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IMPACT ON ENVIRONMENT AFTER COVID-19 & SUSTAINABLE DEVELOPMENT

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Edited by:

Anita Jeph
Assistant Professor
Department of Botany
Government Girls College, Jhunjhunu

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Preface

The impact of corona virus disease- 2019 (COVID-19) is affecting every part of human lives, including the physical world. The measures taken to control the spread of the virus and the slowdown of economic activities have significant effects on the environment. Therefore, in this book intends to explore the positive and negative environmental impacts of the COVID-19 pandemic. This study indicates that, the pandemic situation significantly improves air quality in different cities across the world, lessens water pollution, reduces GHGs emission, noise and reduces the pressure on the tourist destinations, which may assist with the restoration of the Ecological system. In addition, there are also some negative consequences of COVID-19, such as increase of medical waste, haphazard use and disposal of disinfectants, mask, and gloves; and burden of untreated wastes continuously endangering the environment. It seems that, economic activities will return soon after the pandemic, and the situation may be change. Hence, in this book also describe possible ways to achieve long-term environmental benefits. It is expected that the proper implementation of the proposed strategies might be helpful for the global environmental sustainability.

The Present Book ''Impact on Environment after COVID-19 and Sustainable Development'' cover the various aspects of impact on Environment like-negative and positive and impact on human life and sustainable development also. Major chapters included in this book are on- Impact on Environment after Covid-19, Economy, Environment and Rehabilitation after COVID-19, Covid-19 Impact On Human Health and Environment, Various Issues of Loss of Biodiversity in Rajasthan, Eco-Physiological Studies of *Blepharis sindica*- A Vulnerable Medicinal Plant of the Indian Arid Zone, Stinging Wasps of Jalgaon City, Maharashtra: A Temporal Variation Amidst Pandemic, Understanding the Impact of Covid-19 on Food Security and Nutrition in India, Covid-19: Stress Management among students and its Impact on Their Effective Learning, Efficacy of Online Teaching- Learning during Covid-19

Pandemic for Students with Disabilities in an Inclusive Classroom Settings, Changing Faces of CSR During and After COVID-19 Pandemic: The Research agendas in the Days to Come, Rural Development and Its Need, सतत् विकास और गांधी, पर्यावरण पर प्रभाव और चिंता। These chapters provide sufficient information about the Impact on Environment after- Covid-19 : Negative and Positive.

I would like to express so many thanks to my supervisor Dr. J. B. Khan Associate Professor, Department of Botany, Govt. Lohia College Churu, Dr. Sher Mohammad, HOD, Dept. of Botany, Govt. Lohia College, Churu and Dr. Prashant Sharma Associate Professor, Dept. of Botany, Govt. Lohia College Churu for their carrier oriented inspirations, and special thanks to my husband Mr. Vijay Singh Mina (Sr. Manager, Union Bank of India) for his extra oridinary cooperation in the entire period of such type of work alongwith I would like to express so many thanks to these contributors each of whom, have endeavored to present up to-date information of his area of expertise and have given willingly of very valuable time and knowledge. Like wise, I would also like to express so many thanks to the publisher namely; S SHARDA GLOBAL RESEARCH PUBLICATIONS Reg. No. - SCA/2020/14/137251 JAIPUR • DELHI for their kind support. I am sure about the information given in this book will provide help to those interested in Impact of COVID-19 on Environment and human being and sustainable development.

Anita Jeph

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Impact on Environment after Covid-19

Anita Jeph[*]
Dr. J B Khan[**]

Introduction

COVID-19 disease is worldwide disruptive disease and it is a pandemic which has numerously effected climate and our environment. The global reduction occurs in our modern society, routine activity of human being, considerable decline in planned travels which invented anthrop use and has also caused droplets in water pollution and air pollution in many regions (Taneja and Islam, 2020).

Since last decades increased in the amount of greenhouse gases produced due to industrialization era which resulted average global temperature is increasing on the Earth day by day and it resulted melting of glaciers and rising sea levels. Activity of human in many forms caused degradation of environment and anthropogenic impact also. During Lockdowns in china, it has been measured that approx. 25 percent carbon reduces and 50 percent reduces in nitrogen oxides was emissions in 2019-20 that's the positive impact on environment.

In these circumstances, this paper intended to explore the positive and negative environmental consequences of the COVID-19 pandemic, and to streamline possible strategies as a future guideline for environmental sustainability.

Positive Impacts on Environment

The impact of air pollution on Environment and population and their health was extensively studied in past decades by several researchers. The management regarding urban air quality strategies were planned which concentrated on emission inventory, monitoring network, control strategies, and participation of public (Gulia *et al.,* 2015). A general comparison between the major air pollutants was also studied and the impact of transportation, industrialization and other anthropogenic activities were analyzed (Singh *et al.,* 2007). In this paper information from several government and non-government agencies have been collected and analysed to understand the change in quality of various environmental factors such as air and water quality during lockdown caused by Covid-19.

[*] Department of Botany, Government Girls College, Jhunjhunu, Rajasthan, India.
[**] Department of Botany, Government Lohia College, Churu, Rajasthan, India.

There is a positive side effect also of covid-19 which may alleviate the woeful facts of COVID-19. As many of the countries are observing self-quarantine and social distancing for a more than two months now, it has given the nature a “healing time” with reduced human interference in natural environment. Major impacts of lockdown due to COVID-19 can be observed on air quality, which is being experienced by everyone and recorded in various official reports. A lot of decline was observed in smog by which we can see clear and blue skies in the cities like Delhi and marine life is also seeing increased activity, pollution levels have dropped in almost all the metro cities and animals as well as birds are moving around on their own accord. It was also observed that in metro cities like Delhi, as the energy foot print was high, the lockdown has improved the air quality at higher scale (Mahato *et al.,* 2020; Mandal and Pal., 2020).

Main Positive impacts on Environment during lockdown is as below;

- **No_2 Level**

In the first of month in lockdown period in 2019, China was produced approximately 200 million metric tons of Co_2 due to the reduction in air traffic, vehicles, industries of oil refining and coal consumption. In Between 1st January and 11th March 2020, the European Space Agency observed a marked reduction in No_2 emissions from vehicles, power plants, industries and factories in the Po Valley region in northern Italy. In North India, the Himalayas became visible from Jalandhar again in the first time in last decades, because quality of air improved due to drop down in pollution during lockdown.

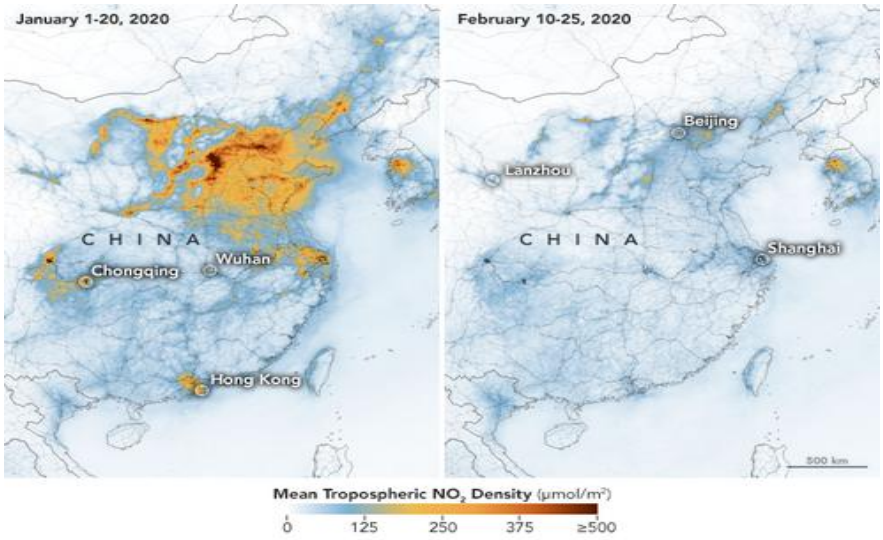


Fig-1: Shows TROPOMI Data of No_2 levels in China at the beginning of 2020

Pollution dwindling in Wuhan during the corona virus pandemic (NASA)

- Due to dropped pollution levels, especially in cities like Wuhan, china by 25-40 to analyzed and observed of ozone layer and pollutants such as NO_2, aerosols and others by Scientist of NASA uses an ozone monitoring instrument (OMI).
- According to NASA scientists, dropping levels of NO_2 pollution began in Wuhan, China and spread slowly- slowly in the rest of the world and same time of year as the lunar year celebrations in China
- According to WHO, NASA scientsts and monitoring pollution satellites observed that decrease in air pollution in lockdown in China and observed dropped of 25 percent in Co_2 emission and 40 percent in No_2 emissions in China and Italy.
- According to SDG report, 2020 the Energy related Co_2 emissions in India was on track with valve 1.8. Under the earlier SDG report, Co_2 emission and particulate matter concentration was observed to be 2.5. It means air pollution was dropped in lockdown period.

- **Wildlife**

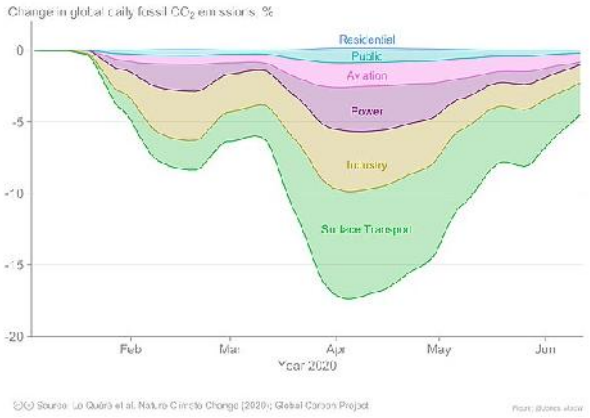
In the United States, Due to reduction of human interference and less pollution which resulted fatal vehicle collisions with animals like as elk, mountain lions moose, deer and bears reduced approximately 58% during lockdown.

- **Deforestation and Reforestation**

Due to low disruption in lockdown provided cover for illegal deforestation operations it was observed where satellite imagery showed deforestation of the Amazon rainforest surging by over 50 percent compared to baseline levels.

- **Carbon Emissions**

According to published study, in May 2020 found that the daily global carbon emissions was measured of decline up to 7%, during the lockdown which would be the biggest dropped since World War II.



Daily CO_2 emissions by 6 sectors in 2019 and first half of 2020

Studying the impact on Air Quality Index using AQI

The studied was carried out to know the effects on air quality of COVID-19, through Air Quality index (AQI) which was one of the important tools to measure the level of pollution due to major air pollutants. It is an overall scheme proposed by Central Pollution Control board (CPCB) which transforms the weighted values of seven air pollutants ($PM_{2.5}$, PM_{10}, NH_3, CO, SO_2, NO_2, and Ozone) in to a single number or set of numbers, to analyze that the impact during lockdown in COVID-19. It categories the air quality into six categories from Good (with AQI ranging from 0 to 50) to Severe (with AQI more than 401). It is found in during lockdown period AQI ranging was from 0 to 50. It has positive impacts on Environment. (OECD, 2016; OECD, 2015),

Causes of Reduced Air Pollution Levels

Main Reasons of Reduction of air Pollution levels on Environment during lockdown is as below;

Release of Less Amount of Gases in Environment-

- Quality of air was improved largely due to road traffic, air traffic, Nitrogen oxide (NO2), factories emissions of carbon dioxide (CO2), ozone, and particulate matter formation also was reduced.
- According to EEA's data show concentrations of NO2 was decreased in approximately 26-35 in many Italian cities during lockdown.

Availability of more Fresh Water

- Reduced activities in industries during lockdown resulted that the water consumption of the industrial sector has decreased to approximately 20-30
- Less activity of hotels and health during lockdown, decreased in water consumption in clubs and hotels and people tendency to be more efficient with water at home than hotels and health club. So besides a decrease in water consumption, there has also been an exemplified fresh and clearness in water quality in river, canals of Venice, as resulting in dolphin were sighted for first time in 60 years due to dropped pollution.

Flourished of Wild Life

- The Inter-governmental Panel on Climate Change (IPCC) was predicted approximately 1.5 C average temperature was raised in atmospheric and may 20-30 of species in jeopardy of extinction.
- Due to increasing temperatures in coral reefs was decline by a further 70-90 and by the year 2030, only 10% of rainforests will be remaining. But during lockdown, it has helped into resolving this devastation to a limit where there has sighted of wild birds flocking to beaches in Peru and wild deer camping across housing estates.

- Along the eastern coast of Odisha, India around 475,000 endangered Olive Ridly sea turtles have laid 60 million eggs and Lagoons in Albania have witnessed an increased in flamingos due to decreased activities of boating.
- According to SDG report 2020, in India, as per red list index species survival was decreasing and hence becoming to environmental.

Decreasing Demand for Oil

- Due to decrease of fuel demands for vehicles, factories, travel and industries. There has been a sharp decline approximately 435,000 barrels a day in the first quarter of 2020, during the lockdown. Reduction of combustion of fossil fuels is a positive sign on the Environment because combustion of fuels of fossil is major cause of pollution.
- Pollution of oil is also harmful for animals, insects, disrupts the food chain, and is hurdle into preventing photosynthesis in plants. Oil contamination can make water unsuitable for irrigation and damage irrigation plants, apart from its common effect on Environment and wildlife.

Vegetation of Grow Better

- Due to less human interference during lockdown, plants are exposed to better air quality and clean water and allowed plants to grow and have healthy production because an required amount of oxygen and other nutrients which required for their growth are not polluted during lockdown period and hence allow plants to grow and harvest healthy produce which is essential for improving the food cycle.

Declined Global Fishing on Marine Life

- According to, World Health Organization, since 11th March 2020, it was declared the global fishing activity which has been down approximately 10% compared in 2018-2019. Due to restriction in movement, supply, fishing imports are declined in lockdown, however the positive impacts on marine life due to the decline in fishing will be dependent on several factors such as species life-history traits and whether these species are bred during these months.

Negative Impacts on Environment:
Increased Plastic Packaging

- Due to an increasing of home deliveries during the lockdown, the online shopping surged which requires a lot of plastic packaging.
- Due to an increase in health concerns, food retailers and shop keepers have resumed the trend and using single-use plastic bags at checkout points instead of reusable papers and bags which was also become a contemporary norm during the pandemic.

- Disposal and production of surgical masks, gloves, protective equipment, and body bags have increased during lockdown period and such type of waste generated and throw to the landfills which negatively effects pollution and our environment also.
- According to study, on an average 8 million tons of plastic trash were found during the lockdown that was 30 times as heavy in The Statue of Liberty and thrown into the ocean and this rate was getting negative effect.
- Only in a single month, about 5796 tons of single-use plastic waste was generated in Bangladesh alone during the ongoing pandemic.

Increasing Organic Waste

- Due to a sharp decline in the availability of cargo transportation services, the export and imports of various essential commodities have come to a standstill. Severe cuts in agriculture and fishery export levels have led to wastage of large quantities of produce.

Ecosystem at Risk-Illegal Deforestation, Fishing and Wildlife

- During lockdown, the workers of Department of Environmental protection at national parks, marine conservation zones, land, were instructed to stay at home and as a result the concerned areas were unmonitored due to not having proper watch.
- The decline in ecotourism activity has led to an increase in unemployment in the regions frequented by tourists hence, to manage their income, there has been a rise in fishing, illegal deforestation, and wildlife hunting.
- In Namibia, Conservation work of 10 years was at risk with animals being poached outside their natural habitats by people in the tourism industry which accounts for 16% of the total employment.

Waste Management is Getting Difficult

Medical Waste during in Lockdown

- During lockdown, Garbage area were added by medical waste has increased.

- In Wuhan, the officials were required to construct medical waste plants as the waste output reached 240 metric tons per day.
- Many local waste recycling centers have suspended their activities over the fear of virus circulation in the recycling centers.

Conclusion

It is a time for policy makers and government to plan strategies to come back into normal life in post-COVID era. From previous discussion it is clear that lockdown has done such a miraculous change in environmental condition which was beyond thinking for us just couple of months back. This is also true that lockdown conditions cannot be imposed forever, industries cannot be shut down for infinite time or vehicular movement cannot be restricted for much longer time but the patterns can be changed and a more responsible behavior can be adopted. It is a well-known fact that anthropogenic activities are the major cause behind degraded environmental condition and disturbed ecology, but as a result, it has become evident that still it can be restored significantly if sufficient mitigative measure and strategic government policies are planned before removing all the restrictions.

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Economy, Environment and Rehabilitation after COVID-19

Anita Jeph[*]
Vijay Singh Mina[**]

Introduction

It will be needless to mention the definition as well as impacts of COVID-19, as almost every human being alongwith all creatures have been effected by COVID immensely. While the Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. From infection point of view, we can say, most of the people infected with the COVID-19 virus and have been experienced mild to moderate respiratory illness and recover without requiring special treatment. And on another side, older people, and those who have their existing medical problems like cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop serious illness (WHO, 2020a).

Common Impacts & Sustainable Development

The economic and social disruption caused by the pandemic is devastating: as tens of millions of people are at risk of falling into extreme poverty due to not having regular job or job opportunities. The COVID-19 pandemic has led to a dramatic loss of human life worldwide and presents an unprecedented challenge to public health, food systems and the world of work. Millions of enterprises face an existential threat and they are hopeless for their future as nobody knows that when it will come to an end finally. From word's point of view, millions of workforce at global level are at risk and losing their livelihoods. As there were no regular income as well income sources during lockdowns, and likewise many are unable to feed themselves and their families (Zambrano *et al.,* 2020).

From restriction point of view, border closures, trade restrictions and confinement measures have been preventing farmers from accessing markets, including for buying inputs and selling their produce, and agricultural workers from

[*] Department of Botany, Government Girls College, Jhunjhunu, Rajasthan, India.
[**] Senior Manager in Union Bank of India.

harvesting crops also, thus disrupting domestic and international food supply chains and reducing access to healthy, safe and diverse diets. The pandemic has decimated jobs and placed millions of livelihoods at risk. Further, when experiencing income losses, and to live life, man started to approach negative strategies, such as distress sale of assets, predatory loans or child labour.

Rehabilitation and Rescue Operations

From rescue point of view, immediate and purposeful action to save lives and livelihoods should include extending social protection towards universal health coverage and income support for those most affected. These include workers in the informal economy and in poorly protected and low-paid jobs, including youth, older workers, and migrants. Particular attention must be paid to the situation of women, who are over-represented in low-paid jobs and care roles. Different forms of support are key, including cash transfers, child allowances and healthy school meals, shelter and food relief initiatives, support for employment retention and recovery, and financial relief for businesses, including micro, small and medium-sized enterprises. In designing and implementing such measures it is essential that governments work closely with employers and workers.

Countries dealing with existing humanitarian crises or emergencies are particularly exposed to the effects of COVID-19. Responding swiftly to the pandemic, while ensuring that humanitarian and recovery assistance reaches those most in need, is critical.

Now is the time for global solidarity and support, especially with the most vulnerable in our societies, particularly in the emerging and developing world. Only together can we overcome the intertwined health and social and economic impacts of the pandemic and prevent its escalation into a protracted humanitarian and food security catastrophe, with the potential loss of already achieved development gains.

Long Term Effects

We must recognize this opportunity to build back better, we should committed to pooling our expertise and experience to support countries in their crisis response measures and efforts to achieve the Sustainable Development Goals. We need to develop long-term sustainable strategies to address the challenges facing the health and agri-food sectors. Priority should be given to addressing underlying food security and malnutrition challenges, tackling rural poverty, in particular through more and better jobs in the rural economy, extending social protection to all, facilitating safe migration pathways and promoting the formalization of the informal economy.

We must rethink the future of our environment and tackle climate change and environmental degradation with ambition and urgency. Only then can we protect the health, livelihoods, food security and nutrition of all people, and ensure that our ‘new normal’ is a better one.

The Impact of Covid-19 on Indian Economy

From GDP point of view, not only the GDP of India but also the GDP of almost all countries have been effected negatively by COVID. As per the official data released by the ministry of statistics and program implementation, this (since 2020) is the worst decline ever observed since the ministry had started compiling GDP stats quarterly in 1996. In 2020, an estimated 10 million migrant workers returned to their native places after the imposition of the lockdown. But what is surprising is the fact that neither the state government nor the central government have any fix data regarding the migrant workers who lost their jobs and their lives during the lockdown. (OECD, 2021; MF, 2020).

During Covid-19 as shops, eateries, factories, transport services, business establishments were shuttered, the lockdown had a devastating impact on slowing down the economy. The informal sectors of the economy have been worst hit by the global epidemic. All the major sectors of the economy were badly hit except agriculture. The surveys conducted by the Centre for Monitoring Indian Economy shows a steep rise in unemployment rates due to COVID. The economy is having a knock-on effect with MSMEs shutting their businesses. Millions of jobs have been lost permanently and have dampened consumption. The most effective way to come out of this emergency is that the government should inject much capital into the economy through FI's 'UGECL' (Union Guaranteed Emergency Credit Line) for MSME borrowers and 'PM SVANidhi' for local street venders. PM svanidhi is the fantastic scheme launched by GOI, and it is the economic booster for lower income group people. The PM Street Vendor's AtmaNirbharNidhi (PM SVANidhi) was launched by the Ministry of Housing and Urban Affairs on June 01, 2020 for providing affordable Working Capital loan to street vendors to resume their livelihoods that have been adversely affected due to Covid-19 lockdown. (GOI, 2020)

COVID and Environmental Crisis at Global Level

No doubt, the environment has been over whelmed by COVID's negative impacts. Over the past few decades, concerns for our environment have become one of the major topics among people. With the rising population, the world has become too crowded and harshly polluted. By using natural resources, people are polluting the environment with hazardous manufactured chemicals. Nature caused an intense impact on India from 1947 to 1995 which was an outcome in a worse situation. Air pollution, water pollution, garbage domestically restricted goods, and the pollution of the natural environment are threats to India. In dealing with different issues and solving them promptly, India has made it's fastest move between 1995 through 2010, reported in data collection, and environment assessment studies of World Bank experts. Still, India has a long way to go in progressing the environmental quality (Grange, 2021).

Nonetheless, the world has changed in the last few months due to the rare disaster Corona Virus. The pandemic has resulted in a tragically large number of human lives being lost. As the countries already implemented necessary quarantine and social distancing practices preventing pandemics, the whole world was put in a great lockdown. Changes came into our life due to the lockdown already commenced impacting our environment in myriad ways. Both the positive and negative indirect effects of Covid-19 are reflected on the environment and the climate, presented by different researches and studies.

Impacts on Air Pollution

It is noticed there is a sudden reduction of Green House Gases (GHGs) emission as industries, transportation and campaigns have shut down. Air pollution had also decreased as the vehicles were inside the houses along with people. It was computed that nearly 50% reduction of NO_2 and CO occurred due to the shutdown of heavy industries, also emission of NO_2 from the burning of fossil fuel indicates a sign of reduction in many countries (e.g., US, Canada, China, India, Italy, Brazil, etc.) (Zoran, 2020; Fattorini, 2020).

In many countries worldwide flights were canceled as international travelers are restricted to enter and depart. Due to the nationwide lockdown, 96% of Air travel dropped from a similar time last year globally, which has a tremendous impact on the environment. It is an enormous help to withstand global climate change for the less consumption of fossil fuels (Bashir, 2020).

Furthermore, water pollution is a common disaster in countries like India, and Bangladesh where industrial, and household wastes are dumped into rivers without any procedure. But it was stopped or reduced during the pandemic as major numbers of industries were shut down. For example, Ganga and Yamuna have reached a significant level of purity in India. Likewise, there was also a sharp declaration of noise pollution and many beaches were cleaned around the world; also the animals were seen back in cities (Zielinski, and Botero, 2020).

On the other hand, there were also negative consequences shown in the environment. During the outbreak of Covid-19, medical waste generation was increased globally, which was a threat to public health and the environment. For the sample collection of the suspected patients, diagnosis, medication, and biochemical wastes are produced from the hospitals. It became a challenge for the local waste management authorities to tackle the situation. To protect from the viral infection, a mask, hand gloves, and other safety equipment are used. But due to the lack of a proper knowledge, most people dump these in open places, causing harmful effects to the surroundings. There are direct effects on air, water, and soil pollution by increasing the rate of municipal waste (both organic and inorganic).

Moreover, the natural ecosystems and different flora and fauna are at great risk for the lockdown ordered by different countries. Different protected areas including Natural parks, marine conservation zones and wildlife, sanctuaries, etc were left monitored as two people who worked in those places were stuck in their homes. It increased issues like wildlife hunting, illegal deforestation, and fishing activities.

Additionally, sudden shutdown of ecotourism activities in tourist destinations, and in the forest areas have increased the unemployment rate, as ecotourism is considered as the major source of an economic mainstream. However, we can also notice the role of environmental communication during this pandemic period. It mainly includes the human interaction with the environment. From interpersonal communication and virtual communities to participatory decision-making and environmental media coverage are the part of this portion. We must understand that Covid -19 is a reminder to indicate the relations between human beings and the environment. So, to prevent future outbreaks, we must address the threats to ecosystems and wildlife, including habitat loss, illegal trade, pollution, and climate change.

Conclusion

Since last two years, as a result, COVID-19 effected every part of human life, environment along with economy. The important thing is that COVID-19 not only effected the things but also a drastic changement has been left over the whole world and due to this changement, human being have changed their mentality towards life and how we should live our life. A very special conclusion is observed that people know the importance of nature and it's products, for example use of Ayurveda and Ayurvedic Medicines. Generally COVID-19 spreads in India which depends on a lot of factors, especially, the common as well as religious gathering of people, which can act as a super spreader of COVID-19. In India, lockdown proved to be a good decision and it should be implemented as and when Govt needs further. There are many unknown parameters that can cause large uncertainties in the prediction; the prediction is supposed to help the Government in further decision making and in coping with the ongoing coronavirus transmission in India. As predicted by the last experiences of human being, more focus should be given to the control measures such as speeding the testing rate, maintain social distancing, avoid unnecessary gathering, and how to inject capital in market to boost the economy in a faster way.

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Impact of COVID-19 on Human Health and Environment

Sonum Bamania*

Introduction

The environment is essential part of every human and animal health. COVID-19 is a global health threat in the twenty-first century. The emergence of SARS-CoV-2 in Wuhan, China in December 2019, and its spread to regional countries and nowadays affecting more than 210 countries worldwide represents the first pandemic in history to be caused by a coronavirus. The COVID-19 pandemic has huge impacts on most aspects of human activities, as well as on the environment and health care systems. Lock-downs, quarantines and border closures in the wake of the pandemic have led to reductions in air pollution through decreased travel and production.

These positive environmental effects are likely mostly temporary, but may serve as an example that changes in our way of life can have prompt positive effects for the environment and demonstrate the usefulness of travel-reducing measures such as teleconferencing. Thus, acknowledging that COVID-19 is first and foremost a worldwide disaster, the pandemic may inspire to future behavioral changes with positive environmental effects COVID-19 pandemic.

COVID-19 is the first pandemic in history to be caused by a coronavirus. While the huge negative effects of living through the COVID-19 pandemic are obvious-psychological stress, fear, severe global economic losses, overwhelmed health care systems and general disruption of societies - the ongoing pandemic may also have some indirect positive impacts.

Virus created a negative impacts on human health but changes in our way of life style. Due to pandemic effect possible positive changes came in the environment, health of humans, animals and the ecosystem. Social distancing and quarantines have led to substantial decreases travel as many jobs shift to working from home.

* Assistant Professor in Botany, Government P. G. College, Karauli, Rajasthan, India.

The widespread quarantines and travel restrictions imposed by several countries have resulted in reduced use of and demand for oil and its products, which has resulted in reduced emissions of smoke and waste due to oil consumption. For example, the National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) recently reported that nitrogen dioxide air pollution has been significantly reduced in connection with the community quarantine and lockdown in Wuhan and other cities in China

COVID 19 Impacts on Human Health

Symptoms of COVID-19 are variable, ranging from mild symptoms to severe illness. Common symptoms include headache, loss of smell and taste, nasal congestion and runny nose, cough, muscle pain, sore throat, fever, diarrhea, and breathing difficulties. People with the same infection may have different symptoms, and their symptoms may change over time. Three common clusters of symptoms have been identified:- one respiratory symptom cluster with cough, sputum, shortness of breath, and fever; a musculoskeletal symptom cluster with muscle and joint pain, headache, and fatigue; a cluster of digestive symptoms with abdominal pain, vomiting, and diarrhea. In people without prior ear, nose, and throat disorders, loss of taste combined with loss of smell is associated with COVID-19.

Most people recover from the acute phase of the disease. However, some people-over half of a cohort of home-isolated young patients - continue to experience a range of effects, such as fatigue, for months after recovery, a condition called long COVID; long-term damage to organs has been observed. Multi-year studies are underway to further investigate the long-term effects of the disease. As is common with infections, there is a delay between the moment a person first becomes infected and the appearance of the first symptoms. The median delay for COVID-19 is four to five days. Most symptomatic people experience symptoms within two to seven days after exposure, and almost all will experience at least one symptom within 12 days.

Of people who show symptoms, 81% develop only mild to moderate symptoms (up to mild pneumonia), while 14% develop severe symptoms (dyspnea, hypoxia, or more than 50% lung involvement on imaging) and 5% of patients suffer critical symptoms (respiratory failure, shock, or multi organ dysfunction). At least a third of the people who are infected with the virus do not develop noticeable symptoms at any point in time. These asymptomatic carriers tend not to get tested and can spread the disease. Other infected people will develop symptoms later, called "pre-symptomatic", or have very mild symptoms and can also spread the virus.

The novel coronavirus is said to have a drastic impact on the respiratory system. However, it should be kept in mind that the virus can affect any organ in the body. Talking about critically ill patients, coronavirus disease can directly injure

multiple organs such as lungs, brain, heart, kidneys, liver, intestine, pharynx and other tissues. It can also result in systemic disorders, ultimately leading to organ malfunction. Therefore, it is significant to properly evaluate a patient to identify any injury to multiple organs.

- **Lungs:** The coronavirus disease is reported to commence its attack starting from the lungs. One of the most common effects of covid in the lungs is breathing issues, which can go from mild to major. While dry cough or a sore throat is common in mild and moderate cases, in severe and critical cases, coronavirus infection can make lungs and airways swollen, inflamed, and filled with fluid or debris, thereby making it extremely tough to catch a breath. Conditions like COPD enhance the effects of the vir**us.**
- **Brain:** The impact of coronavirus on the brain is quite vast and varies as per cases. While in many, the covid-19 infection leads to dizziness, loss of sense and smell, confusion, disorientation, and agitation, in others it was found to result in stroke, brain hemorrhage, and memory loss.
- **Heart:** Coronavirus is known to deprive the heart of adequate amounts of oxygen. In fact, the virus can also invade blood vessels or cause inflammation within them, thereby resulting in blood clots causing heart attacks. Reports also claim clots throughout the body in many COVID-19 patients. Heart complications have also been found in patients with no previous heart disease.
- **Kidney:** Covid-19 infection has a major impact on the kidneys as well. The virus makes its way into the kidney by binding directly to kidney receptors. While kidney injury is common, in the most extreme cases, patients can even go into acute renal failure, thereby losing their ability to remove waste and balance fluids in the body. Dialysis of such patients is to be carried out.
- **Liver:** Liver injury is common in cases of coronavirus disease. Altered liver function, acute liver failure, liver impairment are a few common Covid-19 complications related to the liver. Learn that liver test abnormalities are more frequent in patients with more severe coronavirus infection.

COVID 19 Impact on Environment

The Centre for Research on Energy and Clean Air also reported that CO2 emissions in China were down 25% in the two weeks following the Chinese New Year holiday. Air pollution affects climate and may induce drastic changes on ecosystems, which can also exacerbate infectious diseases outbreaks by affecting pathogens, hosts, vectors, and transmission dynamics. Air quality in China has been reduced in the past few years and this has resulted in increased hospitalizations due to respiratory diseases. The country's response to COVID-19 may have at least partially slowed this trend. International air travel has also decreased dramatically since the

onset of the COVID-19 outbreak due to the implementation of travel restrictions. Recently, extended travel restrictions have been implemented all over the world.

COVID 19 have mix positive and negative effects on environment

Pandemic lockdowns was important time for nature and natural resources. Because absence of pollutants improved the ecological imbalances. Air and water quality was improved and purified for short duration, lack of noise pollution and sky was clearer than normal routine days in metro-cities. Some negative sides also that medical waste increasing, sanitizer and hand washing process made water wastage and garbage in drainage system, organic waste were increased.

We can show and understand positive impacts of COVID 19 situation of lockdowns following by this chart easily:

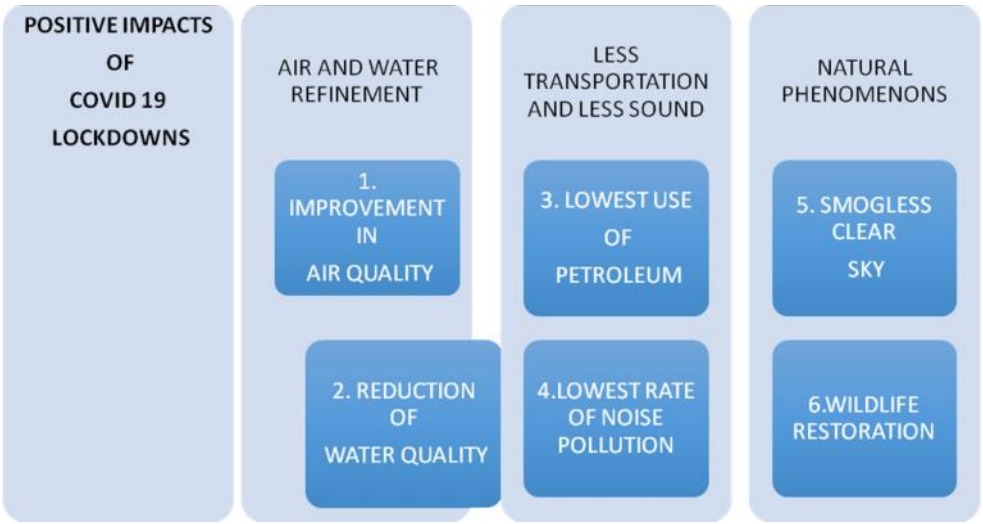

Figure 1: Positive Impacts of COVID 19 on Environment

Positive Sides of COVID 19 Pandemic for Environment

- **Improvement in Air Quality**

Travel and traffic restriction, work from home policies of government created a different scenario during pandemic. Lowest consumption of fossil fuel in environment automatically made good air quality. For example there have been observed serious reductions around 50% in the concentrations of air pollutants such as NO_2 in many polluted urban areas of Europe and China.

- **Reduction of Water Pollution**

Tour, travel and industrial activities during the pandemic was suspended so water quality was improved. Decreasing of tourist numbers and strict lockdown measures contributed to a better condition of beaches. According to Central Pollution Control Board data Ganga River shows high improvement since the implement of lockdown in India.

- **Lowest Uses of Petroleum**

The demand of petrol and diesel falls down due to lockdown and hindrance of transport services. So the use, demand and consumption level of petrol and diesel was it lowest level. This thing made good air quality and reduce air pollution in environment.

- **Lowest Rate of Noise Pollution**

At the time of pandemic roads traffic, oceanic commercial activities, industrial, and transportation activities are totally closed, trains, buses and their crowd, undesirable sounds of horns are absent only very few selective most required rare transportation was visible.

- **Smogless Clear Sky**

The grounding of flights and decline in air traveling had a positive effect on the environment with improving air quality. Both air and noise pollution reduced during the lockdown periods due to flight cancellation. All these things sky make more beautiful and clearer.

- **Wildlife Restoration**

Pandemic create an awesome scene humans were indoor while animals were fearless because all activites which are related to socio-economic aspect were closed during lockdown. Tour, tourist and travels were postponed. There are many examples shows that animals wandering on roads and cities. For example roaming of deers in Noida city, a deer saw in Tirupati, one horn rhino seen in Guwahati. These are some Indian examples but different part of the world wild animals spotted.

Negative Sides of COVID 19 for Environment

- **Wastage Problems**

Two types of wastage problems are increased

  - Organic wastage
  - Medical wastage

At the time of lock down direct transportation services, export and import declined. So the vegetarian and non vegetarian items of food became waste like fruits vegetables and cereals. Fisheries and agriculture sector exports level was it lowest.

Hand sanitizers bottles, single used mask, gloves, protective medical equipments, syringes and PPE kits have made lot of medical waste.

- **Plastic and Chemical Pollution**

Plastic made sanitizer bottles, syringes, PPE kits, dettol, phenyl, alcohol and other chemical cleaning reagents use surgical masks created plenty of plastic garbage and **plastic pollution**. Sanitizer and cleaning practices increased during lockdown periods. Soaps, detergents increased and these all practices level of **chemical pollution** increased. Chemically polluted water poured in pond or water resources and at last they polluted aquatic ecosystem.

- **High Rate of Water Consumption**

As according to COVID 19 guidelines nobody touch their hands to face or other body parts without handwash to spreadout the infection. Hand wash and cleaning practices create the problem of high consumption rate of water. If every day a person use handwash four times and this process required 4 litre water then we can calculate the water consumption rate of each person.

- **Soil Pollution**

Soil and water have deep relation to each other. If water pollution rate will high then soil pollution rate also will be high because water flows on the surface of soil. So chemical wastage and medical-plastic wastage create and increased soil pollution.

- **Deteriorated Soil Quality and Effects on Plants**

Chemicals of sanitizers and medical plastic waste made soil more polluted and destroy the natural nutrients of soil. Declined soil quality directly effected plant growth.

- **Disturbances in Aquatic Flora and Fauna**

When plastics and chemicals poured in water resources then aquatic flora and fauna species dies or destroyed in their natural habitat. At the pandemic crisis humans are dying in hospitals and homes, it was not arranged how to dispose the chemical and medical wastage. Conditions were too much critical so there was no time to consideration about aquatic ecosystem.

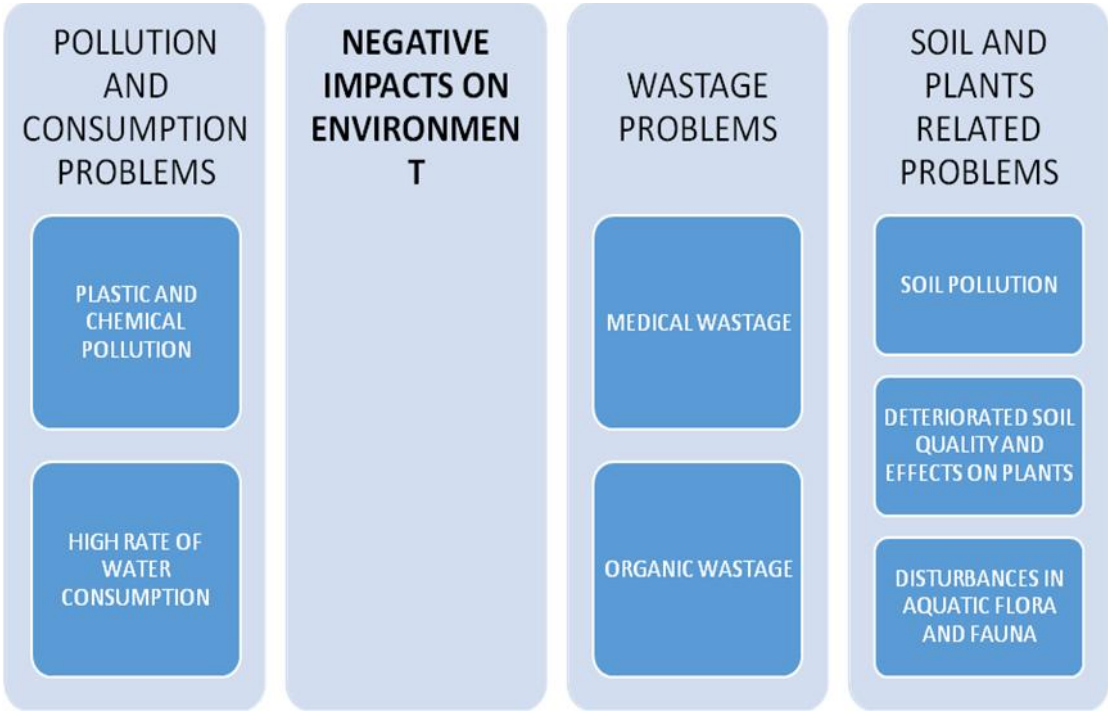

Figure 2: Negative Impacts on Environment of COVID 19

Conclusion

In the present scenario of COVID 19 pandemic affected to all humans and environment. We should keep remember that for COVID 19, no standard specific medicine, vaccine or treatment for this disease. Mortality rate related to COVID 19 is found to be very high in case of people with weak immune system. Old age people, people with diseased are more prone to COVID19, they get early infected and recover delayed than healthy young persons with strong imuunity. We should aware for preventive cure and precautions with environmental safety. Now, the time is where we must not only awareness about the human health but also environmental security. Use of some type chemicals (soap, handwash sanitizers) which is related to cleaning used on large scale by humans. Some other chemical and plastics were used for single time uses like gloves, PPE kits, syringes. These all chemical made more polluted than before so there are some suggestions to tackle the ongoing ad future impacts of pandemic are following:

- At National and International level should be proper guidelines and management of plastic and chemical waste.
- A strong policy should be for waste water treatment and waste water should be not poured in any aquatic system.
- Awareness programmes and campaigns should be organized for young generation in schools and colleges. Urban and rural both area's public need to know about various guidelines related to pandemic.
- Requirement of developing a database for old aged persons and children. Elderly people need more care, timely and proper treatment.
- School, colleges and sports activities are totally banned, children are stressed and mentally unhealthy. So need develop a safe outing environment for children.

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4

Understanding the Impact of Covid-19 on Food Security and Nutrition in India

Preeti Nagora*

Introduction

The Covid-19 pandemic has extensively spread all over the world since late 2019. And, In India the first case was reported in January 2020 in Kerala. And, this led to nationwide lockdown on 21st March 2020. Covid-19 is a virus highly contagious disease turned into spreading a pandemic all over the world. So, to contain the spread of viral disease, Government of India declared lockdown and made people to lock themselves inside their houses. And resultantly thousands of workers and migrant laborers were forced to leave their workplaces and move towards their distant homes barefoot to U.P., Bihar and Odisha with no food and water. Due to this, people suffered a lot due to extreme hunger and non-availability and accessibility of food.

India, being the second largest populous country in the World, the food requirements of the vulnerable sections of the society is immense. FCI maintained a buffers stock of nearly 77 million tones (MT) of Rice and wheat and 2.25 mt of pulses in public storage. This is more than 3 times the buffer stock Food Corporation of India has to keep. But, after the lockdown the conditions become worse. Out of the total population of 1.3 billion people, 190.7 million people are undernourished and 25 percent of the children experience hunger. And, it ranked 94th among 107 continues in Global Hunger Index 2020 report. With, these the conditions of extreme hunger in India prior to covid-19 pandemic have excavated after covid-19 pandemic stalling the efforts of W.H.O. Sustainable Development Goal-2 i.e. Zero Hunger. But, the impact of Covid-19 paralyzed the food supply chains all over India disrupting the food availability and accessibility to the masses at ground level. In India the magnitude of challenge in a country like India such in emergency situations become worse in the pandemic situation.

* Assistant Professor, Department of Geography, Government Arts College, Kota, Rajasthan, India.

Measures Adopted by Govt. of India for Maintaining Food Security

Govt. of India has adopted legislatives measures, schemes, Public Distribution System, Mid Day Meal Schemes, NGOs and Aanganwadis to reach the undernourished and vulnerable sections of the population in the country.

- Legislative measures such as National Food Security Act, 2013 (NFSA) provides for food and nutritional security life at affordable prices and enables people to live a life with dignity. Under this act, 75% of the rural population and 50% of the urban population have been categorized as eligible households for food security schemes such as Antyodaya Anna yojana (AA4), below poverty line and above poverty line cards.
- Public procurement and storage of food grains.
- Public Distribution system working through fair price shops working all over the India.
- The Mid day meal schemes.
- The Aanganwadis
- Non-Government Orgainizations

Nationwide lockdown was declared by government of India on 21st March 2020 and the buffer stock was three times the FCI prefers to keep. But, the implications and immediate effects of the pandemic on the local food supplies chains and socio economic structure of country suffered a huge setback. Resultantly, on 26th March 2020, finance minister Nirmala Sitharaman declared a relief package worth INR 1.7 Lakh Crore under Pradhan Mantri Garib Kalyanyojana for the poor to help them fight the battle against corona virus. It covers following points

- 80 Crore poor people to get 5 Kg wheat or rice and 1 Kg of preferred pulses for free every month for the next three months.
- 20 Crore women Jan Dhan account holders to get Rs. 500 per month for next three months.
- Increase in MNREGA wage to Rs. 202 a day from Rs 182 to benefit 13.62 crore families.
- An ex-gratia of Rs 1000 to 3 crore poor senior citizens, poor widows and poor disabled government to front load Rs. 2,000 paid to farmers in first week of April under existing PM Kisan Yojana to benefit 8.7 Crore farmers.
    - State Governments to use building and construction workers welfare fund to provide relief to construction workers.
    - State Governments took their own measures and the first one was Kerala to take measures regarding food supplies i.e free ration for all for one month i.e. 35 Kg of Rice below poverty line families and 15 Kg for others

through PDS and SUPPLYCO. Kerala initiated supply of food kits for every household irrespective of their income status. And the above model was adopted by Punjab, Haryana, Karnataka and Andhra Pradesh etc to boost food security in their respective states. Even if, the Govt. had huge buffer stock to feed millions month during covid-19 pandemic.

A large number of population percentage faced food shortage supply at various junctures

The Major Challenges faced by the government are as follows:

- Rotting of food.
- Market Challenges.
- Lack of updation of PDS and its automation.
- Large numbers of Rural Migrants and casual labourers
- Coordination and logistics

But, the immediate challenge for the government was to address the concerns of the large number of migrants and casual labourers who were stuck at their workplaces or travelled barefoot without any transportation. The number of 40-50 Million seasonal migrant workers in India needs immediate food requirement.

Some of the major issues which came up during lockdown are:

- 50% of workers had rations left for less than 1 day
- 96% had not received rations from the government and 70% had not received any food.
- 74% had less than half their daily wages remaining to survive for the rest of the lockdown period.
- 89% had not been paid by their employees at all during the lockdown.
- Rate of hunger is exceeding the rate of relief measures.

Coordination and Logistics

During covid effected lockdown agricultural harvest of Rabi season whether it is wheat or Rice for Punjab, Haryana, Rice from Southern States. Poultry, fish stock all were stuck at their production places due to lack of transportation facilities, storage and distribution facilities, Therefore, with very limited transportation. The large supplies of food had gone susceptible to spoilage and contamination. Resultantly, the demand of food commodities increased and there was no transportation. The trucks which were supplying food were frisked at many junctures. Even if, they had papers they had to go through the covid-19 restriction policy.

Updation and Documentation of PDS

In India, where Roti, Kapda, Makan are the three major necessities of the vulnerable sections of the Society. Maintaining PDS updation and documentation became a real hurdle to sustain food security in India majorly going through the effects of Covid-19 on Indian population. Experts have given some suggestions which govt. should focus on:

- Procurement, storage and supply chain management of food grains and food commodities especially for poverty stricken areas.
- Refining the delivery and distribution system to reach each and every needy individual.
- Allocating subsidies to the poverty stricken families.

So, Govt. Should take measures for the vulnerable sections at a large scale with immediate response activity for the poor of our country to control hunger in such conditions. In the post covid-19 India, The Comprehensive National Nutrition Survey suggested that a one third of Indian children are stunted and underweight. The challenges of Covid crisis are likely to deteriorate this very situation. The International Labour Organisation has estimated that around 400 Million Indians from informal sectors are likely to be pushed in deep poverty due to Covid. India's vulnerability to climate change and increasing frequency of extreme events all together pose a serious scenario in the country. But, the 'Normal' Scenario of pre Covid times is not an easy task to achieve. So, steps like 'One Nation, One Card' across the country will universalize the PDS system. Therefore, NGO_s can also help in distributing food and nutrition to the newly emerged hotspots due to loss of livelihood and movement of migrant labourers. The efforts of govt. can be supplemented by these organizations filling the blind spots. Another step could be tracking down the number of beneficiaries under the adopted measures of the govt. And, the country can move forward on uninterrupted development process by building a strong agricultural sector to boost the economy under these Covid times. So, steps taken today are the seeds for tomorrow's well developed fruit giving plant with development, progress in both health sector and making India economically stronger.

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5

Various issues of Loss of Biodiversity in Rajasthan

Hans Raj Parihar*

Introduction

Biodiversity is (Biological + Diversity) 'the variety of life on the earth'. Biodiversity describe the variety of plant and animal life that may exist in a particular area. Rich biodiversity provides sustainability to the ecosystem. Biodiversity is essential as it maintains the ecological balance of our planet. Biodiversity is also very rich in Rajasthan state. Many types of plants and animals are found in Rajasthan. Mostly Xerophytes plants are found here in plant biodiversity. In animal biodiversity, mainly species of mammals, reptiles, avian category are found here. Rajasthan is a dry climate region where rainfall is very less. There are extreme fluctuations in the weather here. Loss of biodiversity refers to the extinction of plant and animal species worldwide. It also includes the decrease in the number of a species in a certain habitat or area. In the present time, many plant species and animal species are completely extinct. Biodiversity loss creates an imbalance in our ecosystem. Many environmental issues are responsible for loss of biodiversity. There are many causes like industrialization, urbanization, pollution, pesticide etc. which are causing great harm to bio-diversity in Rajasthan. Various issues that harm biodiversity have been identified by this article.

Some major issues or causes of loss of Biodiversity are identified by the author:

- **Pollution:** Pollution is the major causes or issues of loss of biodiversity. Water pollution, air pollution, soil pollution, radiation pollution are major types of pollution. Water is polluted by industrial wastes, due to which various animals are dying. Many plants are also being destroyed due to water pollution and soil pollution. In this way, biodiversity is being harmed due to pollution.
- **Global Warming:** Pollution and some other factors are responsible for global warming. Earth's temperature is rising due to global warming. Due to the rise in temperature, many animals are unable to tolerate it and are struggling for life. Many plants are dying due to high temperature. Hence, global warming is also causing loss to biodiversity.

* Assistant Professor, Department of Zoology, MJD Government College, Taranagar, Rajasthan, India.

- **Acid Rain:** Acid rain is the result of air pollution. Acid rain occurs due to nitrogen oxide and sulphur dioxide. Acid rain is very harmful for biodiversity. Therefore, this acidic water causes a lot of damage to many animals and plants.
- **Pesticides:** Now a days most of the farmers are using pesticides for high production. Pesticides are very harmful for everyone. Pesticides are major reasons of the loss of Biodiversity. Many birds have become extinct due to these pesticides.
- **Modernization:** The fast growing and developing sectors like industrial sectors, IT sectors, agriculture sectors and construction sectors are also responsible for the decreasing of Biodiversity.
- **Hunting:** Hunting is another issue for extinction of animal species. Many animal species have become extinct due to hunting; therefore, efforts should be made to stop hunting of animals.
- **Shortage of Natural Habitat:** At present modernization and urbanization are increasing so that natural habitats are decreasing for Biodiversity. In this region many types of farming are done on large scale so there is not any large forest area.
- **Shortage of Water Areas:** Rajasthan is a desert region and there is lack of water resources. Many organisms die due to lack of water. Many plants also dry up due to lack of water, so this is a big issue for loss of biodiversity in this area.
- **Over Exploitation of Natural Resources:** At this time the exploitation of natural resources has increased. Due to over exploitation of natural resources some time many species become endangered and vulnerable which may extinct in near future. Hence, biodiversity is harmed due to excessive exploitation of natural resources.
- **Unemployment & Trading:** Here some people also trade many animals and their organs, due to which many animals are extinct. Some people cut down trees causing damage to plant biodiversity.
- **Lack of Awareness:** There is less awareness about the importance of biodiversity here, due to which bio-diversity is being lost.

Recommendations for conservation of Biodiversity

- Use of insecticides should be controlled and minimum in quantity.
- Renovation of water bodies.
- Wild life act should be strictly followed.
- Develop new water areas.
- Awareness for biodiversity conservation should be spread.

Conclusion

In this paper it is found that many issues are responsible for loss of Biodiversity. Biodiversity is continued to fall in the Rajasthan. Many issues are responsible for loss of Biodiversity such as Climate Changes, many types of Pollutions, loss of Natural Habitat, Modernization, Acid Rain, Global Warming, Shortage of Water areas, use of Pesticides, lack of Awareness, Hunting, Trading and other Environmental issues were identified in this paper.

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6

Eco-Physiological Studies of *Blepharis Sindica* – A Vulnerable Medicinal Plant of the Indian Arid Zone

Dr. Purushottam Lal[*]
Dr. Sher Mohammed[**]

Introduction

One third of world's land surface is in the grip of hot desert. In India, Rajasthan State alone has about 62% of arid zone; in the form of inhospitable environment of the Thardesert. Indian arid zone has characteristic environmental factors, where the flora has adapted in several ways to arid conditions. Water is not only vital for life, but also determines the structure and function of the ecosystem. In the Indian arid zone water act as the limiting factor to determinate various biochemical reactions inside plant body. Extreme variations in diurnal & annual temperatures and high evapo-transpiration rate make the physical environment more and more hostile for existing biotic diversity to multiply with their extreme biotic potentials. As the climate of Indian desert is adverse to vegetation, only those plants such as *Aervapersica, Crotalaria burhia, Calotropisprosera, Leptadeniapyrotechnica, Prosopis cineraria, Tecomellaundulata, Capparis decidua, Balanitesroxburghii,* etc. having special adaptations are able to sustain themselves. However, plants maintain themselves in harmony by their extra-ordinary capabilities to adapt with given conditions (Sen, 1982).

Recently the demand for medicinal plant is increasing in both developing as well as developed countries due to growing recognition of natural products, being non-narcotic, having no side-effects, easily available at affordable prices and sometimes the only source of health care available to the poor and tribes. While the demand for medicinal plants is growing, some of them are being threatened in their natural habitat. With the changing scenario, India has to enhance its research and development preparedness in the field of medicinal plants to a level to meet not only our current needs but it has to stand as front runners at international level also (Pareek, 1998). Cream to light brown coloured compressed seeds of *B. sindica* are used to prepare herbal medicines, which is used in diuretic, expectorant, aphrodisiac and earache as tonic. UNDP (2008) have listed in the category of threatened plants from the Rajasthan desert.

[*] Department of Botany, Shree R.R. Morarka Government College, Jhunjhunu, Rajasthan, India.
[**] Department of Botany, Government Lohia PG College, Churu, Rajasthan, India.

Being a part of an ecosystem, each plant species has a peculiar set of interactions with existing components of the ecosystem. Surrounding and ongoing ecological factors exert a strong influence within the physiology of a species which faces that. Ecologically induced physiological harmony, *i.e.* eco-physiology provides an excellent understanding about sum total of manifestations which push a species in a certain direction to receive adaptations or loss its biotic potential. These eco-physiological findings surely help mankind to design some plant based conservation planning for sustainability of such fragile ecosystems.

Objectives

Different eco-physiological parameters were undertaken to analyse ecological influences inside plant body. Entire physio-chemical machinery inside each plant cell has strong inter-dependent relationships with the surroundings, which are being continuously faced by plant body. Sequential variations in the amount of a physio-chemical parameter parallel to other ones collectively form the body of knowledge about eco-physiology of that plant. So, in the present investigation an attempt was made to evaluate the different eco-physiological parameters of *Blepharissindica,* a vulnerable medicinal plant of the Indian Thar desert.

Study Area

The detailed investigations were carried out in Churu district, which is located in the north eastern Rajasthan of Indian desert between 27°24' to 29°00' north latitudes and 73°40' to 75°41' east longitudes. As a part of Thardesert, it has a vast area of 13784.38 km^2, which receives scanty rainfall and faces extreme temperature conditions during summer and winter seasons. Repeated periodic samplings to evaluate various eco-physiological parameters were carried out at three different sites in Churu region, *viz.* Site-A: Khasoli village (10 km in NE direction), Site-B: Shyampura village (12 km in SW direction), and Site-C: Bootiyan village (13 km in SE direction) from the College Campus and mean values of various eco-physiological parameters are given in Tables 1-3.

Materials and Methods

Plant and soil samples were collected during from July to December from open sandy areas at different sites as described in study area. The area is arid with annual rainfall mainly received during monsoon (July-September). Fresh leaves were collected and analyzed for free proline (Bates *et al.,* 1973) and leaf pigments (Arnon, 1949). Oven-dried powered leaf material was analyzed for total sugars (Plummer 1971), crude protein (Peach and Tracy 1955) and phosphorus (Allen *et al.* 1976). The soil samples were collected from 0-25 cm depths and calculated on percentage basis. The data were analyzed statistically as per Gomez and Gomez (1984).

Observations

Periodic collection of fresh leaves from different sites were carried out for the analyses of various eco-physiological parameters, *viz*. leaf pigments, proline, total sugars, crude protein and phosphorus. The results of these parameters at site-A are given in Table 1. It is evident from this Table that maximum soil moisture values at surface and depth levels were recorded 9.04% in November and 8.07% in August, respectively. Minimum (0.012 µg g^{-1} f. wt.) amount of proline was estimated in July, *i.e.* beginning of growth stage. With regular increasing patterns, it accumulated maximum (1.460 µg g^{-1} f. wt.) in November. The minimum (2.75 mg g^{-1} f. wt.) amount of total chlorophylls was estimated in July whereas maximum (18.08 mg g^{-1} f. wt.) in October. The minimum and maximum values of carotenoids were observed in the same months as in total chlorophylls. Amount of soluble sugar were recorded minimum (24.71 mg g^{-1} d. wt.) in October and maximum (30.79 mg g^{-1} d. wt.) in August. Insoluble sugar was estimated minimum (10.79 mg g^{-1} d. wt.) in October and maximum (16.25 mg g^{-1} d. wt.) in August. Protein values were estimated maximum (8.490% d. wt.) in July with a continuous decreasing trend, being minimum (4.115% d. wt.) in November. Minimum (0.237% d. wt.) values of phosphorus were recorded in July and maximum (0.400% d. wt.) in September.

Table 1 Soil moisture, proline, leaf pigments, total sugars, crude protein and phosphorus contents in *B. sindica* during different months from site-A (values are mean of six replicates).

Months	Soil moisture (%)		Proline (µg g^{-1} f.wt.)	Pigment (mg g^{-1} f. wt.)		Sugars (mg g^{-1} d. wt.)		Protein (% d.wt.)	Phosphorus (% d.wt.)
	Surface (0-5 cm)	Depth (20-25 cm)		Total chlorophylls	Carotenoids	Soluble	Insoluble		
July	7.21	6.82	0.012	2.75	0.33	29.87	15.50	8.490	0.237
August	7.59	8.07	0.119	2.90	0.51	30.79	16.25	7.445	0.327
September	8.01	4.66	0.227	10.31	1.95	30.50	12.62	5.549	0.400
October	0.36	1.71	0.549	18.08	4.43	24.71	10.79	5.214	0.341
November	9.04	7.09	1.460	15.95	3.02	29.62	10.92	4.115	0.327
December	1.43	4.34	-	-	-	-	-	-	-

= Plants not seen.

The results of soil moisture, proline, leaf pigments, sugar, crude protein and phosphorus from site-B are given in Table 2. At this site, maximum soil moisture values at surface and depth levels were recorded 3.65% in July and 5.23% in September, respectively. Minimum (0.012 µg g^{-1} f. wt.) amount of proline was estimated in July and maximum (11.677 µg g^{-1} f. wt.) in December. Amount of total chlorophylls was estimated minimum (2.88 mg g^{-1} f. wt.) in August, whereas maximum (18.74 mg g^{-1} f. wt.) in September. Carotenoids showed the minimum (0.36 mg g^{-1} f. wt.) and maximum (5.80 mg g^{-1} f. wt.) values in August and October, respectively. Soluble sugar were recorded minimum (21.62 mg g^{-1} d. wt.) in December whereas maximum (31.79 mg g^{-1} d. wt.) in September. Insoluble sugar was estimated minimum (2.25 mg g^{-1} d. wt.) in October and maximum (14.28 mg g^{-1} d. wt.) in September.

Protein values were estimated maximum (9.145% d. wt.) in October and minimum (3.385% d. wt.) in December. Minimum (0.144% d. wt.) and maximum (0.262% d. wt.) values of phosphorus were recorded in December and September, respectively.

Table 2 Soil moisture, proline, leaf pigments, total sugars, crude protein and phosphorus contents in *B. sindica* during different months from site-B (values are mean of six replicates).

Months	Soil moisture (%)		Proline (µg g^{-1} f.wt.)	Pigment (mg g^{-1} f. wt.)		Sugars (mg g^{-1} d. wt.)		Protein (% d.wt.)	Phosphorus (% d.wt.)
	Surface (0-5 cm)	Depth (20-25 cm)		Total chlorophylls	Carotenoids	Soluble	Insoluble		
July	3.65	2.15	0.012	3.26	0.69	29.45	13.58	8.958	0.187
August	1.68	4.94	0.338	2.88	0.36	29.58	7.75	6.979	0.191
September	2.21	5.23	0.119	18.74	4.62	31.79	14.28	5.547	0.262
October	0.49	3.10	0.119	17.49	5.80	27.72	2.25	9.145	0.200
November	1.03	3.47	0.656	14.58	3.33	24.25	2.38	4.193	0.147
December	0.55	3.26	11.677	6.07	2.56	21.62	2.32	3.385	0.144

At site-C, soil moisture at surface was maximum (3.80%) in July whereas minimum (0.39%) in October (Table 3). The same pattern was also observed at depth level. The minimum (0.012 µg g^{-1} f. wt.) amount of proline was estimated in July which increased continuously and reaches to maximum (13.257 µg g^{-1} f. wt.) in December. Total chlorophylls were estimated minimum (2.98 mg g^{-1} f. wt.) in July and maximum (16.32 mg g^{-1} f. wt.) in October. Carotenoids have the minimum (0.37 mg g^{-1} f. wt.) and maximum (4.21 mg g^{-1} f. wt.) values in July and December, respectively. Amount of soluble sugar were recorded minimum (23.47 mg g^{-1} d. wt.) in December and maximum (31.95 mg g^{-1} d. wt.) in July. Insoluble sugar was estimated minimum (2.24 mg g^{-1} d. wt.) in November and maximum (18.90 mg g^{-1} d. wt.) in September. Protein values were estimated maximum (6.510% d. wt.) in July and minimum (3.463% d. wt.) in December. Minimum (0.138% d. wt.) value of phosphorus was recorded in October and maximum (0.296% d. wt.) in November.

Table 3 Soil moisture, proline, leaf pigments, total sugars, crude protein and phosphorus contents in *B. sindica* during different months from site-C (values are mean of six replicates).

Months	Soil moisture (%)		Proline (µg g^{-1} f.wt.)	Pigment (mg g^{-1} f. wt.)		Sugars (mg g^{-1} d. wt.)		Protein (% d.wt.)	Phosphorus (% d.wt.)
	Surface (0-5 cm)	Depth (20-25 cm)		Total chlorophylls	Carotenoids	Soluble	Insoluble		
July	3.80	2.64	0.012	2.98	0.37	31.95	12.83	6.510	0.164
August	2.22	6.39	1.728	10.51	1.90	30.00	13.71	4.375	0.146
September	1.23	6.11	0.280	10.56	2.30	25.75	18.90	5.833	0.177
October	0.39	2.10	3.498	16.32	4.14	31.50	5.00	5.365	0.138
November	0.72	2.68	8.754	15.96	3.84	24.50	2.24	4.271	0.296
December	0.51	2.28	13.257	12.64	4.21	23.47	2.30	3.463	0.285

Discussion

The survival of plants depends on their capacity for adaptive transformation and rate of physiological processes during course of vegetative growth. Soil moisture conditions play the most significant role for growth and development of plants in arid zone. Due to erratic, scanty and uneven rain fall the soil moisture show a varied pattern. Soil moisture at surface level was recorded maximum (9.04 %) at site-A in November, which show occurrence of rains during winter season also. Whereas minimum values were recorded in October at all sites. At depth level, it was recorded maximum (8.07 %) at site-A in August.

Proline has been known to accumulate in the leaves of many plants when subjected to low temperature, water stress, salt stress or even starvation (Chu *et al*. 1976, Mohammed & Sen, 1990). In the present investigation, its accumulation was minimum (0.012 µg g^{-1} f. wt.) in July at all sites, indicating plants are in vegetative growth with favorable environmental conditions. As the plants mature and decreasing in values of soil moisture, the amount of accumulating proline becomes much higher. The maximum (13.26 µg g^{-1} f. wt.) value was recorded at site-C during December, *i.e.* during cold stress. The maximum values during winter months may be due to lower values of minimum and maximum temperatures and rainfall as compared to other months.

Estimated values for leaf pigments were found higher at site-B as compared to sites-A & C. Total chlorophylls was recorded maximum (18.74 mg g^{-1} f. wt.) at site-B in September, whereas maximum (5.80 mg g^{-1} f. wt.) values for Carotenoids were observed at site-B in October. Gehlot (2012) observed maximum values of total chlorophylls and carotenoids during October in *Tribulusrajasthanensis*, which was supported by the present findings.

It has been found that leaves of plants subjected to water stress often showed decrease in starch content which is usually followed by an increase in sugar contents (Levitt, 1956; Sen & Mohammed, 1987). In the present investigation almost similar trend was observed. *B. sindica* showed higher sugar contents during July to September months, *i e*. prior to onset of seed maturation stage. The highest values (31.95 mg g-1 d. wt.) for soluble sugar were recorded at site-C in July, while that for insoluble sugar at site-C in September. Swami *et al*. (2008) reported maximum total sugars during rainy season in *Convolvulus microphyllus.* Jain and Ahrodia (2007) recorded the maximum total sugars during September and October in *Helicteresisora* and *Sterculiaurens.* The results observed in the present study were supported by the findings of above researchers.

Crude protein content of various plant tissues declined under drought conditions because of increased proteolysis and decreased protein synthesis (Vaadia & Waisel, 1967). Swami *et al.* (2008) recorded maximum values of crude protein in *C.*

microphyllus during rainy season. In the present study, it was maximum in July when plant-soil water status was higher at all sites, also confirms the observations of above researchers.

The concentration of nutrients indirectly affects the pattern of their distribution in the various components of plant. Phosphorus plays an important role in plant growth and development. In the present investigation, its values were estimated higher during September to November. Maximum (0.400% d. wt.) values were recorded at site-A in September.

The results of the study revealed that soil moisture availability, temperature and growth stage of plant are the some crucial factors besides other ecological factors, which pose much constrains on physiology of plants during their growth. Adjustment toward comparative rates of different biochemical reactions are the only way by which the plants get specified adaptations to survive under harsh conditions of arid region.

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7

Efficacy of Online Teaching- Learning during Covid-19 Pandemic for Students with Disabilities in an Inclusive Classroom Settings

Fr. Baiju Thomas*

Introduction

The COVID-19 epidemic developed a comprehensive awareness of the reality of the living environment. Technological innovations are required in many areas, one of which is the education field. Education institutions and inclusive schools remain closed by mid-March2020 due to the quick breakout of COVID-19. The newest and arguably most common type of advanced program is online teaching-learning today. It's had a huge effect on the teaching of comments in the last years, and the trend is expanding only. In this paper, we will discuss how SwDs teach online and how the role of teachers has changed. Online teaching-learning by qualified teachers is the most effective. The best way to maintain a bridge between online learning and conventional teaching methods is to assure that teachers are fully skilled and involved in online teaching-learning in an internet context (Feenberg 1998). The Web increasingly plays an important part in daily life and determines how we live, socialize, teach and study. Online teaching-learning gives instructors and learners access to numerous resources if the web becomes a primary tool for learning. In recent times, online training of various forms has become a commonplace feature in different schools, usually referred to as online education or distant learning. Online teaching-learning is designed to serve modern students all over the world, each day and at only one level. Fast and easy accessibility for students, better education, and non-traditional learners are all the reasons for the implementation of an online program. Similarly, hurdles in Internet development also provide a standard of professional commitment and the capacity to take and provide classes (D. U. Bollger and O. Wasilik, 2009). The key to effective implementation of online teaching-learning is to

* Research Scholar, Ramakrishna Mission Vivekananda Educational and Research Institute, Faculty of Disability Management and Special Education, Vidyalaya Campus, SRKV Post, Coimbatore.

take personal talents into account. Techniques which work for typical full-time pupils may not be effective for autonomous, filled, and family-level pupils. These people are reasonable opportunities and have a keen interest in tools and technologies (V. N. Gudivada, R. Agrawal, and C.Chu, 2013). Online teaching-learning certainly leads to this necessity because "the proportion of use of online offers is greater under all conditions than the equivalent face-to-face opportunities" (Allen & Seaman, 2009). "Online teaching-learning in a given school is no more a specialist activity for certain selected teachers" (Seaman, 2009). This data demonstrates there is no substantial distinction between the president, non-tenure, and team, which undermines the prevalent assumption that an increased teaching staff carries much of the load of online teaching-learning. Likewise, no age or training was identified as key predictors of online teaching-learning (Seaman, 2009). Consequently, SwDs may experience unique challenges to the online learning approach. There are additional concerns to students with invisible disabilities who are not evident to others. Teachers need to take into account and organize their courses properly, without knowing the difficulties our students can face in online teaching-learning to improve our learning by generating inclusive lessons and resources in the new system.

The Notion of Online Teaching-Learning

Education is a path between students and teachers in the formal systems. It's not always a teacher-learner approach. The term learner signifies that the learner is equipped and personalized and long-awaited. And so the appropriate methods allow learning. The work of the teacher is not easy enough to make learning effective. It is generally not considered that an online teaching-learning environment is formed because educational resources/training components must be offered by displaying and downloading the related task. The teacher uses his skills and ways to promote and collect information. Because every student knows the mentality of learning. It ranges from learner to learner. But the teacher in online teaching-learning wants common thinking, he releases the material he produces. Whenever technological support is expanded, the merging of aid with learning processes and modification to academic requirements of SwDs is not intended for every category. One of the issues is the lack of cooperation to build online innovation methods and teach SwDs. Generalizing psychological information and lack of trustworthy and theoretically appropriate examination of the psychological impacts of online education-learning procedures fitted to the SwDs are other prevalent problems. However, online learning technology can enable students with diverse limitations to participate (Fichten et al., 2009). Educators could be the initiator of the online teaching-learning process. Online teaching-learning initiatives can be separated into two basic tasks: the provision of student content and the promotion of interactions between students and teachers (Schertler & Bodendorf, 2003). To ensure that school pupils around the globe continue their education mostly during the epidemic, online teaching-learning activities

have been established employing various technological tools and internet teaching standards (Zhou et al., 2020). In this context, online teaching-learning, which allows many people to take part in and online lessons are delivered on websites through the use of modern teaching methods (Onyema et al., 2020; World Bank, 2020a). The SwDs are increasingly adopting online teaching-learning opportunities. Study programs are needed to keep these children interested in schools online. They have discovered "effect fields" from information on SwDs which can help learners participate. Online teaching-learning strategies play a significant part in the development of educational technology in various educational lessons. The online teaching-learning system can enhance the inclusion in the learning of students with diverse disabilities. We deemed online teaching-learning roles relevant for SwDs in inclusive classroom settings.

Teaching-Learning on Online Learning

Online teaching-learning can also be a helpful approach for students and teachers to engage, as persons do not have to communicate personally. Online teaching-learning is an educational procedure that takes place throughout the world. This is a means of learning online to address people and children may learn in isolated places and can attend school, academic institutions for different reasons. Online training focuses on physical issues, but with many extra factors which impede educational practices in classes (Hrastinski 2008; Moore et al. 2011; Singh and Thurman 2019; Watts 2016; Yilmaz 2019). The Covid-19 outbreak at educational institutes prompted changes in the education process and changes in teacher-student interactions. The epidemic compelled schools to undertake their online work only with students (Sobaih, A.E.E.; Hassanein, A.M.; Abu Elnasr, 2020).In this regard, the various government is taking efforts to restrict the transmission of the infection and sustain teaching process, and schools have approved online teaching-learning around the world (Ali, W, 2020). Online teaching-learning is an instructional procedure as an online learning activity on the web. The COVID-19 has confronted an unanticipated difficulty internationally, because restrictions, social separation, and home quarantine have forced education in the online fields. Online teaching-learning is an instructional procedure as an online learning activity on the web. As a result of the COVID-19 outbreak, online education will grow ubiquitous during 2020. Online teaching-learning boundaries may vary due to the technical capability of teachers or learners to accessing online sources and operate technology. These restrictions are especially obvious to students and local kids who have minimal knowledge of online teaching-learning resources like laptops or who cannot have online access (Fedynich 2014; Wedenoja 2020). As a result, online teaching-learning has played an important part in pre-school programs, even as the situation develops to determine whether SwDs can study online in inclusive school environments. Many instructors labored to generate and teach on different platforms; several students suffered as well. For instance,

children from low-income families may be stopped from learning in this new paradigm due to a lack of necessary technology. Also, it involves proper guidance and hence adult involvement and participation for young kids to study online as well as online teaching-learning access (Schroeder and Kelley 2010; Youn et al. 2012). In addition to this, online learning may not even be adequate or acceptable to engage children who want to engage and acquire more interaction and practical tasks suitable for older students. The study can also support the development of an online teaching-learning strategy through the presentation of information on the number of strategies that have been employed to produce classes, time spent on work and tasks, time for lessons, and the consideration, proposals and needs, and wants of SwDs for online teaching-learning in an inclusive classroom setting.

Preparedness for Online Teaching-Learning among Disabled Students

While the growth of the COVID-19 (UNESCO 2020a) pandemic has led to online teaching-learning worldwide, the provision of a new kind for SwDs to adapt to diverse learning styles and foster an integrated and courteous online teaching-learning system is a vital technique for establishments worldwide. Lockdowns, quarantine of physical and behavioral effects, and another superbug social and contextual problems can have unacceptable consequences for the underprivileged, particularly SwDs and families; (UNICEF 2020b; World Health Organization and World Bank 2011). The school lockdown has provided teachers, parents, and students an entirely different situation (Huber and Helm 2020). For continuous learning, only alternate means of education were feasible. Teachers had to convert to online teaching-learning by employing diverse learning tools to handle problems and establish new teaching methods (Eickelmann and Gerick 2020). In addition to asking approaches, teachers must also keep in touch with their SwDs to reflect their classroom's activities in day-to-day lives. Although the role of educators in online teaching-learning differs somewhat from traditional teaching contexts, inspiration in such face-to-face settings is frequently optimized to enhance online teaching-learning standards (Archambault & Kennedy, 2016). The SwDs and their close relatives also have adequate access to online teaching-learning during COVID-19 (UNICEF 2020b, 2020c). Educators find the lack of prior online teaching-learning experience and limited technological expertise throughout learning, while families emphasize their child's desire to defend their students learning (Hyseni Duraku and Hoxha, 2020). When traditional classroom approaches continue, a compromise should be developed among SwDs and online teaching-learning. Online teaching-learning can add to personal encounters. Online learning. The discussions in the forums indicated that not all the tasks can be conducted online teaching-learning in an inclusive classroom environment. Technologies that use online and improved facts need to be modernized, widely accessible, and therefore more appealing and inclusive in designed to motivate SWD's engagement and cooperation. According to educators,

these issues are what SwDs want and participate in online. In this sense, it can help to implement these technological developments in online education. To enhance personalized, inclusive, and participatory online teaching-learning, it is essential to boost the use of complex technology for online teaching-learning, incorporating new technologies. It can generate great possibilities and add value to online teaching-learning if related to instructional strategies for SwDs in inclusive classroom settings.

The Challenges and Benefits on Online Teaching-Learning

An online teaching-learning approach that uses its internet browser over the internet and keeps them away from academics. Online teaching-learning has been a slogan for education in recent decades since it can find alternatives to educating the SwDs. Because of the outbreak of COVID-19, the world faces immense fatalities, terrible dread, and sorrow. Countries throughout the world are aiming at preventing gaps and reducing pupil losses from the current epidemic. However, online educational outcomes are not just an advantage for humanity, as they indicate certain inadequacies in the setting of online learning and teaching which lead to mass concerns about it on schooling during COVID-19. Because this paper strives to show the limitations and opportunities of countries that are not as technologically advanced as places with similar technologies. Online identity can be defined as "direct or indirect web learning" (U.S. Department of Education, 2010). Online learning draws on SwDs and is more prevalent in situations spanning from primary to secondary and post-level. This study addresses the potential challenges and benefits of online learning. This study has worries about how students who are engaged in an online program can assist them effectively. Online teaching-learning situations over the internet can be quite distinctive. Online teaching-learning solutions can be divided into three key groups into a full-web, hybrids, or mixed approach, together with traditional web-based features. All online sessions have a comprehensive web-based approach involving face-to-face interactions, and all elements of the curriculum are managed in an online learning process in an inclusive environment. As a result, through Google Classroom and Google Meeting, this way of learning was changed into online education due to the enormous COVID-19 spread. This was a challenge for lecturers and learners to study during the COVID-19 epidemic in an inclusive environment.

Challenges on Online Teaching-Learning

- **Adaptability:** Learners find it more difficult to shift straight to an online setting after conventional instruction. Due to the quick change, they cannot adapt to the subway learning. Students that have always studied at school cannot choose sites online. They must accept the new learning atmosphere in an alternative method.
- **Technical Matters:** Many students are not sufficiently trained with a quick internet browser for online learning. As a consequence, they face obstacles to

being listed for online training and other digital sources. They confront technical issues since they have minimal working knowledge and equipment. The speed of the instruction and the unavailability of live streaming can affect both lower and faster Internet connections.

- **Knowledge of Computers:** The absence of computer education is a critical concern in today's environment. There are still children that can use basic MS word and PowerPoint PCs. If particular technical obstacles develop, people find it extremely difficult to tackle the problem in a context.
- **Management of Time:** Learners frequently find it difficult to sustain their schedules online. Online learning is completely fresh to them and needs a lot of work. You need a scheduled planner to organize your time successfully.
- **Motivation for Oneself:** Learners give up when online learning is not possible. It is motivated to keep and involve students. Low motivation is a typical challenging issue for all children.
- **Distractions:** Residential education is a special experience. One might think of it all as a school playground around you. At residence, though, you might like to have enormous schools, parks, playgrounds, cafes, and coworkers, teachers to counsel and instruct you.
- **Styles of Learning:** Many of the students were taught at school. Online learning also helps you respond to change techniques of learning. No focus, insufficient knowledge of the instructions to be followed, and difficulty generating technology-based assignments.

Benefits of Online Teaching-Learning

- One major benefit of online teaching-learning is that children understand more of it than simply curriculum.
- Online teaching-learning is helpful for self-regulated students (You & Kang, 2014).
- Online teaching-learning provides an opportunity for students at a timetable and place that meets specific instructional needs.
- Online teaching-learning is an easy approach for faraway learners to evaluate.
- There are several benefits to online teaching-learning. More importantly, learners should choose the activities and services in which they participate and where they participate.
- Online teaching-learning also allows users to interact with peers across nations or even continents.
- There are a variety of reasons why online teaching-learning can cost less.

- Online teaching-learning can provide SwDs with access to specialized advanced programs which are not freely or locally sourced in educational facilities.
- When the Internet offers online learning, minimum or no face-to-face encounters are feasible with friends and peers.
- Technological competence is vital for online learning processes.

Inclusion of Students with Disabilities on Online Teaching-Learning

All public education systems for kids have been impacted by the COVID-19 epidemic. SwDs are among the most susceptible. No standardized education is more accessible for every 5 to 19 years, but an economic framework assures that all students have opportunities for education (UNESCO, 2019). On contrary, it is much more probable to be a resident of socio-economic households than other youngsters (Kalyanpur, 2008) with 72 percent of disabled people reliant on Population in India (UNESCO, 2019). Hence, education is also a factor in hardship over several SWDs. The worldwide COVID-19 epidemic has changed many practices and cultures, particularly youth education. Many learners gain their whole education online, most of it. Ensure that SwDs can be accessible online learning might be a problem. This resource has been developed for primary and secondary instructors and specialists. By sharing insights from similar studies, high academics can make sure that their entire learning potential is fully realized through online teaching-learning in inclusive classroom settings. It was mentioned that the inclusion of SwDs in online learning is limited. The study of online teaching-learning for the unique needs of SwDs, lack of accurate bits of advice and guidelines on how educators and parents could even help the SwDs' education and preparation, failure to perform their private preparation processes, and shortage of educational and supporters, as well as family members aware of the role along with children in online learning all, were significant factors. Many other factors related to students and staff were also identified concerning this reduced amount of inclusion, including such: lack of SwDs' technical skills and their family members, the state of the economy, inadequate infrastructure and web access, large family sizes, and residential overloads of parental involvement. Consequently, the lack of inclusion could differ according to the different SwD groups and there was no assessment of the inclusion level and benefits for SwDs during online teaching-learning. It was also observed that disabled students were not fairly included in online teaching between students and teachers since they were not asked to teach. In addition, only young people whose families can aid with their school commitments have been known to participate in online teaching-learning in inclusive classroom settings.

Conclusion

The COVID-19 outbreak has adversely affected education and employment in India. The central government's initial step in the context of teaching-learning was to close schools. The authorities and academic institutes quickly declared the schools going to teach online. The change from conventional face-to-face methods towards online teaching-learning introduces technical challenges which damage the efficiency of the learning process. The aim of studying the effects of online teaching-learning is to help SwDs to be better warmed up in their academic environment which includes strategies for allowing them to flourish. However, studies show that the benefits of online teaching-learning programs outweigh learners' obstacles. To learn more in an inclusive classroom setting for SwDs. Effective online teaching-learning strengthens and extends programs' objectives and changes the processes by which students achieve these objectives and acquire information. To develop a student-focused classroom atmosphere, the resilience of the online teaching-learning is the readiness of the special teacher to take part each student in an improved assessment of significance and to bring on various factors that impact SwDs' learning in online teaching-learning in inclusive classroom settings.

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8

Stinging Wasps of Jalgaon City, Maharashtra: A Temporal Variation Amidst Pandemic

Dr. Manojkumar J. Jadhav[*]
Jyoti P. Jangale[**]

Introduction

Vespoidea is a superfamily of stinging wasps in the order Hymenoptera and it comprises 10 families, namely Mutillidae, Bradynobaenidae, Formicidae, Sapygidae, Pompilidae, Rhopalosomatidae, Scoliidae, Sierolomorphidae, Tiphiidae and Vespidae (Brothers & Finnamore, 1993). Stinging wasps mainly tropical, with about 29,185 species around the world (Peters *et al.,* 2017). They embraces, wasps with a large variety of lifestyles: eusocial, communal and unsociable habits, hunters, scavengers, parasitoids, and some plant eaters. The superfamily Vespoidea includes species that contribute substantially to ecological processes in different agro ecosystems and natural environments as either natural enemies or pollinators (Vanoye-Eligio*et al*., 2020).

Among these vespoid families; Scoliidae and Vespidae are more copious and common groups that co-exists with human habitats, particularly in small pockets of vegetation in gardens and parks. Scoliidae is comparatively a small family with cosmopolitan distribution and consists of 560 species distributed among 43 genera (Osten, 2005). Vespidae is one of the largest families within the super family Vespoidea with more than 5,000 species worldwide (Gawas *et al.*, 2020).

Gardens and Parks are isolated patches of manmade habitat that are conjoint in many urban areas. Apart from divulging much needed relief to the tired city souls and enhancing the exquisiteness of the city, the urban green patches like parks and city gardens provide the city dwellers numerous benefits like recreation and

[*] Department of Zoology, Bhusawal Arts, Science and P.O. Nahata Commerce College, Bhusawal, Maharashtra, India.
[**] Department of Zoology, Bhusawal Arts, Science and P.O. Nahata Commerce College, Bhusawal, Maharashtra, India.

environmental education by exposing the urban dwellers to nature (Matteson and Langelloto, 2012). Human managed gardens and parks are colonized by a variety of insects and other organisms. Insects play an important role in nutrient cycle, organic matter decomposition, pollination and soil aeration in urban ecosystem. (Thompson and McLachlan, 2007). The present paper deals with the occurrence of stinging wasps under the families, Scoliidae, and Vespidae parks and gardens of Jalgaon city. The study was possible due to lock down phase of ongoing pandemic since the gardens and parks of the city are strictly closed for people. In absence of the anthropogenic movements we were able to document the wasp's diversity.

Review of Literature

Some insects visit gardens for sap or other resources, others can breed and spend most of their lifetime in the gardens. Thus there has been growing research to show the potential for small scattered habitats like domestic gardens, community gardens, green roofs and parks to support rich insect diversity, even in thickly populated urban areas (Jaganmohan, 2013).

Some of the selected literature review pertaining to wasp taxonomy is portrayed herewith. Gupta & Jonathan (2003) studied extensively on Scoliidae of India. Girish Kumar & Kazmi (2012), made an important early attempt with the enumeration of 10 species of scoliids from Maharashtra. Recently, Jadhav *et al.* (2014) reported a scoliid wasp, Scolia (Discolia) fasciatopunctatadunensis Betrem, for the first time from Western Ghats of Maharashtra. Subsequently, Jadhav & Gaikwad (2014) documented the new geographical distribution of Megacampsomeris cochinensis Betrem from the Northern Western Ghats. Jadhav & Gaikwad (2019) studied about the scoliid wasp fauna from different parts of Pune and Kolhapur districts in the Northern Western Ghats of Maharashtra. Allen (1975) extensively studied the genus Tiphia from India. Gawas *et al.* (2020) published an annotated distributional checklist of Vespidae of India.

Material and Methods

Specimens were sampled from five Gardens and Parks of Jalgaon Municipal Corporation region (Maharashtra) during June 2020 to June 2021. Species samples were captured by sweep net, properly curated, registered and deposited at the Department of Zoology, BASPONC College, Bhusawal. The specimens were studied under Stereo zoom microscope. The nomenclature and identification has been followed after Das and Gupta (1989) and Gupta and Jonathan (2003).

Result and Discussion

The study divulges taxonomy and diversity of two vespoid families. During present endeavour a total of 13 species belonging to two families, Vespidae and Scoliidae has been documented.

Inventory of Species

Systematic List

Class Insecta

Order Hymenoptera

Suborder Apocrita

Superfamily Vespoidea

Family SCOLIIDAE

Subfamily Scoliinae

Genus *Scolia* Fabricius, 1775

- *Scolia (Discolia) affinis* (Guerin, 1838)
- *Scolia (Discolia) fasciatopunctata dunensis* Betrem, 1928
    - Genus Megacampsomeris Betrem, 1928
- *Megacampsomerisreticulata* (Cameron, 1892)
    - Family VESPIDAE
    - Subfamily Eumeninae
    - Genus Delta de Saussure, 1885
- *Delta conoideum (Gmelin, 1790)*
- *Delta pyriformepyriforme (Fabricius, 1775)*
- *Delta esuriensesuriens* (Fabricius, 1787)

Genus *Antepipona* de Saussure, 1855

- Antepiponasibilans (Cameron, 1903)
    - Subfamily Polistinae
    - Tribe Polistini Lepeletier
    - Genus Polistes Latreille, 1802
- *Polistes* (*Polistella*) *stigma tamulus* (Fabricius, 1798)
    - Tribe RopalidiiniBequaert
    - Genus Ro*palidia* Guérin-Méneville, 1831
- *RopalidiabrevitaDas & Gupta, 1989*
- *Ropalidiafasciata(Fabricius, 1804)*
- *Ropalidiamarginata(Lepeletier, 1836)*
- *Ropalidia stigma* (Smith, 1858)
    - Subfamily Vespinae
    - Genus Vespa Linnaeus, 1758
- *Vespa tropica* (Linnaeus, 1758)

Summary

During present investigation in all 13 species of vespoids distributed over 07 genera and belonging to 2 families viz. Vespidae and Scoliidae were enumerated. The taxonomic composition of the stinging wasps in the present investigation indicates that family Vespidae is the dominant one with a total of 10 species pertaining to 5 genera distributed in 3 subfamilies. Whereas family Scoliidae is represented with 3 species 2 genera under single subfamily.

Further furtherance of the exploration (season wise for at least 2-3 years) is required to get the actual picture of diversity of the wasps in the study region.

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9

Covid 19: Stress Management among Students and its Impact on their Effective Learning

Dr. Neelam Chakrawarti*

Introduction

COVID-19 entered our life at the end of 2019, threatening the health of millions of individuals throughout the world and reaching pandemic proportions. An outbreak of pneumonia with an unknown origin has been reported in Wuhan, Hubei Province, China, since December 2019. (Wang *et al.* 2020). Following the outbreak, the World Health Organization identified a novel corona virus, SARS-CoV-2, as the pandemic's causing virus in China and other areas of the world (WHO). Covid-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020. More than 4.5 million people have been harmed by Covid-19 over the world (WHO, 2020). Because of COVID-19's high mortality rate and associated issues such as economic instability, unemployment, stress, anxiety, and insecurity, this new pandemic is frightening and worrisome for everyone. It's natural for individuals to have a variety of thoughts, sentiments, and reactions as the COVID-19 pandemic and its far-reaching consequences continue to unfold globally and in our community. Thus, the primary goal of this research is to understand the effects of stress on students and the importance of managing it in order to improve learning outcomes.

We must recognize that a pandemic is more than just a medical problem; it also has a social, emotional, and psychological impact on the people. Anxiety, sleep difficulties, panic, tension, and other mental illnesses are linked to the thought of being alone and wearing masks. Many pupils suffered psychological problems as a result of the pandemic, which are impacting their academics as well as their overall personality (WHO, 2020).

* Assistant Professor Jayoti Vidhyapeeth Women's University, Jaipur.

In an attempt to stem the spread, countries around the world imposed stringent restrictions on their residents. The country's in-person educational system was replaced with virtual schooling, with public gathering areas shuttered and travel limitations imposed. Quarantine is the most stressful situation.

"Quarantine" is defined by the Centers for Disease Control and Prevention (CDC) as "the separation and restriction of movement of people who have been exposed to a contagious disease in order to see if they become ill" (CDC, Report, 2020). Living in quarantine, often known as lockdown, can take a toll on everyone's mental health. Quarantine has a significant impact on three aspects of mental health: autonomy, competence, and connectedness. People feel isolated because they are cut off from their pals and unable to go about their everyday routine. Samantha K Brooks' latest study on "the psychological impact of quarantine and ways to mitigate it" revealed how COVID-19 affects people in lockdown. Fear, sadness, numbness, insomnia, bewilderment, rage, post-traumatic stress symptoms, depressive symptoms, low mood, stress, emotional disturbance, impatience, and emotional weariness were among the most common symptoms reported. Some data suggests that these repercussions may last longer than expected. "Stress is the nonspecific response of the body to any demand," says Selye (Fink, 2009). At some point in their lives, everyone encounters stress. "Stress as a scientific notion has the problem of being too widely known and too poorly understood," Hans Selye, a physicist who popularized the concept of stress, observed. Despite being one of the most ubiquitous human experiences, stress is notoriously difficult to define. Stress, according to scientists, is a force or event that disrupts normal stability, equilibrium, or function. The following example may help you understand stress.

A strong wind can cause a suspension bridge's equilibrium to shift, causing it to swing from side to side. When driving across the bridge, most people aren't aware of the mild rocking. When the wind picks up, the bridge begins to shake, and everyone can see it. Although this swaying may make some people feel uneasy or apprehensive, it is the bridge's way of dealing with stress. The bridge would be frail and more likely to be damaged by the stress of the win if it did not waver at all. The bridge may actually collapse if the wind intensity increased drastically to the point where the bridge's restrictions were surpassed. Stress is like the wind in our lives.

Despite the fact that stress is common, it often goes unrecognised. People can feel wobbly or afraid when they are stressed, as if they, like that bridge, are on the verge of collapsing. Usually, this concern is unfounded, and people's foundations are far more solid than they believe. When one is actually on the verge of collapsing, it is crucial to realize the danger. Most of the time, however, the true danger of stress is that it will harm people's health and reduce their quality of life over time. Stress has become an intrinsic element of life and the body's response to a challenge in today's world since it is no longer limited to adults, but is increasingly impacting children of all

ages. COVID 19's current status serves as a catalyst for escalating student stress. Without a doubt, stress has become the most commonly reported obstacle to academic success. Some types of stress can actually be beneficial to our health, as they sharpen our minds and reflexes and drive us to develop and evolve. It's your fight-or-flight reaction to threats you encounter in the real world.

This natural response has physical impacts on the body that help you deal with these obstacles more effectively, such as increased heart rate and blood circulation. While stress manifests itself differently for each person, it is important to realise that everyone, regardless of age, gender, or circumstance, experiences stress at some point in their lives (Currie *et al,* 2016). Stress, on the other hand, can become a nuisance or even a health danger if it persists for an extended period of time.

A certain degree of tension is unavoidable and beneficial when it comes to learning. It encourages students to work harder, stay focused, and return to their studies rather than engaging in other activities. Students, on the other hand, who are overly anxious are unable to study efficiently (Gale *et al.*, 2018). It's critical to distinguish between stress that helps pupils concentrate and stress that makes it impossible for them to study well. Everywhere we go, folks complain that students aren't paying attention in class. Several consultants, trainers, and life coaches are seen assisting others in achieving it. Without a doubt, stress management has been one of the catchphrases for students' devotion to academic achievement, student relationships with their peers, and the more they try or worry, the less they can achieve.

Levels of Stress

Acute Stress

Acute stress is the most prevalent type of stress that everyone goes through at some point in their lives. It is caused by recent or foreseeable events. It can be both advantageous and disadvantageous. It appears unexpectedly or alarmingly. It usually dissipates rapidly, either on its own or when the stressful incident has passed. Acute stress is rarely associated with major health issues. For instance, the anxiety that students had immediately before taking a test or an exam; riding a roller coaster might create acute stress, but in a wonderful way. Positive acute stress is the enthusiasm that builds up before a fun event. A automobile accident is a source of negative acute stress. As long as the acute stress does not linger for too long or occurs too frequently, it is tolerable. There is nothing wrong with having a high level of stress. This form of stress is common, and it's easy to spot. The following are some indications of acute stress (Will, 2006):

- Stomach aches and pains, such as heartburn, diarrhea, or acid reflux.
- An increase in blood pressure and heart rate.

- Chest discomfort or shortness of breath
- Headaches, back discomfort, and jaw pain are all common symptoms.

Acute stress is usually easy to manage and treat because it is so common and lasts for such a short period of time.

Stress on a Regular Basis

Episodic acute stress is a type of stress that occurs repeatedly. People who suffer from episodic stress are frequently overwhelmed by it and find it difficult to manage. This is the type of stress that comes and goes, sometimes in a predictable manner. People who suffer from episodic stress are almost always in "crisis mode," are irritable and worried, and are likely to worry constantly. Worry and agitation about things that are happening to you or around you accompany it. If you have a "type A" personality, you may be more prone to this. Outgoing, ambitious, rigorously organised, extremely status-conscious, impatient, anxious, proactive, and concerned with time management, Type A people are outgoing, ambitious, rigidly organised, highly status-conscious, impatient, anxious, proactive, and concerned with time management. Type A personalities are frequently high-achieving "workaholics." You may feel a sense of urgency and a need to complete tasks, which may become overpowering. For example, instead of studying continuously throughout the time, students may study the night before a test. Because it has become a habit, this type of stress is episodic.

The symptoms of episodic stress are similar to those of acute stress, although they might be more severe or recur on a regular basis. Constant headaches or migraines, hypertension, and heart disease are all indications of long-term episodic stress, according to the APA American Psychology Association (2020). People who experience episodic stress often view it as a regular part of life and are unaware of how harmful it may be. It has been suggested that getting therapy for episodic stress patients may be challenging since they are so used to feeling its symptoms and accepting them as normal.

Chronic Acute Stress

Chronic acute stress can be described as a never-ending source of anxiety that grinds you down. If you don’t see an end in sight, if you’re stuck in a situation with no way out, you’re likely to develop chronic stress. It usually occurs in response to conditions that feel dismal and out of your control, such as a shattered marriage, a poisonous job, or poverty.

This type of stress eventually has an adverse effect on your health, resulting in heart disease, strokes, and even cancer, among other things. Chronic stress necessitates seeking professional assistance. Chronic stress can be difficult to treat, and long-term recovery almost always involves the assistance of a specialist (WHO, 2020).

Types of Stress

Students, whether they attend college online or in person, will almost certainly confront additional stressors during their time there. They may begin to distinguish symptoms that only emerge in specific settings as they begin to see how they and their bodies react to it. When people understand the type of stress they're going through when they face certain obstacles, they'll be able to overcome them without feeling drained.

Dr. Karl Albrecht, a management consultant and social scientist, identified four types of stress: temporal, anticipatory, situational, and encounter (Kraag et al, 2006). While these many categories can be found in a variety of settings, ranging from the office to the family, they are particularly pertinent to the life of a student.

Time Pressure

When you're worried about time, notably when you don't have enough time to complete all of your tasks, you're experiencing time stress. This is common when people are worried about missing deadlines or being late for a meeting or appointment. As a student, you may experience time stress in a variety of ways. You may be concerned about being late to class while you learn the layout of your campus, or if you need to go home and connect onto your computer for a lecture after completing your household tasks. You might also be concerned about the size of your workload or the quality of your class work, which can be a challenging transition, whether you're starting college or returning after a sabbatical.

Stress Caused by Anticipation

During your education, you may experience this type of stress in both a vague and definite way. You're experiencing a more concrete sort of anticipatory stress if you're worried about a looming test, assignment, or presentation. A more nebulous version is a sensation of dread or fear of uncertainty about your future in general. Students may experience this type of stress more frequently as they approach graduation and make decisions regarding their post-college lives.

Situational Anxiety

Situational stress occurs when you are confronted with an upsetting or scary scenario over which you have no control, such as the current COVID 19 crisis. This type of stress, unlike time-related and anticipatory stress, occurs quickly and with little if any warning. In fact, it's possible that you had no idea what was about to happen. This form of stress can manifest itself in a variety of ways for kids. It could be as minor as losing your words during a presentation or as serious as receiving a phone call about a family issue. This type of stress can arise in a variety of circumstances, such as obtaining a poor mark on a project, arguing with a friend, or nearly colliding with a car in front of you on the highway.

Face Adversity

When you're nervous about seeing particular people, whether alone or in a group, you're experiencing encounter stress. It's possible that you don't enjoy spending time with them or that you have trouble talking with them. Whatever the cause, something about this individual or group makes you feel uneasy. Even if you enjoy being among others, encounter stress might emerge if you have spent too much time with them and are burnt out.

Students may experience stress in a variety of scenarios, including intimidating professors and unfamiliar classmates. Furthermore, you may only have this feeling with a person for a short period of time everyone experiences it differently and has their own specific stressors, for example, you might fear meeting your roommate for the first time following a disagreement, but the stress may subside once you settle the issue.

Different Stresses among Students during Covid 19

The following are some of the most common stresses identified by the authors in their present study:

- **Academic:** For college students, this may be the most common long-term source of stress. Student life offers many advantages, but it also comes with its own set of worries. These pressures can provoke anxiety and episodes of depression in those who are already suffering depression or have a pre-existing predisposition to it. Academic stress has been identified as one of the most common types of stress in the student learning process. It is without a doubt one of the most serious issues confronting the present student body during COVID 19. It's also becoming a growing source of anxiety for both teachers and pupils. Without a doubt, stress management has been one of the buzzwords for students' devotion to their academic achievement, student relationships with their peers, and the more they try or worry, the less they can study efficiently (Albers *et al*., 2017). Their minds race everywhere they go, and no matter how hard they try to relax, all they can think about is studying, which they can't do. Some people are tormented by academic stress and are unable to spend time with their families. Even if it appears manageable at first, if it is not handled, it will have a negative impact on the student's performance. It is not only the actual presence in the educational institution that must be prepared for, but also the pre- and post-study travel to and from the institutions. As a result, it's critical to comprehend the causes of student stress and how it affects their ability to study effectively.

Academic vitality is one of the major characteristics that influences a student's ability to adjust to the stresses of learning (Jennings, 2009). Academic vitality refers to the ability to adapt to a variety of problems and roadblocks encountered during the

course of one's education (Folk man, 2015). It denotes a high level of physical or mental vigour, as well as the ability to survive or continue living a meaningful or worthwhile life. When a person acts spontaneously, he or she does not just feel frustrated and fatigued, but also has a constant sensation of strength and heightened energy, as well as an overall sense of inner vitality (Jennings, 2009). As a result, academic success is linked to an individual's ability to adapt to various situations during the academic period, feelings of self-efficacy and empowerment in the face of challenges, experiencing less anxiety and depression, a sense of responsibility in dealing with academic tasks, and a sense of responsibility in dealing with academic tasks (Folkman, 2015).

Class Scheduling and Credit Load are Two Factors to Consider

It is possible that scheduling your classes for several subjects could cause you tension. Trying to sign up for classes at times that are convenient for you and making sure you're taking all of your prerequisite classes are just a few of the many things to think about. This may be the first time some kids have to plan their own timetables. You may be unsure of how many credits you should take or when the optimal class times are for your academic success. If your schedule is not what you expected after a few weeks of classes, you may become frustrated with yourself.

How to Deal with Stress caused by Class Scheduling and Course Load

If your schedule is becoming overwhelming, keep in mind that it isn't set in stone. In a few weeks or months, your existing lessons will end, and you'll have to create an altogether new calendar. Use this time to create a timetable that is more suited to your needs. Make your schedule as flexible as possible.

Exams and Grades

Another source of stress for students is their academic achievement. Due to a variety of causes, such as satisfying the expectations of teachers, parents, and even yourself, you may feel pressured to achieve particular grades in your classes. Good marks enable you to continue on to another degree and pursue your preferred career. You may study constantly, yet when it comes to taking an exam, you become so nervous that you are unable to do effectively (or in some cases, to even take the test). The concern of not studying enough is one of the causes of test anxiety. Furthermore, due to the increasing workload and greater difficulty of courses, combining your education, family duties, work schedule, and social life might be tough. Tests or projects may account for a significant portion of a student's mark in some classes. As a result, this is a source of stress.

How to Deal with Exam and Grade Stress

It's difficult to overcome school-related stress when you're continuously surrounded by your worries and equally anxious students. You are, nevertheless, at school to learn and grow, not to get consecutive A's on your transcript. Instead than

focusing on grades, concentrate on gaining an education. If you take your learning seriously, grades will come in automatically. You should study as much as possible. Concentrate on a single exam at a time. Avoid thinking about an upcoming exam. Consider the subject matter rather than the exam. Don't think about the exam while you're studying. Study in the same classroom or facility where you'll be taking the test or working on timed practice questions. Finding someone to help you study more efficiently, whether it's a teacher to clarify topics, someone to double-check your work, or something as basic as flashcards, can make all the difference.

Future

School is a safe haven for many pupils, particularly conventional students. Because it is unknown and unfamiliar, the idea of life after college might be frightening. The uncertainty of life outside of school can be stressful for even the best-prepared student. If it appears that all of your friends and peers have a future plan that they are confident about, your tension may be increased. If you don't know what you want to do, you may be nervous; on the other side, you may question decisions you've previously made about your future. When students conclude their degrees and are faced with low employment options, they experience stress related to the uncertainty of their career choice and future prospects.

Ways to Plan for the Future while Staying Stress-Free

The future's unpredictability can be difficult to deal with, but you're not alone. As you begin to consider what you want to do after graduation, don't be afraid to seek help and advice from your friends, family, professors, or advisers, as well as the career and guidance team and councilors. If you're unsure about your job path, take an aptitude test. Your journey will be guided by the results of the test. Talk to your career and guidance teacher about it.

Health

In a poll performed by the American Psychological Association (APA) (2020), 63 percent of individuals describe "health-related concerns" as their top source of stress, followed by academic stress. Worries about or concerns with health, in particular, may be a big stressor for college students since they believe it affects their academic performance (Albers et al, 2017). It was also revealed that approximately 30% of students' academic performance was harmed by a medical disease, ranging from allergies to bronchitis (Almojali et al, 2017). Regardless of the cause, whether it's a simple cold, a mental health issue, or a persistent sickness, one thing remains the same: staying on top of your studies can be difficult while you're unwell. If you are contagious, you should avoid going to class (unless you are a distance student or can function watch { [native code] } the lecture from home), as you will miss out on crucial information from your teacher. Even if you are not contagious but simply feel unwell, you may lack the stamina to concentrate on the instruction, learning, and assignments.

As a Student, here are some Tips to keep your Health in Check

If a contagious illness is circulating on your campus or in your community, do your best to avoid contact with anyone who is sick, wash your hands often, and follow other preventive measures. Wearing a mask, social distancing, sanitizing or washing your hands, not sharing your articles, and not having a party are all recommended in the current COVID 19 scenario. Accept that, despite your best efforts, you may become ill from time to time. If you get sick, take care of yourself by resting as much as possible and taking medication before returning to your regular activities. Keep an eye on your nutrition. Eat healthily and properly. Caffeine, for example, might worsen the physical symptoms of test anxiety.

Personal

The difficulty of creating social intimacy is another source of stress. After you enter college, your connections with your friends, family, and significant other may alter. Students frequently lack the time and/or opportunity to form interpersonal connections. School may take precedence over everything else, and as you deal with the obstacles that come with it, you may find yourself with less energy to devote to your loved ones. In addition to dealing with the pressures of school, feeling as though you aren't as connected to your support system might cause tension in your life (Bayram et al, 2019).

Relationship Advice for College Students

Make an effort to only befriend those with whom you enjoy spending time. You don't have enough time at college to spend interacting with people with whom you don't get along. You have the option to be choosy about whoever you offer additional energy to, whether you're working on a group assignment online or participating in a class discussion through chat. In college, you have the opportunity to establish lasting friends, so do your best to devote your time and energy to the connections that are important to you. Improved on boarding for new graduate students, more flexibility in core requirements, and enhancing the role of faculty advisors/Councillors are all options for reducing stress. Throughout the last few decades, The price of education in traditional schools has significantly increased. When combined with other expenses such as accommodation, food, and books, students may experience financial stress while in school. Even if you qualify for financial aid, have family members who can assist you, or work during the school year, you may still be concerned about money. Students may experience additional stress as a result of student debts that must be repaid after graduation. Debt can be a burden before you graduate because it can effect your finances for years after you graduate, as well as during your college years. You may be on your own financially in addition to being on your own physically and even emotionally.

How to Deal with Financial Stress

Positive thinking has been demonstrated in studies to increase physical well-being, reduce emotions of sadness, and reduce levels of distress. Always remember why you wanted to get a degree in the first place, and how it can lead to improved employment prospects when you graduate. Education, according to experts, is still worth the investment in the long run.

Life in the Family

For many students, college is the first time they have lived away from home or spent any considerable amount of time away from their family. Aside than that, it's a strange setting. Everything is different, including the food, people, and living quarters. Even though most students adjust to these new situations without difficulty over time, the first few weeks of college can be stressful. Even if you are genuinely enthusiastic about the changes, this is true. Keep in mind that even favorable changes might cause anxiety (Kessler, 2012). You must strike the correct balance between education, family, and other responsibilities while in college or during your student years. . At various levels of school, the academic load will frequently grow, resulting in more difficult work. Trying to keep up with that on top of your job and family obligations might add to your everyday stress especially if your family and work commitments are so demanding that you fall behind on your academic work. It can be particularly difficult for non-traditional students to strike that balance. While typical students may be concerned about missing another phone call from their parents, non-traditional students may be responsible for their own children. If you have sick parents or children, you may need to devote your energies to financially sustaining your family or caring for them. Instead of going to school, you may need to focus your energies on financially supporting your family or caring for your sick parents or children, if you have any.

Tips for Balancing Work, School, and Family Life

These techniques can assist you in establishing boundaries between different aspects of your life so that you can give each one the attention it deserves. Keep in mind that the ability to adjust to new concerns and needs is equally critical. If you believe you won't be able to make required changes to your plans, you may get more anxious.

As a Student, how should you Deal with Stress

"Set up a few minutes to sit quietly with yourself instead of hurrying through your day. Make sure you're calm and focused on your goal for the day. This way, you'll be ready for a peaceful, enjoyable experience." Stress is unavoidable at college, but it doesn't have to take over your life. Try to figure out what kind of stress you're experiencing, what's generating it, and how you can deal with it effectively. You're doing everything you can to make the most of your college education by dealing with

stress in a healthy way. As a student, you can manage your stress in a variety of ways. We all have different ways of dealing with stress, and we all have different ways of dealing with it. However, not all stress management techniques are beneficial, and some may make you feel much worse than before. It's critical to understand how to deal with stress well as a student in order to overcome it. After all, you don't have control over your stressors, but you do have power over how you respond to them.

The majority of stress management theories work by reducing discomfort without seeking to increase eustress. You can create a vacuum in your life by removing distress, which you will instinctively replace with the same distress you previously pushed away, or with another unpleasant source of pressure. You won't have to worry about defaulting to negative sentiments and drained energy when you have leisure time if you work efficiently to develop eustress.

- **Academic Stress:** An increase in workload over an insufficient amount of time, increased duties, difficult tests, challenging classes, low grades, deadlines to meet, scheduling challenges to coordinate, and a more independent personality are some of the academic factors that can cause stress in students.
- **Social Stress:** The factors of social stress include building a new social network, separation from home and finding less parental support, living with a roommate, balancing schoolwork with friends or part-time employment, and dealing with the responsibilities of young adult relationships. Daily problems, financial crises, studying long, hard hours and rising up early for classes, logistics of living independently (i.e., laundry), and new students dealing with abrupt changes from one college to another are all big sources of stress. There are two types of stress management: unhealthy stress management and healthy stress management.

Stress Management Techniques that are Harmful to your Health

- **Do not Smoke, take Drugs, or Consume Alcoholic Beverages**

After a long day, it may be tempting to go for a cigarette or a glass of wine, but this may not be the greatest way to relax. Short-term stress relief may come from smoking, drinking, or using drugs, but once the effects wear off, you may find yourself feeling much more agitated than before. Researchers have discovered, for example, that drinking alcohol can worsen stress. While using drugs and alcohol to cope with stress may seem like a good idea in the short term, it is a prescription for disaster. The bad consequences will quickly turn your future into a nightmare. Any addiction has the potential to suddenly escalate into something you can't control. Anything that appears to be an addictive trigger for you, such as narcotics, gambling, and the like, should be avoided.

- **Spending with a Compulsion**

When you're feeling sad, your first reaction could be to go out and buy yourself a treat. Buying yourself a gift now and again is acceptable, but if shopping or spending money is your go-to stress reliever, you may be adding to your stress by straining your finances or adding items to your home that you don't really want.

Overeating and Underrating

When you're anxious, you're likely to seek comfort food or lose your appetite completely. When you're stressed, you should strive to keep your usual eating habits, since eating too much or too little might have a long-term harmful impact on your physical health.

Ignore the Source of Stress

It's fine to step away from your problem to relax and come up with a new solution, but ignoring it entirely may not be the greatest option. You may not be able to completely let go of the stressor, and it will most likely remain in the back of your mind until you can no longer ignore it.

Use Social Media, Streaming Services, and other means of Procrastination

There are a plethora of digital distractions available to help you avoid stress. While it's necessary to strike a balance between work and play, it's also crucial to set boundaries on your use of digital media. The more time you spend streaming material or browsing through your social feeds, the more likely you are to fall behind on your work and contribute to your total stress, perpetuating the avoidance cycle.

Stress Management Techniques that are both Healthy and Effective

- **Confront the Source of Stress**

Dealing directly with the source of your stress may be one of the most effective methods to manage it. Sit down and examine what you can do if your hectic schedule is making you anxious. If you're currently enrolled in a traditional institution but are finding that it doesn't meet your needs, consider moving to an online university that might be a better fit.

- **Organize your Time**

One of the most effective stress-relieving approaches is proper time management (Macan et al., 1990). Time must be well utilised, whether it is for recreation, work, or education. Students must be able to create and follow a schedule. Between work and study, take a soothing break, even if it's just a few minutes to breathe. Creating a timetable and effectively managing time reveals goals and priorities. Students should always strive to prepare ahead and avoid procrastination so that they can properly manage stress. If they are straining themselves too thin and falling behind, though, it is always best to remain cool and focused. As a result, they should create a "To Do" list or a planner to keep track of deadlines and timetables, as well as learn to say "No," in order to reduce stress.

Being Well-Organized is Important

In academic life, organisation is crucial for dealing with stress (Sinha, 2014). Stress can be greatly decreased by keeping academic notes organised, turning in assignments on time, and keeping track of all deadlines. Make it a habit to keep an organised system for taking notes, keeping track of assignments, and other critical papers. As a consequence, students will be able to create a nice study atmosphere in which they will be able to concentrate, focus, and complete tasks. Furthermore, if they are well organised, they can provide peace of mind by allowing you to know where everything is, remembering deadlines and exam dates, and freeing your mind of some mental clutter.

Exercise, Nutrition, and Sleep are all Important Factors to Consider

Stress can be reduced to a considerable amount with sufficient exercise, a good diet, and adequate sleep. They must be well-rested in order to have a significant stress-relieving effect. As a result, make everything function and live a stress-free existence.

Spend Time with those you Care About

Surround yourself with individuals with whom you love spending time and who you enjoy spending time with. Even if you don't talk about what's bothering you, being near someone who makes you feel at ease can relieve a lot of stress. All you need is a cup of coffee with family or friends to get your stress levels back to normal. If a person is lonely, stress might become even worse. You immediately feel a lot better after telling someone you trust all of your thoughts. Students can benefit from improved connections with friends, family, parents, and teachers in addition to the health benefits of stress management and relaxation. When they are stressed, their family suffers the consequences, and it is usual for them to vent their frustration and fury on their family. Family members may feel as if they are walking through a minefield, never knowing when their stress levels will explode into rage. Reduced stress leads to more relaxation, which makes them happy, and this makes their family, friends, and teachers happy as well. Everyone, especially those who work from home, should practice stress management and relaxation. Reducing stress has numerous advantages, including improved health and relationships. Knowing your triggers, exercising, meditating, organizing, and taking vacations are all important strategies to de-stress and learn how to relax.

"Happiness isn't about acquiring everything you desire; it's about appreciating everything you have."

Take a Breather

You may discover that most of your days are booked solid with plans, activities, and duties that need to be completed between your lectures, assignments, and other commitments. Take a break if you're feeling overwhelmed by everything you have to do. Schedule a time when you don't have to do anything but read or function

watch {[native code]} a movie. You might not be able to cross everything off your to-do list at once, but don't be afraid to do nothing for a while. "Even if every day isn't perfect, there is something good in every day. Attempt to locate it."Obtain professional assistance. You may require more assistance than your loved ones can provide, or you may be dealing with difficulties that are too much for you to handle. Do not be afraid to seek professional assistance. Even if you're an online student, your school probably provides a lot of resources to aid you.

Conclusion and Discussion

COVID-19 had an impact on the entire world. This lockdown was instituted 100 years ago to combat the Spanish Flu. People at COVID-19 are now tired and anxious as a result of the lockdown. In their academics, students are losing ground. All of this contributes to their mental state being disturbed. The study's conclusion is that students' stress levels are quite high, and that their stress levels are rising as the days pass. Students also use coping tactics such as yoga, exercise, and diversion therapy, which includes spending time with family and watching television. Academic, environmental, social, and health issues all contribute to the emergence of stress. Academic variables are the most significant stressors, necessitating the implementation of particular and focused interventions to significantly reduce the load of stress on students. Teaching methods and college environments should be tailored to the students' needs. The effective use of current student welfare services, the creation of more "student-friendly" environments, and the frequent participation of all students in extracurricular activities can all be beneficial stress relievers. Similarly, students living in hostels have been found to be more likely to develop stress; as a result, a periodic evaluation of hostels with feedback from students should be done, and student complaints should be addressed swiftly. The majority of students wanted stress management education to be incorporated into the curriculum, thus actions should be taken to make it happen. Students' health is a big concern, so encouraging healthy eating and lifestyle practises should be encouraged. Furthermore, instructors, parents, and even students themselves should be aware that having unrealistic expectations for academic success can cause stress. Finally, good study habits and appropriate preparation can help students avoid stress and learn more effectively.

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10

Changing Faces of CSR during and After Covid -19 Pandemic: The Research Agendas in the Days to Come

Raja Ghosh*

Introduction

Ever Since January 2020, the covid-19 virus is ravaging the entire world. It has effected our lives like no previous things ever on this earth in our recent memories. Ever since WHO (World Health Organisation) declared it as a Pandemic, about 21.15 Crore (figures as on 21/08/2021) has been infected and about 44.28 lakhs have succumbed to death to this virus. This pandemic has crippled the economies of developed & developing countries and has taken these economies into serious depression. Though CSR has been a major area of research for the social scientists in the past ten years, it is being noticed that after the pandemic started, the areas connecting CSR and Covid has not been adequately researched, though companies have engaged in to a foray of CSR activities. In India particularly, since CSR is now mandatory as per Section 135 of the Companies Act 2013, there has been a lot of discussion about allowing various Covid related expenditures under CSR head. However, the researcher's interest needs to be rekindled now, post covid on various facets and paradigms connecting the CSR & the pandemic.

Literature Review

Schwab (2020) says "the pandemic has triggered a public health & slump on a scale that's unseen among the history, and has exacerbated general problems like distinction & nice "power posturing". The results of this virus is such profound that many researchers compares this to the impact of the World War-II or maybe more. Scwab& Harris (2020) argue that the covid-19 pandemic has changed our perception of the full world & life and also the method we've got an inclination to urge on that. They collectively assert that "nonetheless the human tragedy of lost lives, broken families and scarred communities, the economic & social changes caused by the covid-19 pandemic might cause a souvenir which might live long in our reminiscences

* Research Scholar ICFAI University.

& those of future generations". The emotional, psychological, economic, social& cultural scars caused by the pandemic may remain as a permanent one in our lives.

In most the countries, imposition of lockdown enacted to prevent additional unfold of the virus has crystally led to a large blow and disturbance to the continuing operation of largely all sectors of the economy. Sectors like business enterprise, hotels, education, real estates, production, services, airlines, restaurants, are the worst hit. The industries least impacted by the pandemic are specialised REITS, property and casualty insurance, Multi level Insurance, Life & General insurance, Industrial REITS. Moreover, some entities has conjointly seen a monumental increase in their turnover and profits. Typical Examples area unit Amazon, Microsoft etc.

Scwab (2020) conjointly brings forth a novel proposition that the pandemic has triggered the re-emergence of a "stakeholders model of Capitalism". This is all the more evident within the incontrovertible fact that firms are now more and more concerned & engaged in CSR activities throughout the pandemic, despite the negative impacts of the pandemic on the operations . Scwab (2020) argues that the pandemic has sparked the idea of the very discussed and re-emergence of "the stakeholders model of Capitalism".

Manuel & Herron (2020) in their investigation of moral responses to United States of Americas businesses to the pandemic indicates that business were earlier giving a aid through the philanthropic & transformational responses. The final philanthropic activities that most of them were engaged in were donations created to support in progress medical analysis and conjointly to support and encourage the frontline medical staff, monetary & product support, and food banks to the required care and to feed those stricken by the pandemic and support for different covid connected activities like providing laptops & different technology product for on-line education to Universities , Colleges, and different establishments.

The transformational responses known within the CSR arena embody efforts created by businesses to control underneath this "transformed business model". These businesses have re-positioned their existing machineries or further new capability to provide product essential for fighting the Pandemic.

He & Harris (2020) posit that real & authentic CSR endeavour by corporations throughout the pandemic contains a potential to send a favourable signal to its customers, employees, suppliers & different stakeholders. The CSR investment in terms of philanthropic gift and different generous outlays can create these stakeholders to require pride within the company & establish a powerful bond to their brand. They additionally state that as a result of the CSR responses throughout the pandemic, firms would be able to produce a substantive & an awfully sturdy association between their brand and shoppers that is even sustainable & lasting throughout traditional times.

It is pertinent to say that the pandemic is here to remain. It will carry on disrupting the individuals & the economy. Noa (2020) believes that "the company Sector will move the needle throughout this crisis by implementing ways & initiatives that affects the society further and guaranteeing their future sustainability- by supporting their workers, customers & economy at large.

Methodology

The CSR practices and CSR activities of Five Companies listed each in BSE, NSE, NYSE, NASDAQ, Euronext, London Stock Exchange,& Toronto Stock Exchange were studied since the last three years. The trends of CSR expenditure vis -a vis their disclosures were studied along with content analysis. Moreover, the existing literature on research relating to Covid and CSR were also studied from SHODHGANGA and other University Records, to find out the latest areas of research in CSR relating to covid.

Findings

- **Research Problems and areas before the pandemic**

Before the covid-19 pandemic, CSR problems were thought-about as a serious focus of organisational & social researchers. The literature is full with analytical studies & there are many reports showing relationship between CSR and monetary performance, company governance, brand value, worker involvement & motivation, cost of capital, trade credit, monetary performance etc, but researchers appear to have currently shifted their focus to different area because the pandemic has progressed &and CSR problems are somewhat being left behind the shadows.

As per a study by Verma & Gustafasson (2020) to investigate to analyse into the expansion trajectories of analysis within the period of the pandemic & the most focus of research regarding covid-19 & business, this fact has been confirmed. The focus has currently shifted to analysis areas writ impacts of Covid-19 pandemic on the economy, price chain, offer chain, management innovation, industry & employment.

This transient study and article is meant to elucidate the potential analysis areas, queries & agendas associated with the research areas of CSR during this existing time of the pandemic and additionally within the close to future , since it is currently sure that the pandemic can keep, could also be not therefore powerfully, within the days to return. By doing therefore, I shall ignite existing & future researchers interest during this terribly crucial space of CSR & additionally develop keen interest and a group of possible problems concerning the dynamics of CSR and new paradigm throughout and when the pandemic still remains to effect our economies and social environment.

- **Research problems throughout Pandemic**

Carroll (1991) posits that CSR as practiced by entities embraces a wider set of responsibilities that may be managed alongside the peak of a pyramid. These

responsibilities are economic, legal, moral & philanthropic. However, the level of importance connected to everyone amongst these responsibilities could vary looking on corporations motives.

Graafland & Mazereeuw-Van der Duijn Schouten, (2012), argue that the CSR motives of organisation will be either in intrinsic or extrinsic areas.

Against the offered literature reviews & background, analysis appear to be taking the eye of scientific discipline researcher, particularly:

- What predominant motive is driving the CSR activities (philanthropic, and different forms)of organization throughout the various stages of the pandemic?
- Is there any variation in motives pursued across business firms?

Newton (2020) reports that technical giants (like Google, Apple, Twitter, Facebook, etc.)are taking the middle stage within the effort to fight the pandemic. His investigation indicates that big companies are actively collaborating in various social activities aimed towards combating the pandemic. The activities he identifies include: Developing applications that are playing an important role within the task of chase and make contact tracing ,countering and removing contents aimed toward spreading misinformation, and contributing billions of rupees to assist the continuing endeavours to develop a vaccination for the virus. Though the world has seen many vaccines successfully being developed, vaccines for childrens and various other forms like Nasal Sprays etc are also being worked upon.

However, many corporations, as the reports of Wakabayashi et al. (2020) indicates, have experienced a surge in wealth because the pandemic is progressing. This reality will then be a principle to cause the subsequent analysis and research questions:

- is that the pandemic coming up to be a bright side for business to come up with even a lot of profits within the name of corporate social responsibility?
- is that the surge in wealth solely associated with the shift in behaviour of consumers and not the outcome of the CSR gestures of those firms?
- is the surge in wealth is alone due to the modification within the shopping habits of shoppers, and can this have any result on the longer term CSR engagement of firms?

The Research Gap

- Post pandemic analysis problems and research issues

The pre-pandemic literature is full with studies that associate CSR engagement with completely different outcomes. In their study assessing the business case for CSR Fatma*et al.,* (2015), for instance, acknowledged that CSR engagement encompasses a direct relating the name of companies and conjointly contributes to

the sweetening of their complete equity. Weber (2008) conjointly points out that corporations that bask in CSR activities get returns within the sort of completely different money and non-financial advantages. The money profit, as per his assessment embrace a rise in revenue, decline in value and risk, and increase in complete price. The non-financial advantages he known embrace sweetening in corporations capability to draw in new and retain its existing customers, better chance to become a leader, motivation and retention of workers, and improved company name. Within the post-pandemic era, thus the subsequent problems that have to be compelled to be investigated by researchers may be:

Are organizations that are considerably engaged in CSR throughout the pandemic happier in terms of economic returns than those with no or very little CSR engagement?

- **Has CSR investment throughout the pandemic helped companies to**
  - Retain their employees?
  - Increasing the productivity and motivation of their employees?
  - increasing the market share by attracting new customers?
  - Retain their existing customers?
  - Build a robust company reputation?

There is conjointly proof that indicates customers have a mental expectation concerning the CSR contribution of corporations and create their purchase call supported by Companies having a strong CSR background. However, the particular reality fits to their expectations to the current impact. Schwab (2020) argues that "Today's shoppers don't wish a lot of and higher merchandise and services for an affordable value ,rather, they more and more expect corporations to contribute to financial aid and also give return and do good for the society in the form of CSR. And if they fail to do that, customers may shift to alternative businesses, eventually rendering them to travel bankrupt"(Manuel & Herron 2020).

So it looks affordable to analyze and carry out further the following:

- Have businesses with very little or no CSR involvement lost their customers and sales to those who were actively engaged in CSR activities?

Limitations of this Study

This study has been done with only 40 Companies listed in major stock exchanges of the World spanning a period of only 3 years .A larger data set and research frame would have been more effective. Moreover there were no hypothesis taken in this study and the study is purely qualitative in nature. Moreover, for a subject like CSR and its changing faces during the pandemic a more extensive study was required.

Scope for Further Research

There remains a lot of scope for future research in this area. A key issue is that of societal risk and uncertainty due to this type of pandemic and the role CSR can play in mitigating such risks. There has been less attention in the CSR literature to pandemics and such global societal risks. However, COVID-19 has reminded us of the role of business both as:

- A source of such risks; and
- as an actor that is critically exposed to such new risks and needs to play a role in addressing them. One could argue therefore that, going forward, the conventional concept of CSR that dominated management domain and academia including practice, is largely unfit for this purpose (Scherer and Palazzo, 2011),or even dead (Fleming and Jones, 2012). COVID-19 rather points us to the fact that we need to explore how different systems of capitalism across the world have prepared for and dealt with the challenges of the pandemic, and what role business can play through the very important tool called CSR to address such social demands and the needs of wider society.

Ultimately, COVID-19 has pointed out to a different way of conceptualizing private sector organisations. Rather than being stereotyped into some water tight concept of 'CSR' that does not transcend the self-interest of the firm, research in this field needs to better conceptualize and theorize how business is a part of greater societal governance, and how the social and political responsibilities of business can be redefined from a systemic perspective (Rhodes and Fleming, 2020).

Another area of challenge for CSR research concerns the issue of responsibility in supply chains. Surges in demand for medical products such as personal protective equipment and ventilators, as well as shortages caused by stockpiling have demonstrated the fragility and vulnerability of some of our global supply chains, especially when lockdowns have severely disrupted production. In addition, low wage workers in these supply chains have clearly borne a great deal of the brunt of these shocks with many workers left without pay, employment, or social protections.

As such, COVID-19 should act as a catalyst towards renewed study in the field of CSR literature to the debate around 'risk society' (Beck, 1992), the central point of which is that modern societies are exposed to several types of risks for which there are no mechanisms to adequately cope with. In fact, the entire world was not even prepared or has even thought about such type of risks and was totally unprepared to face this type of risk. These risks are beyond individual decisions and the protection of insurance but are an inherent part of modern society as has now been realised.

Concluding Statements

The world is tired and is gasping from the devastating effect of the pandemic. COVID-19 has become a challenge on the far side and the management of even the delicate health care systems that advanced nations boast to possess, are under unforeseen stress. The pandemic is still progressing and millions round the world have lost their lives and tens of millions have lost their job.

Businesses (especially smaller ones)have either found it terribly tough to face this storm or have closed their operation permanently. Those businesses who have managed to hold on amid the turbulence and also the topsy-turvy situation are shouldering 2 sets of responsibility: i.e. economic and CSR. These businesses have been engaged in varied CSR activities geared toward serving to the trouble to manage the virus and to serve those that are severely laid low with the pandemic. Despite such an involvement by businesses, social science researchers have somehow been reserved towards working on the problems associated with CSR within the time of the pandemic. The key conclusion here is that CSR research needs to shift from an individual to a societal conception of risk and examine how this plays out in CSR theory and practice.

It is expected that the research agendas stated above and many more of such issues concerning CSR and the fine thread of connectivity between CSR and the pandemic will rejuvenate present & future researchers' interest in this very important area, in social sciences research .The point is we need to move beyond CSR and think about different modes of organizing or new models of the firm that repurpose business to truly attend to social needs and goals. Such research in the scholarly community, however, is still at a nascent stage.

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11

Rural Development and its Need

Dr. Munesh Kumar*

Introduction

The achievement of the Millennium Development Goals is at the heart of sustainable development. Sustainable rural development is critical to the economic, social, and environmental viability of nations. This is essential for poverty alleviation because global poverty is highly rural. The manifestation of poverty extends beyond urban-rural areas, with suburban and regional contexts. Therefore, it has a lot of value to be achieved by coordinating rural or rural development initiatives that contribute to sustainable living through efforts at the global, regional, national, and local levels. Strategies for tackling rural development should take into account the vision and potential of rural areas and provide a targeted different approach.

A healthy and dynamic agricultural sector is an important foundation of rural development, which builds strong ties with other economic sectors. Rural life is enhanced with the effective participation of rural people in the management of their social, economic, and environmental objectives by empowering rural people through organizations such as women and youth, local co-operative societies, and empowerment. The up-approach approach to the closer economic integration of rural areas with neighbouring urban areas and the creation of non-agricultural employment in rural areas can reduce rural-urban inequality, expand opportunities and promote the retention of skilled people, including rural youth. Not only in agriculture, agro-processing, and rural industries but also in sustainable management of natural resources, waste, and waste, there is a lot of potential for rural employment generation. Rural communities in developing countries still face difficulties related to access to basic services, economic opportunities, and to some extent inconsistencies in rural-urban segregation. Investment in environmental protection, rural infrastructure, and rural health and education is critical to sustainable rural development and can enhance national welfare. Beyond meeting basic needs, the investment must be

* Assistant Professor of Law, Govt. P.G. Law College, Sikar, Rajasthan, India.

linked to productivity and the potential to increase income. Economic and financial crises and climate change and water scarcity should address the insecurity of the rural poor.

Concept of Rural Development

The concept now includes “concerns, which are likely to go beyond growth, income and output improvements. These concerns include assessment of lifestyle changes, primarily defined to include health and nutrition, education, environmental protection conditions, and reduction in gender and income inequality. Today, the ultimate goal of rural development seems to be to improve the living standards of rural people. We need to go beyond income-related factors such as prices, production, and productivity that affect lifestyles and therefore include rural development. "Inclusive rural development is a more specific concept than the concept of rural development. In broad terms, inclusive rural development is about improving the living standards of all members of the rural community. What is special is that inclusive rural development has three different but interrelated dimensions.

- **Economic Dimension:** Economic growth benefits, especially in terms of the economic dimensions that provide both capacity and opportunities for the third poor and low-income households.
- **Social Dimension:** The social dimension supports the social development of poor and low-income households, promotes gender equality and women’s empowerment, and provides a social security net for vulnerable groups.
- **Political Dimension:** The political dimension improves the opportunity for the poor and low-income people in rural areas to participate effectively and equally in the political process at the village level.

The concept of rural development has been embraced by researchers in a variety of ways, from thinking as a group of goals and programs to a neat strategy, approach, or ideology. There is a widespread belief that poverty alleviation and distributed justice should be an economically advanced transformation.

Strategies of Rural Development

The term ‘rural development’ is a major concern, especially when the focus is on promoting the effective development and growth of the country. Rural areas in India are still lagging and some programs and plans are needed to bring about reforms. The term ‘rural development’ can be used in different states. As a concept, it can drive the overall development of rural areas. It is widely accepted that rural communities can grow if the overall living standards of rural individuals are improved. In addition to raising the living standards of individuals, agriculture, farming practices, industry, factories, craftsmanship, skills, and expertise of artisans, health care facilities, medical centres, socio-economic infrastructure and economic and human

resources. Development occurs primarily when there is an interaction between various physical, technical, economic, socio-cultural, and organizational factors. Rural people need to create awareness and implement effective growth and development measures.

Rural development is a strategy to enable a particular individual to find opportunities for himself to maintain a good livelihood for himself and his family. A group of the poor and deprived in society cannot achieve its own goals and objectives on its own. They do not need the help and support of other individuals, organizations, institutions, and programs. Therefore, the provision of assistance to rural people to improve their living standards and the promotion of welfare and goodwill is considered rural development. When rural areas need to be improved, natural and human resources, technologies, infrastructure, institutions and agencies, and government policies and programs need to be developed and utilized. These aspects are wholeheartedly dedicated to economic growth, job opportunities, education, and technical knowledge, participation in social, economic, political, cultural, and religious activities, and change in overall quality of life. Eradicating the poverty situation is an important concern.

A plan is an order of different policy parameters to achieve the desired objectives. To achieve the objectives of rural development, different strategies have emphasized on agricultural relations, production techniques, and a different mix of state policies. To clarify some related issues, different types of rural development strategies are available. There are various schemes in rural development giving central importance to agricultural relations for classification:

- **Strategy Based on Collectivization of Resources**

The first policy places almost no importance on the consolidation of rural property (especially land). Private ownership of land has been abolished so that not only inequality of land ownership but also land-use can become more productive. The latter is achieved because small plots can be aggregated so that large-scale cultivation also increases productivity by creating the possibility of using modem technology in the form of tractors, harvesters, etc., and this was successfully achieved in the Soviet Union. , China and Eastern European countries. Soon after the introduction of this strategy, these countries were able to increase their production significantly. However, for many reasons that cannot be recalled here, the previous socialist regime collapsed or changed dramatically, and this strategy is currently not working anywhere.

- **Strategies Based on the Controlled Entrepreneurial Perception**

This strategy envisions the co-existence of the capitalist sector and the agricultural sector with equal support and protection from the state. There has been a refusal to redistribute land on a large scale or to restructure land relations. It is hoped that the rapid growth objectives will be taken care of by the capitalist sector and that

the problem of unemployment in the agricultural sector will increase rapidly until the agricultural sector begins to grow at a faster pace. It has been pointed out that without meaningful land reform the strategy can have only limited success, ignoring rural inequality in this policy. On the one hand, the rural elites control exercise and prevent changes that could lead to unequal distribution of property (land), and on the other hand, much of the resources that are brought in "from outside" to improve the quality of life. Poor. An example of this is the way banking co-operatives in India operate. Much of the rural credit disbursed by the co-operatives have gone to people who are well off and have the ability to pool their own resources. In this way, it is pointed out that this policy of avoiding strict policies in terms of rural development, which can create conditions for rapid development in rural areas, is avoided.

- **Strategies Based on Farmer-Agriculture Approach**

A strategy based on the farmer-agriculture approach argues for complete redistribution of land and repair of land relations. It envisions strong support for small farmers' organizations, which will take care of the dual objectives of growth and employment. In this policy, a wide network of cooperative societies, marketing facilities, etc. have been given significant importance. According to the second and third strategies, the state is expected to play an important role in promoting and strengthening unsustainable economic activities in rural areas to reduce the pressure of additional agricultural labor in rural areas and facilitate production. Decent livelihood options for the long haul. It is expected that all important tasks will be completed. In addition, it is assumed that the state will pay attention to the issue of adequate infrastructure in rural areas and provide education, health, etc. Will focus on investing in similar social sectors.

- **Strategies Based on Irregular Capitalist Perspectives**

Such strategies assume that wealthy landowners will play a key role in accelerating the growth of agricultural production, taking advantage of the economy, and gradually eliminating small-scale planting factors. It is suggested that the state should not interfere in the expansion of the capital sector and there should be no limit on ownership. Continuous expansion of the sector will provide a dynamic, which covers all the rural economy and its benefits, employment, and even lower incomes through rising incomes. Inequality and distributed justice are considered non-issues in such a strategy, as much as the state has a role to play in terms of infrastructure, but even there it is not seen as a major actor as required.

The main concerns of the rural development strategy are as follows.

- Agricultural research, extension, rural education, and training programs for farmers are part of the institution-building activities.
- Construction of infrastructure related to irrigation, transportation, transportation, and growth of health facilities.

- Programs to improve marketing facilities for distribution of agricultural tools and implements
- Policies related to land tenure, agricultural production, prices, and taxes on agricultural income.

Based on the experience of market economies in terms of hip method in terms of land allocation, the type of strategies that promote the development of the agricultural sector can also be classified as “uni-model” and “bi-modal” strategies.

- **Uni-Model Strategy**

A uni-modal strategy is one in which the grounded arch is evenly distributed. In the case of Japan, Taiwan, and Korea, the tactic was a resounding success. It seeks to promote rural development through the use of innovative reforms in the agricultural sector. Thus, due to land reform and subsequent distribution of rural property, the resources available to the agricultural sector have also spread equally. This type of agricultural strategy creates conditions that enable rapid growth with equitable distribution of agricultural income. This not only affects the rapid rural development but also provides an important basis for overall economic development.

- **Bi-Model Strategy**

The two-model strategy for agricultural sector growth seeks to increase agricultural production in rural areas without drastically changing the scale of income and property. Many countries in Latin America are examples of this type of strategy. In this type of strategy, no attempt is made to bring about land reform.

A large number of small farms co-exist with a large number of large-sized holdings. The idea is to focus on modern technology and later tools and thereby increase agriculture. Such a growth pattern ignores the problems of overall development and lacks a solid foundation for overall economic growth.

The main purpose of moving towards rural development is to get information regarding the programs and schemes started. The main objective is to develop the rural areas from 1951. Prosperity in rural areas, equality, and employment in rural areas has been taken into account. The methods are as follows:

- **Multi-Purpose Approach**

The main objective of the multi-purpose approach is to develop the villages based on self-help and self-reliance. It is known as an important approach, which laid the foundation for the upliftment of rural India. During the early 1950s, rural development efforts began in a multipurpose manner, covering agriculture, animal husbandry, co-operation, irrigation, village, and small-scale industries, health care and sanitation, housing, transport and transportation, Women and Child Welfare, and Rural Employment.

- **The Approach of Targeted Group**

The main objective of this approach is to increase the socio-economic backward classes in the society with social justice. Highlighting the improvements in the social and economic life of the people was highlighted by re-imagining the development in rural areas to accommodate the sectors or areas that are lagging behind. Among these individuals, mainly, small and marginal farmers, agricultural labourers, for whom special programs like 'Small Farmer Development Agency (SFDA)' and 'Marginal Farmer Development Agency (MFALDA)' were started. It has been observed that good results have been seen from the point of view of the target group, where information facilities are satisfactory and adequate. In addition, administrative and organizational facilities were also well developed.

- **Basic Needs of Approaches**

The basic needs approach prioritizes the minimum living needs of poor people as the biggest concern of development planning. The goal is equality of social use. It, therefore, makes a significant contribution to the development of development strategies aimed at reducing poverty and inequality, increasing employment opportunities, and delivering justice. Other areas included in this approach include personal and social consumption, human rights, people's participation, and growth with jobs and justice. During the first year of the Fifth Plan, the country's Minimum Needs Program (MNP) was introduced in 1974. In the Fifth Plan, the MNP proposed to establish a network of basic services and facilities for social use within the stipulated period up to the nationally recognized standards. It is a program of investment in human resource development and seeks to improve the use of those living below the poverty line. Improving people's productive performance and their lifestyle is considered to be an important aspect. The main components of MNP are rural health, rural education, rural roads, rural drinking water, rural electrification, housing for the landless, environmental improvement, and nutrition in slums.

- **Rural Development and Approach of Employment Oriented Integration**

The main objective of this approach is to eradicate unemployment and poverty, through regional and regional integration. Multi-sector, multi-level-1979 with the multi-sectoral concept of integrated rural development, to overcome the limitations of previous approaches and improve the overall quality of people in rural areas. Various programs were launched under the Integrated Rural Development Program (IRDP). The aim is to accelerate and ensure the progress of the underprivileged based on the Antyodaya Gandhian concept. Many programs aimed at providing employment opportunities to the rural poor include the Rural Works Program, Rural Employment Guarantee Program IRDP, Rural Youth Training for Self-Employment (TRYSEM), Rural Women and Child Development (DWCRA) and Jawaharlal Employment Scheme (JRY)

Government Initiated Rural Development Program

The Rural Development Department has implemented several programs to reduce poverty in rural areas, create employment opportunities, develop rural infrastructure and provide basic minimum services. Policymakers have recognized the importance of rural development. Programs and measures are the main objectives for making progress in rural areas. The Community Development Program was the first organized effort for rural development. This project was started on 2nd October 1952. It focused on the overall development of rural areas, including agriculture, animal husbandry, roads, transportation, health care, education, housing, employment, and nutrition. The programs launched by the government for rural development are as follows:

- **Pradhan Mantri Gram Sadak Yojana**

Roads are considered important in any region. Road development provides opportunities for economic growth and reduces poverty. The government launched a centrally sponsored scheme, known as the Pradhan Mantri Gram SadhakYojana. The main objective of the program is to connect all the connected settlements in the rural areas by constructing roads by the end of the Tenth Plan period. In rural areas, there are generally more than 500 persons. PMGSY is a special central intervention as part of its poverty reduction strategy. Although rural roads are a state subject, the central government is providing financial assistance as a centrally sponsored program. The main objective of road connectivity is to ensure that essential services like education, employment opportunities, health care and medical, market, etc. are available to all citizens. State Government Institutions and Panchayati Raj Institutions will ensure that the focus will be on the provision of services for the added settlements under PMGSY.

- **Swaranjayanti Gram SarozgarYojana**

The program is the only self-employment program for the rural poor and disadvantaged and minorities. Implemented on April 1, 1999. The main objective of the program is to provide self-employment to the poor in rural areas, such as self-help groups. In addition, other areas considered include capacity building, training, skills development, and infrastructure, planning of works and functions, provision of financial assistance through bank credit and grants, and marketing support.

- **Indira Awas Yojana**

For the survival of individuals, housing is considered a basic requirement. Housing is one of the major initiatives under the National Rural Employment Program starting in 1 housing in0. The Government of India announced a National Housing and Housing Policy in 1998 to provide housing and facilities to all. 20 lakh additional housing units (1 lakh in rural areas and seven lakhs in urban areas) with emphasis on providing permanent benefits to the underprivileged. This action is being taken through Indira Awas Yojana (IAY), Rural Housing Credit Grant Scheme, Innovative

Scheme for Rural Housing and Housing Development Scheme, Rural Construction Centres, Equity Contribution to the Ministry of Rural Development through HUDCO and National Housing and Development Mission.

- **DRDA Program**

April 1, 1999, DRDA administration commenced. The main objective is to effectively manage the plans and enhance their professionalism. It is based on the recommendations of the Inter-Ministerial Committee, known as the Shankar Committee. The plan changed from a previous study to allocating a percentage of program funding for administrative costs. Under this, a separate provision has been made to cover the administrative expenses of DRDA.

- **Integrated Rural Development Program**

The IRDP was started by the government in March 1976. It is considered to be the main tool of the government to alleviate the situation of poverty. Its primary focus is to enable selected families to overcome poverty at a given time. This is facilitated by taking advantage of self-employment opportunities in various fields. These include agriculture, horticulture, animal husbandry, weaving, handicrafts, services, and business ventures. Integrated development cannot be implemented independently, from a project point of view or a program point of view. But it is also about considering the interactions and links that need to be created to achieve the desired goals. Integrated Rural Development is a multifaceted framework that incorporates a multi-disciplinary approach. It indicates spatial, functional, and mundane aggregation of several parameters.

- **Jawaharlal Rozgar Yojana**

JRY merged with NREP and RLEGP in April 1989. Under the scheme, one person from each poor family (BPL family) was expected to be provided employment 50 to 100 days a year at work near his residence. About 30 percent of the jobs under the scheme are reserved for women. This scheme was implemented through Gram Panchayat.

- **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGSA)**

Research has shown that 70 percent of people in rural areas are having difficulty meeting their daily needs. The new scheme was launched with the objective of benefiting the people in rural areas. A new scheme called the National Rural Employment Guarantee Act (NREGA) was launched and enacted. It guarantees 100 days of employment in the financial year of any rural family, whose adult members are willing to do unskilled manual work. The Act was implemented in 200 districts and was gradually extended to other districts as well as notified to the Government.

Conclusion

The concept of rural development is a holistic matter and it takes into account many factors. The word is meant to organize things, which change the existing situation in favour of a better situation. For decades, the concept of rural development was entirely focused on economic change. But in later times, the concept grew to take into account the economic, political, social, cultural, technical, and mental framework of society. In other words, while focusing on rural development, the focus is not only on the development of rural infrastructure, individuals, and their overall living conditions but also on the development of social, economic, political, cultural, technical, and religious aspects. To promote the development of these aspects, modern and innovative strategies, methods, and approaches that are considered necessary to enhance progress in the overall quality of the individual must be worked out.

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12

The Impact of Covid-19 on Tourism Sector of Rajasthan Economy

Mukesh Kumar Meena*

Introduction

Tourism is a dynamic and competitive industry that requires the ability to adapt constantly to customers' changing needs and desires, as the customer's satisfaction, safety and enjoyment are particularly the focus of tourism businesses. Tourism is the temporary movement of people to destinations outside their normal place of work and residence. It is a modern term for applicable to both international and domestic tourists. The Tourism sector of Indian economy has become one of the major industrial sectors under the Indian economy. The tourism industry earns foreign exchanges worth 21,828 crore. Rajasthan is one of the most popular tourist destinations in India, for both domestic and international tourists. Rajasthan is one of the most favored tourist destinations among national and foreign visitors. Rajasthan attracts tourists for its historical forts, palaces, art and culture with its slogan "Padharo Mhare Desh', now it's changed. Every third foreign tourist visiting India travels to Rajasthan as it is part of the Golden Triangle for tourists visiting India. Tourism includes all economic activities which are organized around the needs of such travelers. Any travel for holidaying, business or professional trip becomes a part of tourism if it is temporary and is undertaken voluntarily, without an aim to earn any livelihood out of it. People of all faiths have since been visiting shrines established in every nook and corner of India. The COVID-19 pandemic has been an economic crisis with devastating effects on developing countries, especially those dependent on tourism. The 1st case of corona-virus was found in Jaipur, Rajasthan on the 2nd of March 2020.

* Assistant Professor, Department of Botany, Government Lohia College, Churu, Rajasthan, India.

Covid-19

Corona virus belongs to the Coronaviridae family, Nidovirales order. The corona virus family has significant human and animal pathogens. Corona Virus Disease 2019 is an RNA virus, with a typical crown-like appearance under an electron microscope due to the presence of glycoprotein spikes on its envelope. The corona virus has rapidly become widespread, resulting in an epidemic throughout seafood market Wuhan, China, followed by a pandemic, an increasing number of cases in various countries throughout the world. The first confirmed case of Covid-19 outside was found on 13th January 2020 in Thailand. Covid-19 is spread primarily via respiratory droplets during close face-to-face contact. In February 2020, the WHO named the disease as Covid-19. The virus that causes Covid-19 is nominated as severe acute respiratory syndrome corona virus 2 (SARS-CoV-2).

The COVID-19 disease has caused a sudden significant increase in hospitalization for Pneumonia with multi organ disease. It's may be as asymptomatic or wide spectrum of symptoms such mild symptoms of upper respiratory tract infection. WHO also continues to recommend the importance of maintaining physical distances and avoiding people with fever or respiratory symptoms. Infection can be spread by asymptomatic and symptomatic carriers. The average time from exposure to symptoms onset is 5 days, and 97.5% of people who develop symptoms do so within 11 days. The most common symptoms are fever, dry cough, and shortness of breath. A few early studies suggest the Delta variant causes more severe illness than other strains. Treatment is basically supportive and symptomatic of the patient. The first step is to guarantee sufficient isolation to stop spread for other contacted individuals, cases and healthcare workers.

The CoWIN platform provides every citizen the facility of conveniently and safely pre-book vaccination appointments. All government and private vaccination centers would also provide onsite registration facility, available both for individuals as well as groups of individuals. As on 2021, in India there are three vaccines namely *Covishield, Covaxine* and *Sputnik-V foe* Covid-19 available for free of cost for Indian peoples.

Impact of Covid-19 on Tourism Sector of India

The spread of Covid-19 in India has started in mid January 2020. The second wave of Covid-19 started at the start of Mid April, 2021 and it's more aggressive than first wave of Covid-19. Mutant of virus is more affecting the lungs and immune system of human. Tourism sector of India is important for the country growing economy. The World Travel and Tourism Council calculated that tourism generated Rs 16.91 lakh crore or 9.2% of India's GDP in 2018 and supported 42.673 million jobs, 8.1% of its total employment.

The underlying idea of visiting new places to appreciate their beauty, in course of time, has given birth to a modern industry called tourism. An international tourist crosses the frontiers of many countries, uses different currencies and faces different cultural activities and languages. Larger countries are likely to have greater attractions for international tourism. It is the job of tourism industry to spot such places of beauty and interest and bring people and places physically closer to one another by providing every facility and comfort. Tourism includes all economic activities which are organized around the needs of such travelers. India is a developing country in terms of economic growth, it has led to a greater development in tourism sector as compared to any countries. In India, the tourist places are of many types because of their location in different geographical regions, diverse characteristics of their sites, and a scope for a variety of tourist activities. India is rich in heritage tourism. Our cultural heritage consists of ancient temples, forts and shrines held sacred by the people of different faiths. These forts were built by the powerful rulers like Rajputs, Mughals, Marathas of their times for needs of defenses or for their own grandeur.

Types of Tourism

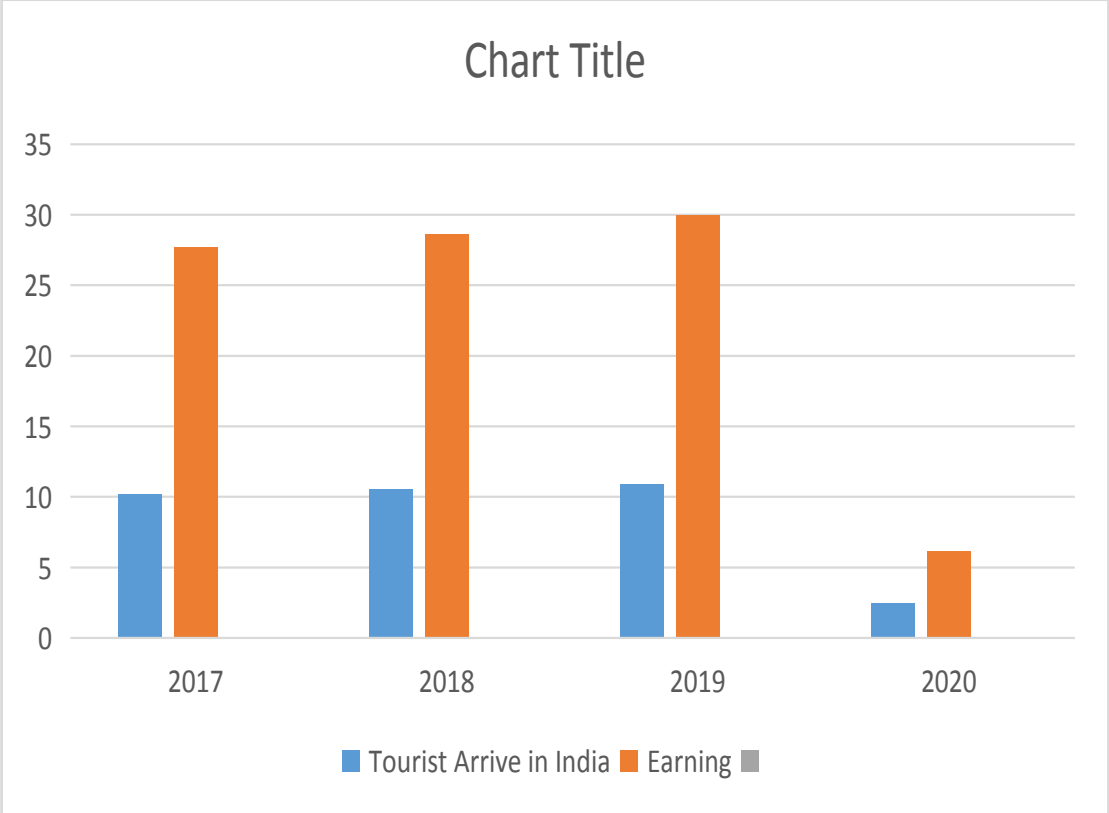
- **Medical Tourism**: World class hospitals and skilled medical professional makes India a preferred destination for medical tourism.
- **Cruise Tourism:** It is the most dynamic and fastest growing segments in the global leisure industry.
- **Rural Tourism:** The potential for development of rural tourism in India.
- **Eco-tourism**: India is the hotspot for bio-diversity and its rich natural heritage.
- **Adventure Tourism**: A wide range of adventure sports are covered under this parts with specialized package.

National Tourism Policy 2015 was initiated to encourage Indian citizens to explore their own country as well as position the country as a ‘Must see’ destination for global travellers.

During 2019, foreign tourist arrivals in India arrive 10.89 million. In 2020 foreign tourist arrivals were 2.46 million. As the lockdown restrictions are now relaxed, many people look forward to receive themselves with short vacations. Holiday tripper will now prefer private hotel rooms and vacation homes to safe feel during their travelling. The Covid-19 pandemic has greatly disrupted the tourism sector of the world.

Input of Tourism Sector in India

Year	2017	2018	2019	2020
Tourist Arrive in India (Million)	10.18	10.55	10.89	2.46
Earning from Tourism in India (US$ Billion)	27.69	28.59	29.96	6.15

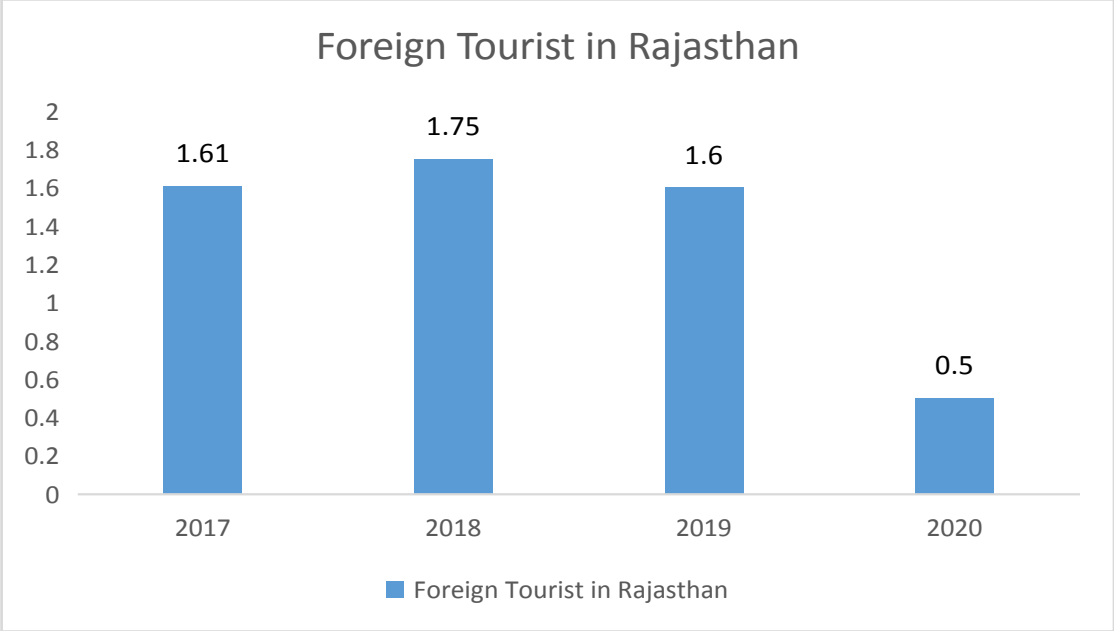


Impact of Covid-19 on Tourism Sector of Rajasthan

Rajasthan has emerged as one of the popular tourist destinations in India for both domestic and foreign tourists. Rajasthan has a total area of 0.342 Sq. Kms, making it geographically the largest state in the country. Rajasthan is rich in its cultural diversity with each region in the state having its own identity in terms of traditions and customs, lifestyle, art, music and dances, attire and cuisine. Due to the rich culture and traditionally diversity, Rajasthan is presenting itself as one of the most preferred destination for tourist around the world. The tourist sector is the one of the most rapidly growing industry of India. The tourism industry today employs over one lakh people directly and over three lakh people indirectly. Its contribution to the state economy is estimated to be over Rs 2000 Cr. presently.

In India, Rajasthan plays a crucial part in the tourism sector at national as well as international level and the spread of COVID-19 has been seen increasing due to tourism. Rajasthan is the first state of imposed a statewide lockdown, due to flow of Covid-19 cases.

Year	2017	2018	2019	2020
Foreign Tourist arrivals in Rajasthan (million)	1.61	1.75	1.60	0.5



As per Statics of India, domestic tourists accounted 52 million visitors to Rajasthan in 2019, while international visitors accounted for about 1.6 million which is good amount. The world is facing an unparalleled global social, health and economic crises due to Covid-19. Tourism sector of Rajasthan are worst-affected industries with worldwide travel restriction, including the closure of several borders to control the infections.

Today September 25, 2021 data of Covid-19 in India and Rajasthan are:

	India	**Rajasthan**
Total Infected Cases	33624419	954290
Total No. of Death	446658	8954
Percentage (%) of death	1.33%	0.94%
Vaccination	848929160	54056998

Result and Discussion

Tourism sector has always been a major contributor to job growth and a major source of foreign income for the state. The economic benefit of tourism development projects have been measured in terms of employment generated directly in the tourism sector, as well as in the economy as a whole due to linkages of the tourism sector with the rest of the economy. In 20 April to 25 May, all 33 districts of Rajasthan, daily new cases are coming.

With the help of Covid-19 data, Rajasthan Government play a crucial role in prevention and control of infection of Corona and would be a first step towards improving sector of tourism in Rajasthan.

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13

Biodiversity Conservation - Its Significance and Pandemics

Naveen Kumar*

Introduction

The Covid-19 pandemic is affecting both the physical and social environment. Pandemics are large-scale outbreaks of infectious diseases that increase morbidity and mortality over a wide geographic area and cause significant economic, social, and environmental. The Covid-19 case is over 108.2 million and over 2.3 million people dead globally and still counting (World Health Organization, 2021). In the past, several significant diseases and pandemic such as the Spanish flu, SARS, Hong Kong flu, Ebola recorded to cause extensive disruption of the economy and conservation of biodiversity across the world on the global scale. Urbanization, land-use changes, and greater biodiversity exploitation led to the recent increase in pandemics.

Therefore, the undue pressure posed a challenge to the protection and sustainable management of biodiversity and the environment. Human pressure on ecosystems has disrupted the species composition, function and structure of ecosystems and that has possibly resulted into increased risk of infectious disease dynamics.

The Impact of Covid-19 Pandemics on Biodiversity

The Covid-19 pandemic has affected virtually all sectors of biodiversity conservation that is at local, regional and global levels. Its effects on biodiversity conservation are many and either negative or positive in form, but the negative impact outweighs the positive one. In the same vein as the previous disease outbreaks, Covid-19 led to the inability to manage the protected areas and carry out conservation programs because of the total lockdown.

* Assistant Professor, Department of Botany, R.N. Ruia Government College Ramgarh Shekhawati, Sikar, Rajasthan, India.

The effects of Covid-19 are inevitable, as there is a reduction in human pressures on the natural ecosystem because of the lockdown of social and economic activities. Ecosystem integrity (in terms of species diversity, endemism, and threats) in African countries with global hotspots for biodiversity conservation threatened.

The Positive Impact of the Pandemic on Biodiversity Conservation Globally, as we all are aware, that there have been problems of pollution and carbon emissions throughout the world. However, the challenge of pollution reduced with improved air quality and the environment since the inception of the Covid-19 pandemic owed to industries and transport shut down besides, there will be a reduced impact on marine systems because of the decline in shipping worldwide. As far the air pollution is concerned, NO_2 is one of the primary drivers of air quality degradation in industrialized and urban areas. During the total lockdown period, the NO_2 contents substantially decreased on an average by 40 and 20–38% over cities. The NASA Earth Observation , 2020 recorded 6% reductions in NO_2 content globally. The problem of pollution is bound to continue after the pandemic lockdown. Thus on the positive side of it, the pandemic has done a great favor in improving the quality of the atmosphere and the environment at large.

Reduced Human Pressure on Wildlife

The exploitation of wildlife resources may have reduced as protected areas staff, expected to continue with anti-poaching patrol activity in protecting vulnerable species. The no-vehicular movement during the complete Covid-19 lockdown makes movement in and out of the protected areas difficult for the poachers, who traveled a long distance to hunt in the park and loggers, thus reducing the rate of disturbance in the protested areas. This led to increase in the possibility of restoring wild animals to their natural environment without being disturbed by human or poaching activities.

The natural environment will be more enriched as a new flush of animals with vegetation's will sprout out because of low anthropogenic pressure. For instance, Covid-19 improved conservation in the protected areas of Nepal (Neupane, 2020). This improvement owed to reduced vehicular movement and human pressures on the natural resources. The temporary ban during the covid-19 lockdown reduced the undue human pressure on the protected and conserved areas in the world. The positive impacts of the pandemic on the nature —reduced air, water pollution, short-term disruption in wildlife trafficking and that has led to some extent in restoration of the ecosystem.

The effects of Covid-19 are inevitable, as there is a reduction in human pressures on the natural ecosystem because of the lockdown of social and economic activities. Wildlife also benefited from reduced air and noise pollution as industry, natural resource extraction, and manufacturing declined during the covid-19 pandemic.

Satellite images have shown dramatic improvements in air quality in every country affected by the pandemic, as industry and transport shut down. Shipping has declined worldwide and reduced impacts on marine systems might be expected. This year will very likely see a global decline in greenhouse gas emissions, as well as large reductions in other drivers of global warming, such as the contrail cirrus from high-flying aircraft. These may be short-term improvements, but they dramatically underline the pervasiveness and severity of anthropogenic impacts worldwide.

On the positive side, a drop in consumer demand and goods production has led to decreased energy consumption by industries, leading to a decline in shipping and trade that's also had an impact on oil usage. Travel restrictions have brought down the mobility by 75% to 95% in many developed nations, resulting in reduced oil and fossil fuel usage. Consequently, many air pollutants such as PM2.5, PM10, NO2, SO2, CO, and CO2 reduced up to 30% within 2–4 weeks of the lockdown. This reduction is good news for biodiversity as past studies show that elevated COx, NOx, SO2, and other air pollutants are known to negatively affect plant, insect, bird, and mammal biodiversity.

There has also been a significant decrease in noise pollution since the lockdown. Noise pollution is known to affect anatomical and morphological development, physiology, and behavior in a range of invertebrate and vertebrate species in terrestrial and aquatic ecosystems. Noise pollution is also known to reduce diversity, changing the community structure and inter-specific interactions. Studies before the lockdown have shown that noise pollution is not just an urban problem but also pervades more remote locations, including protected areas, where anthropogenic sound levels are often double the natural background noise levels. The problem can be more acute in aquatic environments because noise travels faster and farther in water. Calmer waters and calmer terrestrial environment may thus result in lower levels of stress hormones, higher survival rates, and higher sightings of acoustically communicating organisms closer to human inhabitation and regaining original ecosystem structure and function.

The COVID-19 pandemic has led to shifts in human activities and mobility patterns that have altered all aspects of society. Unexpected opportunities to examine relationships between humans and nature have arisen. Initial findings point to diverse direct and indirect pathways linking shifts in human presence and activity to both positive and negative outcomes for wildlife, ecosystems, and conservation.

Conclusion

The pandemics occurrence in time to time has made humans to think about the activities which they have been carrying out for the developments of human beings. As to how their efforts have been destructing the nature and reducing the ability of the nature to heal itself and keep itself sustained.

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सतत् विकास और गांधी

डॉ. अलका अग्रवाल*

प्रस्तावना

ब्रंटलैड रिपोर्ट के अनुसार, ''सतत् विकास ऐसा विकास है जो भविष्य की पीढियों की जरूरतों को पूरा करने की क्षमता से समझौता किए बिना, वर्तमान की जरूरतों को पूर्ण करता है।'' 1980 में प्रथम बार सतत् विकास की अवधारणा का (शब्दों में) प्रयोग किया गया। यह ऐसा विकास है, जिसमें प्राकृतिक संसाधनों के आधार को क्षय नही होने दिया जाता है। सतत् विकास को सुनिश्चित या धारणीय विकास भी कहा जाता है। इसमें पर्यावरण और पारिस्थितिकि का संरक्षण किया जाता है, जिसमें भूमि, वायु, जल और पर्यावरण को प्रदूषण से बचाना सम्मिलित है। साथ ही वनों की अंधाधुंध कटाई रोकना, जैव – विविधता की सुरक्षा करना पेड़ लगाना भी शामिल है। सतत् विकास का लक्ष्य – पर्यावरण के लिए सम्मान, सुरक्षित, शांतिपूर्ण और रहने योग्य विश्व का निर्माण करना है। सतत् विकास की अवधारणा प्रमुख रूप से, आर्थिक विकास, पर्यावरण संरक्षण और सामाजिक आयाम से जुड़ी है। विकास के पश्चिमी मॉडल के विपरीत, यह विश्व के सभी लोगों और क्षेत्रों का संतुलित विकास चाहता है। असंतुलित विकास एक ओर तो असमानता और शोषण को जन्म देता है और दूसरी ओर असंतोष और तनाव उत्पन्न करता है। अतः सतत् विकास एक नागरिक को रोटी, कपड़ा, मकान, रोजगार, शिक्षा एवं स्वास्थ्य की सुविधा प्रदान करना चाहता है, जो मानव होने के नाते उसे मिलना ही चाहिए।

आज विकास के पश्चिमी मॉडल का अनुकरण किया जा रहा है, परन्तु इसके दुष्परिणामों को गांधी ने 100 वर्ष पूर्व ही समझ लिया था। इसलिए वे नगरीकरण, औद्योगिकरण और मशीनीकरण को उचित नही मानते थे। गांधी का यह कथन बहुत ही प्रसिद्ध है, जो आज भी प्रासंगिक है, ''यह धरती सब की आवश्यकताओं की पूर्ति कर सकती है, परन्तु किसी एक के लालच के लिए नही।'' लेकिन मनुष्य के संचय और लोभ का तो कोई अंत है ही नही। इसलिए जिसे वह विकास समझ रहा है, उसमें विनाश के बीज निहित हैं। इस तथाकथित विकास के लिए मनुष्य ने जल, जंगल, वायु और पृथ्वी का विनाश किया है। पृथ्वी का अंधाधुंध दोहन भी किया। भूमि से इतना जल निकाला गया कि भूमिगत जल–स्तर बहुत नीचे चला गया है। वनों के विनाश और पशु– पक्षियों के शिकार के कारण जैव–विविधता में कमी आ रही है। कितने ही पशु – पक्षी और पेड़ – पौधे लुप्त होने के कगार पर है, जिसका पर्यावरण पर प्रतिकूल प्रभाव पड़ रहा है। वनों की कटाई के कारण वर्षा पर प्रतिकुल प्रभाव पडता है तथा दूसरी और मिट्टी का क्षरण होता है, जिसके कारण रेगिस्तान बढता ही जा रहा है।

* सेवानिवृत प्राचार्य, राजकीय कन्या महाविद्यालय, झुन्झुनू, राजस्थान।

रासायनिक खादों और कीटनाशकों के असीमित प्रयोग के कारण मिट्टी ही नही जल में भी रासायनिक प्रदूषण पाया जाता है। गंगा जैसी पवित्र मानी जाने वाली नदी का भी हमारे कल–कारखानों ने प्रदूषित कर दिया है। हम सब जानतें हैं कि 'जल है तो जीवन है'। पवित्र मानी जाने वाली गंगा नदी को भी हमने प्रदूषित कर दिया है। भारत के ही कुछ नगरों में जल स्तर इतना नीचे चला गया है कि कल वहां जल होगा भी या नही, कहा नही जा सकता है। इस तरह उपयोग की वर्तमान दर के कारण प्राकृतिक – संसाधन समाप्त होते जा रहे है। अगर हम अपना कल बेहतर चाहते है तो एक और हमें इनकी बर्बादी रोकनी होगी और दूसरी और इनका बेहतर और अल्प मात्रा में उपयोग करना होगा।

जल की तरह ही पेट्रोल, डीजल, गैस, और कोयले का भी मानव अंधाधुंध दोहन कर रहा है। हालांकि पेट्रोल और डीजल के दाम आकाश छू रहे है, लेकिन सड़कों पर दुपहिया और चार पहिया वाहन धड़ाधड़ दौड़ रहे है यहां तक कि बड़े शहरों में तो इतनी भीड़ है कि तेज गति से चलने वाले वाहन भी कछुएं की तरह ही रेंगते दिखाई देते है। और ट्रैफिक जाम ऐसा कि मिनटों की दूरी घंटो में तय होती है। ना हम पेट्रोल या डीजल बना सकते है और ना ही पृथ्वी को बढ़ा सकते है। फिर भी सड़को पर वाहन निरंतर बढते ही चले जा रहे है। इन सब वाहनों का काला धुआं वायु–प्रदूषण और ध्वनि–प्रदूषण उत्पन्न करता है। बड़े बड़े कारखानों की चिमनियों से उठने वाले धुएं ने दानव की तरह हमारा जीवन कठिन बनाया हुआ है। अस्थमा के रोगियों के लिए ऐसे परिवेश में सांस लेना और भी अधिक कठिन हो जाता है। अब तो प्रदूषण का स्तर हदें पार करने लगा है। हम आखिर अपनी भावी पीढीयों को क्या ऐसा विश्व देकर जाना चाहते है?

आज इस तरह के विकास के कारण ग्राम से नगरों की पलायन बढता जा रहा है। नगरों का आकार इतना अधिक बढ गया है, कि वहां सभी व्यक्तियों की अनिवार्य आवश्यकताओं की पूर्ति भी असंभव होती जा रही है। अधिकांश जनसंख्या गंदी बस्तियों में कबूतर के दड़बेनुमा घरों में रहने को मजबूर है। इसके दुष्परिणाम बीमारी और बाल–अपराध जैसी अनेक समस्याओं के रूप में सामने आ रहे है। भारत जैसे देश में जहां मानव – शक्ति की कोई कमी नही है, श्रम आधारित उद्योगों की जरूरत है। परंतु यहां पूंजी और मशीन आधारीत उद्योग लगाए जा रहे है, जिसके कारण बेरोजगारी और गरीबी तथा आर्थिक असामानता में वृद्धि हो रही है। गांधी मशीन मात्र के विरोधी नही थे, परन्तु अगर मशीन मनुष्य से रोजगार ही छीन ले तो वे इसके विरोधी अवश्य ही थे। जहां मानव की जान जोखिम में हो, वहां अवश्य ही मशीनों का उपयोग करना चाहिए। ऐसा गांधी का दृढ़ मत था।

आधुनिक सभ्यता में ही इसके विनाश के बीज निहित थे। हिंद स्वराज में गांधी ने लागातर हो रही खोंजो के कारण पैदा हो रहे उत्पादों और सेवाओं को मानव जाति के लिए खतरा बनाया था। यह तो आज हमसब देख रहे है। कि निजीकरण, उदारीकरण और वैश्वीकरण विश्व के लिए घातक है और सतत् विकास की अवधारणा के विपरीत है। यह सब लोभ और लालच पर आधारित है। 'अधिक और अधिक' की इच्छा इसके केन्द्र में है। इस समय विश्व में 70 प्रतिशत प्रदूषण और विनाश केवल 10 प्रतिशत जनता द्वारा किया जा रहा है। विश्व की अर्थव्यवस्था इस समय 'पांइट आफ नो रिटर्न' की स्थिति पर पंहुचने लगी है, जो हमारे लिए खतरे की घंटी है। अगर विश्व विकास मार्ग पर आज की तरह ही चलता रहेगा तो वह दिन दूर नही जब आर्थिक विकास पूरी तरह गैर आर्थिक हो जाएगा। गांधी के समय में भी ब्रिटेन में इतना अधिक उपभोक्तावाद था कि गांधी ने कहा था, 'इग्लैंड में एक व्यक्ति जितना उपभोग करता है, दुनिया का हर एक व्यक्ति अगर इतना उपभोग करे तो सबकी जरूरतों को पूरा करने के लिए हमारी धरती जैसे तीन और ग्रहों की और जरूरत होगी।

इस समय विश्व में बड़ा ही भयानक प्रदूषण है। वायुमंडल में कार्बनडाइऑक्साइड, कार्बन मोनो ऑक्साइड, सल्फर डाइआक्साइड गैस बढ रही है, जो चिंताजनक है। यह हमारे स्वास्थ्य के लिए तो घातक है ही, भावी पीढ़ियों के लिए भी विनाशकारी है। वायुंमडल की ओजोन परत, जो हमें सूर्य की पराबैंगनीकिरणों से बचाती है, क्लोरोफ्लोरोकार्बन के कारण उसे भी नुकसान पंहुचा है। जलवायु परिवर्तन के कारण भारत सहित पूरी दुनिया में ग्लेशियर तेजी से पिघल रहे है। इससे एक तरफ समुंद्र का जल स्तर बढेगा तो दूसरी तरफ दुनिया में जल – संकट बढता ही जाएगा। वैज्ञानिकों का मानना है कि यदि कार्बन – उत्सर्जन पर नियंत्रण नही किया गया तो मीठे पानी के स्रोत निंरतर कम होते चले जांएगे। समुद्र का जल–स्तर बढता जाएगा, जिससे महासागरों के किनारों बसे शहरों और देशों के डूबने का भय भी है। इसका प्रमाण भारत का सुंदरवन है, जो निरंतर समुन्द्र में समाता जा रहा है।

विश्व स्वास्थ्य संगठन के अनुसार दुनिया के 200 करोड़ लोग गंदा पानी पीने के लिए विवश है। ऐसी स्थिति में हमें सतत् विकास के गांधीवादी विचारों को अपनाना होगा क्योंकि अब हमारे सम्मुख कोई विकल्प शेष नही है। इसे अपनाते हुए पर्यावरण – संरक्षण के लिए हमें आगे आना होगा तथा जीवन शैली में हर संभव बदलाव भी करना ही होगा। हमने पूरी पृथ्वी को चारों ओर ऐसे कूड़े से पाट दिया है, जो बायोडिग्रिडेबल नही है। प्लास्टिक, पॉलिथीन, थर्माकोल ऐसा कचरा है जो सदियों तक हमारी पृथ्वी पर ऐसे ही मौजुद रहकर उसे निंरतर नुकसान पंहुचाता रहेगा। क्योंकि यह कचरा कितने ही वर्षों तक धरती पर पड़ा रहेगा।

सतत् विकास के लिए, विकास और अर्थव्यवस्था के गांधवादी मार्ग पर चलना होगा। हमें यह समझना होगा कि सादा जीवन ही सतत् विकास का आधार है। अगर जीवन सादा होगा तो आवश्यकताएं बहुत कम होगी। अगर आवश्यकताएं कम होगी तो प्रकृति का अंधाधुंध दोहन नही होगा। उपभोग कम होगा तो प्रदूषण भी कम होगा। ऐसा होने पर ना तो पानी का, ना पेट्रोल को अंधाधुंध दोहन किया जाएगा। अगर प्रत्येक व्यक्ति अपने आस पास 20 किलोमीटर में उपलब्ध उत्पादों का प्रयोग करे तो वस्तुओं के आवागमन में जो पेट्रोल खर्च होता है नही होगा, वाहनों से प्रदूषण कम होगा और स्थानीय वस्तुएं भी सस्ती उपलबध होगी। इस तरह स्वदेशी से सतत् विकास की ओर बढना आसान होगा। लघु ओर कुटीर उद्योगों में उत्पादन होने पर अर्थव्यवस्था श्रम आधारित होगी। इससे एक ओर बेरोजगारी दूर होगी तो दूसरी ओर गरीबी से भी आम जनता को राहत मिलेगी। ऐसी स्थिती में पूंजीवाद नही आ पाएगा और औद्योगीकरण और बड़े स्तर पर उत्पादन भी नही होगा। ऐसी स्थिति में शोषण भी नही होगा और कारखानों से होने वाले जल और वायु–प्रदूषण भी रूकेगा। औद्योगीकरण के कारण नगरीकरण से होने वाले दुष्प्रभाव उत्पन्न होते है। अगर गांव में ही व्यक्ति की आवश्यकता की पूर्ति हो जाएगी तो नगरों की ओर पलायन की भी कोई आवश्यकता नही रहेगी और ना ही असंतुलित विकास ही होगा। ऐसा होने पर नगरीकरण के कारण होने वाली बुराइयों पर भी अंकुश लगेगा। वनों की कटाई नही होगी। वृक्ष लगाए जाएंगे तो पृथ्वी पर हरियाली बढेगी। जैव–विविधता को संजोए रखने में भी सफलता मिल सकेगी। रासायनिक खादों और कीटनाशकों का प्रयोग न होने पर मिट्टी के प्रदूषण में भी कमी आएगी। अपनी जीवनशैली में कुछ बदलाव करके प्रदूषण आसानी से कम किया जा सकता है। सौर उर्जा, पवन उर्जा आदि का प्रयोग भी किया जा सकता है। उर्जा के वैकल्पिक स्रोतो का प्रयोग करने से पेट्रोल के उपयोग में कमी आ जाएगी। इसके अतिरिक्त वाहनों से होने वाले प्रदूषण में भी कमी आएगी। वायु–प्रदूषण में कमी होने से अस्थमा या फेफड़ों से संबधित बीमारियों में भी कमी आएगी। अगर greed based नही वरन need based अर्थव्यवस्था होगी तो अनेक समस्याओं का समाधान

हो जाएगा। हमें ऐसी अर्थव्यवस्था की आवश्यकता है ऐसे विकास की आवश्यकता है, जो नैतिकता और मानवता पर आधारित हो, अन्यथा उपभोक्तावाद हमारा विनाश ही कर देगा। यदि हम ऐसा कर पाए तो हानिकारक गैसों का उत्सर्जन भी कम जाएगा और पर्यावरण सुरक्षा और परिस्थितियों पर अनुकूल और सकारात्मक प्रभाव पड़ेगा। इसी प्रकार जीवन शैली में छोटे– छोटे सुधार करके महत्वपूर्ण सकारात्मक योगदान दे सकते है।

अगर पॉलिथीन की थैली की जगह कपड़े या कागज की थैली का प्रयोग करें, तब ही धरा को कचरा मुक्त रख सकते है। सामूहिक भोजन के अवसर पर प्लास्टिक या थर्माकोल के स्थान पर मिट्टी की थाली, सकोरे आसानी से काम लिए जा सकते है। पत्तों से बनी थाली और दौने भी बायोडिग्रेडेबल होने के कारण जल्दी ही नष्ट हो जाते है। दिल्ली में कार पूंलिग और ऑड–ईवन के फार्मूले से सड़को पर वाहनों से होने वाले प्रदूषण को कम करने का प्रयास किया गया, जो पेट्रोल की खपत कम करने में भी सहायक है। प्रत्येक भवन में 'रेन वाटर हार्वेस्टिंग सिस्टम' लगातार भूमिगत जलस्तर को बढाया जा सकता है।

अनुपम मिश्रा जी ने जल सरंक्षण के क्षेत्र में बहुत काम किया है। पेड़ों की कटाई रोकने के लिए 'चिपको आंदोलन' का नेतृत्व सुंदरलाल बहुगुणा जी ने किया विश्व के अनेक देशों में गांधी के विचारों से प्रभावित 'ग्रीन मूवमेंट' चल रहे है। गांधीवादी विचारक जे सी कूमारप्पा ने अपनी पुस्तक'इकोनामी ऑफ परमानेंस' में ऐसी ही अर्थव्यवस्था का उल्लेख किया है। जर्मन विचारक शूमेखर ने भी अपनी पूस्तक 'स्माल इजब्यूटीफुल' में लघु उद्योगों पर आधारित अर्थव्यवस्था का मॉडल की प्रस्तुत किया है। ग्लोबल वार्मिंग के खतरों को रोकने के लिए समूचा विश्व ही गांधी के मार्ग पर चलने की बात करने लगा है। यह एक ऐसा आर्थिक सामाजिक और पर्यावरणीय मार्ग है, जो पृथ्वी तथा पर्यावरण–सरंक्षण के साथ ही भावी पीढियों के लिए भी संसाधनों की उपलब्धता में कमी नही होने देगा। गांधी की सरल जीवन–शैली ही पृथ्वी को बचा सकती है। सतत् विकास तथा शाश्वत और स्थाई अर्थव्यवस्था के लिए गांधी के मार्ग पर चलना जरूरी है।

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कोविड–19 का पर्यावरण पर प्रभाव और भविष्य की चिंता

रमेशी मीना*

प्रस्तावना

पिछले कुछ दशकों में, हमारे पर्यावरण की चिंता लोगों के बीच प्रमुख विषयों में से एक बन गई है। प्राकृतिक संसाधनों का उपयोग कर लोग खतरनाक निर्मित रसायनों से पर्यावरण को प्रदूषित कर रहे हैं। 1960 के दशक के दौरान, पर्यावरण के लिए एक चिंता शुरू हुई। इसे रेचल कार्सन की पुस्तक साइलेंट स्प्रिंग (कार्सन, 1963) द्वारा प्रेरित किया गया था। इसमें डीडीटी नामक कीटनाशकों के खतरनाक उपयोग के बारे में बताया गया, जिसके लिए नदियों को प्रदूषित किया गया और गंजे ईगल जैसे पक्षियों के अंडे नष्ट कर दिए गए। 22 अप्रैल, 1970 को पृथ्वी दिवस के पहले उत्सव तक कोई पर्यावरण संरक्षण एजेंसी, कोई स्वच्छ वायु अधिनियम या स्वच्छ जल अधिनियम नहीं था। इसे एक जमीनी आंदोलन के रूप में शुरू किया गया था, जो बाद में हमारे पर्यावरण को संरक्षित करने के लिए समर्पित जागरूकता के एक अंतरराष्ट्रीय दिवस में बदल गया। 1947 से 1995 तक प्रकृति ने भारत पर गहरा प्रभाव डाला जो एक बदतर स्थिति का परिणाम था। वायु प्रदूषण, जल प्रदूषण, कचरा घरेलू प्रतिबंधित सामान और प्राकृतिक पर्यावरण का प्रदूषण भारत के लिए खतरा हैं। विभिन्न मुद्दों से निपटने और उन्हें तुरंत हल करने में, भारत ने 1995 से 2010 के बीच सबसे तेज कदम उठाया, भारत में अलग–अलग कानून पेश किए गए हैं जिनमें प्रमुख्य हैंः–

- जल प्रदूषण की रोकथाम और नियंत्रण अधिनियम 1974
- वन–संरक्षण अधिनियम 1980
- वायुप्रदूषण की रोकथाम और नियंत्रण अधिनियम 1981
- पर्यावरण संरक्षण अधिनियम 1986
- ध्वनि प्रदूषण विनियमन और नियंत्रण नियमों का एक सेट 2020

बहरहाल, दुर्लभ आपदा कोरोना वायरस के कारण वर्श 2020 –21 में दुनिया बदल गई है। महामारी के परिणामस्वरूप बड़ी संख्या में मानव जीवन खो गया।

* सहायक आचार्य वनस्पतिशास़्त्र,राजकीय स्नात्कोत्तर महाविद्यालय करौली, राजस्थान।

कोरोना वायरस

कोरोनावायरस (CoVs) वायरस का एक समूह है जो जूनोटिक ट्रांसमिशन के माध्यम से मनुष्यों को प्रभावित करता है। सीवियर एक्यूट रेस्पिरेटरी सिंड्रोम (SARS) 2003 और मिडिल ईस्ट रेस्पिरेटरी सिंड्रोम कोरोना वायरस (MERSCoV) 2012 के बाद पिछले दो दशकों में तीसरी बार नोवेल वायरस ने महामारी की स्थिति पैदा की है।कोरोना वायरस –2019 का पहला मामला सर्वप्रथम 31 दिसंबर, 2019 को चीन के वुहान में डब्ल्यूएचओ कंट्री ऑफिस में अस्पष्टीकृत कम भवसन संक्रमण के लक्षणों के साथ सामने आया था। जिसे संक्रमण का कारण ज्ञात नहीं होने के कारण "अज्ञात एटियलजि के निमोनिया" के रूप में वर्गीकृत किया गया था। 12 जनवरी, 2020 को WHO को जरनकारी मिली कि वुहान में इस संक्रमण का कारण कोरोना वायरस था बाद में 11 फरवरी 2020 को WHO के महानिदेशक ने इस वायरस (CoV) को 'COVID-19' के रूप में घोषित किया जो 'कोरोना वायरस रोग 2019' का संक्षिप्त रूप है।

अर्थात् COVID-19 = CO+VI + D-19

जहां CO = Corona,VI = Virus,D = Disease और 19 = 2019

पूर्व में, इस बीमारी को '2019 नॉवेल कोरोनावायरस' (2019–nCoV) कहा जाता था। ब्टप्क.19 वायरस एक नया वायरस है, जो सीवियर एक्यूट रेस्पिरेटरी सिंड्रोम (SARS) और कुछ प्रकार के सामान्य वायरस परिवार से जुड़ा है। जबकि इंटरनेशनल कमिटी ऑन टैक्सोनॉमी ऑफ वाइरस ने वायरस को 'सीवियर एक्यूट रेस्पिरेटरी सिंड्रोम कोरोनावायरस 2' (SARS-CoV-2) नाम दिया है। SARS-CoV-2 परिवार कोरोनविरिडे का सदस्य है और इसमें दो उप–परिवार शामिल हैं–

- कोरोनविरिने
- टोरोविरिने

उपपरिवार कोरोनाविरीने के सदस्य चार जेनेरा में उप–विभाजित हैं, अर्थात्–

- अल्फाकोरोनावायरस
- बीटाकोरोनावायरस
- गैमाकोरोनावायरस
- डेल्टाकोरोनावायरस

30 जनवरी 2020 को भारत ने केरल में अपना पहला COVID-19 सकारात्मक मामला दर्ज किया जिसके बाद मार्च 2020 की शुरुआत में, इसके तेजी से प्रसार के कारण, WHO us COVID-19 को एक महामारी घोषित किया। 8 जुलाई 2020 तक, यह दुनिया भर में अधिकाधिक 210 देशों में फैल गया जिसके कारण लगभग 11 लाख से अधिक लोग संक्रमित हुए और 539,026 की मौत के साथ COVID-19 के रूप में अत्यधिक संक्रामक, मृत्यु दर रही WHO की 13 अगस्त 2021 की रिपोर्ट के अनुसार 205338159 लोग संक्रमित हुए और 4333094 की मौत हुई। डेल्टाकोरोनावायरस को दूसरी लहर के बाद राजस्थान के बीकानेर जिले में ऑवजर्व किया गया।

लेगों को दुनिया भर में बड़े पैमाने पर COVID-19 स्क्रीनिंग परीक्षण, संगरोध, सामाजिक दूरी, मास्क पहनने, हाथों की सफ़ाई के लिए सैनेटाइजर का उपयोग आदि के रूप में विभिन्न एहतियाती उपाय करने पडे। जैसे–जैसे COVID-19 महामारी दुनिया भर में तेजी से बढ़ी और जीवन के लिए

खतरा पैदा हुआ, इसका पर्यावरण पर भी बड़ा प्रभाव पड़ा। कुछ ही महीनों में दुनिया ने अपना रहन–सहन बदल दिया और लॉकडाउन के विभिन्न तरीकों के कारण हमारे जीवन में अनेक बदलाव आए। जिससे कोविड –19 के सकारात्मक और नकारात्मक दोनों अप्रत्यक्ष प्रभाव पर्यावरण और जलवायु पर परिलक्षित होते हैं, जो विभिन्न शोधों और अध्ययनों द्वारा प्रस्तुत किए गये है।

पर्यावरण पर महामारी के सकारात्मक प्रभाव

जब से कोरोना ने वि व में दस्तख दी हैं तब से पूरे संसार में शांति सी छा गयी हैं. इस शांति से पर्यावरण और पृथ्वी को अनेक सैकड़ों सकारात्मक और हितेषी प्रभाव देखने को मिले हैं. कोरोना ने एक बार फिर हमको साफ़ आकाश और स्वच्छ वातावरण देखने को दिया हैं, यहाँ कुछ प्रभाव दिए गए हैं जो कोरोना के कारण सामने आए हैं–

- **कोरोना का वायु प्रदुषण पर प्रभावः–**विश्व स्वास्थ्य संगठन (WHO) के आंकड़ों का अनुमान है कि वायु प्रदूषण दुनिया भर में हर साल 70 लाख लोगों की जान लेता है। इसके डेटा से यह भी पता चलता है कि 10 में से 9 लोग उस हवा में सांस लेते हैं जो प्रदूषकों के उच्च स्तर पर डब्ल्यूएचओ की दिशानिर्देश सीमा से अधिक है। वायु गुणवत्ता, वातावरण और स्वास्थ्य, वायु प्रदूषण लंबे समय से पर्यावरणीय क्षति के सबसे गंभीर रूपों में से एक रहा है। मानव गतिविधियों से लगभग एक चौथाई CO_2 उत्सर्जन के लिए ईंधन के दहन से उत्सर्जन होता है। इसलिए कोविड –19 महामारी में दुनिया भर में परिवहन पर लॉकडाउन का गहरा प्रभाव रहा है।

कोरोना से वायु प्रदूषण कम हुआ हैं, 7 जनवरी को WHO ने COVID-19 को महामारी घोषित करी दी थी. इसके कुछ समय बाद धीरे धीरे सभी देश लॉकडाउन करने लगे, जिसके फलस्वरूप वायु का प्रदूषण स्तर गिर गया. मुख्य रूप से SO2, NO2 o CO2 का उत्सर्जन कम हो गया, क्योंकि प्रदूषण के स्रोत जैसे परिवहन, उद्योग, पॉवर स्टेशन सभी बंद हो गए। 2019 के पहले प्रतिवर्ष कार्बन डाई ऑक्साइड में एक प्रतिशत की वृद्धि होती थी। प्रदुषण के स्रोतों के कम होने पर अप्रैल 2020 को एक आंकड़ा नोट किया गया, जिसमे 11 से 25 प्रतिशत तक कार्बन डाई ऑक्साइड उत्सर्जन में कमी आई।

अंतर्राष्ट्रीय ऊर्जा एजेंसी के अनुसार, 2019 की तुलना में दुनिया की सड़कों पर औसत गतिविधि में लगभग 50ः की गिरावट आई है। यूके के नेशनल सेंटर फॉर एटमॉस्फेरिक साइंस द्वारा एकत्र किए गए डेटा से पता चलता है कि 10 शहरों में नाइट्रोजन डाइऑक्साइड (NO_2) और पार्टिकुलेट मैटर ($PM_{2.5}$) में उल्लेखनीय कमी आई। हवा की गुणवत्ता में सुधार मुख्य रूप से 22–31 मार्च 2020 के दौरान लॉकडाउन के कारण स्पष्ट रूप से देखा गया। लॉकडाउन मार्च 2020 से पहले पीएम$_{2.5}$ की औसत सांद्रता लॉकडाउन के बाद की सांद्रता की तुलना में अधिक थी।

लॉकडाउन अवधि के दौरान दिल्ली में प्रदूषण का स्तर काफी कम हो गया और अधिकांश समय के लिए वायु गुणवत्ता सूचकांक (एक्यूआई) "संतोषजनक" श्रेणी में बना रहा। लॉकडाउन मार्च 2020 से पहले पीएम$_{2.5}$ की औसत सांद्रता लॉकडाउन के बाद सांद्रता की तुलना में अधिक थी। कोलकाता में पीएम$_{2.5}$की सांद्रता 34.52ः और भारत की राजधानी दिल्ली में 27.57ः कम हो गई है। मुंबई, चेन्नई और हैदराबाद में पीएम$_{2.5}$ में क्रमशः 19.25ः, 5.40ः और 3.99ः की कमी आई। कोलकाता में पीएम 2.5 की सांद्रता 34.52ः और भारत की राजधानी दिल्ली में 27.57ः कम हो गई है। मुंबई, चेन्नई और हैदराबाद में पीएम 2.5 में क्रमशः 19.25ः, 5.40ः और 3.99ः की कमी आई। यूरोपीय पर्यावरण एजेंसी

(ईईए) के अनुसार मिलान में, नाइट्रोजन डाइऑक्साइड प्रदूषण गैस की एकाग्रता मार्च 24 पिछले चार हफ्तों में 24: की कमी हुई। वि व मौसम विज्ञान संगठन (WMO) ने कहा कि कोविड –19 संकट की वैश्विक प्रतिक्रिया का CO_2 के वायुमंडलीय सांद्रता में निरंतर वृद्धि पर बहुत कम प्रभाव पड़ा।

- **कोरोना का जल प्रदूषण पर प्रभावः–**जल प्रदूषण के प्रमुख स्रोत वाहनों से होने वाला तेल रिसाव, इंडस्ट्रियल क्षेत्र से निकलने वाला दूषित पानी, खेतों में काम में लिया जाने वाले उर्वरक हैं. वाहनों से निकलने वाला तेल जल स्रोतों में घुलकर जल को प्रदूषित करता हैं। आयात निर्यात करने के लिए बड़े बड़े वाहनों और जहाजों का इस्तेमाल किया जाता हैं, लेकिन कोरोना महामारी के चलते सभी परिवहन बंद पड़े हैं. इसलिए जल प्रदूषण में गिरावट आई हैं. भारत की पवित्र नदिया यमुना और गंगा में धातु और आयनिक रसायन तैर रहे हैं, इसकी पुष्टि दुनिया भर के कई शोधकर्ताओं ने की हैं। इन नदियों में 80 प्रतिशत गन्दा पानी घरो और कस्बो से आता हैं जबकि 20 प्रतिशत औधोगिक क्षेत्रो से आता हैं।

उद्योगों के बंद होने से भारत की सभी प्रमुख नदियों के जल की गुणवत्ता में सुधार हुआ हैलॉकडाउन अवधि के दौरान गंगा जल की गुणवत्ता में उल्लेखनीय सुधार हुआ। 2,500 किलोमीटर लंबी यह नदी हजारों सालों से भारत के इतिहास, पहचान, धार्मिक आस्था और अर्थव्यवस्था का अहम हिस्सा रही है। लेकिन नदी अनुपचारित सीवेज और औद्योगिक कचरे के लिए एक डंपयार्ड बन गई। सीपीसीबी के अनुसार बेसिन में आधे से अधिक अपशिष्ट जल उपचार संयंत्र निर्वहन मानदंडों का पालन नहीं करते हैं।

बनारस हिंदू विश्वविद्यालय के भारतीय प्रौद्योगिकी संस्थान में केमिकल इंजीनियरिंग के प्रोफेसर पीके मिश्रा ने इन परिवर्तनों के लिए औद्योगिक तालाबंदी और 15 और 16 मार्च को हुई बारिश को जिम्मेदार ठहराया, जिससे गंगा का जल स्तर बढ़ गया। उन्होंने कहा कि कुल बीओडी भार का 30 प्रतिशत नदी के किनारे उद्योगों के कारण था, जो प्रति दिन 130–150 टन था। चूंकि सभी प्रमुख प्रदूषणकारी उद्योग बंद हैं, इसलिए नदी से विषाक्त भार दूर है। सीवेज और औद्योगिक अपशिष्टों में 500 प्रतिशत की कमी के कारण हरिद्वार और ऋषिकेश में गंगा का पानी पीने के लिए उपयुक्त बताया गया। हरिद्वार में घाटों पर आगंतुकों की संख्या में गिरावट से भी नदी के पानी की गुणवत्ता में मदद मिली है। मिश्रा ने आगे कहाः "यदि आप प्रकृति को अपने आप छोड़ देते हैं, तो यह जीवित रहती है और जीवन में वापस आती है। लेकिन जैसे ही हम अर्थव्यवस्था को फिर से खोलेंगे, स्तर फिर से ऊपर जाएगा।

- **कोरोना का ध्वनि प्रदूषण पर प्रभावः–** लॉक–डाउन के कारण सभी वाहन इत्यादि और सभी धार्मिक स्थल बंद रहे, सड़कों और मोहल्लो में होने वाली भीड़ भी शांत रही, इसलिए शोर शराबा बिलकुल बंद रहे अतः कोरोना से पृथ्वी पर शांति आ गई खदानों में होने वाली ड्रिलिंग भी बंद होने से अनावश्यक होने वाला कम्पन्न भी शांत रहा।

वैज्ञानिकों ने कोरोनावायरस महामारी के दौरान दुनिया भर में साइज्मिक (भूकंपीय) स्टेशनों से शोर के स्तर को कम होने का प्रमाण मिला है. वैज्ञानिकों के अनुसार, उन्होंने इस महामारी के कारण पृथ्वी पर एक अनयूजअल साइलेंस खोजी। साइज्मिक मैप में यह साइलेंस चीन से होती हुई वेव के रूप अन्य देशों में जाती दिखती है. यह मैप यातायात, उद्योगों और ह्यूमन गेदरिंग से होने वाले शोर को रिकॉर्ड करते हैं. इस स्टडी के लिए वैज्ञानिकों ने विश्व के 117 देशों में फैले 268 साइज्मिक सेंसर के नेटवर्क से डेटा रिकॉर्ड किया। वैज्ञानिकों ने अपनी स्टडी में डेटा का विश्लेषण करने पर पाया कि हाइ

फ्रीक्वेंसी की साउंड कोरोनावायरस महामारी से प्रभावित देशों में 50 प्रतिशत या उससे अधिक डाउन हो गई। दुनियाभर में शोर प्रदूषण में सबसे बड़ी गिरावट न्यूयॉर्क और सिंगापुर में देखी गई थी. स्कूल, कॉलेजों और अन्य संस्थानों के आसपास साइज्मिक रिकॉर्डिंग कम थी. छुट्टियों के दौरान अक्सर जो गिरावट देखी जाती है, उससे यह गिरावट 20 फीसदी अधिक थी. इस स्टडी पर सबसे पहले लिखने वाले थॉमस लेकोक ने कहा कि ऐसी साइलेंस पहले कभी नहीं देखी गई। "बोस्टन" यूनिवर्सिटी में ' ध्वनि प्रदूषण' पर शोध कार्य करने वाली एरिका वाकर ने कहा कि मानसिक तनाव, रक्त चाप, हृदय रोग जैसी समस्याओं से ग्रस्त मरीजों को ध्वनि प्रदूषण बहुत समस्यात्मक रहता था, यह कोरोना लॉकडाउन परिणाम उन पर सानुकूल प्रभाव दिखाता, मनुष्यों पर ही नहीं, क्रूइज़् जहाजी यात्रा के दौरान, भूमि से कई गुना अधिक ध्वनि प्रदूषण का प्रभाव समुद्र के जीवों पर पड़कर, वे भी जहाज की ध्वनि से तनावग्रस्त होते हैं। फिलहाल, ये सब रुक गये, अतः शांत मुद्रा में समुद्र और ताज़ा हवा सूँघते हुए, अंदर के जीव प्रफुल्लित हो गये।

- **कोरोना का ओजोन पर प्रभावः**–पृथ्वी से 10 से 50 किलोमीटर तक समताप मंडल पाया जाता हैं, इसी के अन्दर पृथ्वी का कवच "ओजोन परत" पायी जाती हैं. ओजोन परत सूर्य से आने वाली हानिकारक किरणों का अवशोषण करती हैं. ओजोन ऑक्सीजन के तीन परमाणुओं से मिलकर बनी होता हैं। जब समताप मंडल में क्लोरिन या ब्रोमीन गैसे पहुँच जाती हैं तो ओजोन का क्षय हो जाता हैं. क्लोरोफ्लोरोकार्बन (CFC), हाइड्रोक्लोरोफ्लोरोकार्बन (HCFE), मिथाइल क्लोराइड ऐसी गैसें हैं जो ओजोन को आघात करती हैं, ये गैसे क्लोरिन और ब्रोमीन से बनी होती हैं.लगभग तीस सालों पहले अन्तराष्ट्रीय सरकार ने मॉन्ट्रियल प्रोटोकॉल पर हस्ताक्षर किये थे जिसमे यह लिखा गया था कि विश्व स्तर पर उन गैसों का उत्पादन कम किया जाये जो ओजोन के लिए क्षयकारी होती हैं, COVID-19 के दौरान लॉकडाउन के कारण सभी मानव निर्मित उत्सर्जन नियंत्रित होने के कारण ओजोन क्षेत्र में भी राहत हैं।

विश्व मौसम विज्ञान संगठन (WMO) का कहना है कि COVID-19 के दौरान आर्थिक गतिविधियों को सीमित कर दिया गया है जिसके परिणामस्वरूप ब्$_2$ उत्सर्जन में गिरावट आई है। 2019 में, नासा और NOA। ने बताया कि अंटार्कटिका के दक्षिणी ध्रुव क्षेत्र में ऊपरी वायुमंडल में गर्म तापमान होता है, जिसके कारण एक छोटा ओजोन छिद्र हो गया हैं, यह पहली बार 1982 में देखा गया था। 23 अप्रैल 2020 को वायुमंडलीय निगरानी सेवाओं (CAMS) ने घोषणा की कि आर्कटिक के ऊपर ओजोन परत में अब तक का जो सबसे बड़ा छेद देखा गया था, अब वह पूर्ण रूप से वापस ठीक हो चुका हैं, यह लॉकडाउन का सकारात्मक प्रभाव हैं।

- COVID-19 **का वन्य जीवन पर प्रभावः**–पारिस्थितिकी तंत्र में श्रंखलाए होती हैं, जो की एक दसरे पर निर्भर होती हैं. जब श्रंखला के किसी एक स्तर पर कुछ असाधारण हलचल होती हैं तो इसका असर पूरी श्रंखला पर होता हैं. इसलिए पशु द्वारा जनित रोग पूरी प्रकृति के लिए विनाश का प्रकोप हैं। जंगलों में पर्यटन, समुद्र में जहाज, वाहनों के शोर से जानवरों की दैनिक दिनचर्या बहुत बुरी तरह से प्रभावित होती हैं। लॉकडाउन के दौरान मानव घरो में बंद हो गए हैं जिसके चलते सभी जानवरों को मुक्त वातावरण में चलने फिरने की आजादी मिल गयी हैं। वन्यजीवों के लिए COVID-19 महामारी का मुख्य रूप से सकारात्मक लाभ कम मानव यात्रा है। यात्रा में उल्लेखनीय कमी के कारण लोग सडकों पर वन्यजीवों को कम मार रहे हैं।

कोरोना महामारी के बीच, विशेष रूप से लॉकडाउन चरण के दौरान, वन्यजीवों पर कुछ सकारात्मक प्रभाव देखे गए। लॉकडाउन चरण के दौरान, जानवरों का एक बढ़ा हुआ और अबाधित क्षेत्र था। कुछ इलाकों में सड़कों और रिहायशी इलाकों में जंगली जानवर देखे गए। कम यातायात, कम मानवीय हस्तक्षेप और कम प्रदूषण ने वन्यजीवों को पनपने के लिए जगह दी। यह निश्चित रूप से सड़कों पर एक दुर्लभ घटना थी। उनसे छीने गए इलाकों में वन्यजीव फिर से घुस गए। पर्यटक तट पर आई डॉल्फ़िन; शहरी केंद्रों में पक्षियों को पहले कभी नहीं सुना और देखा गया था। लॉकडाउन के दौरान, मनुष्यों और पर्यटकों के कम प्रवाह के साथ वन्यजीव शांति में थे।

पर्यावरण पर नकारात्मक प्रभाव

वायरल संक्रमण से बचाव के लिए मास्क, हैंड ग्लव्स और अन्य सुरक्षा उपकरणों का इस्तेमाल किया जाता है। लेकिन सही जानकारी न होने के कारण ज्यादातर लोग इन्हें खुले में फेंक देते हैं, जिससे आसपास के वातावरण पर हानिकारक प्रभाव पड़ता है। नगरपालिका अपशिष्ट (जैविक और अकार्बनिक दोनों) की दर में वृद्धि से वायु, जल और मृदा प्रदूषण पर सीधा प्रभाव पड़ता है।

- **अपशिष्ट जल क्षेत्रः**–COVID-19 वायरस एक नाजुक बाहरी झिल्ली से ढका होता है जो कम स्थिर और ऑक्सीडेंट के प्रति अधिक संवेदनशील होता है । इसलिए, इस प्रकार के वायरस अन्य वायरस की तुलना में जल्दी निष्क्रिय हो सकते हैं जो पानी आधारित संचरण को सक्षम करते हैं । जिस हद तक कोरोनोवायरस बना रहता है और संभावित रूप से अपशिष्ट जल में संक्रामक रहता है, वह कई कारकों पर निर्भर करता है जैसे कि पानी की निकासी अवधि, उपचार का प्रकार और प्रचलित पर्यावरणीय स्थिति।

हालांकि, विश्व स्वास्थ्य संगठन (WHO) ने पुष्टि की है कि मानव कोरोनावायरस डीक्लोरीनेटेड पानी और अस्पताल के अपशिष्ट जल (यानी, तापमान 20^0C) में केवल 2 दिन जीवित रह सकता है। वायरस की उपस्थिति के लिए सामुदायिक सीवेज की निगरानी ने अतीत में कुल मामलों (दोनों रोगसूचक और स्पर्शोन्मुख मामलों) को निर्धारित करने में महत्वपूर्ण भूमिका निभाई थी प्रभावी निगरानी सीवर शेड स्तर पर संक्रमण हॉटस्पॉट की पहचान करने में सहायक होगी। जबकि एक बेहतर संकल्प पर नमूना लेना और एक बड़े भौगोलिक सीमा को कवर करना उच्च–संसाधन सेटिंग में भी चुनौतीपूर्ण है।

भारत जैसे विकासशील देशों में यह काफी मुश्किल है, जहां अधिकांश आबादी अपशिष्ट जल उपचार संयंत्रों (डब्ल्यूडब्ल्यूटीपी) से जुड़ी नहीं है, बल्कि वे सेप्टिक सिस्टम और/या खुली नालियों का उपयोग कर रहे हैं। भारत में, शहरी क्षेत्रों में उत्पन्न होने वाले लगभग 70ः सीवेज को बिना उपचार के सीधे पास की नदियों या जल निकायों में छोड़ दिया जाता है। मिट्टी की उर्वरता में सुधार के लिए शेष उपचारित सीवेज पानी, और ॅज्चे के अंतिम जैव–ठोस का उपयोग सिंचाई क्षेत्र में किया जाता है, जबकि इस अपशिष्ट जल आधारित ब्व्टप्ब्.19 निगरानी के प्रतिमान को उच्च–संसाधन सेटिंग्स में भी समझना मुश्किल है, यह भारत और अन्य विकासशील देशों जैसे निम्न–संसाधन सेटिंग्स में और अधिक जटिल है, इस प्रकार, किसी भी मात्रात्मक विश्लेषण को संचालित करना मुश्किल होगा।

- **ठोस अपशिष्टः**–COVID-19 ने पर्यावरण को भी गंभीर और अप्रत्यक्ष रूप से प्रभावित किया है। कीटनाशकों, साबुन, डिटर्जेंट, सिंगल यूज प्लास्टिक आदि का उपयोग कई गुना बढ़ गया है और यह पर्यावरण पर भारी पड़ रहा है। हैंड सैनिटाइज़र का उपयोग भी कई गुना बढ़ गया

है। व्यक्तिगत सुरक्षा उपकरण (पीपीई) किट, फेस मास्क और दस्ताने चल रहे महामारी के दौरान महत्वपूर्ण सुरक्षा उपायों के रूप में उभरे हैं । उनके उपयोग में अचानक वृद्धि के कारण, पर्यावरण को निकट भविष्य में बढ़ते ठोस अपशिष्टप्रदूषण के नकारात्मक परिणामों का सामना करना पड़ सकता है। यूएनईपी कार्यकारी निदेशक इंगर एंडर्सन के अनुसार COVID-19 के चलते अस्पताल, स्वास्थ्य सुविधा और जनता सामान्य से अधिक अपशिष्ट/कचरा उत्पन्न कर रहे हैं, जिसमें मास्क, दस्ताने, गाउन और अन्य सुरक्षात्मक उपकरण शामिल हैं जो वायरस से संक्रमित हो सकते हैं।

महामारी की स्थिति से निपटने के लिए विभिन्न प्रकार के मास्क जैसे सर्जिकल, N95 और वाणिज्यिक कपड़े/कपड़े के मास्क का उपयोग किया जाता है विश्व स्वास्थ्य संगठन (WHO) के अध्ययन के अनुसार, संयुक्त राज्य अमेरिका में ब्व्टप्क–19 से वचाब के लिए लगभग 89 मिलियन मेडिकल मास्क की आवश्यकता होने का अनुमान है क्योंकि यह संकट कुछ समय तक बना रहने की संभावना है। मास्क के बढ़ते उपयोग से मास्क का उत्पादन काफी बढ़ गया है और यह अधिक मात्रा में ऊर्जा की खपत करता है। Klemes et. al- (2020) द्वारा एक अध्ययन से पता चलता है कि एक मास्क उत्पादन लगभग 10–30 Wh ऊर्जा की खपत करता है और पर्यावरण को 59g CO_2– ग्रीनहाउस गैस छोड़ता है। इसके अलावा, फेस मास्क के लगातार बढ़ते उपयोग से लैंडफिल और मेडिकल वेस्ट भी बढ़ जाता है। इनमें से अधिकांश फेस मास्क कचरे में या तो पॉलीप्रोपाइलीन/ पॉलीइथाइलीन, पॉलीयुरेथेन, पॉलीस्टाइनिन, पॉली कार्बोनेट, पॉलीएक्रिलोनिट्राइल होते हैं, जो पर्यावरण में प्लास्टिक या माइक्रोप्लास्टिक प्रदूषण बढाते हैं ।

उत्पादित होने वाले एकल उपयोग प्लास्टिक की मात्रा में भी बड़ी वृद्धि हुई है। अगर पर्यावरणीय रूप से उचित प्रबंधन नहीं किया जाता है, तो संक्रमित मेडिकल कचरे की अनियंत्रित डंपिंग हो सकती है, जिससे सार्वजनिक स्वास्थ्य को हानि हो सकती है, खुले मे जलाने से पर्यावरण में विषाक्त पदार्थों का रिसाव और मनुष्यों में रोगों का संचरण हो सकता है। अन्य अपशिष्ट जल स्रोतों तक पहुंच सकते हैं और नदी और समुद्री प्रदूषण में जोड़ सकते हैं। ये प्रक्रियाएँ स्वास्थ्य सुरक्षा संबन्धित संक्रामक और धारदार अपशिष्ट के उपचार पर (WHO)के दिशानिर्देशों का पालन नहीं करती है, न ही मानव स्वास्थ्य और पर्यावरण को खतरनाक रसायनों और कचरे से बचाने वाले बेसल, रॉटरडैम और स्टॉकहोम सम्मेलनों के निर्देशों का पालन करती है। अतः स्पष्ट है कि वर्तमान में चल रही महामारी, पर्यावरण प्रदूषण को बढ़ाती है और मानव तथा पशु स्वास्थ्य पर नकारात्मक प्रभाव डालती है।

- **जलवायु संकटः–** संयुक्त राष्ट्र पर्यावरण कार्यक्रम (यूएनईपी) की एक नई रिपोर्ट में चेतावनी दी गई है कि COVID-19 लाखों लोगों को गरीबी में डुबोने और वैश्विक भूख को खराब करने की धमकी दे रहा है, जो सतत विकास के लिए लंबे समय से चल रहे जोर को कमजोर कर रहा है। रिपोर्ट इस बात की भी पुष्टि करती है कि विश्व मौसम विज्ञान संगठन (WMO) जैसी संयुक्त राष्ट्र की एजेंसियां किस पर अलार्म बजा रही हैंः 2020 में आर्थिक मंदी ने जलवायु संकट को धीमा करने के लिए बहुत काम किया, जो काफी हद तक बेरोकटोक जारी है। प्रमुख ग्रीनहाउस गैसों की सांद्रता में वृद्धि जारी रही, जबकि वैश्विक औसत तापमान पूर्व–औद्योगिक स्तरों से लगभग 1.2 डिग्री सेल्सियस ऊपर था, जो खतरनाक रूप से पेरिस समझौते में स्थापित 1.5 डिग्री सेल्सियस सीमा के करीब था।

- **अनौपचारिक और अवैध खननः–** लैटिन अमेरिका और कैरिबियन का क्षेत्र, जिसमें कई अर्थव्यवस्थाएं शामिल हैं जो धातु खनिजों के उत्पादन और बिक्री पर निर्भर हैं, जैसे तांबा, चांदी, सोना और, कुछ हद तक, टिन, लोहा और जस्ता भी निर्भर है। चीन के आर्थिक सुधार पर, उन संसाधनों के लिए इसके मुख्य व्यापारिक भागीदार के रूप में। चीन की आर्थिक गतिविधि पहली तिमाही में सिकुड़ गई, जैसा कि इसके खनिज निर्माण क्षेत्र, विशेष रूप से इसके तांबा गलाने और शोधन कार्यों, और इस्पात उत्पादों के अपने स्टॉक के संचय में परिलक्षित हुआ थाः दोनों मामलों में साल–दर–साल परिवर्तन में भारी गिरावट दिखाई देती है। इसके अलावा, चिली और पेरू में तांबे और ब्राजील में लौह अयस्क के उत्पादन और निर्यात में बदलाव पर एक नज़र, गतिविधि और प्रवाह में गिरावट की पुष्टि करती है, हालांकि थोड़े समय के अंतराल के साथ, यह देखते हुए कि आपूर्ति श्रृंखलाओं को ठप करने वाले लॉकडाउन उपायों को इस क्षेत्र में चीन की तुलना में बाद में लागू किया गया था। इस क्षेत्र की कंपनियों ने भी निवेश कम करना शुरू कर दिया है और नौकरियों में कटौती अंत में, एक समस्या जो वर्तमान स्थिति से विकराल हो गई है वह है अनौपचारिक और अवैध खनन। वर्तमान परिस्थितियों में, यह समस्या बढ़ सकती है और समुदायों और क्षेत्रों पर इसके कई नकारात्मक प्रभाव पड़ सकते हैं।
- **वन और वन्य जीवों को खतराः–** कोरोना प्रभाव की लहर दूरगामी है। इंसानों के साथ–साथ शहरी इलाकों में रहने वाले जानवरों के साथ–साथ जंगली जानवर भी इससे संक्रमित हो रहे हैं। सूची में कुत्ते, बिल्ली, खरगोश, मिंक और यहां तक कि बाघ और शेर भी शामिल हैं। यह इस तथ्य का संकेत है कि कोरोनावायरस मानव से जानवरों में स्थानांतरित हो सकता है। भारत जैसे विकासशील देशों में कुत्तों और बिल्लियों जैसे आवारा जानवर, लॉकडाउन की शुरुआत के बाद से रेस्तरां और दुकानों के बंद होने के कारण अपशिष्ट खाद्य सामग्री की अनुपस्थिति के कारण कोरोनावायरस महामारी के पीड़ितों में से हैं। साथ ही, उनके मालिकों द्वारा निराधार आशंकाओं के कारण उन्हें छोड़ा जा रहा है कि वे COVID-19 फैला सकते हैं। सबसे बुरी संभावना यह है कि आवारा जानवर डिस्पोजेड मास्क और दस्ताने खा सकते हैं, जो घातक हो सकते हैं। इसके अलावा, विभिन्न देशों द्वारा आदेशित लॉकडाउन के लिए प्राकृतिक पारिस्थितिक तंत्र और विभिन्न वनस्पतियों और जीवों को बहुत खतरा है। इस वैश्विक महामारी का संरक्षित क्षेत्रों पर तत्काल और दीर्घकालिक दोनों प्रभाव पड़ेगा। महामारी ने पहले ही कई देशों में पार्कों और संरक्षित क्षेत्रों को बंद कर दिया है, दुनिया के कुछ हिस्सों में रेंजर गश्ती का निलंबन व्यापक है, जिसके परिणामस्वरूप पर्यावरण–हानिकारक गतिविधियों की संभावना है, जिसमें कृषि अतिक्रमण, अवैध कटाई और अवैध शिकार शामिल हैं। कंबोडिया, भारत, दक्षिण अफ्रीका और बोत्सवाना जैसे देशों में अवैध शिकार और अवैध संसाधन निष्कर्षण की उभरती हुई रिपोर्टें पहले से ही ग्रामीण आजीविका के नुकसान और प्रवर्तन कर्मचारियों द्वारा गश्त और फील्डवर्क करने की क्षमता में कमी से जुड़ी हैं।

अग्नि प्रबंधन, आक्रामक विदेशी प्रजातियों के नियंत्रण, और प्रजातियों के पुनः परिचय सहित संरक्षित क्षेत्र प्रबंधन और बहाली कार्यक्रमों का निलंबन। ऑस्ट्रेलिया में, विनाशकारी जंगल की आग के दौरान क्षतिग्रस्त पार्क आवासों को बहाल करने के प्रयास अब रोक दिए गए हैं। पार्कों के कर्मचारियों को आत्म–पृथक करने के लिए घर भेज दिया गया यहां तक कि पार्कों को बंद भी किया जा गया।

कई पार्क एजेंसियां पहले से ही कर्मचारियों की ड्यूटी में कटौती कर रही हैं। क्योंकि कर्मचारियों का स्तर संरक्षित क्षेत्र की प्रभावशीलता के लिए महत्वपूर्ण है, यह प्रमुख आवासों और प्रजातियों के संरक्षण पर गंभीर प्रभाव डाल सकता है।

निष्कर्ष और भविष्य के दृष्टिकोण

हमें यह समझना चाहिए कि कोविड–19 मनुष्य और पर्यावरण के बीच संबंधों को इंगित करने के लिए एक अनुस्मारक है। इसलिए, भविष्य के प्रकोपों को रोकने के लिए, हमें पारिस्थितिक तंत्र और वन्यजीवों के लिए खतरों का समाधान करना चाहिए, जिसमें निवास स्थान का नुकसान, अवैध व्यापार, प्रदूषण और जलवायु परिवर्तन शामिल हैं।

यूएनईपी रिपोर्ट का समन्वय करने वाले यूएनईपी के सलमान हुसैन कहते हैं, "एक वास्तविक चिंता यह है कि COVID-19 के तीव्र प्रभावों को कम करने के लिए संसाधनों पर ध्यान केंद्रित करने से सामान्य रूप से सतत विकास कार्यक्रमों के लिए संसाधन कम हो सकते हैं, 2021 और उसके बाद भी महत्वपूर्ण पहल हो सकती है।" "दुनिया को स्थिरता, लचीलापन और इक्विटी के लिए आपातकालीन राहत और दीर्घकालिक उद्देश्यों के बीच स्थिरता और सुसंगतता की आवश्यकता है।"हालांकि पर्यावरण पर COVID-19 के कुछ सकारात्मक प्रभाव देखे गए, लेकिन ये बड़े पैमाने पर राष्ट्रव्यापी तालाबंदी से प्रेरित अल्पकालिक प्रभाव थे। वास्तव में, महामारी से भविष्य में पर्यावरण पर दीर्घकालिक प्रतिकूल प्रभाव पड़ने की आशंका है। रसायनों (साबुन, डिटर्जेंट और सफाई के अन्य रासायनिक साधन), दवाओं और प्लास्टिक (दस्ताने, मास्क, पीपीई किट, सीरिंज, आदि) के उपयोग से पर्यावरण प्रदूषण में और वृद्धि होने की उम्मीद है।

COVID-19 के चल रहे और भविष्य के प्रभावों से निपटने की आवश्यकता है। प्लास्टिक और रासायनिक अपशिष्ट और अपशिष्ट जल उपचार के उचित प्रबंधन के लिए नीतिगत दिशानिर्देश तैयार करना और उन्हें अंतरराष्ट्रीय और राष्ट्रीय स्तर पर लागू करना। ठोस अनुसंधान प्रयासों के साथ COVID-19 के पर्यावरणीय और पारिस्थितिक प्रभावों को समझना ताकि भविष्य में ऐसी प्रतिकूलताओं से अधिक प्रभावी तरीके से निपटा जा सके। बुजुर्ग लोगों का डेटाबेस विकसित करना, जिन्हें COVID-19 के कारण अधिक देखभाल, उचित और समय पर उपचार की आवश्यकता हो सकती है और भविष्य में उनके स्वास्थ्य और देखभाल को सुनिश्चित करना है।

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About the Editor

Anita Jeph, Assistant Professor, Department of Botany, Government Girls College, Jhunjhunu. She has qualified M.Sc., M. Phil. from MGSU Bikaner. She has 13 years teaching experience. She has attended and presented papers in many conferences, seminars and workshops. She has published 12 papers in referred and UGC approved National and International journals. She has authored 2 book "Ecology and environment" and "A Textbook of Algae and Bryophyta". She is pursuing Ph.D. on "Biodiversity & Ethno-botanical study of Plants Traditionally used in Jhunjhunu district: A Part of Indian Thar Desert".

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