Asian Journal of Agricultural Extension, Economics & Sociology

40(5): 50-59, 2022; Article no.AJAEES.83983
ISSN: 2320-7027

Digital Agri-solutions and Advisory Services in Indian Agriculture amidst COVID 19 Pandemic

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2022/v40i530885

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/83983

Short Research Article

Received 11 January 2022
Accepted 22 February 2022
Published 24 March 2022

ABSTRACT

The study aims to focus on the effect of COVID 19 on Indian agriculture and food systems in India. Approximately, 14 million to 22 million people faced dangerous poverty across the globe and many low- and middle-income countries have to witness about 25% fading in agri-food exports. Negative effect of COVID 19 created temporary restrictions in physical movement which ultimately made the communication delay in many functionaries involved in Farming. Henceforth, there existed a communication gap among the farmer groups. The dynamic roles of Information Communication Technology in different sectors made agriculture a stable domain. The study followed purposive sampling and secondary data collection. The mobile app erections were created to bring farmers, distributors, and producers together to collect valuable data, observe fields, and manage crops in order to improve the processes. In the light of our investigation, we conclude that Information Communication and Technology is highly necessary to fill the gap in receiving the advisory services for farming community and advices related to supply chain management. Providing farmers with useful and practical agricultural knowledge can help them build their businesses and, in turn, give a

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positive view of the country. This paper delivers visions into how Information Communication and know-hows can promote in solving the agri and allied sector related glitches like soil degradation, excessive water, emissions, pollutions, the market place, etc.

Keywords: Pandemic; food security and Indian economy.

1. INTRODUCTION

The COVID-19 epidemic has taken the ecosphere entirely unmindful, exposing the vulnerability of agricultural system along with public health in surviving with these pandemics in specific and a great loss to food security in country. Instant preparation, response and recovery at local, national and international levels are the significant in this status quo. Similarly, India also fallen short in all the sectors, which has fast-tracked COVID-19 to spread like wildfire athwart hundreds of countries, affecting lakhs and killing thousands. International Food Policy Research Institute [1] projected that even under an effective COVID-19 containment scenario, 14 million to 22 million people have to face extreme poverty across the globe and many low- and middle-income countries have to witness about 25% decline in agri-food exports. Addressing the COVID effect entails all of us to work organized across all sectors and local and international borders to alleviate the abrupt impacts of the epidemic and to redesign food systems and sustenance healthy diets for all people. The Covid-19 pandemic has wedged the supply chain universal and some international industries have been scale back to the national level.

1.1 Effect of Covid 19 on Indian Agriculture and Food Security

These changing characteristics pose severe threats to food security and nutrition. According to the current State of Food Security and Nutrition report [2], about two billion people had moderate or severe food insecurity prior to the beginning of the pandemic. As a result of the pandemic, there has been an increase in the usage of single-use plastic food packaging and carrier bags, which are difficult to recycle [3]. Farmers are an important component of the supply chain who must adjust to a changing and unpredictable future. Fortunately, farmers and the agriculture industry were rapidly adopting new technologies in the years prior to the pandemic. Food availability was impacted in some cases by supply chain disruptions, particularly where items were unable to reach markets, putting increasing pressure on pricing of some limited goods, as shown below. The quality of food environments was also impacted, resulting in occasional fresh fruit and vegetable shortages. Seeds and other agriculture inputs must reach farmers according to the season during the peak season, and India requires roughly 250 lakh quintals of seeds.

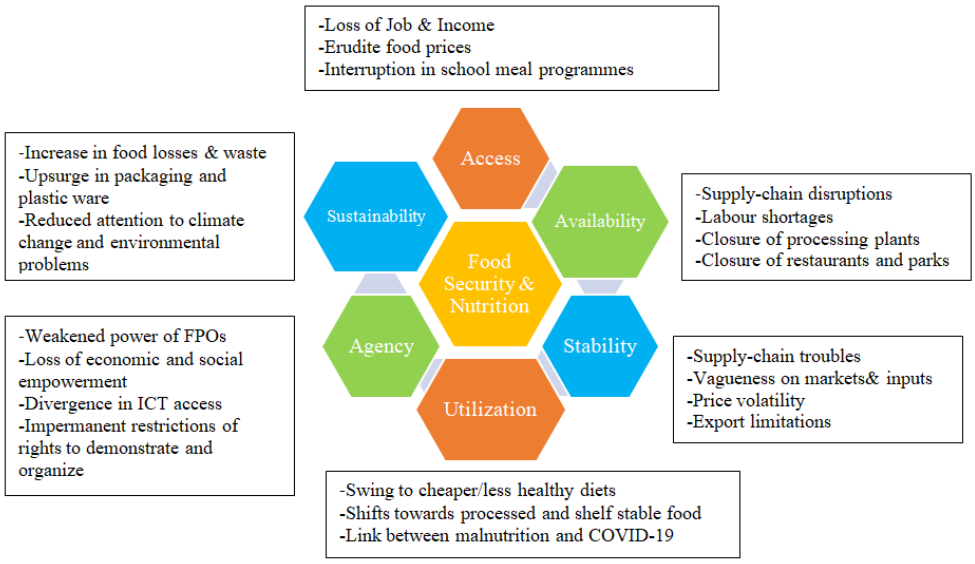

Fig. 1. Influence of COVID 19 food system dynamics on six dimensions of Food Security

1.2 ICT Interventions during Pandemic

Because purchasing technologies and farm management software is an expensive decision, shifting to a smaller scale of agricultural apps has proven to be a prudent option. A wide range of apps are available in the market, and they may be installed on a variety of platforms, including Android and iOS. Individual farmers now have access to a plethora of smartphone apps, and demand is still growing, particularly in the event of a pandemic. This trend has created opportunities for mobile app developers to address farmers' aspirations for sustainable production and consumption (UN, 2020) One famous article described the rapid advancement of agriculture technologies, estimating that IoT devices, drones, and software will be worth more than $15 million by 2025. Because, everything may wait, not the farming season and hunger. A complete seed production ecosystem is intricate and requires the help of allied sectors such as transport, testing labs and the packaging industry. However, fear spreads faster than COVID-19. Central and State governments of India have already announced exclusions for the agriculture sector viz. seeds, labourers, and other farm activities. Unusual packages have also been allotted for different sectors as well as railways have been fixed firmly to effortlessness transport logistics. Despite of these, in certain areas roads are blocked and movement of labour is not allowed. Transport services are not allowed to operate after all [4].

2. MATERIALS AND METHODS

Secondary data was collected for the study. Farming sector is also not far-off with the instilling of digital mode of teaching and learning with the conventional teaching mode. Descriptive research design has been followed for the study. The researcher had gone through many valid sources in detail to make the study more authentic.

3. RESULTS AND DISCUSSIONS

3.1 ICT Interventions to help the Farmers during and in Post COVID-19 Crisis

Mississippi University Extension revealed that, in the time of COVID-19, extension agents are no longer delivering in-person training, providing technical support on a host of matters at distance basis. To keep people informed on COVID-19, Extension faculty and administration members sharing messages through webinars, written communication, and/or technical assistance over phone [5\ Where, University of Delaware has specialists in food safety, child development, family science, health literacy, etc. They are also making connections through video, social media, and print resources in this crisis period [6].

Indian extension experts also have to come forward to join their hands in this life-threatening period. Extension system in India with the great networks from KVKs, state and central agricultural universities, to ATMA, ATARI and ATIC can aid the farmers by open-handed advices for maintaining their daily sanitized lives along with farm operations. Indian Council for Agricultural Research (ICAR) have engaged in the mission to advice the growers about the varying agricultural operations and to make them attentive of social distancing, covering faces, maintain washing of hands-on regular basis with the help of behaviour change message. Thus, dissemination of right information and awareness using the right channels at this stretch of pandemic are the key goings-on being performed by the Indian agricultural extension professionals [7].

3.2 ICT Interventions and Access to Digital Agri-solutions

Digital agriculture can aid to offer a extensive range of care to lecture the impacts of COVID-19 on agricultural production, labour availability, input supply, and logistics. In China agricultural drone assisted to address labour constraints and to reduce human interaction amid COVID-19. Therefore, drones and other digital extension tools can support farmers adopt labour- and input-saving practices and linkage of farmers to buyers and logistics services that will lessen the effects of control measures related to COVID-19 on collectors and supply chains.

Government of India launched a innovative app *"Kisan Rath"* on 18th April, 2020. Indian Council for Agricultural Research has issued an agro-advisory system to preserve cleanness and social distancing [4]. Thus, public-private partnerships and investments in prevailing agricultural technology plans hasten these resolutions faster to help more people be able to handle this pandemic situation due to COVID19. Besides, toll-free help lines in local languages must be happening to answer the queries regarding government initiatives and for opposition recompence purpose and other agricultural related evidence [8].

Table 1. Showing the social and agricultural system in Pre-covid, during Covid and Post Covid times

Pre-covid 19 social and agricultural system	During Covid 19 social and agricultural systems	Post Covid 19 and agricultural systems
Policy process	Decentralization	Farm Production
External grant budget	Local revenue control	Small and Marginal farmer protection
Gender relation	Self-Government Budget	Food Security
Custom/cultural change	Access to Primary Health services	Budgetary Contraction
Personal Freedom	Migratory labourers	Social Protection
Governance	Educational, research and extension mechanism	Livelihood and employment
Accountability	Market and risk orientation	Admittance to Knowledge and innovation
Legal Support	Institutional capacity	Access to Public health services
		Gender mainstreaming

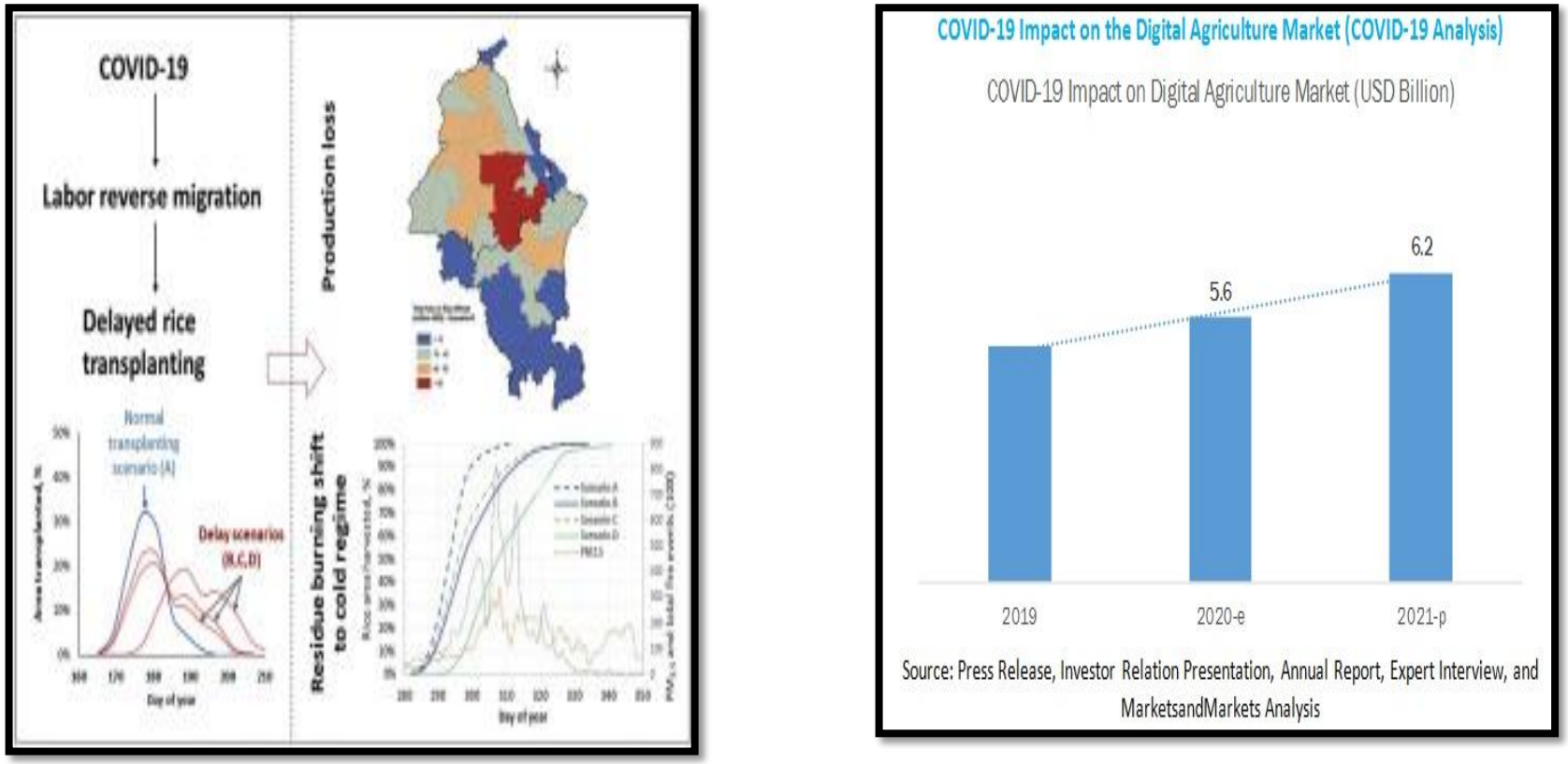

Fig. 2. Figure showing the impact of Covid 19 in delayed transplantation of rice and Digital Agriculture Market

Fig.3. Agro-advisory services through *KISAN RATH APP* launched by GoI

Further, during COVID-19 pandemic, the agriculture sector performed effortlessly. All necessary measures were taken to ensure smooth operation of agriculture related activities. Many schemes/programmes were also launched to assist the farmers of the country during the lockdown period, such as:
(i) From 24.03.2020 to 02.02.2021, funds amounting to Rs. 62,301.22 crore have been transferred to the Bank Accounts of PM-KISAN beneficiaries.

(ii) Kisan Rails were operated for the first time from July, 2020 to facilitate movement of perishable Agri-Horticulture commodities.

(iii) Central Sector Scheme of financing facility under Agri Infrastructure Fund. This scheme is operational from the year 2020-21 to 2029-30. The aim is creation of infrastructure at the farm gate.

(iv) The National Bee and Honey Mission (NBHM) - Rs.500 crore from 2020-2021 to 2022-2023 is allocated for the sector.

(v) Concessional credit boost to 2.5 crore farmers through Kisan Credit Card. So far 174.96 lakh Kisan Credit Cards have been issued as part of the KCC saturation drive since February 2020 to 03.02.2021.

(vi) Under Pradhan Mantri Fasal BimaYojana (PMFBY), total claims of Rs.30802.02 crore have been settled for 256.29 lakh farmers during the COVID-19 pandemic from March 2020 to January 2021.

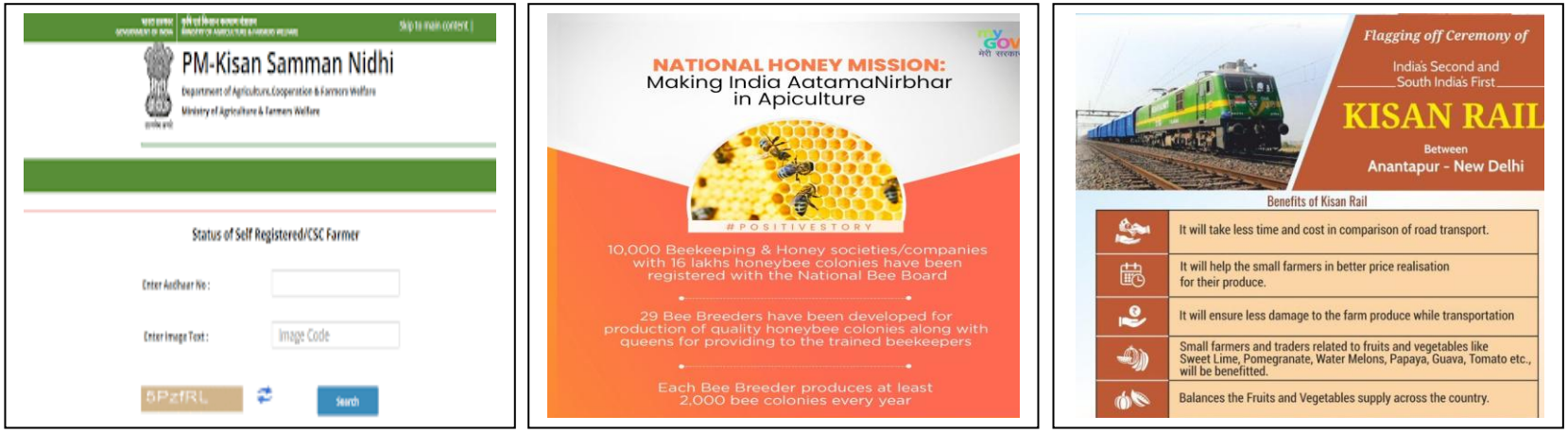

Fig. 4. Figure showing Centrally sponsored schemes for Agri and allied sectors

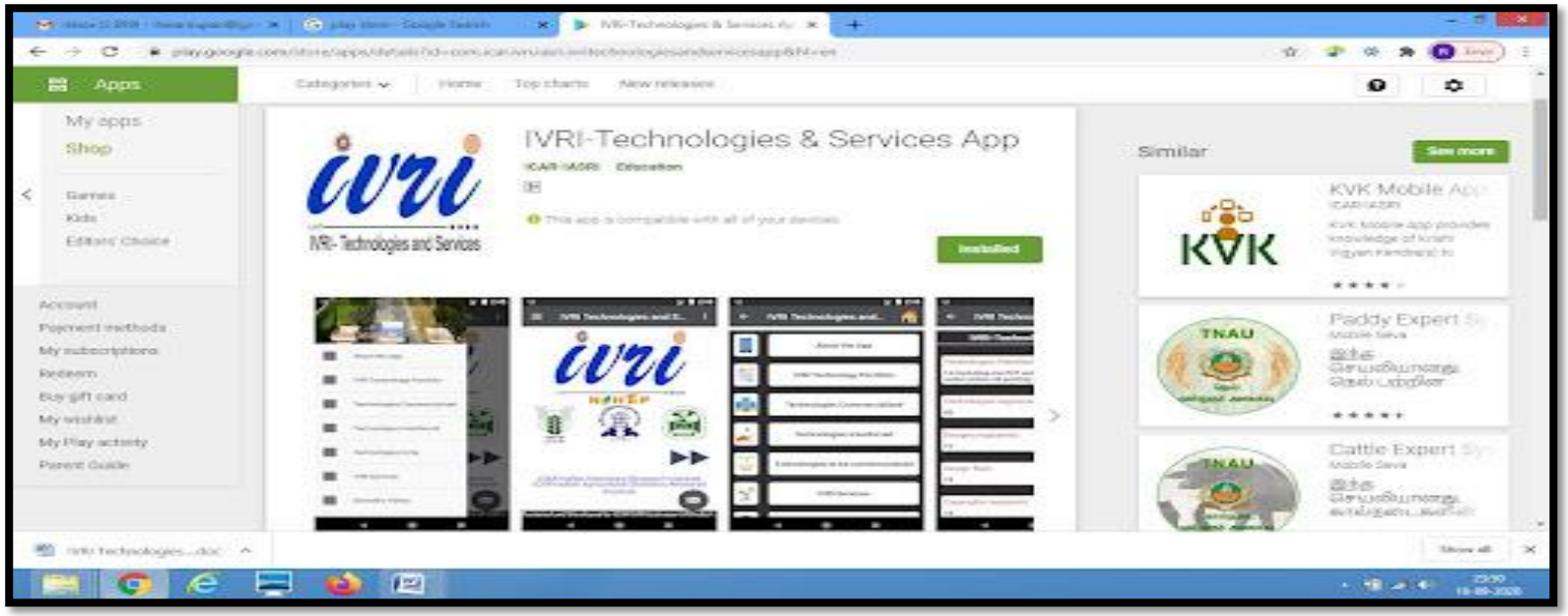

Fig. 5. Advisory services of ICAR-IVRI through Mobile apps, Facebook and Watsapp

Some government institutions are also using ICT platforms to help farmers with digital agri-solutions, for example, the Haritha Kerala Mission is holding online classes on vegetable farming via Facebook live [9]. Though the Indian government has recently relaxed the lockdown regulations for farming operations, farm employees, custom hiring centres for farm harvesters and implements, as well as mandis

3.3 Providing Judicious Data

Farmers want reliable information, advice, and warnings in order to maintain their business. To deal with lockdown scenarios, the ICAR-IVRI has created a comprehensive range of advisories on many aspects of safe and hygienic milk, meat, and egg production, as well as handling and marketing. ICAR has adapted to the present state of lockdown by disseminating these advisories through a variety of internet channels, including social media, Facebook, WhatsApp, and YouTube. The pandemic has compelled us to dig deeper into these channels in order to stay in touch with farmers and other stakeholders. EAS is becoming increasingly reliant on these online services [11].

4. CONCLUSIONS

National and International development agencies must be in the front line to activate exertions to alleviate the penalties of COVID-19 on food and farming sector and, utmost significantly, to guard the food security of world population. And in this mission along with the government decisions, agricultural research and extension wings must come advancing to support the farmers in the field, manufacturers of agro-chemicals and the logistics, otherwise, it will be grim to manage.

Hence, effective communication and decision-making systems essentially be reinforced instantly and extension personnels can aid in this regard to save farming sector from the noticeable effect of COVID-19. Through Information Communication and Technology, the delay in communication among the farmers about market prices became negligible. Besides, there should be solid network of SAU, ICAR and other agricultural institutions to strengthen then stakeholder network which would help the farmers in getting advisory services in-time. Hence, more number of socio-economic research are needed incorporating Indian data for designing socio-economic models for India for coping with coronavirus crisis, without further delay.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/83983