merely 51% schools have electricity and just about 3% schools in the state have a functional computer [3]. So the online study due to the pandemic has brutally affected the rural children. The situation of digital eco-system in the state like Kerala is far better than Uttar Pradesh and Bihar. This shows that there is a vast digital diversity exists in India.

Digital literacy in agriculture

Agriculture has gone through a number of revolutions throughout history that have increased efficiency, production, and profitability to previously impossible levels. The digital infrastructure is the much essential facility to attain digital equality but not sufficient, due attention should be given to enhance digital literacy, sustained use over time with substantial benefit. Only 3% of farmers acquire agricultural information from government institutions, but 94 percent rely on “fellow farmers,” followed by agricultural input merchants (10%), and television/radio (4%). According to a "Situation Assessment of Indian Farmers," just approximately 28% of all farmers use any kind of available as per their need. Around 72

percent of farmers, particularly small farmers, do not have access to any information distribution system that can assist them in adopting new technology. Furthermore, farmers are unable to take use of a number of institutions, organisations, and agencies formed to provide support services [credit, insurance, marketing, and so on]. This results in issues of low productivity, high input cost [4].

IT eco-system in Rural and Urban area

India is known for vast diverse culture, heritage and tradition. The vast diversity of digital ecosystem also found in rural and urban areas. The difference in specific differentiation in digital ecosystem is as follows:



Figure 1: Data on mobile and internet user

Mobile subscriptions: As the graph above shows the total mobile users in India is 1.1 billion (Both smart phone and normal phone) with urban tele-density of 139.01% and rural 59.08% (Deptt of telecom.)

Internet access: The web client internet base in 2020 was 299 million. The investigation report indicates India had 622 million dynamic web clients in 2020, when the all population was assessed to be 1,433 million people. This implies around 43% of the population is using internet services, characterized as somebody who had accessed to the web in the earlier month.

ICT education: ICT is the best way for improving the efficiency and reach of the mainstream production of goods in every corner of rural India. It is very useful in creating agripreneurial activities and has potential to impact the livelihood strategies.

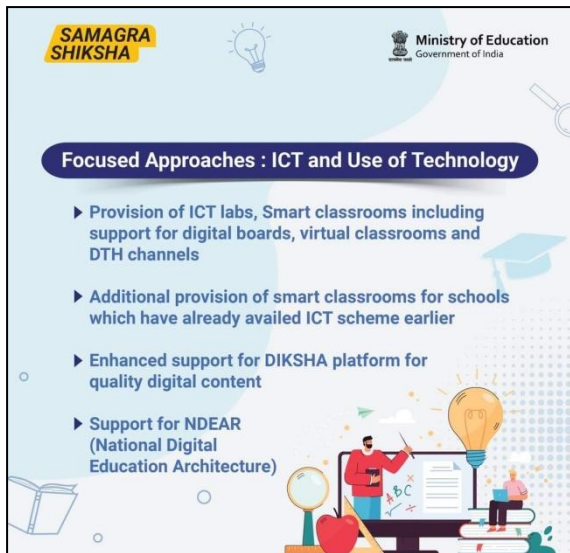


Figure: 2 (a) Ministry of Education promoting ICT Education and (b) Digital India Initiatives for Digital Payment Solutions

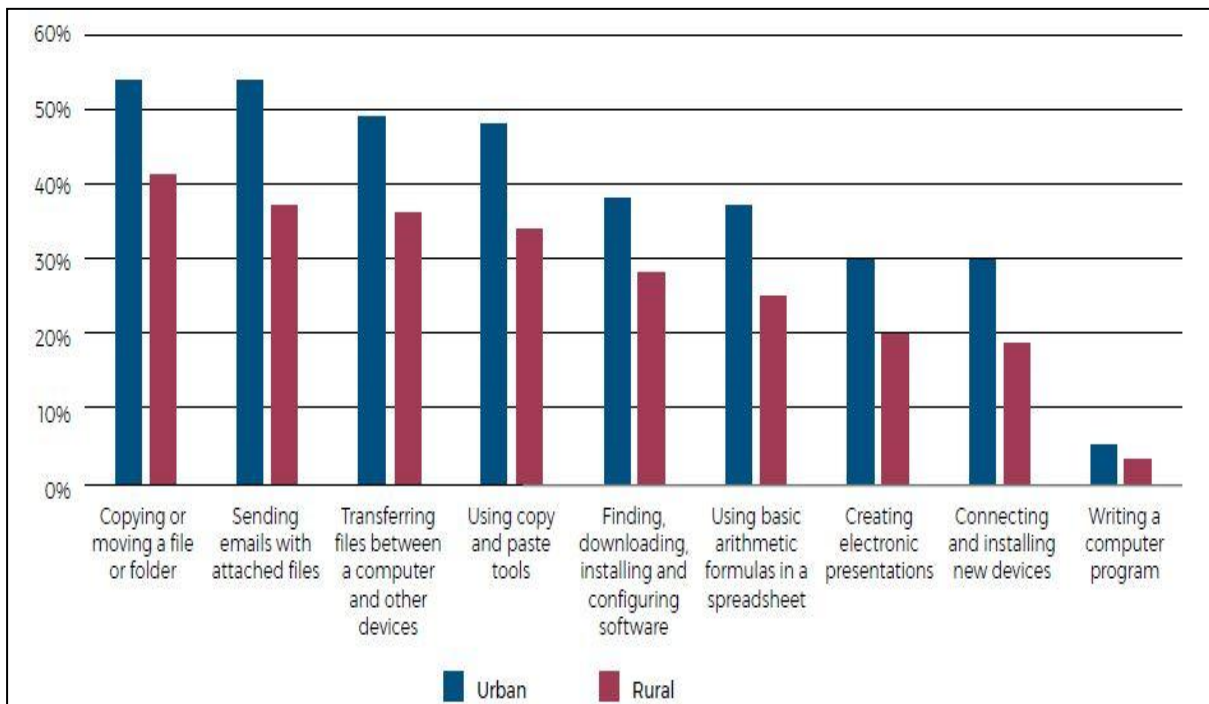


Figure 3) Knowledge for Levels of ICT Activities in rural and urban areas (global status)

Policies and programmes for enabling digital agriculture

Digital India: The vision of Digital India programme is to transform India into a digitally empowered society and knowledge economy. The programme was started in 2015 and impacted almost every sector. Digital India has brought major changes in agriculture sector too. Today almost every agriculture related website have a dashboard and mobile application to help the stakeholders.

PMGDISHA: It is the scheme to make six crore persons in rural areas, across States/UTs, digitally literate. It is basically for empowering the rural citizens of India specially targeting marginal section of society.

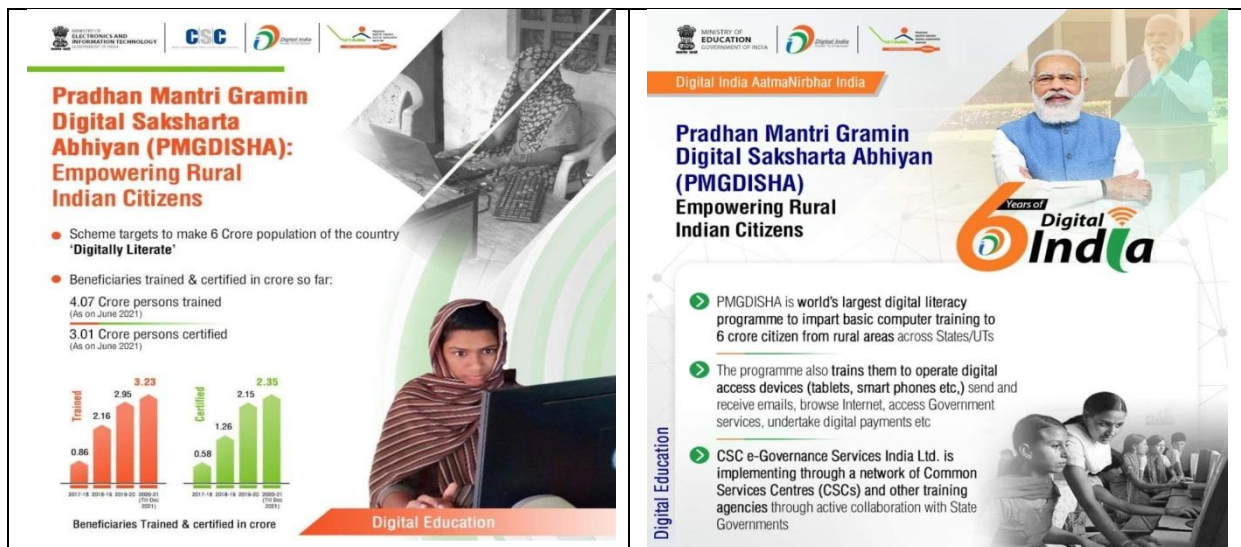


Figure 4: PMGDISHA initiatives for digital literacy

Digital technology supporting modern agriculture

Drone Technology: Drone technology has changed the scenario of modern agriculture. The manual intervention has reduced drastically. The technology is able to perform various task like Soil Analysis for field planning, Seed Pod Planting, Crop Monitoring, Crop Spraying, Irrigation, Crop health assessment, Crop surveillance, Controlling weed, insect, pest and diseases, Scaring birds etc.

Artificial intelligence: Artificial Intelligence has already proven its efficiency in other fields so it must be used in Agriculture sector. There are various AI-enabled apps available in market for different sectors. It is well suitable in monitoring health of the cattle, vaccination of the cattle, etc. Due to its efficacy it is widely adopted by different sectors.

The use of artificial intelligence in agriculture helps farmers understand information from data such as temperature, precipitation, wind speed, and solar energy. Analysis of historical stock data provides a better comparison of ideal results. The best aspects of artificial intelligence implemented in agriculture will not eliminate the work of human farmers; on the contrary, it will drive the procedures.

The implementation of AI emphasizes defective crops and strengthens the prospects for the production of healthy crops.

The development of artificial intelligence technology is better managed by agrobased companies.

AI is used for use in applications such as weather forecast and pests or pest identification.

Artificial intelligence can improve crop management practices, resulting in investing in algorithms that many technical companies are useful for agriculture.

IoT: The Internet of Things is also the latest technology adopted by the agricultural sector. The IoT devices communicate with each other, and the artificial intelligence enabling mechanism can make decisions. Intelligent agriculture based on the Internet of Things is a system designed to monitor farmland and realize irrigation automation with the help of sensors (soil moisture, humidity, light, temperature, etc.). Farmers can observe field conditions from anywhere. Irrigation systems equipped with IoT not only save water, but also ensure that crops receive the right amount of water for optimal growth. This irrigation method is based on soil moisture levels rather than watering at predetermined intervals. Real-time data can be used as input for crop monitoring and yield modeling. However, using existing platforms to record information in real time to model and monitor crops is puzzling.

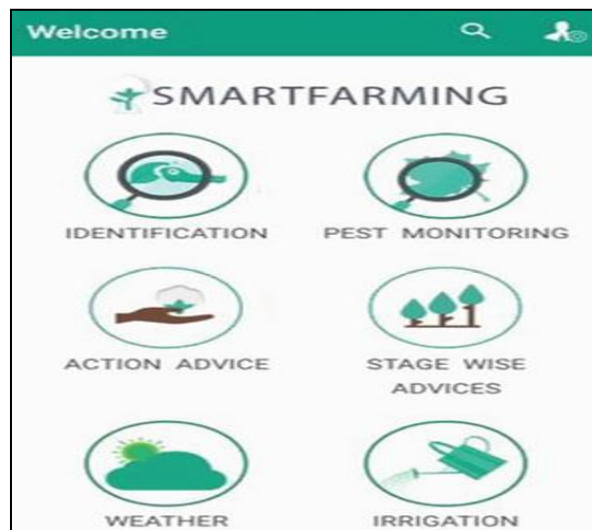


Figure 5: Mobile application showing usage of Smart farming

In the Covid era, specifically in India (Unmanned Aerial Vehicles) UAV can be used for monitoring the agriculture land to help the farmers using computing paradigm. By the use of artificial intelligent techniques and Meta-heuristic optimization technique, we can optimize the task evaluation, efforts done by the farmers and compare the outcome with previous results in agriculture.

We can easily access above optimized results in our mobile devices by the use of Edge application. The cloud computing provides us the facility to store data coming from sensor, as a outcomes of agriculture land (whether in case of use of treatment of crops, find the soil water level etc) using IoT and UAV services.

Portals Helping Farmers

Integrated Scheme for Agricultural Marketing (ISAM) : The one of main objectives of this scheme is " to use ICT as a vehicle of extension to sensitize and orient farmers to respond to new challenges in agricultural marketing ". So due to the issue of digital literacy the stakeholders are not taking benefits as up to the mark.

Farmer Portal

The portal is intended to provide relevant information and services to the farming community and the private sector through the use of information and communication technologies, to complement the existing distribution channels provided by all 'supply. The Farmers Portal is an attempt in this direction to create a one-stop-shop for all information needs related to the field of agriculture, animal husbandry and fish production, sale / store of an Indian farmer. With this Indian farmer, there will be no need to sift through the maze of sites created for specific purposes

E-NAM: The NAM portal provides one aggregator for all APMC related information and services. This includes incoming goods and prices, commercial offers for buying and selling, providing responses to trade offers, among other services. While the flow of raw materials (agricultural products) continues through the mandis, the online marketplace helps to reduce transaction costs and information asymmetries.

MKISAN

mKisan SMS Portal was designed to provide a leap in farmer coverage and geographic area by disseminating timely, specific, comprehensive and essential knowledge to farmers. farmers, but also to respond to their concerns and questions.

Different mobile applications: Hundred of user friendly mobile applications have been developed for Farmers. The different mobile apps covers all sectors of agriculture's. e.g Horticulture, fisheries, animal science, crop science etc. A brief list of apps are also given at ICAR website for their help.



Figure 6: Smart agriculture using the mobile application

Benefits related to the Movement towards digital agriculture:

Global reach: The digital technology has a global reach or world wise access of farming techniques. farmers may be benefitted from many sources digitally.

Enhanced Data collection: data is an asset in modern world. Based on the data, the automated systems are able to take decision accurately about the showing time, soil test, pest management etc.

Low time: As we have fast computers today the collection, analysis and decision making process takes less time.

Provides better suggestion: Based on the data accuracy the modern systems are able to take decision wisely. The invasion of AI plays a pivotal role for this purpose.

Efficient in terms of cost: In today's digital era the digital devices are not too much costly, so it can be used as one time investment for taking benefits for years.

Increased productivity: The productivity must be increased if the digital technology will be used in agriculture sector.

Conclusion

Digital technology has potential to change the scenario of agriculture. In today's digital era, from field to market every action can be performed with less physical participation. The biggest hurdle to implement the digital eco system is the ICT education of farmers. The adaptability of using mobile apps and digital devices by farmers may increase the use of IOT, AI practises in agriculture. Definitely it can be said that IoT has full potential to bring second wave of green revolution.

References:

- [1]. <https://www.ideasforindia.in/>
- [2]. NSSO data
- [3]. <https://www.oxfamindia.org/>
- [4]. Digital India
- [5]. Ministry of education
- [6]. <https://www.datareportal.com/>
- [7]. <http://www.fao.org/>

