



Indian agriculture and role of agricultural extension system to cope up with COVID-19 crisis

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ABSTRACT

The ongoing coronavirus pandemic is a global emergency, having potential impact on the global population. India, as a part of the world, is also facing crisis in health sector. However, globally, lakhs of confirmed cases of COVID-19 and thousands of deaths are shadowing the agricultural issues. India is not also lagging behind. So, it must be said, create food security crisis in India if correct measures are not taken. In India, it is important to minimize the undesirable effect and harming livelihood of the poor and marginal people. Till date supplies of staples foods, fruits, vegetables, and meats are although adequate, but, it still is carrying threats to food security, in the long run. Due to prolonged lockdown, restrictions are imposed on transportation and movement of people. This is hampering agricultural logistic and supply chain. Thus, India needs to be smart and innovative to bridge the health shock and socio-economic shock. An inter-disciplinary team of medical professionals and extension personnels have to join their hand in creating awareness of the COVID-19, its modes of transmission in the community and safety measures. Quality seeds must be reached to farms for un-interrupted sowing operations in the current and following seasons. Automated machinery facility and ICT should be introduced which may help the farmers in this time of labour shortage. Subsidies must be provided to the manufacturers of such machineries for the sake of the farmers. These may demand in some policy changes. Thus, both the role of central and state governments have to play some crucial roles in strengthening Indian agriculture sector at this time of pandemic to maintain the continuous flow of food production. Otherwise, both export and domestic demands will get hampered badly. Hence, one of the most important post-COVID-19 challenges will be to restore agro-economic activities as before. The government should take these matters into consideration to maintain food production sustainability.

The COVID-19 outbreak has taken the world completely unaware, exposing the vulnerability of agricultural system along with public health in coping with these pandemics. Immediate preparation, response and recovery at local, national and international levels are the only solution in this situation. This is also same for India. Thus, the world has fallen short on all these parts, which has accelerated COVID-19 to spread like wildfire across hundreds of countries, affecting lakhs and killing thousands. While many apocalyptic consequences are being made about a post-Covid-19 worldwide crisis, it can act as an alarm tone for an individual, a society and a country. Days after COVID-19 will not be the same. It will demand change in priorities, focus on primary areas and alteration in our daily habits.

International Food Policy Research Institute (2020) projected that even under an effective COVID-19 containment scenario, 14 million to 22 million people may have to face extreme poverty across the globe and many low- and middle income countries may have to witness about 25% decline in agri-food exports. Where in India, nearly three-quarters of Indian families are dependent on rural incomes and about 70 percent of them are from rural areas. And India's food security mainly depends on cereal crops, though fruits,

vegetables and milk also meet the demands of growing population with increasing incomes.

At the same time, India is the world's agricultural powerhouse also being largest producer of milk, pulses, and spices, and has the world's largest cattle herd as well as the largest area under wheat, rice and cotton. So, if these get disturbed, it will be as disastrous as famine (World Bank, 2020). However, the tragedy is not just the threat of another famine, but amnesia of the lessons learnt from past disasters, that leave unprepared.

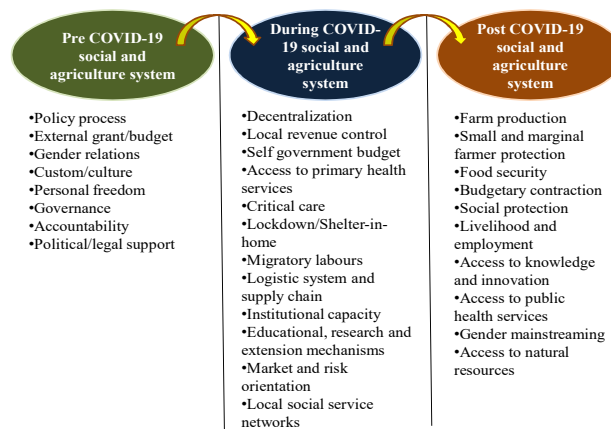


Figure.1. Main factors evolving in pre, during and post COVID-19 period in India.



To maintain the long-term food security, during and even after this COVID-19 nightmare, a paradigm shift is much needed; require a strategy that will go beyond “proverbial relief and development dilemma”. Thus, local systems must develop a sustainable food system with high resilience (Babu and Dorosh, 2017).

India subsequently declared nation-wide lockdown till May 3, it can be extended also depending upon the situation, for controlling rapid spreading of the coronavirus. And 140 million farm households across India are also reeling under this threat. This article aims to assess the immediate challenges due to COVID-19 on the Indian farm sector and suggest mitigation measures by agricultural extension system to provide a sustainable food system during, even in the post-crisis period (Padhee, 2020).

1. Current impact of COVID-19 on agricultural system:

Agricultural systems of both the world including India are in the midst the coronavirus crisis. During this period seeds and other farm inputs have to reach to the farmers for this kharif season, while India needs about 250 lakh quintals of seeds. Because, everything may wait, not the farming season and hunger.

However, complete seed production ecosystem is complex and requires the help of allied sectors such as transport, testing labs and the packaging industry, for the current season which has to operate from March to May.

In a recent statement, International Seed Federation (ISF) quoted the European Food Safety Authority (EFSA), Centre for Disease Control and Prevention (CDC), and the Bundesinstitut für Risikobewertung (BfR), said that “there is currently no evidence that food, including seed, is a likely source or route of transmission of the virus. Transmission via surfaces which have recently been contaminated with the virus is, nonetheless, possible through smear infections. However, this is only likely to occur during a short period after contamination, due to the relatively low stability of the coronavirus in the environment.” However, fear spreads faster than COVID-19.

Central and State governments of India have already announced exemptions for the agriculture sector viz. seeds, labourers, and other farm activities. Special packages have also been allotted for different sectors as well as railways have been roped in to ease 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 (Singh, 2020).

2. Agricultural extension to help the farmers during and in post COVID-19 crisis:

This is the high time, to work jointly for combating present and future impact of Covid-19. Thus it is not necessary to know whether they are agricultural or medical extension professional, they are more needed. US co-operative extension already engaged their extension personnels in this Covid-19 awareness campaign. Extension Committee on Organization and Policy done a survey on this and found that more than 40 Universities have engaged extension professionals in COVID-19 related outreach.

In India, the extension professionals also can play critical roles like in US, in building working relationships with local and state emergency/Covid-19 management networks. They may provide educational programs on this pandemic fight through mass media and collaborate in recovery efforts

While the COVID-19 pandemic continues to unfold, more partners must be involved, to overt public health as well as agricultural functions in response to COVID-19. Non-traditional partners will be of great help in achieving our collective goal to a healthy and hunger free society in the near future. Here, extension professionals are example of a partner that seeks to do just that!

Here are two another examples from US, that how extension mechanism are helping like anything during this COVID-19 crisis. Mississippi University Extension told that, in this time of COVID-19, extension agents are no longer delivering in-person training, providing technical assistance 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 (Buys, 2020). 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 (Extension Disaster Education Network, University of Delaware, 2020).

Indian extension specialists also have to come forward to join their hands in this critical period. Extension system in India with the large networks from KVKs, state and central agricultural universities, to ATMA, ATARI and ATIC can help the farmers by giving advices for maintaining their daily sanitized lives along with farm operations. Indian Council for Agricultural Research (ICAR) have taken the mission to train the farmers about the changing agricultural operations and to make them aware of social distancing, covering faces, maintain washing of hands on regular basis with the help of behaviour change communication. Thus, dissemination of right information and awareness using the right channels at this time of pandemic are the key activities being performed by the Indian agricultural extension professionals (Pandav et al., 2020).

Here are some points on how the agricultural extension functionaries can play a crucial role through their operations:

2.1. Helping farmers in producing and marketing food

Farms have to practice safe labour practices, access to personal protective equipment viz. masks and gloves that and reduce direct contact with packaging and produce. However, this is quite difficult where these are not sufficient for the health professionals. So, farmers may use any cotton clothes, cotton towels to cover their face and can wear polythene packets as gloves that would be both cost effective and safe to some extent. These will help to reduce the spread of COVID-19, keep farmers healthy and help to maintain continuous flow of production of food. Farmers should be motivated by extension workers to adopt labor-saving practices as some constraints like sick family members, limitations on labor gathering, and restrictions on the movement of people to producers' fields.

2.2. Immediate access to required agricultural technologies and digital agri-solutions

Digital agriculture can help to offer a wide range of support to address the impacts of COVID-19 on agricultural production, labour availability, input supply, and logistics. In China agricultural drone helped to address labour constraints and to reduce human contact amid COVID-19. Thus, drones and other digital extension tools can help farmers adopt labour- and input-saving practices and link farmers to buyers and logistics services that will reduce the impacts of control measures related to COVID-19 on aggregators and supply chains.

Indian government also launched a new app "Kisan Rath" on 18 th April, 2020. Indian Council for Agricultural Research has issued an agro-advisory system to maintain hygiene and social distancing (Singh, 2020).

Thus, public-private partnerships and investments in existing agricultural technology programs accelerate these solutions faster to help more people manage this pandemic situation due to COVID-19.

Besides, toll-free help lines in local languages must be started to answer the queries regarding government initiatives and for grievance redress purpose and other farming related information (Padhee, 2020).

Some government organisations are also helping farmers for digital agri-solutions through ICT platforms e.g. Haritha Kerala Mission is arranging online classes on vegetable farming topic using Facebook live (Maji et al., 2020).

Though, recently the government of India has exempted farming operations, farm workers, custom hiring centres of farm harvesters and implements as well as mandis and procurement agencies from the lockdown rules (PTI, 2020).



2.3. Innovation in supply chains and markets

Long disruptions in supply chains and lockdown at markets will have widespread impacts on the food system. However, digital logistics, both in rural and urban areas, can play crucial services in reducing the impacts of COVID-19 on whole transport, aggregation, and retail systems. ITC field staffs are supporting farmers giving farmer friendly foldable chilli dryers during the period of social distancing. It has several advantages; viz. ensures faster drying, prevents contamination from foreign materials and farmers will not face disaster sales or throwing out of unsold ones (Maji et al., 2020).

Small farmers in Maharashtra are also joining hands to bring vegetables and fruits near the doorsteps of because big markets as well as Agricultural Produce Market Committees (APMCs) are not in full opening because of lockdown. In many places farmers' groups are being connected to housing complexes by district agricultural department. The farmers' producer companies (FPCs) initiatives like Sahyadri Farms, Nashik-based FPC have also started selling fruits and vegetables (Maji et al., 2020).

The Indian Institute of Horticultural Research (IIHR) has designed a handy solar-powered vegetable and fruit vending van to supply fresh, dust-free and hygienic vegetables at customers' doorstep. This van also keeps those vegetables fresh for two days due to evaporating cooling technology. It has also storing trays for vegetables, leafy vegetables and fruits with a cooling chamber (Kumar, 2020).



Photo.1. Solar-powered vegetable and fruit vending van (Source: Fresh Plaza.com, 2020)

As a result, producers are directly getting share in consumers' rupee, at the same time consumers are

getting the produces in a better deal. These are helping in developing direct marketing link, even a middlemen free business model are getting its position.

2.4. Re-evaluation of national and international policy matters

Both central and state governments need to innovate and collaborate for national food security and agriculture policy. This is same for international cases also. As it will help the countries across the globe to better manage their agri-food imports and export, reduce the risks of food trade bans, and ultimately food-security for their citizens. Investments in sanitary and phyto-sanitary controls should be taken under consideration immediately and good practices in transport and food safety can build confidence in regional and global trade systems must be ensured to maintain the flow of food as it is. However, e-commerce and delivery companies and start-ups must be encouraged with suitable policies and incentives, at this time of COVID crisis, as Indian people living on agriculture are losing their jobs day by day. Besides, small and medium enterprises that operate with raw materials from agriculture and allied sector, need special attention, otherwise, rural economy will get collapsed (Padhee, 2020).

2.5. Assessment of the impact of COVID-19 on agri-based livelihoods and food security based on gender

COVID-19 control approaches must consider the gender dimensions of food security, labour, health, and vulnerability as women play a central role in the farm accounting major part of works, in market as traders, producers, and also as health care workers, and they basically play the role of caretakers in the society. These may increase their risk of exposure to illness and impact of coronavirus.

Besides, access to food, income, resources and assets, information, and social support sometimes are not equal in every society. Thus, divisions of labour and interpersonal and social dynamics within the household and society may influence access to information, financial support, and health services. Thus, gender-sensitive solutions to address COVID-19 should be highly encouraged (Choularton and Mallory, 2020).



3. Response of the Government of India due to COVID-19:

In response to COVID-19 crisis, the Indian government has involved three policy measures for agriculture sector. These have to be implemented immediately, otherwise post crisis will be fiercer, virus is killing presently, but hunger will kill later.

a. Most of the agricultural activities have been enlisted in the essential list. Farm workers in the fields, farming operations by farmers, various agencies engaged in procurement of agriculture products including MSPs, *mandis* notified by the State Governments, inter- and intra-state movement of harvesting and sowing related machines and manufacturing, packaging units of fertilizers, pesticides, and seeds among others have been exempted from these.

b. It has also stated that the first instalment of the PM-Kisan payment to farmers, i. e., Rs 2000, will be paid up front to farmers and MGNREGS wage will be raised from Rs 182 to Rs 202 per day.

c. The Reserve Bank of India (RBI) has also announced a moratorium on agricultural term loans (including crop loans) for a period of three months (Ramakumar, 2020)

Conclusions

Governments and the international development agencies have to take immediate actions to mobilize efforts to mitigate the consequences of COVID-19 on food and agriculture sector and, most importantly, to protect the food security of world population. And in this mission along with the government decisions, agricultural research and extension wings have to come forward to help the farmers in the field, manufacturers of agro-chemicals and the logistics, otherwise, it will be difficult to manage. Thus, effective communication and decision-making systems must be strengthened immediately, and extension personnels can help in this regard to save agriculture sector from the obvious impact of COVID-19. 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.

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