**‘Impacts of COVID-19 pandemic on Agricultural Water Management and Countermeasures in India’**

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## General over view of the spread of the COVID-19

The novel coronavirus disease has also infiltrated into India. In India, the first case of COVID-19 was reported on 30 January 2020, followed by two similar cases on February 2nd and 3rd. All three had a travel history to Wuhan, China. A month later, on March 2nd, two new cases were reported – one each from New Delhi and Hyderabad. A sharp increase in numbers then followed and on March 22nd, Prime Minister Narendra Modi initiated the lockdown process with a 14-hour 'Janta Curfew', followed by lockdown in 75 COVID-19 affected districts and a nationwide lockdown for the 3 weeks.

As of 23 November 2021, India reported a total of 34,526,480 confirmed cases. On 22 November 7,579 confirmed cases have been reported, this is the lowest single day cases after second wave. Currently, India reports 49 cases per million per week (7DMA: 17-24 November) and 466,147 deaths, so far. Vaccine doses given are 120 Cr (1,200,000,000); fully vaccinated are 42.2 Cr (422,000,000) which is about 30.6% of the population (1.3 Billion).

Due to the remarkable population density, poor socioeconomic conditions and health care resources, the World Health Organization (WHO) recently stated that the “future of the pandemic will depend on how India handles it.”

## India’s response to COVID-19

India has promptly responded to the novel threat. International borders have been shut and nationwide lockdown has been imposed since 25 March 2020. As per the Oxford COVID-19 Government Response Tracker, India’s response has been rated as one of the most stringent in the world, exceeding the United States, Germany, France, Italy, and the United Kingdom,

The COVID-19 testing rates in India have markedly increased from 0.02/1000 people in late March to 3.28/1000 people as of June 7. As of 25 November 2021; 637,106,009 samples have been tested for COVID-19.

In addition, the Government has established over 7740 COVID-19 dedicated facilities (11 May 2020) all over India asserting that adequate health infrastructure is in place to fight the pandemic. All efforts are being made to increase awareness about COVID-19 and its prevention via print, broadcast, and social media.

## Challenges that lie in the road ahead

The biggest challenge in India's fight against COVID-19 is the population, with a population density that is almost 3 times that of China. The scenario is potentially worse in urban slums where the population density may exceed more than 250 000/km2, making social distancing impossible. As many as 140 million people in India are migrant daily-wage laborers; with imposition of nationwide lockdown, they are being forced to flock back to their villages without being able to abide by government advisories of social distancing. Unfortunately, another major hurdle in India's struggle against COVID-19 has been the attitude and action of some of the citizens; there have been occasional reports of civilians hiding travel history in an attempt to escape quarantine and people participating in otherwise forbidden massive religious gatherings. Although the health care infrastructure has been urgently strengthened and nearly 7740 dedicated COVID-19 facilities have been amassed all over the country over a short period of time, the dearth of doctors cannot be made up overnight. India has just 0.8 doctors per 1000 population as against Italy's 4.1, China's 1.8, Spain's 4.1, Iran's 1.1 and the United States' 2.6. In addition, the eastern states of West Bengal and Odisha were hit by a super cyclone named Amphan that have wreaked havoc in the 2 states. People stranded homeless by the natural calamity have been rescued and placed in cyclone shelters where social distancing is practically not possible.

## Silver lining in the dark clouds

Certain factors, although hypothetical, do favour a limited spread of COVID-19 pandemic in India, notably, the ambient tropical temperatures, malarial endemicity, universal BCG (Bacillus Calmette-Guérin) vaccination, and the age-old Indian tradition of greeting by Namaste as opposed to handshake.

In addition, the proportion of people ≥70 years of age is only 3.3% in India, as against 11.9% in China and 37.6% in Italy, thereby, one could expect overall mortality rate to be low in India.

## Impacts on agriculture and lives in rural area

Irrespective of any such incidence, rural areas have also come to bear a major brunt of the lockdown imposed since 25 March 2020. With hordes of migrants returning to rural areas, there could be the double-whammy of the spread of Covid-19 and the worsening of the socio-economic situation. The major finding of the study suggests 400 million workers in India in the informal economy are at the risk of falling deeper into poverty during the crisis. The reverse migration will create excess pressure on the agriculture and rural economy which will result in a significant number of people to fall into abject poverty. COVID-19 will have both short and long-run effect on the rural economy in India. The government economic package contains majorly long-term measures whereas short-term measures such as cash incentive and wage subsidy should be given to save migrant labourer and marginal farmers.

**Impacts on water resources and agricultural water management**

Already Indian farmers face several issues such as monsoon delays or failures, extreme weather conditions, price volatility, and rising debt. In addition, the COVID-19 pandemic has created new challenges that were previously not experienced by the agriculture sector. Due to the COVID-19 lockdown, most of the agricultural activities had been suspended or postponed for at least a couple of months (i.e., from March to May 2020), which has direct impacts on the water withdrawals for irrigation and crop production.

Due to less agricultural activities, the ministry of water resources in India reported that the average discharge in the Yamuna river for this period has increased from 300 to 3,000 cusecs. The water storage status of 123 major reservoirs (as on 06 May, 2020) was 68.036 billion cubic meters (BCM), which is 159% of the last 10 years' average storage of 41.328 BCM for the same period (CWC, 2020). However, the extent of the decrease in reservoir releases for irrigation is largely unknown. Also, a similar reduction may be possible in groundwater usage since the lockdown because it supports around two-third of irrigated agriculture in India. However, lack of data hinders any quantitative analysis about changes in water withdrawals for agriculture during the lockdown period.

**Measures taken for the impacts, including governmental project**

Government of India has been proactive in the planning and implementation of policies to curtail corona virus disease spread. It involves advisory on social distancing measures, suspension of mass gatherings, closing of school and colleges, suspension of public transport (trains/buses) and COVID-19 cases handlers' quarantine.

Some of the salient achievements include: Under Pradhan Mantri Garib Kalyan Package valued at Rs. 2.76 lakh crore, free food grain for 80 crore people, free cooking gas for 8 crore families, and direct cash transfer to over 40 crore farmers, women, elderly, the poor and the needy were provided. (One crore is equal to 10 million).

Other Government schemes:

- Under Pradhan Mantri Garib Kalyan Package
- MGNREGS - Mahatma Gandhi Rural Employment Act, is regarded as the Indian labour law and social security measure that targets to guarantee people of India the 'right to work'.
- Pradhan Mantri Garib Kalyan Rojgar Abhiyan, 50.78 crore person-days of employment was generated
- Collateral-free Automatic Loans for Businesses - Under Emergency Credit Line Guarantee Scheme
- Partial Credit Guarantee Scheme
- Additional Emergency Working Capital Funding for farmers

**Conclusions and way forward**

India is presently witnessing a very low number of COVID-19 cases. Although the nationwide earlier lockdown has been able to decelerate the spread, the country's ever-increasing population, remarkably high population density and poor socioeconomic conditions are major barriers in India's battle against COVID-19. However, the overall low case-fatality rate is reassuring. The Government of India and the health care providers have been relentless in their efforts. The citizens must also help support the fight against the pandemic by adhering to government advisories of containment and social distancing.

Over the past 18 months, COVID-19 has emerged as a public health threat around the world. It adds to the list of previous epidemic infectious disease outbreaks, including Bovine Spongiform Encephalitis in 1986, the Avian flu in 1997, the SARS in 2002, the Swine Flu in 2009, and the Ebola in 2014. All these outbreaks remind us that we live in a habitat where it is necessary to respect the relationship between animal, social life, and the environment to survive and thrive. Rapid urbanization and our incursion into forest lands, has created a new interface between humans and wildlife; and exposed humans to unfamiliar organisms often involving the consumption of exotic wildlife. As stated by the UN Environment Chief, Inger Anderson *"Our continued erosion of wild space has brought us uncomfortably close to animal and plants that harbor diseases that can jump to humans."* She further said, "If we don't take care of nature, we can't take care of ourselves". With COVID-19, nature is sending us a message that we need to recognize the interrelationship between animals, including pets, livestock and wildlife.

**References**

Various News papers

Government websites

Health and Social Journals

**THANK YOU**

**TAKE CARE AND STAY SAFE !!!**