

IMPACT OF LOCKDOWN ON EDUCATION, ECONOMY & ENVIRONMENT IN INDIA



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Preface

The purpose of this book is to provide meaningful insights into the issues and challenges during Lockdown due to COVID 19 pandemic and its impact on Education, Economy and Environment. The book envisages identifying the magnitude and dimensions of the problems encountered due to COVID-19 in Education, Economy and Environment and coping strategies or remedial measures to the stakeholders. The book also traced several positive impacts witnessed in each of the three fields, compelling the mankind to realize hard realities which need to be sustained even after Covid-19. It has thrown open several challenges in Educational Sector viz Education Technology opportunities for online Learning. In Economic front it has given opportunity to focus on '*Make in India*' and '*Atmanirbhar Bharath*' slogan and strategy of Government of India. In Environment it has made us to introspect how we are exploiting this nature with our industrial and commercial activities without much environmental concerns. The Book substantially covered these issues by the learned faculty members, while sharing their perceptions and observations, how COVID 19 is boon and how it is Bane. It is intended that the book educates, brings awareness, and provides useful guidelines to readers especially to Policy Makers, students, teachers and other stakeholders. It is an initiative to provide literature review to the research investigators for further research in arriving at scientific solutions to the issues and challenges during COVID-19 on education, economy and environment.

This book is a compilation of Readings of literature on impact of Covid-19 on Economy, Education and Environment. The book primarily reflects the genuine concerns of faculty fraternity and students. The Book has comprehensively depicted the perceptions and observation on each of the three facets which are vital and are interrelated. The book on the whole in its 51 papers raised following very pertinent questions and answered them in the process, viz a) What are the socioeconomic, sociocultural, psychological and mental health issues and concerns of different sections of the society? b) What are the specific issues and challenges in each of said three fields? c) What are the measures and strategies desired to combat the situation in each of the fields d) What are the specific packages and policy initiatives of Government and guidelines to different sectors in the Economy – All industries including MSME, SSI etc, Service Sectors including Health, Public Utilities, Educational Institutions, etc e) What are the short-term and long-term measures to rebuild the economy after Covid-19 pandemic? The views of World Economic Forum, WHO and several other apex bodies' findings are shared on all the three fields.

Firstly, the book addressed several issues viz. Mind shift mechanism desired for both teachers and students; switching over to strategy focused education technology on education; chalk and talk to online; e-learning issues and challenges, Traditional pedagogical tools to sophisticated high-end technology based tools; training the students to training the trainers; reforms on education, perceiving the scenario as boon rather than as a bane in harnessing strengths of the teachers. The articles covered the disruption to education sector right from primary school to P.G. Level, right from conducting entrance test to declaration of results. The book among several issues will speak about multipronged strategy to manage the crisis. Several suggestions as DIKSHA platform, Open Source Digital Learning etc. are discussed. Further the book also addressed its impact on middle and lower middle class students with poor financial background and similarly pathetic situation of certain educational Institutional without much of infrastructure to face challenges. In respect of over 240 million populations very existence is in threat with loss of employment and income. The book also addressed the problems and challenges on socioeconomic, sociocultural and psychological dimensions of the students and parents in the present scenario. It also addressed the policy initiatives desired from the government to provide solutions to the problems.

Secondly, the book also substantially covered the issues and challenges due to covid-19 on economy viz slowdown of economy and drop in the GDP due to closure of several Manufacturing Industries, Agriculture, all the Service Industries, Construction activities, Service providing outlets, Hotels, Cinema Theatres, malls, etc to mention a few. The book covered how the complete lock down in turn resulted in hunger and poverty despite government support. It also traced the problem of workforce especially migrated workers in vulnerable condition. The impact on Financial System especially banking sector and NBFC are discussed. The problems and challenges of workers in both organized and unorganized sector are discussed. The impact on Economy both in the short run and long runs are highlighted in these articles. The book also covered substantially the government policy measures on various fronts for short run and long run. The immediate loss of employment and income, several resultant issues on socioeconomic and psychological concerns and the coping strategies are discussed. The measures to sustain and growing in the long run are discussed.

The book also focused on the impact of Covid-19 on Environment. Mostly articles covered the positive impact in terms of drop in pollutants in air and water, reduction in carbon emissions due to Lockdown and thereby closure of factories, service industries, reduction in the movement of vehicular traffic etc. The study highlighted the blessing in disguise to Mother Nature, and how the nature restores its balance and reduction in pollution levels are covered. The book shared the statistics of changes in the environment in terms of pollutants, carbon etc.

The Book certainly will provide a great source in bringing awareness on COVID-19 pandemic its magnitude and dimensions. The book also will enlighten all of us with the critical findings on the subject to combat the situation.

1

STUDY OF STUDENT PERSPECTIVE ON ONLINE CLASSES- A NEW TEACHING PEDAGOGY TO COMBAT COVID-19 LOCK DOWN

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Abstract

The whole world is fighting with an invisible enemy, the novel covid-19, corona virus. It was first observed in the Wuhan city –china and within no time started spreading to other countries of the world leaving the whole world in to a strange situation which has never been heard or seen. Because of sudden outbreak of an unknown virus, the world is not ready with any vaccine/medicine for this virus, as such even till date(15th may -2020) there is no scientifically proven medicine to cure this virus, resulting which , the World Health Organization has made very clear that the only way to stop further spread of this virus is to maintain social distancing –resulted in country wide lock down in India from the month of March. A Complete lock down of the whole country like India which is still in its developing stage and with such a huge population had a very strong impact on the economy, environment, education, Businesses, Agriculture etc. In this paper, an attempt is being made to analyze the impact of this lockdown on educational sector with respect to student education-from student's perspective.

1.Introduction

The corona virus outbreak came to light in the month of December, 2019 when China informed the World Health Organization of a cluster of cases of pneumonia of an unknown cause in Wuhan City in Hubei Province. Slowly the disease spread to more parts of China, and to the rest of the world. The WHO has now declared it a pandemic. The virus has been named SARS-CoV-2 and latter called COVID-19

Humankind is going through a new and unprecedented experience with the rapidly spreading Covid-19 pandemic. The severity of this virus, which has caught the world by surprise, lies not only in the delay of laboratories in finding an effective and efficient vaccine, but also in the fact that the measures taken to counter it differ considerably from what was previously adopted to confront various acute crisis, whether health political, social or economic. There is no doubt that the Covid-19 pandemic will change the face of human society, but it forces us to ask some important questions. Will this change only

affect the healthcare systems, or will it extend to consumption patterns, value systems, political regimes and legal systems, educational systems, thus leading to the fall of the huge financial and economic empires.

According to the World Health Organization, the problem does not lie in Covid-19 alone but rather in the fear, panic and terror caused by the spread of this virus, and amplified by the media, which has been presenting the situation as if it were the end of the world.

Under my current study and analysis, an attempt is being made to address the following

2.Objectives

- To examine the need and causes of lockdown
- To understand and analyze the impact of lockdown on education-students perspective
- To suggest measures to reduce the negative effects of lockdown on education

3.Research Methodology

Empirical research with a descriptive research was adopted for study and analysis, by administering a questionnaire through Google forms to a sample of 110 Higher education students from different colleges and different courses with in Hyderabad. Since it was hard-to-reach the target populations during COVID-19 lockdown a snowball sampling technique was adopted for the study.

4.Literature Review:

The current crisis is not of the pandemic alone. Rather, it is of the far-reaching consequences on human behavior. Novel corona virus truly remains invisible except under microscopic lens. This virus has a superfast spread and by the time victims understands about them having been hunted by this invisible assassin, they already are firing salvos at other unsuspecting preys. As there is no medicine to kill novel corona virus disease Covid-19 remains invincible in a sense. It runs its course in an infected person and then leaves the body like any other viruses. During the course of stay, novel corona virus aggravates many of existing health conditions, particularly those related to heart, lungs, kidney, cancer and diabetes. The only way, health experts have been saying, is to stay clear of novel corona virus. Don't let it

reach your respiratory tract. On the basis of what health experts suggest, here is what can protect you from novel corona virus: Social distancing

Social distancing: This is the phrase they use. This is the principle that was used in China earlier and has been used in India now to enforce lockdown. Stay indoors is the mantra for survival. If you go out, novel corona virus may come home. Researchers are well on their way to discovering vaccines and treatments for the virus, but even in a best-case scenario, these are likely to be 12-18 months away. Until then, extreme social distancing is pretty much the only intervention available to help individuals stay healthy, and to break the chain of transmission - giving more vulnerable populations a fighting chance of surviving this pandemic.

The ability of individuals who are asymptomatic or have mild symptoms, but can still spread the disease, explains why social distancing – limiting contact with others – in addition to other actions such as washing your hands and not touching your face, is so critical. The World Health Organization is beginning to ask it as physical distancing instead to emphasize the importance of being distant enough to avoid infection from the respiratory droplets that carry the virus.

Noting that lockdown has great repercussions for economy, society and psychology, Union Health Minister Harsh Vardhan in the exclusive interview to The Hindu said that lockdown has its socio-economic implications, in addition to the health-related issues. "Given the diversity of a country like India, it becomes essential to use this extreme strategy very judiciously," he said.

By considering the impact of Covid-19 lock down on various spheres of economy, this paper is primarily trying to focus on the academic side of the student education system based on student perception.

A nationwide lockdown, ordered by Prime Minister Narendra Modi in late March, led to home educating India's school-age population of around 300 million. Forcing all the educational institutions across India to temporarily shut and this resulted in creating a big gap in the education system despite the central and state government doing their best to provide support for e-learning and online education.

As per the guidelines given by the government and Universities Grants Commission , to ensure the academic calendar doesn't suffer much disruption on account of the lockdown several schools and colleges across the country are now starting to provide online classes to help students continue their education from the comfort of their homes and bridge the gap. The National Council for Educational Research and Training (NCERT) has also developed a curriculum to suit the online education pattern.

Top educational institutions of India like Indian Institute of Technology Delhi (IIT-D), Delhi University (DU), Jawaharlal Nehru University (JNU), Jamia Millia Islamia (JMI), Netaji Subhas University of Technology (NSIT), and more have stopped their offline operations and have shifted to their teaching-learning procedure online. In addition to the online classes, the Universities and colleges are encouraging students to take up online courses to prevent loss of studies amid the shutdown

All India Council for Technical Education (AICTE) launched 49 e-learning courses for free. Amid closed academic institutions, postponed exams and delayed results, AICTE e-learning courses will not only prevent academic loss of students but will also help students utilize the COVID-19 lockdown period effectively by upgrading their skills. Other than promoting online content on applications such as Diksha and e-Pathshala, India's Ministry of Human Resource Development has said it is working on dissemination of lessons through radio and television. State education departments are creating their own models based on local needs.

Amidst of all these elevating efforts by the government and the concerned boards, to bridge the gap raised because of this lockdown, many of the educationalists are worried over a digital movement in education threatens to cut off a sizeable number of students. Only about a third of the students will have access to any online content. It could be difficult for parents, especially in rural and marginalized communities, to understand that content.

Although about 78 percent of India's 1.3 billion population has mobile phones, teledensity in rural areas is around 57 percent, according to the Telecom Regulatory Authority of India, These numbers are not conducive to virtual classrooms for the majority. According to the officials, students in the colleges are better off in using the online facilities for their academic purpose than the school students. Professor Anil Sahasrabudhe, chairman of All India Council for Technical Education said, the number of users accessing online courses has swelled to 7.58 million.

Though, online lessons are helping educational institutions around India beat the Covid-19 lockdown to push ahead with the academic calendar. But the trend has raised many concerns among educational experts, including those at UNESCO and UNICEF. While some have expressed alarm about the potential dangers of internet exposure for young children, others say they are scared the digital shift may alienate economically disadvantaged students who don't have access to the technology.

In between many different perceptions about these digital classes among the educationalists, university boards and government an attempt has been made to consider the view and perception of the students about the decision of digital classes, **through an empirical research with a descriptive research was adopted for study and analysis, by administering a questionnaire through Google forms to a sample of 110 Higher education students from different colleges and different courses with in Hyderabad .**

The students were asked about their perceptions regarding the lockdown, effect of lockdown on their psychological wellbeing, their educational aspects and many more. The analysis was taken up based on the data collected and analyzed, the findings can be summarized as:

- More than 96% of the students agree and accept that the decision of implementing lockdown to curb the unexpected pandemic – covid-19 was appropriate
- Even though around 30% of the students have a different opinion, most of the students are under the perception that this lockdown will have an impact on their learning prospects.
- More than 60% of the representative sample size is accepting that online teaching is not as effective as real time teaching and they are also emphasizing that the mode of online teaching has been adopted merely to complete the syllabus.
- It is also observed based on the respondents answers that, students are losing their interactive learning skills because of these online classes resulting in to loss of interest in their academic activities
- Based on the responses received, it is understood that continuous lockdown and unexpected changes in the curriculum and schedules, resulting in psychological stress on the students which may have a negative impact on their forth coming career.
- There was a clear indication of responses which says that class room teaching is more beneficial than online teaching as the respondents have unanimously opted for class room teaching

- Even though online teaching was more flexible than class room teaching with respect to certain factors like time, place etc, students are against continuing with these online classes in future.

5.Suggestions

Responses given by the sample respondents, clearly indicates that continuous homebased learning has its own disadvantages or negative impacts like,

- Psychological stress,
- Loss of interpersonal skills,
- Long-term impact on their career opportunities
- Loss of interest in academic activities
- Hence to mitigate these negative impacts, it is suggested that the families have to play a major role, as it is always seen that families are central to education and psychological wellbeing of a child.
- Measures should be taken by the schools /universities to make these online classes moreinteractive by choosing proper tools/platforms, rather than simply concentrating on cost cutting applications.
- The concerned boards with the help of Governmental bodies should take measures and organize programs to boost the confidence and psychological wellbeing among the students and to council the students to make them understand that this is not something which is going to last for a longer period and once the situation becomes normal they will be assisted personally by their teachers or institutions both on their academic front as well as career wise.

6.Conclusion

Based on the above analysis, it is understood that even though online teaching is being seen as advancement in the field of technology or development of the country towards digitization by most of our educationalists, economists or government as such we can observe a different outcome from the student's perspective. The findings clearly indicate that students are not really satisfied or feeling that they are

actually benefiting based on these online classes rather they are considering it as only one of the options in the current situation which they are not interested in continuing as such after lockdown. Hence, according to the student's perspective, even though online classes are being considered as an option to bridge the academic gap generated by the sudden lockdown, it is not fulfilling the real purpose of education. As such, most of the students are interested in direct, interactive class room teaching when compared to these online classes

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2

IS ONLINE LEARNING A BOON OR A BANE DURING PANDEMIC? – PERCEPTION OF BUSINESS MANAGEMENT STUDENTS

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Abstract

In today's global covid-19 pandemic scenario, life has changed and is at the extent of struggling for its very survival. The novel corona virus has largely affected the global Economies, Industries and the Education system at large across the world. This paper attempts to present the perception of students in the wake of shift of the education system from the traditional learning to the e-learning platforms with the enablement of the technological resources. The research article also emphasizes on the challenges that are faced by the students in the process of e-learning, and also intends to give a scope for wide spectrum of learning opportunities and various prospects for e-learning as a mode of instruction in the future especially during the lockdown periods. For this study, a survey was conducted in which the participants were drawn from the post -graduate level Business Management students with a convenient sample size of 129. A questionnaire was designed, and the data was collected through google forms and it was analyzed through statistical technique of cross tabulation, means and percentages to discern the significant insights. It is hoped that the findings of the study would contribute to fine tune the online classes to the likings of students, besides chipping in some knowledge in the topical area. Finally, the research article includes the findings and suggestions.

1.Introduction

The novel corona virus outbreak has been declared as epidemic in more than a dozen states and union territories of India in the third week of March, where provisions of the Epidemic Diseases Act, 1897 have been appealed, and the educational institutions and many commercial establishments have been shut down. The COVID – 19 pandemic is such a storm that has successfully attempted to alter the education systems in both the local and global scenarios that has resulted in a paradigm shift to online education (Teaching & Learning) entailed by the sudden closures of the institutions impacting the students to larger extent world-wide. In response to the

closures, the Universities have recommended the use of distance learning programs and various open educational applications that schools, and teachers can use to reach the students remotely and thus limit the disruption in education (UNESCO, 2020).

It has become an existential problem which has to be understood and dealt with a might that would enable the students to overcome the challenges of remote learning that is vital during this lockdown situation to yield better learning experience and be future ready. In this time of crisis, a thorough and effective educational practice is what is needed for the capacity-building of the young minds to thus enabling continuous learning process. It will develop skills that will drive their employability, productivity, health, and well-being in the decades to come, and ensure the overall progress of India.

2.Objectives

1. To identify the various sources of noise to the communication in the online classes
2. To find out the extent of interaction with and by the students in the online classes
3. To find out the level and extent of comprehension of the students exposed to online teaching
4. To identify the various pros and cons of online teaching and learning during lockdown.

3.Purpose of Study

The main purpose of this study is to identify the major challenges, opportunities, and effectiveness of online classes that are observed by the students during this sudden havoc of lockdowns because of novel corona virus that has forced the students across the globe to shift from the traditional classroom training to electronic learning.

4.Review of Literature

In the review of literature, an attempt has been made to bring out the main findings of the earlier studies bearing on the online instruction in the wake of corona virus lockdown and earlier to that also, besides news about the institutional attempts world-wide to mitigate the damage caused to the education. In the following pages, reviews are arranged in the order of institutional arrangements to tackle lockdown due to coronavirus, Barriers to Technical Aspects (Noise), Interaction with & by the Students, and Comprehension.

5. Institutional arrangements to tackle lockdown

Most governments around the globe have momentarily closed educational institutions in an attempt to contain the spread of the COVID-19 pandemic. For the same, on 16 March 2020, India declared a countrywide lock-down of schools and colleges. These nationwide closures are across the globe are impacting almost 70% of the world's student population. Several other countries have also implemented localized closures impacting millions of additional students disrupting the learning, (UNESCO).

UNESCO is supporting countries in their efforts to alleviate the immediate impact of the school closures, particularly for more weak and disadvantaged communities, and also to facilitate the continuity of education for all through the remote learning, ("COVID-19 Educational Disruption and Response"). Online learning has become a critical lifeline for education, as institutions seek to minimize the potential for community transmission (Murphy, Michael P. A. 2020). "Educational institutions to reconsider the current delivery and pedagogical methods in school and higher education by seamlessly integrating classroom learning with e-learning modes to build a unified learning system", ET (Economic Times). ET mentions that in response to the pandemic, many schools moved to online distance learning via platforms like Zoom. The Organization for Economic Co-operation & Development (OECD) has created framework to guide an education response to the COVID-19 Pandemic for distance-learning. Technology can enable teachers and students to access specialized materials well beyond textbooks, in multiple formats and in ways that can bridge time and space ("OECD").

5.1 Barriers to Technical & Non-Technical Aspects (Noise)

There were several studies that were taken up to assess the role of technology and its impact in creating a hurdle in online learning far and between emphasizing on the technical distance that refers to differences in access to technology or technological capabilities across various students throughout the world. It may also refer to different individual competency with technology. The Internet has made electronic or online learning probable, many researchers and educators are interested in online learning in order to enhance and improve student learning outcomes while contending the reduction in the various resources, particularly with reference to higher education (Farinella, Hobbs & Weeks, 2000; Kim & Bonk, 2006; Pape, 2010). The Internet resolved many of the challenges experienced by students in correspondence and broadcast media based courses, although with the expected, large number of technical issues in the beginning. The initial days of the Internet saw a lot of hindrance from the participants due to various reasons like instability across the telecommunication systems, disjoint online communication and difficult

user interfaces or navigational issues (Rohleder, Bozalek, Carolissen, Leibowitz, & Swartz 2008), inability to access needed resources (O'Hanlon, 2001) and also the existence of a user base with fewer online skills, that were also combined with a deficiency of the technical support. Even though the Internet has greatly reduced the issues in the correspondence and broadcast delivery systems for online distance education, some dread existed that the worldwide telecommunication network would be inept to accommodate the rapid expansion of the Internet (Galusha, 1997). Still, the ease of accessibility, fast communication among teachers and students, and relative cost effectiveness of using the Internet for distance education overshadowed the potential and perceived drawbacks (Hansen, Shinkle, & Dupin, 1999). These obstacles to education at a distance affect both actual communication and disrupt how participants perform and feel about their learning experience (Jones, 2010) Many see mobile technology as a source to outspread the reach of distance learning. Mobile learning does not always seek to replace the traditional classroom learning or the laptops in distance learning Rather, mobile learning provides the students with supplementary and exceptional learning support, also the flexibility of access, availed with broader channel of communication, and few temporal and spatial limitations. (Donaldson, 2011) Students express "a desire to control and maintain a boundary between academic and personal life by limiting cell phone communication to things like texting" (Donaldson, 2011). Keegan (1986) stated that a critical link in communication in distance education was absent, that was caused by the geographic separation between the teachers and the students.

5.2 Interaction with & by the Students

The interactions between students and the teacher can be offline or online communication, with the teachers facilitating learning, delivering information, answering questions, and providing timely feedback. At the same time, individual students can take the initiative to ask questions or to contact the teacher for doubts clarification. The interactions among students provide them with a way to exchange their varied ideas and information among their peer groups. This can occur between individual students, in group projects and group discussions, in case studies, etc., and can stimulate the sharing of knowledge, collaboration, enhancing skills and imparting student learning. With instructor-student interactions being the key to successful online education, the more often those connections occur, the more engaged the students are in their courses (Rao & Tanners, 2011). Whipp and Lorentz (2009) in their study have suggested that to maintain effective interaction, instructors in online courses ask challenging questions, probe for elaboration and explanation, provide timely, clear, and concise responses to students' help-

seeking, offer direction and guidance of discussions to prompt all students to participate, focus on specific issues in discussions, and summarize contents weekly. Brindley, Blaschke, and Walti (2009) outlined more strategies in great details, including facilitating learner readiness for group work; providing scaffolding for developing skills; establishing a healthy balance between structure (clarity of task) and learner autonomy (flexibility of task); nurturing the establishment of learner relationships and a sense of community; monitoring group activities actively and closely; making group tasks relevant for learners; choosing tasks that can be best suited for being performed by a group; and providing sufficient time for collaborative learning activities. Yuan Kim stated Online learners benefit greatly from online learning communities in the following ways: (1) because of their connectivity with one another, they are able to share knowledge and fulfill common goals, which can reduce students' dropout rates; (2) the relationship and interaction between the instructor and learners and among peer learners can increase student performances and their level of satisfaction of the program; and (3) the learners can obtain help and support from their peers and also can enhance their knowledge base through their interactive actions (Yuan & Kim, 2014).

6.Comprehension

The various studies implicate that the level and the extent of comprehension of the students in online teaching varies on the dimensions or factors like the understanding of the content, the usage of materials like power point presentations, nature of the subject and the impact from the presenter being known or an unknown presenter along with various other factors. Brown and Liedholm (2004) found that there was significant diversity in both the order in which the learners used the course materials (ranging from content for textbooks, media-enhanced PowerPoint presentations, video lectures, interactive and individualized Excel-based practice numerical problems, and repeatable, low-stakes practice questions) and the value they placed on different content and materials for learning. They concluded that additional tools and variegated materials in a course would be more beneficial than the exclusion of them. The Handbooks of Research on Educational Communications and Technology has covered substantial ground on online education and learning, ranging from the theoretical foundations of the content, different types of technologies and tools, the instructional design approaches & strategies, and finally the learning models (Jonassen & Driscoll, 2004; Spector et al., 2008). There are also practical resources that offer and provide innovative ideas to promote active learning online with ready-made adaptable activities, specific examples of what can be done focusing on the content knowledge, case studies detailing actual teaching

practices, tips for effective pedagogical usage and technologies that are based on traditional theories combining with the latest research studies in cognitive learning process (Bennett, Marsh & Killen, 2007; Boettcher & Conrad, 2010; Thomas, 2011).

Other factors such as the structure and existence of learning communities, the type of online learning activities, varied materials, formative assessments, and the level of students' active engagement also play vital roles in determining the outcomes of the two formats (Hiltz et al., 2000; Brown & Liedholm, 2004; Wang et al., 2006; Blitz, 2013; Tsai, Tsai, & Lin, 2015)

7. Research Gap

As the reviews of the above studies indicate that a very few studies have been conducted on online mode of learning during the pandemics to handle these sudden standstill changes affecting the students at large thereby giving transition to the Education system globally. Hence, I have taken this study as my research area.

8. Methodology

This study is mainly of exploratory and descriptive in nature using the qualitative research approach and the study was taken up in Hyderabad and some villages across, Telangana State, India. The Data used for the study is of primary nature and data was collected from the sampled students drawn from the various Business Management Schools that were suddenly closed during this lockdown. The survey was taken in an online mode abiding by the restrictions of the Government in the State during the pandemic COVID-19.

9. Sample Size & Sampling Technique

For this study, convenient sampling technique was used to select a sample of 129 students pursuing their Business management studies in the Hyderabad city of Telangana State as my study basically is exploratory and descriptive in nature.

10. Research Instrument

For collecting the data, a structured questionnaire in a Google form was designed and used as a primary instrument of data collection. The questionnaire used a four-point Likert-scale ranging from "Strongly

Dimension 1: Technical Aspects

Agree

(SA)”

(scoring as 4) to “Strongly Disagree (SD)” (scoring as 1), as the Likert-scale being the most widely used technique for descriptive survey studies, with both closed-ended and open-ended questions. The secondary data was collected from various journals, research articles and Internet was also explored.

10.1 Data Collection Procedure

A Google form was used for creating a structured questionnaire and it was administered to the students through e-mail and various student WhatsApp groups to get the response from the target group, after the purpose of study was explained to them with assured confidentiality.

10.2 Analysis of Data

The questionnaire was administered to a sample of 129 business management students and the responses were recorded for the demographic variables and for the questions that were constructed according to a 4-point Likert scale.

Table showing the Composition of the Sample - 129

Average Age of Students	Residential Status of the Students (In %)		
	Urban	Sub-Urban	Rural
22	78.4	9.6	12

The responses were cross tabulated and analyzed and following are the interpretations for each dimension.

As to analysis to address the first objective, i.e., to identify the various sources of noise to the communication in the online classes, the study states that as far as the technical aspect is concerned the respondents slightly agree(2.609) and opine that the online classes are clear with clarity, internet facility is hassle free with enough accessibility. They also opine that they experience household disturbance and device related issues at times. But they opine that over-all they fairly agree that the classes are technically hassle-free.

The states as the with and students the agree opine online students questions teacher answers

S. No	Questions	Mean Value of the responses
1	The e-classes are clear with clarity	2.844
2	Usage of Internet facility is hassle-free	2.512
3	There is enough internet access to enable learning with my phone or laptop	2.573
4	There is household disturbance distracting you during classes	2.674
5	Have device related issues	2.441
Mean Value of the Dimension		2.609

above table that as far Interaction by the is concerned responses (2.535) and that during classes the can ask freely, also promptly,

and they find the sessions to be interactive. The students also opine that it would have been better if the teacher was face to face for better understanding of the concepts. But they opine that over-all they slightly agree that the classes are Interactive and enable interaction with and by the students.

Dimension 2: Interaction		
S.No.	Questions	Mean Value of the responses
1	Having face to face contact with teachers enable them to explain concepts better to my understanding	3.17
2	You can freely ask questions during the e-class	3.162
3	Teacher answers to your questions promptly	3.341
4	The sessions are interactive (Two-way)	3.5
Mean Value of the Dimension		2.535
Dimension 3: Comprehension		
S.No	Questions	Mean Value of the responses
1	Do not find any difficulty in understanding the content	2.736
2	For a class, you are comfortable with a power point presentation	3.224
3	Class without a power point presentation is effective	2.077
4	There is difficulty in dealing online classes for practical papers (quantitative)	2.952
5	There is difficulty in dealing with theoretical papers	2.186
Mean Value of the Dimension		2.629

The above table states that as far as the extent of Comprehension is concerned the respondents agree (2.629) and opine that they are comfortable with a power point presentation during online class and they also opine that they understand the content but they find difficulty in understanding a practical quantitative paper in comparison with a theoretical subject.

The study observes that the students find the online classes effective when compared to the offline classes and the respondents rated the effectiveness of these classes as 62% as they could enable learning in a convenient manner. After examining the open-ended questions in the questionnaire, regarding the prospects of the online classes, the students stated that they find these online classes come handy during the lockdown period with certain Pros and Cons as mentioned below:

11. Pros or advantages of online classes

- Enables learning a new technology
- An easy way to learn through mobile phones
- Reduce Travelling Time & Cost
- Enables on-time completion of the syllabus even during the pandemic
- Easily Accessible
- No disturbance made by peers
- Interactive
- Comfortable to manage

12. Cons or disadvantages of online classes

- Internet related issues
- Data and gadget related issues
- Lack a **real-time** interaction
- Lack of understanding especially for Quantitative subjects
- Health related issues like headache and fatigue

13. Findings & Conclusion

The analysis of primary data obtained through questionnaire, and the secondary data from various publications including literature review has enabled me to unravel the various findings of which the following are the significant ones:

1. The study suggests that 55% of the respondents have opined that the online classes are clear with clarity causing no hassle for the continuation of the classes.
2. The major problem according to the respondents regarding the technical aspect is that they find device related issues and household disturbances during the classes.

3. The respondents are also of the opinion that their over-all online class experience is technically hassle-free.
4. It is found out that the students find the interaction during the class to be interactive but lack understanding at times, but they find the teacher to be prompt in answering the questions.
5. The study states that the students find the class effective with a power point presentation as they can understand and relate to the concept better.
6. It is found that the students find difficulty in dealing with the practical or quantitative subjects which would be better understood with the usage of chalk and talk traditional learning method rather than an online platform.
7. It is found that the students are satisfied with this method of learning during the pandemic for which they rated as 62% for the effectiveness of the online classes.
8. The study also states that the online classes have been a boon in this pandemic for enabling learning process and for completing the syllabus on-time.
9. The study also emphasizes that the online classes reduce the level of strain, travelling time and its associated costs.
10. It is also found that the online learning enables the students to learn new technologies & help them enhance their skillsets and they find learning through mobile phones at ease.
11. When asked to mention about the cons of the online learning, most of the students opined that apart from the disadvantages mentioned in the point numbers 2, 4 & 6 of the above they opine that they have adverse effect on health (headaches & fatigue) and they also express that they lack emotional content of communication during online learning.

13.1 Conclusion

Going by the findings and keeping them in view we can conclude that the online classes can be used and treated as a boon during these times of pandemic or other types of lockdown times to mitigate the damage to the students at large but it cannot be a substitute to the traditional classes, rather can be a supplement to combat the current unforeseen scenario of COVID – 19 caused by the novel corona virus.

13.2 Limitations of the Study

1. As the convenient sample is used in the study the findings may not be reflective of the true population of the students
2. As the study is exploratory in nature, the inferences may be taken as probable generalizations for further definitive studies.

14. Recommendations for further studies

Due to the prevailing condition caused by the novel corona virus and its impact on the education emphasizes on the fact that there needs to be a continuity by leveraging the remote learning to ease the learning process for the students. So, it is recommended the need to further studies to identify the opportunities and the challenges posed by online learning. Furthermore, empirical research should be carried out to authenticate on not just the technical aspects afflicting the learning process but also, the need to focus on the non-technical aspects impacting the remote learning.

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3

THE COVID-19 EFFECT ON EDUCATION: CHALLENGES AND OPPORTUNITIES - A CASE STUDY ON ONLINE CLASSES TAKEN BY THE AUTHOR FOR UNDERGRADUATE STUDENTS

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Abstract

The lockdown due to COVID-19, has made a major impact on education, in terms of the mode of delivery, assessment and evaluation. Teachers and students alike had to change and adapt to the growing demands of teaching and learning from home. This paper addresses the need to provide online learning to students and also at the same time focuses on how the teachers are working towards achieving their goal of tutoring students, by adopting the various tools to facilitate online learning. It tries to explore the mindset of both the students and the teachers and the challenges to be overcome by looking at the opportunities that have risen due to the current crisis. Finally, it also looks at the road ahead, where online classes may become part of the curriculum, given the exponential way COVID-19 has grown and made its impact on education, centered around learners and teachers.

1.Introduction

Ever since the World Health Organization(WHO) assessed that COVID-19 was a pandemic on 11 March 2020, the world was and is still caught up in the web of COVID-19 pandemic. Educational institutions are clamoring to tide with the wave of uncertainty in holding regular classes amidst the growing crisis. There has been paradigm shift from holding traditional classroom -based education to virtual classrooms. This facilitates in maintaining the continuity in teaching and learning by changing the means of delivering education through online classes.

According to All India Survey on Higher Education (AISHE)_[1] report 2018-19, the total enrolment in higher education has been estimated to be 37.4 million and the Gross Enrolment Ratio (GER) is 26.3%, which is calculated for 18-23 years of age group, and 60.53% colleges are located in rural area.

United Nations Educational, Scientific and Cultural Organization (UNESCO)^[2] gave 10 recommendations to ensure that learning remains uninterrupted in this pandemic crisis and these recommendations are elaborated briefly:

1. To use technology based on the network connectivity and the digital skills of both teachers and students.
2. To make learning accessible to all, irrespective of their social strata (especially the low-income groups), physical disabilities etc.
3. Assess the resources before being uploaded to ensure security and privacy.
4. Maintain contacts and interaction with stakeholder viz. students, teachers, parents and educational institutions, to address the psychosocial challenges.
5. Explore and plan the schedule to complete the content, especially of affected zones.
6. Provide orientation and support for teachers and parents.
7. Avoid the use of too many tools, that will only lead to overload.
8. Define new rules to monitor learning patterns of the student.
9. Plan the classes and its duration limiting it to a short time.
10. Create communities of support for teachers, parents, students and institutions.

2.Statement of the Problem

Education is a life-long learning process. And we have to find ways and means of connecting both the teachers and students, and study the various tools that are available for online classes. It is very important that students have to be engaged in active learning, lest they forget what they studied when they last attended classes in the traditional classrooms. And it is equally important to keep them focused in their pursuit of their goal to secure a degree.

3.Objectives

- To understand how online classes were implemented and the tools and devices used.
- To analyse the perception of the student community towards online classes.
- To know the impact of online classes in terms of understanding concepts and clarity towards the future of online classes.

4.Research Methodology

The study is confined to the students pursuing B.Com Computers at Loyola Academy. It was undertaken using primary data collection by sending online forms to respondents comprising of students from undergraduate programme of all three years separately.

The study also gathered information from secondary sources through the various publications available on the internet. The sample size of respondents for first year is 60, second year 59 and third year 54 respectively. Total sample size is 173 respondents.

5. Online Tools

Teaching and learning can be facilitated to connect, communicate, and collaborate. Several tools that are free to use are offered by many vendors such as Microsoft Teams, Zoom, Skype, GoToMeeting etc as well the far more advanced ones like WebEx etc, When we take a look at all these tools, one thing is common to all and that is, it can be used to host a virtual event.

6. Teaching Methodology

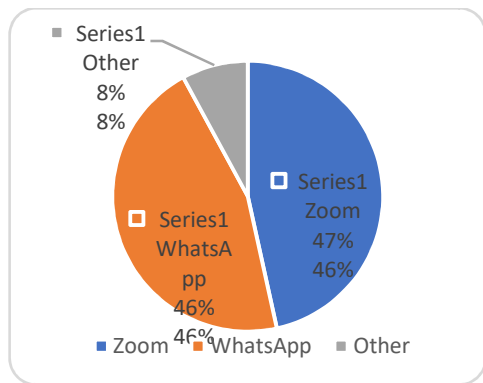
The online classes were conducted with audio-video aids and powerpoint presentations. All the information was sent in the form of files to their **WhatsApp** groups that were specifically created for the conduct of online classes as well **Zoom** video conferencing tool. The material was also sent to their email addresses. The students were given the schedule in advance for online classes indicating the date, time and number of hours.

7. Data Analysis and Interpretation

Objective-1: To understand how online classes were implemented and the tools and devices used.

1.1 Tools used for online classes

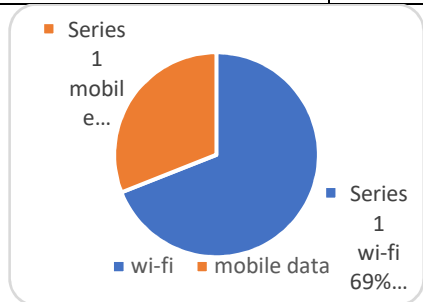
S.No.	Options	No. of Respondents	Percentage
1	Zoom	81	47%
2	WhatsApp	79	46%
3	Other	13	8%
Total		173	100%



From the given chart it is evident that the majority (47%) of the students prefer Zoom, whereas a close 46% prefer WhatsApp, while only 8% have opted for others like Meet, Duo etc.

1.2 Mode of network connectivity, if using smartphone.

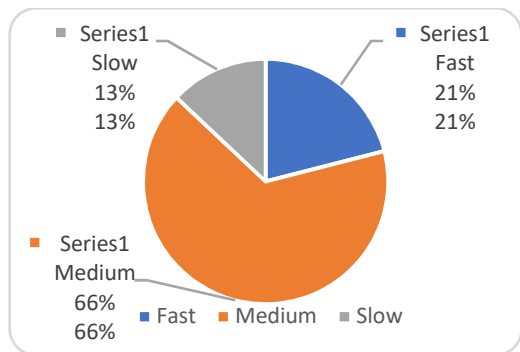
S.No.	Options	No. of Respondents	Percentage
1	Wi-fi	97	69%
2	Mobile data	76	31%
Total		173	100%



From the given chart it is evident that the majority (69%) of the students have wi-fi, while only 31% have mobile data connectivity.

1.3 Network connectivity speed

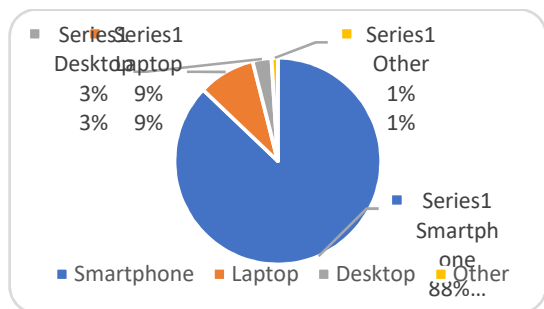
S.No.	Options	No. of Respondents	Percentage
1	Fast	37	21%
2	Medium	114	66%
3	Slow	22	13%
Total		173	100%



From the given chart it is evident that for the majority (66%) the connectivity speed is medium, 21% fast and only 13% have slow speed connectivity.

1.4 Access device for online classes

S.No.	Options	No. of Respondents	Percentage
1	Smartphone	151	88%
2	Laptop	15	9%
3	Desktop	4	3%
4	Other	2	1%
Total		173	100%



From the given chart it is evident that the majority (88%) of the students have a smartphone, 9% laptop, 3% desktop and only 1% other devices.

1.5 Clarity in the audio/video lectures

S.No.	Options	No. of Respondents	Percentage
1	1	13	8%
2	2	11	6%
3	3	35	20%
4	4	52	30%
5	5	63	36%
Total		173	100%

From the above it is clear that 66% of the respondents found there was clarity in the audio-video lectures. However only 14% found it was not satisfactory.

1.6 Ability to receive the lectures completely

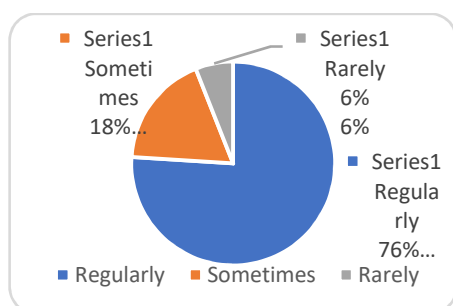
S.No.	Options	No. of Respondents	Percentage
1	1	9	5%
2	2	11	6%
3	3	28	16%
4	4	61	35%
5	5	65	38%
Total		173	100%

From the above it is clear that 73% of the respondents found that they could receive the lectures without any disturbance, while 11% found it was not satisfactory, while the remaining 16% were neutral.

Objective-2: To analyse the perception of the student community towards online classes.

2.1 Frequency of attending online classes

S.No.	Options	No. of Respondents	Percentage
1	Regularly	132	76%
2	Sometimes	30	18%
3	Rarely	11	6%
Total		173	100%



From the given chart it is evident that the majority (76%) of the students attended the online classes regularly, while 18% said sometimes and only 6% said that they rarely attended classes.

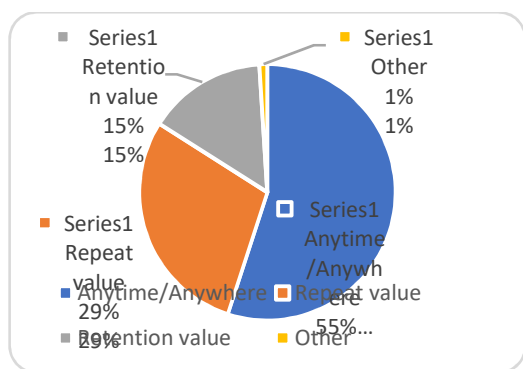
2.2 Understanding the topic being delivered

S.No.	Options	No. of Respondents	Percentage
1	1	19	11%
2	2	9	5%
3	3	28	16%
4	4	76	44%
5	5	41	24%
Total		173	100%

From the above it is clear that 66% of the respondents found that could understand the lectures, while 16% found it was not satisfactory.

2.3 Benefits of online classes

S.No.	Options	No. of Respondents	Percentage
1	Anytime/Anywhere	95	55%
2	Repeat value	50	29%
3	Retention value	26	15%
4	Other	2	1%
Total		173	100%

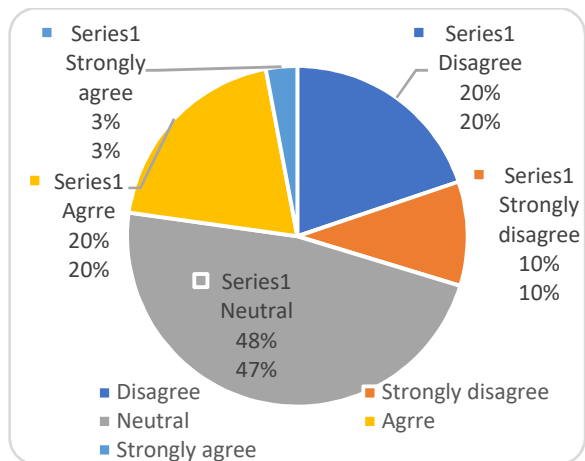


From the given chart it is evident that the majority (55%) said that online classes can be accessed anytime/anywhere, while 29% for its repeat value and only 15% said that it has retention value. Only 1% did not have anything to say.

Objective-3: To know the impact of online classes in terms of understanding concepts and clarity towards the future of online classes.

3.1 After lockdown is removed preference for online classes

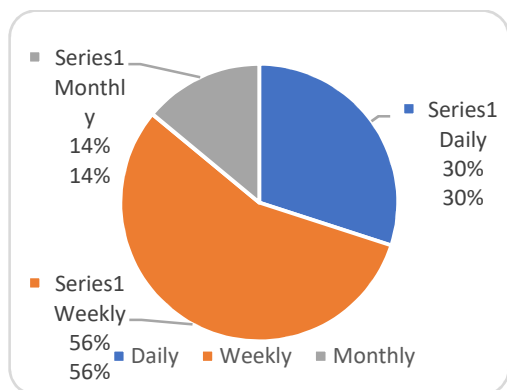
S.No.	Options	No. of Respondents	Percentage
1	Disagree	35	20%
2	Strongly disagree	17	10%
3	Neutral	82	48%
4	Agree	35	20%
5	Strongly agree	4	3%
Total		173	100%



From the given chart it is evident that the majority (48%) were neutral, and 23% were positive about it and 30% negative about having online classes.

3.2 If online classes are made mandatory after lockdown, how often should it be conducted

S.No.	Options	No. of Respondents	Percentage
1	Daily	52	30%
2	Weekly	97	56%
3	Monthly	24	14%
Total		173	100%



From the given chart it is evident that the majority (56%) of the students said that it should be conducted weekly, while only 30% wanted daily and 14% monthly.

3.3. Type of classroom preferred by students

S.No.	Options	No. of Respondents	Percentage
1	Traditional classroom	132	76%
2	Virtual Classroom	41	24%
Total		173	100%

From the above it is evident that majority (76%) preferred traditional class room and only 24% preferred virtual class room.

3.4 The most interesting part in traditional classroom

S.No.	Options	No. of Respondents	Percentage
1	Personal Contact	67	39%
2	Interaction	97	56%
3	Trust	9	5%
Total		173	100%

From the above it is evident that majority (56%) preferred interaction in traditional class room, 39% personal contact and only 5% had preferred trust in traditional class room.

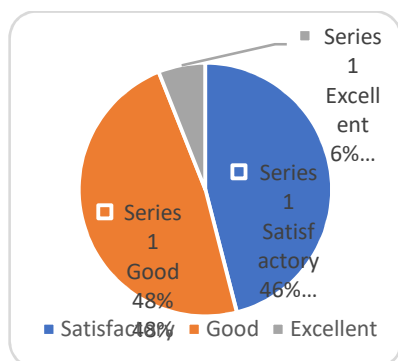
3.5 The most liked part in online classes or virtual classroom

S.No.	Options	No. of Respondents	Percentage
1	Anytime/Anywhere	112	65%
2	Repeat value	52	30%
3	Retention value	6	4%
4	Other	2	1%
Total		173	100%

From the above it is evident that majority (65%) preferred anytime/anywhere 30% repeat value, 4% for retention value and only 1% for other reasons as the best part of online classes.

3.6 Overall impact of online classes

S.No.	Options	No. of Respondents	Percentage
1	Satisfactory	80	46%
2	Good	82	48%
3	Excellent	11	6%
Total		173	100%



From the given chart it is evident that the majority (48%) of the students thought online classes were good, 46% satisfactory and only 6% as excellent.

Findings

From the study we can infer the following findings:

- Majority (47%) of the students prefer Zoom, whereas a close 46% prefer WhatsApp as many of them are aware of these two tools being used extensively for the conduct of online classes.
- 69% students have access to wi-fi, with 66% medium connectivity speed.
- Majority of students 88% used smartphone to attend online classes.
- 73% of the respondents found that they could receive the lectures, and 66% found clarity in the audio-video lectures.
- Most of the students (76%) attended classes regularly and the reason being it had place and time independence, meaning attend anytime/anywhere.
- However, the students were not very strong in their opinion (48% neutral) about online classes after lockdown and said that if it was made mandatory, then it should be conducted on a weekly basis (56%).

8. Suggestions

- Most of the students (76%) preferred traditional class room, hence more emphasis should be placed on having class room interaction (56% votes), and (39%) personal contact, to make online classes meet the demands of the students.
- Since majority of students have a smartphone, teachers should learn to exploit its usage to the maximum. They should educate the students about the optimum use of storage space and how to use it positively and effectively for accessing information.
- While providing audio-video lectures, necessary care should be taken to see that there is right mix of sound and video, otherwise the students may have disturbances in transmission, due to medium network connectivity speed, as most of them were having mobile data connectivity.
- Students found that majority (48%) thought online classes were good and 46% as excellent, hence there is huge potential for tapping the resources and tools to be used, to offer variation in the conduct of online classes, to make it more attractive and interesting.
- Archiving, accessibility, audio-video backups, extended support and classroom management tools^[3] are non-negotiable for the success of online classes.
- The teachers should explore the best tools so as to make it easy to create online classes, without getting into the technical glitches. They should also ensure that the lessons are prepared by them to have an instant connect with their students.
- Online classes should also be interspersed with practical assignments to understand the potential of the student and helping him/her to explore and improvise.

9. Conclusion

The future of online classes looks very bright and promising. Teachers should upgrade themselves in posting lessons online, which are not only to tutor, but also to give assignments to improve the analytical and critical thinking of the student. The students should be taught how to use the Open Educational Resources (OER) and explore the vast amount of information stored in digital resources like Swayam, NPTEL, NLIST etc.

The students also should be made aware of how to spot fake news and malicious software lurking on the internet, which may become a potential threat for their devices, as most of them do not have anti-virus updates. Let us, teachers take it as a challenge and explore the wide opportunities to deliver online lessons, because learning should never stop. The day we stop learning, we stop growing.

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4

IMPACT OF LOCKDOWN ON EDUCATION IN INDIA**P A L N S Kalyani**

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Abstract

India is a rapidly changing developing country with high quality education is inclusive of its utmost importance for the prosperity. The country is currently in a youth bulge phase with its largest youth population in the world, with an approximate veritable army of 600 million young people under the age of 25 years. Nearly 28% of the population is below 14 years of age and the growth rate of population is expected to be around 1% for years. The demographic change will be a powerful engine of economic growth and if India can manage to modernize and expand its education system and raise the educational attainment levels by providing skills to the youth, it can gain significant competitive advantage. The COVID 19 pandemic has affected all educational institutions across the global, leading to closure of Schools, Higher educational institutions and Universities. It has an impact not only on students, faculty members and families but also have far reaching economic and societal consequences. The effect has shed light on various economic and social issues viz., student fees dues payment, digital learning, food insecurity, lack of shelter as well as access to childcare, housing, healthcare, internet and disability services. The impact is even more severe for unprivileged children and their families leading to interrupted learning, child care problems, compromised nutrition and economic cost to families who couldn't work. The present article explains about the impact of COVID19 on Education sector, the challenges and opportunities and recommendations for preparation towards future.

1.Introduction

As a part of the efforts to stem the spread of COVID 19, as a part of preventive measure such as self isolation, social distancing etc., has prompted the wide spread closure of educational institutions all over the world. All the Governments around the world have closed educational institutions temporarily in an attempt to contain the spread of Corona Virus. As per UNICEF, 186 countries are presently implementing nation wise, local closures impacting about 98.5% of world's student population. Examinations were cancelled in many Universities and Institutions. In India, Students of Primary Education upto Class XI were promoted by State Boards and Central Boards; few examinations were postponed and in case of few papers the students were directly promoted. Many Universities took the decision to remove detention policy for the present academic year. The Evaluation process has been stopped for the time being and Entrance Examinations in India, after Class X, Polytechnic, Engineering and Medical Entrances, Professional Courses, PG and PhD Admissions were halt for the time being, leaving the students and

parents into depression about the careers. It has disturbed the placement activity of graduating students as well. The students who took admissions in foreign universities and institutions had to postpone or cancel their admissions due to cancellation of flights. Many universities and Institutions had to postpone the planned FDPs, Seminars, Workshops etc., Social distancing strategies such as cancelling field trips, large gatherings viz, physical education, assemblies, choir classes, yoga, gymnasium, meals in canteen etc were implemented when there is a minimal to moderate community transmission. In addition to this, decrease in the school or examination timings, increasing space between desks, staggering arrival or dismissal timings, limiting non-essential visitors, using spate health location for children with flu symptoms are to be implemented.

1.1 Historical Background

When there was Influenza pandemic during 1918-19 in United states, there was closure of schools and public gathering bans are associated with lower total mortality rate. Peak mortality rates were observed in the cities which delayed the implementation of such interventions. As per a study of 43 United States cities, schools closed for an average duration of 4 weeks in response to the Spanish Flu. During 1957-58 Asian Flu outbreak, It shown to reduce morbidity from the Asian Flu by 90 percent and also could able to control influenza upto 50% during 2004-2008. During 2009 H1N1 flu pandemic, school closures have successfully slowed the spread of infections in multiple countries, such closure and other social distancing measures were associated with a 29%-37% decrease in Influenza Transmission rates.

During the second week of March 2020, state government across India began to shut down colleges and schools temporarily as a measure to contain the spread of COVID19 it has an impact on more than 285 million young learners in the country but also engendering far reaching societal and economic consequences.

When the closure takes place, the structure of learning and schooling, teaching and evaluation methodologies are the first to be affected. Only a handful of premiere institutions can adapt online teaching methodologies. Due to lack of access to e-learning solutions, the low income private educational institutions and government schools have to completely shut down their operations. Many child missed Mid Day meal programme offered by Governments, subject to social and economic stress.

The Pandemic also disrupted the Higher education sector, the critical determinant of a nation's future. Many Indian students, after China, enrol in many Universities abroad, especially in countries like US, China, UK and Australia where the pandemic was worstly affected. Many Indian students were barred

from leaving these countries. If the same situation exists for a long run, there would be a decline in the demand for Global Higher Education.

The major concern for everyone is the impact of disease on Employment rate. Fresh graduates in India are afraid of withdrawal of job offers from corporates due to the present situation.

As per the estimates on Unemployment by Centre for Monitoring Indian Economy, it was estimated that the unemployment increased from 8.4% to 23% from March 2020 to April 2020 and the urban unemployment rate has been increased to 30.9%.

The Teaching methodologies adopted by the faculty members have been changed from Chalk-Talk to technology driven models due to Pandemic. The disruption in education delivery has pushed the policy makers to chalkout the engagement drive at scale to ensure e-learning solutions and handling the digital divide.

2. Emerging Challenges and Adoption of Technology In Education with special reference to Covid19 Situation

COVID19 has ensured all the professionals across service sector for an easier transition to work from home with their smart devices and laptops. It is missing the personal and face to face to face communication which can be restored when the things are back to normal. There is a need for bigger adjustments for the students as learning has always been in the classrooms. Many students are not well equipped with latest technological tools to avail remote learning. For solving present crisis due to Covid19, Government's vision of Digital India is emerging as vital instrument.

Lockdown time is an ideal time to deploy and experiment new tools for meaningful education delivery to students who cannot go out of campuses. It provides an opportunity to be more productive and efficient and also to develop innovative and improved professional knowledge and skills through online assessment and learning. Through the usage of technology, concept of education changes from teacher centric system to student centric system.

Virtual classrooms and online tools allows the faculty and students to be engaged and close to a real classroom experience. Time and costs of Parents, Teachers, Management will be saved through digital interactivity. Pedagogy acts as an important link between educationalists, course content, course takers and technology in the areas of digital education. With the given constraints viz, telecom infrastructure, internet connectivity, laptop or desktop availability, affordability of online system, educational tools, software online assessment tools etc., technology democratization is an important issue presently.

Technology based education is more reliable and transparent, as it doesn't make any difference between Backbenchers and Front or Boys Vs. Girls.

To tackle the challenges of schools and colleges being closed due to lockdown, Government of India, as well as state governments and other private institutions are publishing information regularly. Initiatives undertaken by Ministry of HRD, AICTE, Department of technical education, NCERT and other organizations is benefitting and supporting the students and youngsters.

SWAYAM is an online platform for teachers; for Undergraduate and Post graduate students MOOCs (Massive Open Online Courses) were introduced for non technology courses; e-PG Pathshala or e-content containing modules were introduced on Arts, Fine Arts, social science, natural science and mathematical sciences. CEC-UGC is an Youtube Channel is being used by many youngsters today; VIDWAN – a database of experts providing information to peer groups and prospective collaborators; NEAT is an initiative by AICTE developed in collaboration with Education Technology Companies, based on the PPP Model to enhance the employability skills.

With single window facility, National Digital Library , the repository of learning resources are helping student and faculty members. Noteworthy initiatives viz., Free and Open source software for education (FOSSEE), spoken tutorials, google classroom, e-Yantra etc, has been taken up. Government of India and state governments is delivering e-education through the creation of infrastructure viz. NPTEL – National Project on Technology Enhanced Learning, NMEICT – National Mission on Education through Information and Communication Technology, NAD – National Academic Depository etc., National Knowledge Network is providing high speed network and acting as backbone to educational institutions in the country.

Courseera is a world wide online learning platform which works with universities and other organizations to offer online courses, specializations and degrees in various subjects. Many private business houses are in the process of product improvement and designing online assessment modules taking into consideration social distancing, limited bandwidth and also by managing remotely proctored skilling assessments or examinations. Usage of technology in the areas of teaching, recruitment leads to new era wherein the best of faculty are available across the globe to the students. The quality of education is gauged not only with the Faculty quality, but also with Information Technology infrastructure quality, faculty familiarization with teaching technologies etc., With digitalization, the physical infrastructure

available at educational institutions will have low impact on educational quality and direct on educational cost.

Faculty members and students started using Zoom, Moodle LMS, Cisco Webex, Google Meets, Zoho etc., for teaching and online meetings. Edpuzzle, Prezi, iRubric, Mentimeter, Quizlet, Visuwords, Google Sheets, Google forms are used for demonstrations. Innumerable workshops are organized by UGC, AICTE, Universities and Private Institutions on usage of Open Source LMS, Software for online classes and interaction, video recording software, LMS for video based learning, Presentation Software, Software for rubrics creation, software for assignment submission, Instantaneous assessment software, learning through gamification, mind mapping software, software for visual effects, software for peer learning and collaborative technologies, software for data collection, online coding platforms, mobile apps for coding, English language learning softwares etc.,

3. Strategies to be adopted

There is a need for designing a long term multi pronged strategy to manage the crisis and building resilient education system in India.

1. Ensuring continual learning in Government Universities and schools is the immediate action to be taken. Learning management software and open source digital learning solutions are to be adopted by the teaching community to conduct online teaching. Strengthening 'Diksha Platform' to ensure accessibility of learning to the students across all the states in India.
2. There is a need for developing inclusive learning solutions for most marginalized and vulnerable community. The technology is enabling personalization of education and ubiquitous access in the remotest parts of the nation as usage of mobile internet in India is expected to reach 85% household by the year 2024. The schooling system can be changed and the effectiveness of teaching and learning will be increased which provides multiple options to teachers and students. Mobile based learning models were introduced in many aspirational areas for effective education delivery.
3. For evolving Demand and Supply trends across the globe, many strategies have been prepared by the higher education sector which are related to global mobility of faculty and students to improve the quality of and demand for higher education in India. There is a need to take immediate action to mitigate the impact of pandemic on research projects, internships and job offers.
4. Need to reconsider the current pedagogical methods and content delivery in school and higher education by impeccably integrating class room learning with e learning modules to build a uniform learning

system. The major challenge faced in Education Technology reforms at the Indian Level is, Indian Education System is the largest and most diversified education system in the world with more than 50,000 Higher Education Institutions and 15 lakh schools.

5. There is a need to establish Quality assurance mechanisms and benchmark for quality in Online learning offered and developed by Indian Higher Educational Institutions as well as rapidly growing e-learning platforms. Multiple courses are offered on same subjects are offered by many e-learning players which offers different certification levels, assessment and methodology parameters etc.,
6. In order to develop sustainable medicines and technologies, Indian traditional knowledge is reputed across the world for its values, scientific innovations and benefits.
7. To serve the larger cause of humanity there is a need for integrating the Indian Traditional knowledge systems viz., Indian medicines, yoga, hydraulics, architecture, ethno botany, agriculture and metallurgy with the presentday mainstream university education.

4. Conclusion

The true vision of New Education Policy for liberal education will be executed, which is possible in times to come. The students are allowed to carryout courses from any University or College based on the teachers' quality and fees for the course irrespective of the location. It enables to secure degree from the home university wherever the student registers or from the university where the student has taken maximum courses, which results in balance of economics of good education. A drastic change in the thought process is required in the mindsets of Authorities, policy makers, institutions, educationalists, academicians, faculty, parents and students. The faculty selection need to be linked with his/her technology friendliness and keenness towards adaption of technology. There is a need for reconsideration of accreditation criteria and parameters. In the decades to come, to ensure the overall Indian progress, there is a need for effective and well rounded educational practice for capacity building of young minds in the crisis times which develops skills, to drive employability, health, productivity and well being. COVID-19 has provided an opportunity to accelerate the adoption of technologies to deliver education which strengthens the India's Digital Learning Infrastructure in the long run.

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5

**TEACHER EDUCATION FOR THE ADAPTATION OF VIRTUAL LEARNING:
AN INEVITABLE MEASURE CREATED DUE TO THE OUTBREAK OF COVID-****19****Meera Joshi**

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Abstract

The outbreak of covid-19 pandemic has traumatized the world in all fronts and fields. The number of covid-19 positive cases is increasing exponentially on each passing day. To control the dangerous spread of pandemic almost fifty percent of the world is under lockdown. The lockdown pressed the system of education to face some situations and challenges like never before. The teaching and learning process is one of the fields which has been thriving to become better and better over the years. In this paper some of the challenges faced by the teacher and the learner are discussed along with some solutions or recommendations with a special focus on the teacher education for adapting effectively to the Virtual learning system of education.

1.Introduction

The access to information at the finger tips has generated demand for internet based teaching and learning. "The learning that takes place partially or entirely over internet" (US Department of education,2010) is defined as online education or virtual education. The educational environment is virtual when the interaction between the student and the teacher is with the help of Information and communication tools or technologies (ICT). Traditionally the on-campus teaching and learning is in lecture halls and laboratories. So far before the outbreak of covid-19 the education was mostly on campus in face-to-face mode. Although in some situations the ICT is used strategically to enhance the students learning experience and it is not a regular consistent practice.

After the outbreak of Covid-19 pandemic we have seen a sudden rise in use of ICT and the virtual teaching learning practices. There was no time gap to absorb this swift and sudden change both for the teacher and the learner. In a way we can say that, it was forced upon them to move to virtual educational

environment due to the necessity of completing the course work in time. The University Grants Commission(UGC) insisted that the course work must be completed through the online educational platforms in order to minimize the loss to the students in terms of not losing an academic year. Due to such circumstances the teachers suddenly started to even think about using online platforms for teaching. The availability of apps for implementation of online education is no doubt very encouraging. In this Scenario it is important to understand whether the teachers and learners are exposed to such practices of performing educational activities with the help of technology. It is also a question which needs attention, whether both are prepared to handle this situation with a positive outcome in terms of having knowledge about usage of various ICT. The virtual education can contribute significantly in the present period of lockdown provided the teacher and the student are aware of the information about ICT and usage of technology to promote virtual education environment. Currently controlling the pandemic is the priority but at the same time moving forward positively with life cannot be neglected. In moving forward, the academic activity is the core for any society. It is important to understand the challenges in this system to make it more productive.

1.1 Evolution of online education

The online education began in late 20th century. In Online education the teaching and learning might not happen simultaneously (Moore & Kearsley,2011). In the initial stages, the online education used chat rooms, instant messaging and texting (Sun, A., & Chen, X. 2016). The invention of @ symbol in 1972 for use in email(Maloney-Kirchman & Abras, 2003) followed by World Wide Web (WWW) in 1991for internet connectivity (Harasim,2000) were adapted as the platforms to host online education. Online education's adaptations later extended to working together via Google drive, Google Docs, Google hangout etc. Later came the era of Massive Open Online Courses(MOOCs) for self-motivated individuals based on their learning goals, prior knowledge and skills (MC Auley, Stewart, Siemens and corner 2010, Schoeder,2012). To provide easy accessibility to quality education by larger segment of learners the model of MOOCs was introduced in 2008 by Universities and Corporate sectors also (Sun, A.& Chen, X. 2016). Some of them which are worth mentioning are Edx in 2012 by Harvard University and Massachusetts Institute of Technology, eduMOOC in 2011 by university of Illinois Springfield., Coursera in 2012 by five universities – Princeton, Stanford, California/Berkeley, Michigan-Ann Arbor and Pennsylvania together.

3.Factors of governing the phenomenon of virtual learning

The factors governing online education can be classified into two categories. They are 1)Infrastructure or facility related 2) Skills required for the teacher and learner.

2.1 Infrastructure/ Facility related: (Both teacher and Learner)

The major factors under this category are the availability of resources like the required electronic device or gadgets, Internet connection with reasonably good bandwidth,access to different types of Information and communication tools (ICTs).

2.2 Skills related

2.2.1Teacher

- Awareness about various Information Communication Tools(ICTs) to make the course more interesting and student friendly. Gaining the expertise over the usage of the ICTs by attending the trainings or by experimenting with these tools which can further contribute to the designing and conducting of a fine quality course .
- Designing the planned and structured flow of the courses in terms of reading material, lectures, assignments keeping in view the clear learning goals.
- Strategizing of assessment methodologies that sync with the level of difficulty and with the learning objective.
- Timely feedback and proper attention to the doubts posed by the learners.

The studies have shown that courses that facilitated increased performance and satisfaction were interactive. This provides the learners with the insight that kind of skill they are learning, its application in the current research scenarios. All of these factors involved in satisfaction come down to instructional and course design. Instructors should provide timely feedback and serve as facilitators of discussion and interaction just as they do in traditional courses. Based on the interest and abilities of the learners the instructor can also help the learners by referring to the resources that lie beyond the purview of the course so that the highly skilled learners can extract the maximum by learning. Courses should provide

opportunities for peer collaboration and sharing of ideas in order to develop an online community of learners, rather than feelings of isolation.

2.2.2Learner

- Awareness about various Information Communication Technologies.(ICTs) and the capability to use it for learning.
- Learner must be self motivated and self-directed so that they could have maximum benefit out of the courses.
- Having good time-management skills to complete the course in certain convenient time limit and pace without procrastinating work.
- Ready to be patient enough to collaborate with peers and colleagues as these collaborations are via digital platforms so they are time consuming processes.

The learner characteristics which contribute to positive outcome of course must be understood critically for optimizing the online learning experience. The online learner needs to be independent along with being aware of their responsibilities. Learners need to work consistently with a positive attitude being aware of needs and good management of emotional factors. In online education system the learner cannot expect a immediate assistance or support for understanding the concepts. So the learner must have patience without getting frustrated till some assistance is found.

3.Positive impact of the process of online Learning

The online learning is effective in giving a firsthand experience by watching the course videos, diagrams, animations etc. It motivates the learners to involve in learning abstract concepts with ease. Online education meets the needs of a student who struggles to learn in conventional classroom due to inhibitions or attitude issues. The learner can communicate with teacher through chat, email or phone in a personalized manner. It gives learner a feel of personal attention by the teacher. This system of learning improves the productivity of learners by enhancing professional skills to meet global demand by choosing a online course which are congruent with the learners career objectives. The access to the course work is easy. It promotes participative learning with the help of discussion boards, assignments, seminars, blogs etc. It is possible to grasp the concepts or theories as the learner can watch the lecture video again and again till the clarity is obtained without disturbing the teacher and one can learn at their own pace without compromising on self-respect. Virtual learning happens a tension free environment because the human

psychological parameters that play a role in influencing the learning of an individual are least in action while in this process.

3.1 The Times of Virtual Learning: Outbreak of the Corona Pandemic

The outbreak of the covid-19 pandemic was very shocking to the whole world as it started shaping as the most dangerous outbreak of a virus since the historic times. Even the education system was forced to accept this challenge. All the education institutes were shut and the students and teachers were not allowed in the institutions premises to hold classes. As a result the entire education system came to stand still point for certain amount of time. It took some time to absorb the shock but the educationists were keen to continue the education of the learners community without friction despite the vulnerable circumstances and the challenges posed by the virus. Then the only solution that surfaced for this problem was to opt to a different mode of learning i.e the online Learning.

3.2 Relevance of online education in present scenario of lockdown:

The online system of education which has many advantages is perfectly suitable or rather inevitable during the lockdown period imposed to control covid-19 pandemic. Since everyone has to stay indoors the only mode of communication with the outside world is through the digital sources or internet web. Hence if the learning has to happen it can happen only through the online classes, emails or various applications. The study material and assignment can be sent and received through mails or applications. In the same way the classes for completion of the syllabus must be conducted online. The online education is more safer compared to the conventional education with the practice of social distancing. The online teaching keeps the spirit of the students intact with regards to their connectivity with their study. Because of the lockdown though the economy of any country might suffer from a crisis but it would be more hampering to the country if its students and the education system loses its stability and track. As once the lockdown resumes, it would be more difficult to streamline the system of the country if the students and the education system goes out of flow. And the prevailing of the online education or the online classes keeps the student herd focused towards learning. As they are constantly occupied with work which implies that this way online learning contributes to the successful prevailing of the lockdown. It also minimizes the negative impact on environment caused due to transportation and manufacturing. Presently it appears that this mode of education is conserving many natural resources like petrol and electricity.

4.Challenges involved in implementation of online education for teachers and students:

4.1 Challenges faced by teachers and solutions/recommendations to overcome challenges:

- The most important challenge which is being faced by teachers presently is lack of resources. The teaching fraternity is not able to access the library physically for reference in preparing reading material and assignments. Though there is an option of accessing the e-books exists yet it does not fulfil the need to the full extent due to copyright issues in most cases the books (especially the prescribed books) could not be downloaded/ accessed. The teachers prepared the reading material with difficulty. The teachers had to type the material or scan it in order to send it to students. In some cases the material was uploaded in their respective websites. Since the situation emerged unexpectedly the reading material was prepared in a very short stipulated amount of time. The efforts were made in shorter time to achieve the learning objectives. This outlines the realization of the requirement that the teachers community though involved in the conventional teaching system should always have a digital copy of their teaching or reference resources as they can be easily shared and help the students in such ordeal times.
- The second issue which had to be resolved was completing the syllabus with the help of online classes. Under normal circumstances there is no institution in India which gives complete priority to the the online education system. Even in all the premiere level institutes or premiere universities the traditional classroom system of education prevails. The awareness with regards to the applications which help in conducting online classes was also almost negligible. The teaching community over came this challenge by gaining awareness about the applications and by learning to use them. They started the online classes. Another hindrance in managing this process was lack of internet connection of good bandwidth and power cuts.
- The faculty is not aware of the various Information Communication technologies (ICT) available for the smooth and effective conduction of online classes. There are various colleges, Universities and institutes which are organizing webinars on ICT. It is a very positive trend which has emerged for enhancing the skills of the teaching community. But one should remember “Rome is not built in a day”. The efforts are being made by the teaching group towards learning tools for conducting effective online classes. They are organizing and attending webinars but that is not going to serve the purpose. They need to master using all the features of the applications/technology by working with it consistently. The whole traditional classroom experience from writing on board to interacting with learners must be brought into the online

class. For making this experience accomplishing the faculty needs to spend time during their home-lockdown period to develop such skills. Experts have expressed that this pandemic will stay with us for quite a long duration it has become mandatory for the teachers to gain these skills at the earliest. The number of experts in the field of ICT is also limited so it is suggested that the teachers explore and find technology which enables them in overcoming this challenge. Even post lockdown for some period it is expected that the teaching learning process is going to be online.

- Another aspect which is not yet addressed by any institute or University is conducting the term end exams or evaluation process in general. In addition to huge strength of student community, lack of resources is making this task difficult. Presently some adhoc measures are being suggested and are being implemented but these measures are going to put stress on the system in upcoming days and months. All the online exams which are being conducted mostly as entrances for admission into universities are in the pattern of multiple-choice questions (MCQS) which are easy to evaluate but the term end exams are a combination of descriptive and MCQS. If they are changed to MCQ pattern the ability of students comprehension cannot be tested. So, a lot of brain storming needs to be done to resolve this problem or a new technology has to emerge so that the things start moving in right direction.

4.2 Challenges faced by students and solutions/recommendations to overcome Challenges

- The most important challenge which is being faced by students presently is lack of resources. 30 to 50 percent of students do not belong to the same place at which the educational institute is located. Most of them are from small towns, small villages or some remote place where the internet access is very negligible. In these circumstances it is impossible for the learners to join online classes. Even contacting through mail is not possible. With this kind of state of affairs, the student is bound to lose a lot of learning activity.
- Another major challenge is that of constructive usage of technology for learning purpose. The awareness about various online learning resources is insignificant among the students. The awareness is better among the students of engineering streams but it is poor in case of students from conventional or non-professional courses. The incident of pandemic was so sudden that the student community was not prepared to handle it. There is hardly a very small percentage of students who are making efforts to utilize the online courses for their skill development.
- As discussed in the previous section in this period of lockdown the students or learners need to be more self-regulated and self-motivated than the normal times. It is observed that the students are not utilizing

the time to optimum in building their potential as they lack the ability to plan, monitor and reflect on the strategies to succeed in academic field. It is observed that there is lack of discipline among the students who are not self-regulated and they delay and postpone the academic work. They are disorganized to the level that they are not utilizing ability of thinking in the pursuit of knowledge. The parents and teachers have a great role in drawing them out of this mindset. The parents can spend time and counsel them about proper utilization of time and their energy. Motivate them to take up some online course for their benefit. The teachers can also motivate the students for proper utilization of time & energy. The teachers can also assign some work related to academic curriculum or beyond the curriculum for optimal use of time and energy of students. The activities must be planned and assigned depending upon the capability of the student so that they feel encouraged to do it and earn knowledge or some skill.

- In this period of lockdown, the students are having lack of community and social connectedness. This might lead to a situation where they may feel lost and isolated which is a greater challenge. It is possible for the students to get connected using digital sources it cannot replace the face-to-face campus interaction between student to student, student to teacher. They are missing the extracurricular and co-curricular activities which are held at the campus. It is responsibility of all of us that is the teaching fraternity and the institutions need to maintain the communication with the learners to maintain the academic and moral tempo. It is to be appreciated that many institutes are conducting online quizzes, webinars and many such activities keeping the teacher and the learner fully absorbed in the education related activities.

5. Conclusion

The lockdown due to outbreak of covid-19 has exposed us to many unprecedented challenges. We all know that facing challenges leads to new opportunities. This lockdown has given the teachers an opportunity to change and redefine their pedagogy of teaching and adapt the online mode of education. This has created a necessity for the teacher to learn various Information and communication technologies (ICTs) to be used for education process. The up gradation of knowledge and skills of the teachers is mandatory even in the time of crisis. The effort made by the teaching community in upgrading their own expertise during this challenging period of emergency caused by lockdown will determine the outcome of achieving success in overcoming the present challenges. The more the teaching community enlightens itself will lead to generate best results and practices which can be implemented to strengthen the education process and make it dynamic and positive to face any kind of challenges. A teacher is first a

learner forever, even during the lockdown period. This mindset of the teachers must be transferred to the students. This is an opportunity for the students to focus on themselves and their work without paying attention to other factors. If this is understood and the actions are taken accordingly by the students under the guidance of teacher the student would be a transformed professionally into a better student by the end of lockdown period.

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6

TEACHING THROUGH A PANDEMIC: A MIND-SET FOR TEACHERS AT THIS MOMENT

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Abstract

COVID-19 pandemic has forced most of the governments around the world to temporarily close educational institutions in an attempt to contain the spread of this pandemic. These nationwide closures are impacting over 89% of the world's student population. The lockdown orders of the governments has caused widespread school closures for an unknown duration impacting millions of learners worldwide. Teachers are scrambling to find ways to support students from afar through distance and online learning though feeling overwhelmed by this daunting task. Hundreds of teachers, are contemplating various concerns of pending teaching classes, teach-from-home options, online teaching pedagogies and weighing in on the mental approach they need to stay grounded in this difficult time and same time keep the student community rightly motivated. In all about discussions and conversations about teaching during the coronavirus pandemic, spilling out the concerns and anxieties of teachers: What will we do if the educational institutions close for months? How can we shift to online learning if we're closing tomorrow, or even in a few hours? How will special education students be cared for? What about children who have no internet access? What if, in the end, the education systems decide that online learning is working just fine, and never reopen? The panic is all perfectly understandable.

1. Introduction

Many of the teachers around the world are traditionally tuned to direct interactive style of teaching in the classrooms under a formal setup. Chalk and board method is the most widely used technique for teaching supported by use of ICT tools to make the class a bit more interesting. The physical presence of teacher and students in the classroom where direct teaching and discussions are conducted is the most familiar scenario in the educational system. Neither the teaching fraternity nor the education system at a large imagined such crises of lockdown hindering the entire process. A big jolt has fallen on it thereby challenging to find alternatives to combat it. As silver lining in the cloud there are plenty of teachers in

the mix who had weeks of crisis experience under their belts and also many educators who had long careers in online and distance learning. There are many highly educated, experienced, effective, fantastic and highly creative teachers providing strategies as fast as the obstacles are appearing.

At the highest level, a shift in mindset would be required—even the most optimistic educators should concede to this point. There are plenty of strategies and tactics to be adopted and the crucial emotional and psychological scaffolds that need to be considered to teach in this new paradigm. In order create a sustainable and engaging distance learning experience for the students for effective implementation of digital instruction and self-paced learning the following pointers need to be considered:

1.1 Simplicity Is Key

Every teacher has her own unique style of handling her students and the course. As per the course requirements, a teachers adopts various strategies to explain the concept clearly to their students offering instructions as per the need. It usually starts with a whole group discussions and teaching, followed by an endless stream of questions from students to clarify next steps. While this process can be frustrating at times, students can always rely on each other and the teacher in the room when they're stuck. One of the challenges of distance learning is that the teacher and the students are no longer in the same room to collectively tackle misconceptions. Instead, the large bulk of learning time is inevitably going to be driven by tasks that require a high level of self-direction.

As a result, simplicity is key. It is critical to design distance learning experiences that have very clear instructions and utilize only one or two resources. It's also best, when possible, to provide resources like readings as PDF's and selfcreated teaching videos that students can always access. Keep in mind that simple structures can still require rigorous work: Tasks with few instructions often lead to the greatest amount of higher-order thinking, as students figure out what to do within defined parameters. Distance learning should push educators to think about how they can be leaner and more concise with their delivery of new information.

1.2 Establish A Digital Home Base

Simplicity being understood, it's important to have a digital home base for the teachers as well as students. Digital setup need to have accessibility to effective network with wifi and internet connections. Edutech can be made possible through learning management system like Google Classrooms, or it can

be a self-created class website. Also recommend are Google Sites as a simple, easy-to-set-up platform. What is needed is a single digital platform that students can always visit for the most recent and up-to-date information. It can be tempting to jump around between all the cool edtech applications out there—especially as so many of them are offering free services right now—but simplicity and familiarity are invaluable. Students need to feel comfortable going to the same place to access the same tools. The farther away the teachers are from students, the more important it is to cultivate stability and practice norms.

Additionally, if attendance was a challenge before, distance learning is going to magnify it. So students need a place to go when they fall out of the loop. Filling in gaps is only going to get harder when the teacher cannot quickly engage in individual or small group instruction. Students are going to need to take control of their own learning. Teachers' goal is to create a clear framework that allows them to do that.

1.3 Prioritize longer, Student-Driven Assignments

Efficiency is key when designing distance learning experiences. Planning is going to take more time and require a high level of attention to detail. One will not be able to correct mistakes on the fly or suddenly pivot when kids are disengaged. To effectively manage time and sanity, teachers will want to prioritize longer, provide student-driven assignments and tasks that buy them time to keep planning future units—and that get their students off the computer. Focus on building toward long-term projects where students have autonomy and a clear set of checkpoints and deadlines that need to be met. When possible, create opportunities for students to discuss what they're learning with their families and include an element of student choice to really build engagement.

1.4 Individual touchpoints are Game-Changers

The things that is mostly missed is the human connection cultivated in the classroom. The interactions teachers have with their students in the corridors, before and after class or during breaks in between teaching, are irreplaceable. The verbal and non-verbal connection that vibrates and connects students and teachers disappears in a digital classroom. What students will miss the most is the human connection that is cultivated in the classroom. While it can be tempting to focus on content in the distance learning assignments and instructional videos, what matters more is creating structures for personalized touch points with one's students.

Touch points can be maintained through any medium like: emails, video messages, phone calls, messages through learning management system, comments on shared documents, etc. Creating a structure and sticking to it by a teacher may inculcate certain discipline among the students. Students will gauge the teacher's investment and know that they care about them. It's important to bear in mind that cultivating an engaging distance learning experience is hard. It takes time and an incredible amount of patience on behalf of the teacher.

2. Challenges

Adapting digital platform to connect with the students and conduct teaching is by no way smooth and easy for a teacher. Left with no choice and also perceived as one of the best alternatives during this lockdown time for engaging the students productively, a teacher has to prepare oneself to accept and adapt to the challenges. Some important factors a teacher need to understand to face such challenges are

2.1 Expect Trial and plenty of Error

Start by being reasonable with oneself. Putting too much pressure on oneself may result in total chaos in teaching. It is, in fact, impossible to shift to distance learning overnight without lots of trial and error. Expect it, plan for it, and to do ones best to make peace with it.

2.2 Acknowledge the Extraordinary

All are operating in the shadow of a global pandemic, and it is disorienting and limiting. Business as usual is unrealistic. The real “points to consider” are not **“the strict adherence to ‘regular’ conditions and norms,”** about how to structure distance learning like more typical learning experiences, **“but how to provide a rich experience to all learners who are now without ‘traditional’ teachers standing beside them in classes.”**

So while a teacher should try to provide “meaningful activities,” caution should be exercised due to limited exposure in effectively utilizing the ICT tools. It must be understood that everything cannot be tackled immediately. In other words, teachers should give themselves the time and the permission to figure this out.”

2.3 Reduce the Workload

A teacher should plan to do less. Students won't be able to work as productively, anyway—so don't assign the work they cannot do. Consider that parents are trying to work from home, and siblings are vying for computer and Wi-Fi time. Try Google quizzes using Forms, a reading log, some short live sessions with teachers and classmates, maybe vocabulary extension, maths and geometry problems (but not too many). Experience confirmed that time and distance play funny games during a crisis: "What would normally take one class period to teach in the classroom will probably take twice as long in online mode.

2.4 No Person is an island

Humans are social animals. Working from home, or worse, from quarantine, is isolating and often depressing for both teachers and students. Make a concerted effort to speak to other colleagues and trusted professionals to provide emotional and psychological context to work. Teaching at this moment is extraordinarily hard, and a teacher would need the virtual company of people who are experiencing the same.

2.5 Mind the Gap

Teachers' work will be hard, but there are students facing more severe challenges. Students with no internet or no computer will need support, as will those with learning differences or other circumstances that make distance learning especially difficult. Equity is an issue. Assessment is an issue. But the students are doing their best and giving the strength to go on. Teachers can focus on the old analog approaches: paper-and-pencil tasks, workbooks and activity packets that can be mailed home, and updating parents and students via phone calls daily.

3. Conclusion

The mission of all education systems is the same. It is to overcome the learning crisis we were already living with and respond to the pandemic we are all facing. The challenge today is to reduce as much as possible the negative impact this pandemic will have on learning and teaching and build on this experience to get back on a path of faster improvement in learning. As education systems cope with this crisis, they must also be thinking of how they can recover stronger, with a renewed sense of responsibility of all stakeholders and with a better understanding and sense of urgency of the need to close the gap in opportunities and assuring that all children have the same chances for a quality education.

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7

THE IMPACT OF COVID-19 ON TRANSFORMATION OF TRADITIONAL PRACTICES TO VIRTUAL PRACTICES IN INDIAN EDUCATION SYSTEM**Degala Pushpa Sri^{1*}, Kaluva Mahesh² and Dr. K Sethuraman³**^{1&2}Assistant Professor, Department of MBA, PACE I.T.S, Ongole, Andhra Pradesh.³Assistant Professor, Business Administration, Annamalai University, Chidambaram.*Corresponding author Email ID: pushpasri.degala@gmail.com

Abstract

Covid-19 outbreaks across India in March 2020, the World Health Organization announced health emergency alert to all nations. Doctors all over India are instructing people to follow strict self-precaution like social distancing to avoid community spread. Still there is no proper medicine for this virus. There is a high risk of spreading this virus in places like huge gatherings, shopping malls, schools/colleges, transportation and in movie theaters etc. The countries began to shut down all malls, schools and colleges temporarily as a measure to control. Due to this pandemic disaster all regular education related class works, university examinations, competitive exams, board examination for schools are disturbed. The immediate measures are needed to be taken to ensure the continuity of teaching and learning. So, it is time to adopt open source digital learning solutions and learning management software by faculty members to conduct online teaching. In this critical time technology is playing predominant role than ever before. Usually the IT employees depends more on technology to carry out their operation smoothly but now all private and public institutions are also relied on technology to deliver their lectures by staying in home at different places to connect with their students. Thus, this article focuses on how the traditional teaching practices are transformed to virtual teaching and also discussed the impact of lockdown on schools, colleges, students and teachers and discussed the role of government and other virtual learning platforms in support of adoption of e-learning by education institutions during this pandemic period.

1.Introduction

The pandemic Covid-19 grabs the attention of entire world within a short span of time. Slowly it has become a big disaster in all over the world and countries has become experiencing its worst effect on human lives. Slowly it is also showing effect on economy of all countries not only that all education institutions also temporally shutdown.No doubt, this is the crucial period for education sector to conduct all year end semester exams, board examination, entrance tests of several universities and competitive examinations are held during this period and also time to start new academic year. Due to this pandemic everything was going to be rescheduled after some period. However, as the days passes by with no proper

solution to stop the outbreak of Covid-19 pandemic, all schools and universities will not only have a short-term impact on continuity of learning of their students but also engender far reaching economic and social consequences. The system of schooling and learning, including teaching and assessment of students, was the first to be affected due to the lockdown by this pandemic. Only a half of the private institutions and schools can adopt online teaching methods as a substitute in this period. Some other schools and colleges who are having low access to e-learning tools are facing problem. Even though the educational institutions are proving e-learning platform, some students are no longer to access it due to economic and social stress parents having low income levels may not afford an android mobile or Laptops and internet facility to their children education. Besides this many corporate sectors are offering free online classes on various current issues to all branches of students and faculty. This pandemic has changed the system of learning from physical class work to virtual class.



Image-1 Source: <https://blog.edmentum.com/>

The above image-1 is extracted from edmentum blog which clearly shows the traditional way of teaching and learning. This image is clearly showing the interaction between student and teacher in the class room where the student has an opportunity to clear his/her doubts in class itself and at the same time the teacher can monitor and discipline each and every student through direct contact.

2.COVID-19 Vs Virtual Learning

We all know “**Learning has no limits**”. Now the government and educational institutions has taken this to next step and proving that “**Learning has no barriers**” too. For this teachers and professors has taken technology as a base to plug in their teaching from home itself through laptops and android mobile by using internet. Technology is enabling ubiquitous access and personalization of teaching and learning

even in the remote places of the country. Many education institutions have initiated innovative and PC/Mobile- based learning models for effective delivery of lessons to their student learners. So, Digital India vision of our government is now emerging as a key instrument for solving present crisis for learning due to Covid-19 pandemic.

Lockdown has accelerated to adoption of digital technology by all education institutions. This is an ideal time for all teachers and professors to experiment and deploy new technology for making delivery of teaching more meaningful to students who cannot go to campuses. It is a chance to learn things in new ways and also to improve professional skills and knowledge through e-learning and assessments. It is also fact that using technology in education is moving from teacher-centric education to student centric education.

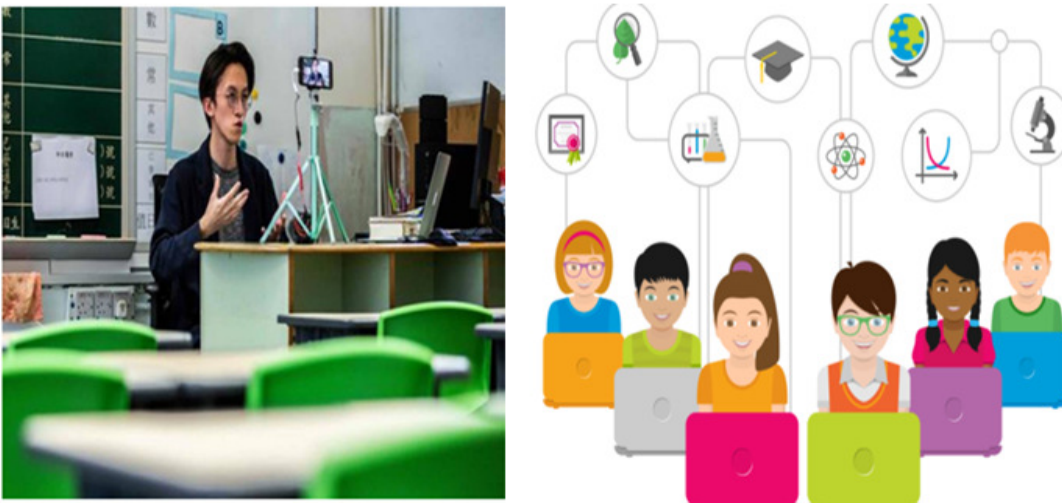


Image -2 Source: <https://blog.edmentum.com/>

The above image-2 is also extracted from edmentum blog which exactly depicts the current situation of education system at worldwide. The entire world today is depended on technological devices to operate and execute their roles and responsibilities. This image is clearly explaining the virtual learning concept. Here the teacher is delivery his lecture through live recording where the student can access and learn the subjects by staying at home using laptops/ mobiles.

3.Impact of COVID-19 on Education System in India

Covid-19 pandemic not only showed its tremendous negative impact on countries economy and on survival of a human butitis also impacted on education system in all countries. The following points explain the positive and negative impact of covid-19 on various facets related to education.

3.1 Impact on Schools

On 16th March central government of India declared country wide lock-down of private universities, schools and colleges. Later on all examination schedules are cancelled and are postponed to future dates. Government asked all schools to promote their students from 1st to 9th standards based on their performance in previous terms. In India over 320,713,810 learners are affected due to temporary shutdown of schools by Covid-19 pandemic according to United Nations Educational, Scientific and cultural organisation (UNESCO) report. Only in Greenland the schools are opened. In China, only in selected regions schools are reopening with students in the last year on secondary education. The table1 states the affect of Covid-19 lock-down on schools in India.

Table: 1 Impact of Covid-19 pandemic on schools in India.

COVID-19 IMPACT ON EDUCATION IN INDIA			
Affected Learners	320,713,810		
Total Females	158,158,233		
Total Males	162,555,577		
School Type	Females	Males	Total
Preprimary	4,557,249	5,447,169	10,004,418
Primary	72,877,621	70,349,806	143,227,427
Secondary	69,160,694	63,983,677	133,144,371
Tertiary	16,739,686	17,597,908	34,337,594
Data Source: Enrolment figures are based on latest UNESCO Institute for Statistics Data.			

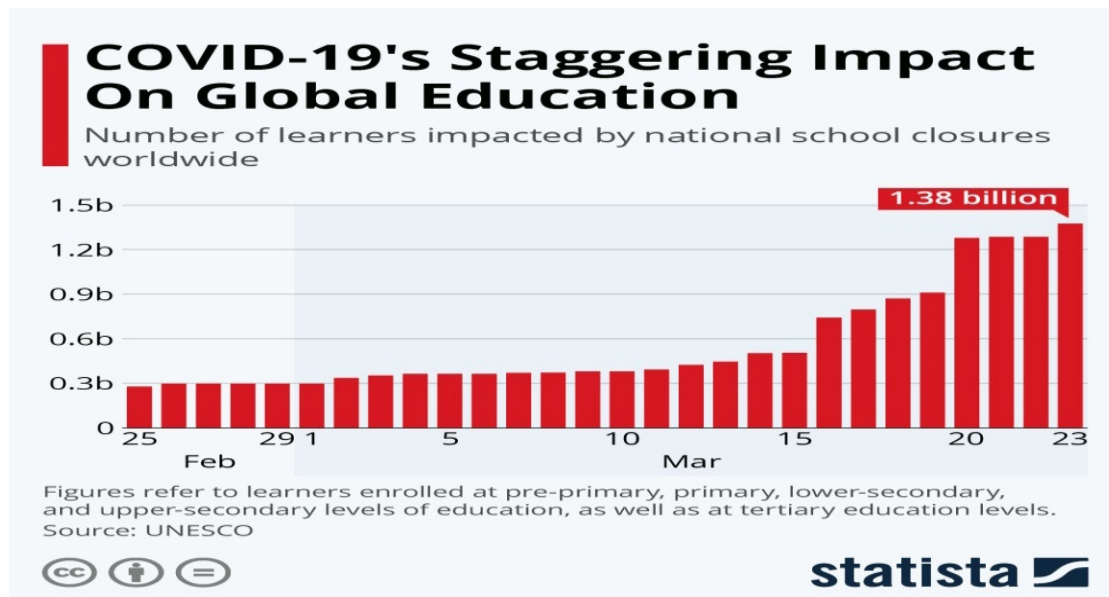


Image-3 Source: From UNESCO statistics.

3.2 Impact on Colleges

The continues spreads of Covid-19 across the globe made countries to decide to close all colleges temporarily apart from social distance policy in order to slow transmission of the virus. All university exams, term exams are postponed and government is going to be rescheduled it. Due to this the students who are in their final year are going to face a delay in completion of their courses. Colleges who are affiliated to government universities have to wait for further announcement on conducting of term examinations. To reduce this gap, government and AICTE has given some instructions to all universities and colleges regarding collection of assignments and internal exams through online or conduct manually exams by giving multiple choice questions or OMR bubbling system in limiting actual time to 2 hours that to by maintaining social distance with minimum number of students on shift basis if possible, but some colleges are not able to implement this online pattern of exams.

3.3 Impact on teachers

Due to changing view of students, teaching pattern is also changing time to time. Whereas lockdown has given teachers and professors a transformation challenge from traditional ways of using black board and PPT in class room to virtual teaching. Teachers started using virtual platforms to stay connect with their students from home. Using e-learning tools faculty cannot monitor their students physically whether they all connected to the concept of a lecture or not, so direct face- to- face interaction with students will be missed. To make use of this virtual classes faculty has to prepare effective power point presentations to provide visual notes to students where again a drawback for most of the teachers who do not have laptops

and good internet facilities. So, globally this Covid-19 pandemic is giving a technological challenge to all institutions and teachers to increase their technical skills to give best out of worst situation within short time.

3.4 Impact on Admissions

This Pandemic impact can also see on admission process of various institutes and universities for academic year 2020-2021. The schedule of competitive exams and entry exams like EAMCET, ICET, PGECET, etc., and other government exams are cancelled and are postponed. Government had announced the start of academic year from August and September of 2020 which impacts teachers and students a lot which delays start and joining of schools and colleges. But some top private universities are taking their admission processes though online or by calling aspirants to know about their interest of course to join.

4.Role of Government & Other E-Learning Platforms

In view of the COVID19 pandemic outbreak and National lockdown from March 25th, many students have been facing difficulties due to closure of colleges and hostels. Hence in order to provide help and support to such students, AICTE (All India Council for Technical Education) has come out with a unique website and addresses the issues. The website was launched by the Honourable Minister for Human Resource development Shri Ramesh Pokhriyal “Nishank” on 3rd April, 2020.

This portal is essentially to connect those who are willing to provide help with those who need help which includes Accommodation, Food, on line Classes, Attendance, Examinations, Scholarships, Health, Transport, Harassment etc. More than 6500 colleges have come forward to provide support at this crucial situation.

Looking at this challenge of shut-down of schools and colleges, Government of India, State Government and other private organisations are taking a step forward by publishing and announcing on various initiatives that are taken by MHRD, Department of technical education and NCERT and others to support faculty and students in learning. MHRD was providing IIC-online sessions for faculties and students to enhance their knowledge by staying at home and also assessing the learning though daily online assignments.

Education institutions like schools and colleges are also using various e-learning platforms like Google hangouts meet, Zoom and WebEx Meet, You Tube, Go to meeting, Loom, Talent LMS, Class marker, Socrative and Kahoot etc., to ensure continuity in learning of their students. As per the instructions of government, colleges are also conducting their internal examination through online. NEAT an initiative by AICTE based on PPP model is helping to enhance employability skills in students by collaborating with various Education Technology Company and Nation Digital Library (NDL). Many private institutes like Spoken Tutorial, Google classrooms, FOSSEE, Byju's, DIKSHA portal, e-Pathshala, Swayam, e-Yantra and so on came up with an initiative to provide free education platform to all learners during this pandemic period.



Image-4 Source: <https://edition.cnn.com/>

From the above image-4 we can clearly see the combination of traditional way of using board and chalk and virtual way of teaching by recording the lecture. Students can access the lectures by using technological devices like laptops and android phones with internet connection though E-platform apps as a base.

NPTEL is also providing online session and webinars on various disciplines for faculty and students. Many other public and private education institutions are also providing free online courses not only for students but also for faculties by providing free online FDP's, workshops and Webinars. These institutions are also providing e-certificates for participants after conducting assignment on learned courses which is add on advantage for faculty and students. Amity University also provided e-certificate courses for free of cost globally during this pandemic period.

5. Conclusion

The impact of Covid-19 will remain for years and the key aspect of coping with this Covid-19 pandemic is to ensure learning is a continuous process through virtual classes. The world was already started using virtual classes for all levels of education. Now in developing countries like India is also switched from traditional board teaching to virtual teaching due to covid-19 pandemic in both public and private education institutions. But still we can see gaps in it. It takes time for developing countries to adopt advanced technologies. Jack Ma, the former executive chairman of the Alibaba Group shared his view on pandemic that, 2020 is just a year for staying alive. He said to people that do not even talk about your dreams and plans in this year, just make sure that you are staying alive. If we can stay alive, then we would have made a profit already.

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8

COVID-19 LOCKDOWN RAMIFICATIONS ON EDUCATION IN INDIA: A BROAD PERSPECTIVE

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Abstract

The COVID-19 pandemic and lockdown measures throughout the world and specifically in India have several ramifications on the Education system. There is a sudden unexpected shift from the traditional classroom based education system to an online based education system. The lockdown has given a good opportunity and ample amount of time for the young students to acquire new skills through digital platforms, to learn moral and family values through frequent family interactions and being more hygienic in addition to attending the online classes conducted by educational institutions. On the contrary there are various challenges with online education system and closure of the educational institutions. This situation requires quick reforms in the education system to embrace digital technology and encouraging personal development of the student fraternity.

1.Introduction

In lieu of the ongoing COVID-19 pandemic disease and subsequent closure of schools & colleges, Department of Education, Government of India has recommended resuming teaching & learning process through online classes for the student fraternity. This Online Education system serves as a good interim solution in the current lockdown situation when social distancing has become a norm to prevent COVID-19. However, the lockdown and online education system has both pros and cons and require quick reforms in the education system to embrace digital technology which we shall go through in detail in this chapter.

2. Personality development of students during lockdown

The lockdown and subsequent closure of educational institutions in India has immensely helped in keeping the Covid-19 infection & fatality rate low when compared to many other developed countries as of mid of May 2020. This strategy reduces people from being exposed to the virus which in-turn saves valuable lives amongst whom the future generation potential leaders, scientists, astronauts & entrepreneurs can thrive towards making India a super power.

This lockdown has given an opportunity for students to spend quality time towards learning new soft skills through digital devices, media & other latest technologies which would vastly improve their knowledge and talents and make them competent in the modern day world. It has also given students who are always under stress some essential leisure time as they are able to interact with family members at home and the extended family through virtual platforms and thus by the exchange of ideas amongst the family members and imparting of wisdom from the elders onto the younger one's is an invaluable process taking place for the students at home while also involving themselves in doing household chores. Many students are now learning to be hygienic all the time and the meaning of the quotes "cleanliness is next to godliness" & "health is wealth" is now being truly understood and put to work by them.

3. Traditional classroom benefits:

Due to the lockdown & closure of educational institutions, students and teachers both are finding it difficult to cope with the missing physical teaching classroom environment.

Traditional classroom education involves a lot of interaction between students & teachers and students & their peers. As teachers through years of acquiring the teaching skillset possess good classroom management skills like maintaining eye contact with the students during teaching as it effectively is the most proven concentration fixating technique which draws the students to understand the subject in an easy way. Also, in typical physical classroom setup if the students have any doubts on the subject, they can inquire about it in the classroom right away and get them clarified. Teachers can also cite various relevant examples for student's clarity, based on mass understanding levels in accordance with the needs

of the subject/topic. But during virtual online classes as there is limited time and teachers have limited control over the students the above said elements do not work with the same efficiency.

The extra-curricular and co-curricular activities that take place inside educational institutions make the students physically & emotionally, active and strong. These activities are also the stress busters. A lot of learning happens through these activities. Competitive spirit, understanding levels and individual personalities develop through such activities. Students simultaneously also improve their spoken, written and social skills while being at the educational institutions and also during their interactions with their peers. So the all-round development of the students is hindered to a large extent due to the long stay at home during lockdown, physical activities at educational institutions with their peers is also a big miss for the students. Hence the student's life being restricted only to the family environment can cause a major impact on social skills for the students especially for those who are already passive.

4. Challenges with online classes:

As many of the teachers and students lack formal training about virtual/online teaching, the quality of teaching and learning seems to be reduced. The problem of Teachers dealing with technical glitches is altogether another domain which needs a special mention as they seem to be struggling to maintain good quality audio, avoiding noise disturbance, using mute/unmute features, using proper presentation modes, etc. While younger school students unable to maintain constant attention to the online classes is been another struggle of sorts. Also, it has been observed that even many college students are unable to work on the assignments effectively or not putting much thought into them as much as they do during classroom training.

To top it all, many of the students from under-privileged families do not have the opportunity to utilize the online classes due to the costs involved for necessary Laptops/Computer desktops/smart phones, Internet, etc. Some students also face imminent distractions during these online classes as they are called for by their parents to help them in agriculture and other occupational works etc. in order to meet their ends during the ongoing difficult times of lockdown amidst covid-19 pandemic.

5. Student perspective:

When we look at the impact from students' perspective at various levels of education, there are mixed feelings among the students. Students aspiring to seek admission in major professional courses are very

much confused and are uncertain about their future as their scheduled examinations got postponed and their routine time table got abruptly disturbed.

The mental health of the students is also taking a huge toll as it is building anxiousness and creating a lot of stress due to the uncertainty created by the lockdown extensions as well as due to the rapid spike of Corona cases. A long wait for the vaccine & medication to tackle the virus and also the effect of this pandemic on the global economy which is resulting in the reduction in the number of jobs are also affecting the students enormously.

However, students who are not career oriented and are already addicted to high screen time are getting more addicted now which in turn is causing health issues like eye problems, weight gain and certain psychological disorders. As the students get habituated to the present circumstances of lockdown staying at home, laziness can increase and the zeal of learning may reduce. This can lead to a decrease in motivation for education and a rise in dropout rate of the students. The students who are in real pursuit of acquiring knowledge always try to find ways to make the best use of available free time and resources. They can spend time on completing various certificate courses, learning new languages, developing new skills & hobbies, gaining in-depth knowledge in subjects of their liking, understanding their own strengths & weaknesses and utilize the time constructively for their career planning.

Many universities, libraries and publishers are making e-books, book series and videos available for free or discounted rates for students. Some are conducting workshops, webinars and online competitions through media for attending from home itself and ensuring continuity of learning during the lockdown. Students can take advantage of these and scale up their knowledge and skillsets. As physical activities like sports, drills that are usually mandatory in educational institutes for student's well-being are missing during lockdown, it is important for the young people to continue physical exercise at home and stay fit.

6. Parent perspective:

If the closures of educational institutions continue for a longer time then the parents may fall prey to negative thinking and assume the burden to pay the educational fees/ transport charges/rents and in turn may opt for Distance Education or home schooling for their wards while also forcing their children to take up small odd jobs while studying through Distance Education system. For students coming to cities from rural areas for education, their parents may find it better that their ward may rather get occupied with their

family occupations and can do better in those fields rather than staying away from families and risking Covid-19 infection.

7.Loss of food benefits:

In Government schools & colleges, where food benefits are usually provided towards extra nourishment for students and since these institutions are closed due to covid-19 pandemic, the students who are mostly under-privileged also happen to miss their food benefits. This can lead to malnutrition and reduction of immunity and in turn make them vulnerable to Covid-19 infection and compensating the same by providing extra nourishment towards their children would bring more woes to the parents who are already dealing with existing stress and anxiety due to lack of livelihood during this pandemic.

8.Life lessons from the pandemic for students:

As Covid-19 impacted education globally every student in the world is feeling the impact and slowly the students do get adapted to the new situation. Students have learnt lot of life lessons and values during this pandemic and lockdown. They learnt being more hygienic, eating hygienic food that is cooked at home and using limited resources effectively as new non-essentials cannot be bought during the lockdown. They also learnt minimalism and quickly understood the importance of time, family bonding, health, education, money and survival needs. These values cannot be taught in such a short span of time at the educational institutions.

In future, the present generation students as now are being forced to learn lives most valuable lessons can withstand any crisis as this experience of pandemic and lockdown has increased many moral and ethical values among the youth. These life lessons will definitely be useful and will be passed on to the next generations.

9.Reforms required in Education System:

The following measures can be implemented to bring about reforms in the Education system to embrace digital technology and to encourage personal development of the student fraternity:

- Every teacher at every level should get trained and gain in-depth knowledge in Information and Communications Technology (ICT) tools in order to conduct the online classes in an efficient way.

- At every level of education, one or two subjects should be imparted through online platform or self-learning through digital media even after the lockdown is lifted.
- Every student should be given the details of various websites, SWYAM Courses, free educational TV channels such as SWAYAM PRABHA, DEEKSHA, foreign universities offering free online certificate courses, digital apps, virtual museums, virtual tours of universities and digital books in the libraries which are either free or can be bought.
- With time, institute managements must change their policies, fee structure, facilities they provide to staff and students.
- Institutes should also provide some tripods, white/black boards with markers, teaching aids for facilitating teaching from home. Besides conducting regular classes, they should organize some fun events using online classes, quizzes, asking what students have learnt, making videos, anything that is fun to make the learning process as more interesting.
- Universities to have advisory/health centres/information sites for COVID-19 or other infections.
- It would be great if personality development classes are made compulsory at every level of education.
- Changes in the examination patterns would also be required.
 - a. Online exams to be increased
 - b. Open book system for some of the exams to be included
 - c. Credits for extracurricular and co-curricular activities
 - d. Credits for good citizenship, adherence to hygienic practices and social responsibility
- Competitions on future problem solving, creating innovative digital apps, Artificial Intelligence (AI), etc. have to be introduced on a large scale among student fraternity.
- The bright and talented students can impart training to the lower classes students under few bridge courses and awards/rewards/ cash prizes/certificates can be given to them, which increase the soft skills & confidence for the students and also enable knowledge sharing among student community.
- Students to devote more time for self-learning.
- Promote reading books (Fiction/Non-Fiction) from a very young age.

10. Conclusion

Considering all these aspects it is imperative for the students, parents, teachers and management of educational institutions to adapt to the changing times while supporting the initiatives of the governments,

embrace digital technology in education systems and ensure a bright future for the youth and bring glory for India.

No Pandemic can stop a learner to learn and a teacher to teach when both are passionate in doing so!

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Chapter has been authored based on

- Author's personal educational & family life experiences as an individual & citizen of India.
- Opinions of my family members & friends who are academicians & experts in various fields and from couple of bright students.

9

IMPACT OF LOCKDOWN ON THE EDUCATION SECTOR IN INDIA**Saroja Ranganath¹ and Dr. Jacqueline Williams^{2*}**¹Visiting Professor, Aurora's Degree & PG College, Chikkadpally,
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Abstract

The corona pandemic has plunged the economies of the world into a catastrophic situation. The world we face today is full of new challenges and uncertainties. The massive impact of such economic shocks will reverberate for some time to come. The collateral damage would result in a further slowing down of the economy. It is the gravest as it has affected all walks of life, every single country, people belonging to all income groups, caste, creed, age and almost every aspect of life. Despite a slow curve of infection in India, the impact has been merciless in different ways. Many sectors of economy including the education sector, have been battered and are on a sloppy gradient. The initial lockdown of 21 days had been estimated to cost nearly \$4.5 billion every single day. The present chapter takes you through a Bird's Eye view of the impact of Covid -10 on the education sector, as it attempts to explain the constraints and challenges affecting different educational institutions. It also suggests strategies and solutions to combat the negative impact of the pandemic and ends in a positive note as it visualises a world of digitisation for the education sector enabled with the help of Government and other agencies to bring it on the track of progress.

1. Introduction**A Bird's Eye View of the Impact of the Lockdown across Educational Institutions**

The COVID-19 pandemic has significantly disrupted different sectors in India including oil and gas, automobiles, aviation, agriculture, retail, education and so on. The impact on the education sector is of primary importance in this study and we will also explore possible strategies and solutions to try to nullify the effects of the enormous pandemic.

The lockdown has struck at a time when the Education System is at its peak time of the academic year 2019-20 the period in which students propose to enter their next leg of progress in their academic career.

The period between January and May is a period in India, when students plan to write exams and as results are declared, they will be ranked in order to get admission into higher studies.

The academic schedules at schools and higher education institutions have gone haywire as classes have been halted for an indefinite period. This sudden and unplanned closure has severely disrupted the scheduled plans for completing courses within the academic year. This will not be a short-term but if this uncertainty persists then more than 285 million young learner's future will be in jeopardy and the outcome will have far-reaching economic and societal consequences. As per Government orders, the students of I to IX standards have been promoted to the next standard. The UNESCO report has noted that in India, more than 320 million of students have been affected by this decision. It also states that the students from 9th to 12th classes were greatly impacted by this lock down due to Covid 19 and more than 13 crores of children fall into this bracket.

The lockdown has thrown off gear the conduct of final examinations for 10 and 12 standards as it could not be conducted. In a few cases where the examinations have already been conducted, the valuation of the answer scripts could not happen on time, as a consequence of which the results will be delayed. Every academic event will have a chain effect. The next academic years' admission and schedules will also get affected. Moreover the entrance exams like IIT, NEET, AIEEE, IIM, P.G. courses to mention a few, will face challenges. Professional colleges have also been impacted, as the courses which require laboratory sessions could not be conducted. Online classes were conducted to complete the syllabi in schools and colleges due to the unplanned closure of the educational institutions.

2. Impact on Girls' Education

At this juncture, we deemed it relevant to also make a mention of the impact of this COVID on Girls education. Suzanne Grant Lewis, IIEP Director emphasised at a recent UNESCO Webinar that "evidence shows that both education and gender are neglected in response to disease outbreaks. We need to pay more attention to the gender magnitudes of the corona virus school closures."

The domestic burdens, healthcare demands, domestic violence, sexual and reproductive health are the gender dimensions of the closures. The intensity of such dimensions may vary from country to country, but it definitely exists. As Ms. Grant Lewis said, "this is a universal issue. All countries must consider how this calamity might widen the inequalities and need to take action to address them effectively".

3. Key Constraints and Challenges across Educational Institutions

The key constraints and challenges for initiating a suitable online mechanism for education institutions, students and teachers on a country-wide perspective are dealt with in this section.

As students and faculty remain confined to their homes, education institutions are developing ways to keep the students actively engaged using technology and creating a virtual classroom environment to complete their courses. Efforts have been started to leverage meeting platforms and applications having video conferencing facilities to run online classes. Teachers are connecting with their students at a set time to conduct online classes. It is observed that this mechanism can be adopted in urban areas where the affluent sections of the student community can access it, a serious constraint is what about the others who cannot access a viable medium? A survey was conducted to find out the effectiveness and problems in the online learning. The report titled "COVID 19: A wake up call for telecom service providers" is based on a survey conducted by QS I Gauge. This rates various colleges and universities in India with complete operational control. The survey pointed out that the infrastructure in terms of technology in India has not achieved a state of quality so as to ensure sound delivery of online classes to students across the country. In this both the state and private players have not managed to overcome the technical challenges, providing adequate power supply and ensuring effective connectivity as evident from the data (Figure 1).

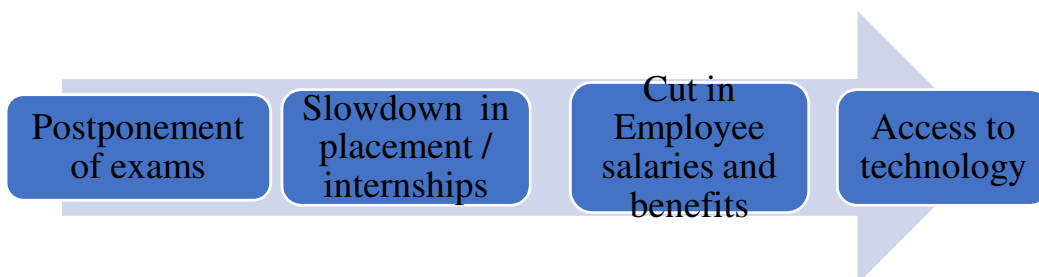


Figure 1: Key constraints and challenges faced by educational institutions

3.1 Postponement of Various Examinations

The Covid 19 pandemic has affected the examination cycle of many educational institutions across the education sector. Major entrance examinations have been deferred to a later period, they include engineering, medical, law, agriculture, fashion and designing courses, etc. This challenge can sound an alarming bell across private sector universities and the government sector too. Secondly, the impact of the Covid 19 can also be felt among the student community who are on the verge of completing their final

year at their respective courses like the engineering courses, degree and post -graduate courses. They may face a slowdown in placements or internships.

3.2.Unemployment.

Students who have completed their graduation may have a fear obsession on their minds of withdrawal of placement offers from the corporate companies. The Centre for Monitoring Indian Economy's estimates unemployment shortage from 8.4% in mid-March to 23% in early April. In the urban areas, unemployment rate is 30.9%.A serious constraint is the uncertainty of the economy. Educational institutions will have to face lots of problems. It is visualized that they will face a steep fall in the revenues of these institutions as the admissions may fall. Due to the economic situation, institutions may not be able to increase the fee structure and collection of fees for the existing students. Hence, the institutions may have to adopt cost – cutting measures to manage the working capital.

3.3.Financial constraints

Financial constraints of educational institutions during lockdown may compel them to cut their costs and this can affect the paying capacity of several people in the private sector, who cater to a sizeable section of the students in the country. Many institutions may pause faculty hiring plans for existing vacancies and this can affect quality and excellence. Existing Employees and faculty may experience a cut in their salaries and incentives.Student counselling operations have also come to a standstill.In addition to this, the Structure of schooling and learning methodologies including teaching and assessmentpolicies, have been affected due to the sudden closure of educational institutions.

3.4.Technology

Technology will play a vital role as students and teachers will be expected to study from home and work from home. The need of the hour is a streamlined ICT tools for teachers and students in the areas of a proper connectivity and accessibility. In India, some private schools could adopt online teaching methods. Low-income private and government school may not be able to adopt online teaching methods, and this could result in a complete shut down as they will not be able to access e-learning solutions. Accessibility and affordability challenges have to be addressed by the Education Ministry.In addition to the

opportunities for learning, students will also miss their meals and may result in economic and social stress.

3.5.Higher education sectors will also be disrupted

This will impact the country's economic future. Study abroad in countries like the US, UK, Australia, China etc. may be impacted due to Covid 19. If the pandemic persists, then there will be a decline in the demand for international higher education also. The primary problems stand at that these can happen or happening in urban areas and big corporate schools. Is it affordable for students in rural areas, Government schools and small private schools? Another hurdle is the content for the on-line classroom which is to be made acceptable across the country. For this the educational institutions have to train the teachers to prepare the study material suitable for the purpose. Now the next problem faced by students is that those who opt to go abroad for higher studies as their future plans look doomed. With uncertainty and fear around the world, the students and parents are left confused about their future.

Though there is a massive shift from the traditional Face to Face (F2F) to online platform as a mode of classes, due to the inadequate infrastructure, a total shift is a distant dream. Moreover, the Indian educational system (especially at the school to the undergraduate level) is yet to acclimatise and find acceptance itself with the online mode of teaching-learning. India is a land of mixed classes of people. Educational institutions too vary in their service towards the different categories of children depending on whether they are rich, middle-class or poor. The nature of institutions is either private or Government. Private institutions charge high fees and provide a number of services such as good infrastructural facilities and teaching capabilities. On the other hand, Government institutions charge a nominal fee, lack proper infrastructural facilities but may possess good teaching capabilities.

4. Strategies to Combat the Negative Impact of the Lockdown

A multi-dimensional strategy is essential to manage the crisis and build a resilient Indian Education System in the long run.

(A) Measures are to be taken to ensure the continuity of learning in government schools and universities and other private institutions.

(B) Inclusive learnings are needed especially for the most vulnerable and marginalised, who are to be developed. Using Technological tools can reach even the remotest corner of India.

(C) Strategies to make the higher education sector evolve itself is required to meet the demand- supply trends across the globe.

(D) Measures to mitigate the effects of the pandemic on job offers, internship programs and research project are to be planned and put into action.

(E) Measures are needed to change the method of teaching from F2F to online teaching. Care should be taken to establish quality assurance mechanisms and quality benchmark of online methodology. There will be a need for conducting on-line classes and observing social distancing in classrooms. This will increase the cost in terms of infrastructure. There will be cost in training the teachers to adopt to new method of teaching.

(F) The courses on Indian traditional knowledge systems in the field of yoga, Indian Medicine, architecture, hydraulics ethno-botany, metallurgy and agriculture should be integrated with a present-day mainstream university education to serve the larger cause of humanity. In addition to all the above measures, there will be changes observed. The role of the teacher will shift to that of a facilitator and a motivator. They will be expected to manoeuvre a student to solve or apply the knowledge in the classroom. This methodology may be seen in higher education as we see in developed countries

Infrastructure enhancement through 5G can act as a catalyst to transform the society, government machinery, economy and the education system too. 5G mobile communication can enable the students to learn more with minimum intervention of the faculty. Examinations too can be conducted online.

5. Providing Solutions for Uninterrupted Learning Using Technological Tools

“In the middle of difficulty lies opportunity” -- Albert Einstein

‘Necessity is the mother of invention’

With the help of power supply, digital skills of teachers and students, internet connectivity it is necessary to explore digital learning, high and low technology solutions, etc. There are many education technologies companies that deal with on-line learning platforms and content, who can enable to explore digital learning platforms In schools and colleges, these solutions have been largely leveraged as supplementary classroom learning in terms of understanding concepts, encouraging critical thinking and

inquisitiveness among the students. Such as gaming techniques and Quiz programs. Teachers can also be trained to become digital; they can utilize technological tools and apps to remain relevant in the field of education. Distance learning programs are suggested for those students coming from low-income groups or have disabilities, etc. A broad sector of educational teaching-learning programs should be made available for the students by the Government or other non-profit agencies across the country, it is mandatory also, to promulgate policies to encourage the girls education as the saying goes "the education of a boy forms a man but the education of a girl forms a nation". Measures should be considered to mitigate the effects of the pandemic on job offers, internship programs, and research projects. Edtech reform at the national level can integrate technology in the current Indian education system.

6. The Road Ahead: Positive

Dr. Ramesh Choudhary expressed that "the development of intellectual skills and knowledge that will equip students to contribute to society through productive and satisfying professionals as innovators, problem solvers, decision-makers and leaders in the global economy." The lockdown induced through COVID 19 is teaching the human community to think differently and act swiftly. It has initiated a lot of creativity amongst teachers. Teaching and teachers are reaching a new platform where they are better equipped. Through on-line education, students can benefit from getting knowledge from the world best teachers. Teachers can use innovative, unique techniques to outcast the talents within them. Educational institutes can really strive to impart the best of the knowledge. The institutions which have real worth and work with good motive, will survive and others which are lukewarm will die slowly. This is a good sign for education sector and a better society. The mantra for success will be Survival of the smartest – both from the viewpoint of the teacher and the students. The genuine students will thrive and the less responsible will change for the better. A well-planned effective education plan will develop skills that will improve the employability, productivity, health and well-being in the decades to come and ensure the overall progress of India. Thus, the Education Ministry and Human Resource Department should take steps to ensure the education of girls and reduce the dropouts.

The Indian higher education system is in the process of experiencing transformational changes as in response to the claim by employers and industries that there is a skill crisis among the candidates hired from India. The reasons for this are low quality teaching, grade-oriented mentality of the students. In effect, the rigorous classroom teaching is the main cause. The teaching methodology needs a relook, as

this has been blocking the way to acquire certain attributes of true professionals like problem- solving approach, critical thinking etc. Students should be encouraged to imbibe independent learning. The skills which are needed to be fit for employment can be acquired through a paradigm shift in teaching, from classroom to online teaching, from teaching - centric to learning -centric.

7. Conclusion

The Government agencies and regulating bodies like UGC should invest in research relating to technological ways to achieve digital learning. Autonomy to educational institutions with minimum monitoring for adopting the digital learning system is essential. Leveraging modern technologies such as proctoring , Learning Management Software and a suite of examination tools are helpful for executing digital learning. There is an urgent need to make examination tools that are scalable, secure and credible. Thus, our education system can use this VALLEY, COVID 19 pandemic to scale new heights and reach the PEAK, keeping in mind the lessons learnt in this crisis.

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10

IMPACT OF PANDEMIC - COVID-19 ON EDUCATION SYSTEM

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Abstract

This paper aims to explain our Indian education system throughout this pandemic. the essential challenges in pedagogy system in Asian country, learner's motivation, technological skills of learners, analysis etc. Therefore, a brand new and trendy method of education is needed to handle such transformation arising as a result of creation of giant quantity of data in a very systematic manner. Exploring the utilization of digital technologies offers educators the chance to style partaking learning opportunities within the courses they teach, and these will take the shape of integrated or Digital Education may be a combination of technology, digital content and instruction within the education system to form it more practical and economical than the normal education system. Through this analysis paper, an endeavour has been created to clarify digitization, challenges encountered, graduate state, effects on analysis and personal education establishments.

1. Introduction

Lock down effected all sectors of the country and destabilized them with serious consequences including education. The Government has imposed lock down to save the country by stopping the spread of corona virus. The strict action of lock down was required due to density of population. The large number of people living in closed areas are at risk for the easy spread of contagious disease. India unlike other countries is prioritising health sectors to minimize contagion and decrease death rate.

The lock down for educational institutions including preschools, child care, primary-elementary schools, secondary-high schools, and universities may extend to prevent gathering of kids and young adults in large numbers. 85 to 90 percentage of students use overcrowded public transport system like rails and

buses, through which they can be affected by virus. Students may not be vulnerable to this viral Infection but may act as potential carriers because 40% of Indian families are non-nuclear or joint families. Most of these families will have one person above 60 years of age, one below 18 and two others aged somewhere in between. Three generations live together. One infected person in a family means the chance of widespread household spread, one of the fastest modes of transmission of infection is high. Locking up the entire family to save the elderly who are the most vulnerable to be affected.

The Impact of lockdown is hazy on the strategies of education sector. Effects of lock down on Education system the pandemic has significantly disrupted the higher education sector, which is a critical determinant of a country's economic future. The period of lock down (March to May) is a crucial time for the education sector which would have Central and State board examinations, preschool admissions, entrance tests of various universities and competitive examinations are cancelled during this period. As the days passed by with no immediate solution to stop the outbreak of Covid-19, school and university closures could not bear the impact on the continuity of teaching and learning which would also affect economic and societal consequences. There was a need to find alternatives to keep the system active and most of the institutions have taken online teaching as an alternative tool for the conduct of academic sessions.

2.Challenges Encountered

The lock down has transformed the centuries-old, chalk–talk teaching model to one driven by technology. This transformation in the delivery of education is pushing policymakers to figure out how to drive engagement at scale while ensuring inclusive e-learning solutions and tackling the digital divide.

The major part of education system in India is based on conventional methods. The lock down has disturbed the structure of teaching, learning and assessment methodologies. Education institutions had no option but to get adapted to the use of information and communications technology (ICT) to deliver their programs online at a distance to their enrolled students, a new experience to most teacher's students and parents. It became mandatory for all the educational institutions to adopt online teaching methods. It was an unexpected shift from conventional to digital classrooms. The teachers and students were given adequate training sessions at all levels of the system to get adapted to the new technologies. All the stake holders of this sector were prepared to address the consequences. Institutions located in rural areas, faced many challenges to continue with their academic activities for not having access to e-learning solutions.

2.1 Digitization: The process of digitalisation of education was well received by the institutions that have good ICT infrastructure than others; with some equipped and experienced than others; and between students within the same institution who live in urban areas and in rural areas who can barely afford to access the internet and its availability. It is true that the crisis has provided an opportunity to all higher education institutions to improve and maximise their ICT operations. However, most of them do not have the capacity to fully deliver whole programmes online. Higher education institutions could easily shift to digital mode because their target groups are mostly mature students. While a significant number of higher education institutions have been implementing blended learning (a mixture of face-to-face and online learning) in order to increase access and improve learning, hardly any had intentions for their face-to-face delivery to be completely replaced.

The apps for interactions and group meetings have become favourite tools in the Education system during lockdown, where significant achievements have been made in improving the quality of online teaching and learning in education institutions. Teaching is done through interactive apps like Zoom, Cisco WebEx, Google Classrooms, Google Meet, Go To Meeting, Microsoft Teams etc. These are video conferencing tools designed based on the web-structure. This video conferencing stuff allows the users to meet online with or without video. If a user wants, then he can record the sessions, do project collaboration etc. Screen sharing facility is also there. Many teachers are using WhatsApp for personal interaction and sharing notes. Assessments are also done using Google Forms as a platform for testing the knowledge of the students through multiple choice questions.

Experience has shown that quality online learning requires that the teaching material is prepared, and the teacher is pedagogically trained for delivering the programme and the students are equally exposed to the pedagogy of online learning. The worst affected programmes will be science and technology as students will be unable to access laboratories for their practical's. Yet, science and technology programmes are the ones that are most important for scientific development.

2.2. Effect on Examinations and Admissions

Higher educational institutions have less chances of getting admissions because tenth and Intermediate exams are postponed. Many students enter higher education institutions through their performance in entrance exams. Students are in a difficulty if the situation continues, admissions in best educational

institutions will decrease. It is time for the higher educational institutions to redesign curriculum and adopt new strategies to overcome these challenges.

2.3 Research

The focus of research is on combatting covid and facilitating research projects related to health sector. Obtaining financial support to pursue research in other fields has become a challenge which effects the research centric activities at higher education institutions.

2.4. Graduate Unemployment

Almost every country has lately been experiencing the challenge of graduate unemployment, and in some countries the unemployment figures are alarming, and India is no exception. The bigger concern is there on the employable opportunities of the youngsters who are in the verge of completion of their education. Recent graduates in India are worried of their job offers from corporates. For economic reasons, many private employers are forced to remove their staff, thus increasing unemployment. This will make it even harder for fresh outgoing graduates to find employment leading to large-scale unemployment.

2.5. Effect on Private Education Institutions

A characteristic of the education sector in India is the presence of private institutions. The number of institutions is significantly greater than public ones and private student enrolment has steadily increased over the years, having almost equal student enrolment in public and private institutions. These private institutions usually operate along a business model and are solely dependent on students' fees to cover staff salaries and operational costs. Now the private ones may be forced to stop their operations for lack of funds. Closure of these institutions would have a dramatic impact on the higher education sector and countries' economic development.

Economic recovery and support to alternative sectors of the economy can got to come back later. however,it is important for education sector to begin reflective on the impact of internment and assessing its doable consequences, otherwise recovery of the arena is also too slow, too late. The approach ought to be holistic and involve all stakeholders, together with the non-public sector. To build a versatile education

system a decent coming up with is needed. Government ought to type a committee to survey things and be able to provide remedies for the prevailing problems. e-learning ought to be adopted by lecturers to conduct on-line teaching and inclusive learning solutions, particularly for downgraded ought to be developed. Uninterrupted net facility is important for enabling teaching and learning method. This transformation in education system increase the effectiveness of learning and teaching.

Immediate measures square measure needed to scale back the consequences of pandemic on job offers, office programs, and analysis comes. it is vital to rethink this education strategies in class and better education by desegregation schoolroom learning with e-learning. The main challenge is that the integration of technology within the gift Indian education system. it is additionally vital to ascertain quality assurance mechanisms and quality benchmark for on-line learning developed by e-learning platforms. Several e-learning platforms provide multiple courses on an equivalent subject with totally different levels of certifications, methodology and assessment parameters. So, the standard of courses might disagree across totally different e-learning platforms.

3. Conclusion

In this time of crisis, all-around and effective academic observe is what is required for the capacity-building of young minds.

It will develop skills which will drive their employability, productivity, health, and well-being within the decades to return, and make sure the overall progress of India.

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11

A VIRUS THAT CHANGED THE SCENARIO OF EDUCATION

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Abstract

The outbreak of the unexpected coronavirus pandemic has twisted immediate and unprecedented challenges even in the field of education. As of 31st March, 185 countries around the globe have implemented or announced the closure of schools and universities. All through the globe the education sector came to a standstill. Nearly 1.5 billion children and youth have been impacted by the crisis. In India, schools were among the first of many organizations which started shutting down as a precautionary measure to prevent the spread of the virus. After schools were shut down in the face of the crisis, the whole education system was confronted with adversity when on 24th March, Prime Minister Shri. Narendra Modi ordered a nationwide lockdown. The lockdown limits the movement of the entire 1.3 billion population of India, compelling both the private and government schools all over the country to suspend classes indefinitely. The pandemic has significantly disrupted the higher education sector as well, which is a critical determinant of a country's economic future.

1.Introduction

The COVID-19 crisis may well change our world and our global outlook; it may also teach us about how education needs to revolutionise to be able to better prepare our young learners for what the future might hold. These lessons include:

1.1 Educating citizens in an interconnected World

COVID-19 is a pandemic that illustrates how globally interconnected we are – there is no longer such a thing as isolated issues and actions. Successful people in the coming decades need to be able to understand this interrelatedness and navigate across boundaries to leverage their differences and work in a globally collaborative way.

1.2. Redefining the role of the educator

The notion of an educator as the knowledge-holder who imparts wisdom to their pupils is no longer fit for the purpose of a 21st-century education. With students being able to gain access to knowledge, and even learn a technical skill, through a few clicks on their phones, tablets and computers, we will need to redefine the role of the educator in the classroom and lecture theatre. This may mean that the role of educators will need to move towards facilitating young people's development as contributing members of society.



1.3. Teaching life skills needed for the future

In this ever-changing global environment, young people require resilience and adaptability – skills that are proving to be essential to navigate effectively through this pandemic. Looking into the future, some of the most important skills that employers will be looking for will be creativity, communication and collaboration, alongside empathy and emotional intelligence; and being able to work across demographic lines of differences to harness the power of the collective through effective teamwork.

1.4. Unlocking technology to deliver education

The COVID-19 pandemic has resulted in educational institutions across the world being compelled to suddenly harness and utilize the suite of available technological tools to create content for remote learning for students in all sectors. Educators across the world are experiencing new possibilities to do things differently and with greater flexibility resulting in potential benefits in accessibility to education for students across the world. These are new modes of instruction that have previously been largely untapped particularly in the kindergarten to Grade 12 arena.

Most importantly, it is our hope that for Generation Z, Alpha and the generations to come, these experiences of isolation and remote learning away from their peers, teachers and classrooms will serve as a cautious reminder of the importance of our human need for face-to-face social interaction.

Sometime in the second week of March, all the respective state governments across the country began shutting down all the schools and colleges temporarily as a measure to contain the spread of the novel coronavirus. It's close to a month and there is no certainty when they will reopen. This is a crucial time for the education sector—board examinations, nursery school admissions, entrance tests for various universities and competitive examinations, among others, are all held during this period. As the days pass by with no immediate solution to stop or control the outbreak of COVID-19, school and university closures will not only have a short-term impact on the continuity of learning for more than 285 million young learners in India but also engender far-reaching economic and societal consequences. It has created a dynamic necessity to adjust our education sector to transform the classroom traditional teaching to more web teaching, networking teaching through E-Learning.

The structure of schooling and learning, including teaching and assessment methodologies, was the first to be affected by these closures. Only a handful of private schools could adopt online teaching methods. Their low-income private and government school counterparts, on the other hand, have completely shut down for not having access to e-learning solutions. The students, in addition to the missed opportunities for learning, no longer have access to healthy meals during this time and are subject to economic and social stress.

As the Coronavirus pandemic is gaining momentum everywhere, it has inflicted incalculable damage on the world. Besides altering the lives of humans in an unprecedented manner, COVID-19 has also spelt doom for entire industries. As a part of this program, the most innovative projects will be shortlisted for advanced mentoring. Subject matter experts from T-Hub, Q City, Emerging Technologies Wing, ITE&C Dept, Government of Telangana, and the Centre for Cellular & Molecular Biology (CCMB) will work with the students to help them transform their ideas into viable business propositions.

The program is open to student innovators across colleges in Telangana. Students are encouraged to develop a potential solution, idea or an app for reporting, curing or tracing the COVID-19 pandemic, or anything else that can help curb its spread and prevent future outbreaks. The focus areas for the program are as follows

- Easy detection of infected persons
- Low cost and easy to implement
- Efficient tracking of infected persons and their contact with other persons
- Regular monitoring of the spread of the virus and predict outcomes

The benefits that the student innovators will receive are as follows:

- Mentorship and guidance under subject matter experts from T-Hub, which leads India's pioneering innovation ecosystem.
- To be part of a curated mentorship program by T-Hub for student entrepreneurs
- Gain exposure to the industrial experts from Q City, Grace Cancer Foundation, CCMB and other leading corporate partners.

A multi-pronged strategy is necessary to manage the crisis and build a resilient Indian education system in the long term. It will be benefiting the education sector in the long run and slow switch over to the web learning process and E-Learning practices.

1. Immediate measures are essential to ensure continuity of learning in government schools and universities. Open-source digital learning solutions and Learning Management Software should be adopted so teachers can conduct teaching online. The DIKSHA platform, with reach across all states in India, can be further strengthened to ensure accessibility of learning to the students even from distant to their teachers.

2. Inclusive learning solutions, especially for the most vulnerable and marginalized, need to be developed. With a rapid increase of mobile internet users in India, which is expected to reach 85% households by 2024, technology is enabling ubiquitous access and personalization of education even in the remotest parts of the country. This can change the schooling system and increase the effectiveness of learning and teaching, giving students and teachers multiple options to choose from. Many inspirational districts have initiated innovative, mobile-based learning models for effective delivery of education, which can be adopted by others.

3. Strategies are required to prepare the higher education sector for the evolving demand–supply trends across the globe—particularly those related to the global mobility of students and faculty and improving

the quality of and demand for higher studies in India. Further, immediate measures are required to mitigate the effects of the pandemic on job offers, internship programs, and research projects.

4. It is also important to reconsider the current delivery and pedagogical methods in school and higher education by seamlessly integrating classroom learning with e-learning modes to build a unified learning system. The major challenge in EDTech reforms at the national level is the seamless integration of technology in the present Indian education system, which is the most diverse and largest in the world with more than 15 lakh schools and 50,000 higher education institutions. Further, it is also important to establish quality assurance mechanisms and quality benchmark for online learning developed and offered by India HEIs as well as e-learning platforms (growing rapidly). Many e-learning players offer multiple courses on the same subjects with different levels of certifications, methodology and assessment parameters. So, the quality of courses may differ across different e-learning platforms.

5. Indian traditional knowledge is well known across the globe for its scientific innovations, values, and benefits to develop sustainable technologies and medicines. The courses on Indian traditional knowledge systems in the fields of yoga, Indian medicines, architecture, hydraulics, ethnobotany, metallurgy and agriculture should be integrated with a present-day mainstream university education to serve the larger cause of humanity.

In this time of crisis, a well-rounded and effective educational practice is what is needed for the capacity-building of young minds. It will develop skills that will drive their employability, productivity, health, and well-being in the decades to come, and ensure the overall progress of India.

2. Problems Due To Pandemic

In my opinion, there are 3 major problems that we face because of this pandemic:

2.1. Students caught in the cross-wire: These are those students who are caught in the limbo on account of education outcomes being withheld due to the Covid-19 pandemic. Some of them do not have a result because exams either did not happen or were left in the middle. Many of them face uncertainty as to their future because their next steps further education or careers are dependent upon them clearing their school or college leaving exams. We believe that these students, while may face a degree of uncertainty with

respect to future, are not facing a very difficult problem. Hence, they should patiently wait while staying in touch with their prospective universities. Any clarity as to the decision-making process and entry factors would come as soon as the Covid-19 pandemic impact recedes and life returns to normalcy.

Be on the lookout for new information and make sure that you are able to position yourself very quickly in line with that so that you don't lose out when things start to move.

2.2. Students one year away from school or college-leaving exams:

These students are in a bigger quandary because of the Covid-19 pandemic because not only their education process is disrupted, but they also face a big challenge of proving themselves for their next journey. In the absence of hard academic indicators such as grades and marks, many of these students find themselves in a situation where they are unable to differentiate themselves and lack a cohesive framework to get themselves ready for the jobs and education tasks they face next. Many schools, especially those which are outside India, and jobs anyways focus on a holistic profile. Students should therefore focus on those pieces which are aligned to their interests and strengths and through demonstrable projects showcase their skills in those areas. A great platform to look for those projects is the idea and project library, ACadru Others can be found through your teachers and mentors.

2.3. Education disruption:

All other students who are away from such outcome-dependent situations such as above also face severe education disruption. In response to the Covid-19 scare, many schools have moved online and parents seem to have assumed the role of teachers and are fast becoming savvy with resources created for home-schoolers to cause minimal disruption to their children's education. Again, while there are a ton of fantastic resources which are available, there are not too many resources which mimic the school that is, provide for multidisciplinary learning, encourage connections across different domains and inspire ideas which help a child develop 21st century skills and prepare themselves for the jobs of the future.

3. Conclusion

No doubt, that the Covid-19 pandemic has unleashed the biggest calamity that humanity has faced so far. We all are going through perhaps the most trying circumstances of our lives.

Education disruption impacts our readiness for the future and also has huge economic and lifestyle costs.

Make sure that you take all measures to minimize this disruption so that when life returns to normal, you are even more prepared to take advantage of the opportunities that life and the world-at-large presents to you. Whatever has happened, we may think it is for our better and the education sector is going to transform from traditional teaching to modernised methods.

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TEACHING AND LEARNING DURING COVID LOCKDOWN

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Abstract

This situation had risen in the context of the outbreak and is considered to be unique as there is no evidence of the similar situation in a couple of decades. 'Janata Curfew' followed by 'lockdown' is painstaking decision laid on Indian citizens to fight against the global epidemic war. Due to the decision imposed on the people, all the sectors of various departments functioning have come to a halt. Among the all the sectors, education sector is one entity which is shut in all the parts of the nation. To bridge the gap in an optimistic approach, creativeness in learning and teaching has come forward for adoption by various universities and schools. Hence, using technology, teaching, students' assessments are in action online.

1.Introduction

A huge impact on the education sector is laid upon during any national crisis. It is threatened as the concept of right to education is halted during the disasters. Among such various disasters occurred, COVID-19 or Corona Virus outbreak is a pandemic which forced the educational system to shut the doors. This has led to think various alternatives or strategies to engage students and benefit them from loss of learning. One best auxiliary method for doing so is Online mode of teaching adopted by the education department throughout the nation. Online mode of learning is learner centric mode where students are open to choices of choosing the subject responsibly.

1.1Approaches that ensure increase in online teaching and learning methodology includes:

1.1.1 Smart teaching practices adopted-

- Conducting online lecture sessions for all the students' starting from 1st grade of school to the professional degree graduates. These sessions are scheduled using software's like 'Skype', 'GoToMeeting', 'Zoom', 'Google Duo', etc. The monitoring of the students happens with interaction with everyone involving the aspects of questionnaire for doubt clearance.
- Sharing of the material and administration of assessment assigned through various options available- 'Google Classroom', 'WhatsApp', etc. with specification of deadline.
- Conducting quiz or looking forward for multiple choice questions from the students (MCQ's), etc., methods could be adopted using classroom or other software like 'Testmoz' for active participation of the students and create interest and enthusiasm among them.
- Options available in Google platform, like 'Google Docs' could be used to engage students in concerted writing to enhance their skills and contribute them for research extensively.
- Educational videos available online on 'YouTube' helps the student to watch and learn the topic with clear understanding and browsing.
- Faculty has an option of creating videos/presentations with voiceover and slides to share with the students for preparation or learning of the syllabus.

1.1.2 Students' learning resources-

- Students learning access could be a preliminary step from their side by creating or formulating their own study material or presentations from the topics in their curriculum.
- Apart from the curriculum of study, students are also encouraged to take part in various competitions or activity sessions where they focus on co-curricular activities.
- They are encouraged to utilize the time available to create their portfolios which reflect the learning experiences the students went through the course duration.

1.1.3 MOOCs- Massive Open Online Course has a relevance in learning platform as the short-term course could be a base for the student to be encouraged in further learning as they would be awarded with credits and certification. Various MOOC's available for students accepted across the globe could be SWAYAM NPTEL, Coursera, Udemy, edX, etc.

Any pioneering evolution in learning-teaching practices in a developing nation has pros and cons to admit. They include-

Advantages	Disadvantages
Increases the learning ability using various technology and tools available	Absence of direct conversation with the faculty or expert in all circumstances
No standstill situation because of epidemic spread	Lack of infrastructure in few places
Working according to pace and convenience	Difficulty in being adapted to online mode of learning and submissions with distractions around.

2.Changing from offline to online mode of learning

Conferring about the assertion given by *UNESCO's Assistant Director-General for Education, Mrs. Stefania Giannini*, “*We need to come together not only to address the immediate educational consequences of this unprecedented crisis, but to build up the longer-term resilience of education systems*”, we are involuntary near the inclination towards the learning without the suspension of classes. The continuity of learning is an emergency learning phase that is different for both- the learning and teaching as well. It generally focusses on the students’ transition period that helps them to explore not only the course curriculum but also their skill development.

The global platform of education in collaboration with the world bank has made efforts to use the technology for educational purpose and specified up the exertions with respect to individual country to provide learning prospects to all the students with instructive assessments in context of the closure due to the epidemic Covid-19.

According to the review on “*How countries are using edtech to support access to remote learning during the COVID-19 pandemic*” by the World bank, the following analysis has been done-

Table 1: Review on “How countries are using edtech to support access to remote learning during the COVID-19 pandemic”

S. No	Country	Broadcasting On Television	Broadcasting On Radio	Use Of E-Classroom	Distribution Of Stationery	Subsidary On Internet/ Cable Fee	Free Access To e Library And Self Learning Resources	E-Assement
1	ARGENTINA	1	1	1	1	1	1	0
2	AUSTRIA	1	0	1	0	0	1	0
3	BELIZE	0	0	1	0	0	1	1
4	BHUTAN	1	0	1	0	1	1	1
5	BRAZIL	1	0	1	0	0	1	0
6	BULGARIA	1	0	1	0	1	1	1
7	CHILE	0	0	0	0	0	1	0
8	CHINA	1	0	1	0	1	1	0
9	COLOMBIA	1	1	0	0	0	1	0
10	COSTA RICA	1	0	1	1	0	1	0
11	CROATIA	1	0	1	0	1	1	0

12	CZECH REPUBLIC	1	0	0	0	0	1	0
13	DOMINICAN REPUBLIC	0	0	1	0	1	1	0
14	ECUADOR	1	1	1	0	0	1	0
15	EGYPT	0	0	1	0	1	1	1
16	EL SALVADOR	1	0	1	0	0	1	0
17	FIJI	0	1	0	0	0	1	0
18	FRANCE	0	0	1	0	0	1	0
19	GEORGIA	1	0	0	0	0	1	0
20	GUYANA	1	1	0	0	0	1	1
21	INDIA	1	0	1	0	0	1	1
22	INDONESIA	1	0	1	0	1	1	1
23	ITALY	0	0	0	0	1	1	0
24	JAMAICA	1	0	1	1	1	1	1
25	JAPAN	0	0	1	0	1	1	0
26	JORDAN	1	0	0	0	1	1	0
27	KENYA	1	1	0	0	1	1	0
28	KOREA	1	1	1	1	1	1	1
29	KUWAIT	1	0	0	0	0	1	0
30	KYRGYZ REPUBLIC	1	0	0	0	1	1	1

31	LIBERIA	0	1	0	0	1	1	0
32	LIBYA	1	0	0	0	0	0	0
33	MADAGASCAR	1	1	0	0	0	1	0
34	MALAYSIA	1	1	0	0	0	1	0
35	MALDIVES	1	1	1	0	0	1	0
36	MEXICO	1	0	1	0	1	1	0
37	MOLDOVA	0	0	1	0	0	1	1
38	MONGOLIA	1	0	0	0	0	1	0
39	MOROCCO	1	0	0	0	0	1	0
40	NIGERIA	1	1	1	1	1	1	1
41	NORTH MACEDONIA	1	1	1	0	0	1	1
42	PARAGUAY	0	0	1	0	1	1	1
43	PERU	1	1	1	0	1	1	0
44	POLAND	0	0	1	0	0	1	0
45	RUSSIA	0	0	1	0	1	1	1
46	RWANDA	1	1	1	0	1	1	0
47	SAUDI ARABIA	1	1	0	0	0	1	0
48	SOUTH AFRICA	0	0	0	0	1	1	0
49	SOUTH SUDAN	0	1	0	0	0	0	0
50	TUNISIA	0	0	1	0	1	1	0

51	TURKEY	1	0	0	0	1	1	0
52	UNITED ARAB EMIRATES	0	0	1	0	1	1	1
53	URUGUAY	0	0	1	0	0	1	1
54	WEST BANK AND GAZA	1	1	1	0	1	1	1

Source: <https://www.worldbank.org/en/topic/edutech/brief/how-countries-are-using-edtech-to-support-remote-learning-during-the-covid-19-pandemic>

*1= Yes (Presence and usage of the method)

*0 = No (Absence and no usage of the method)

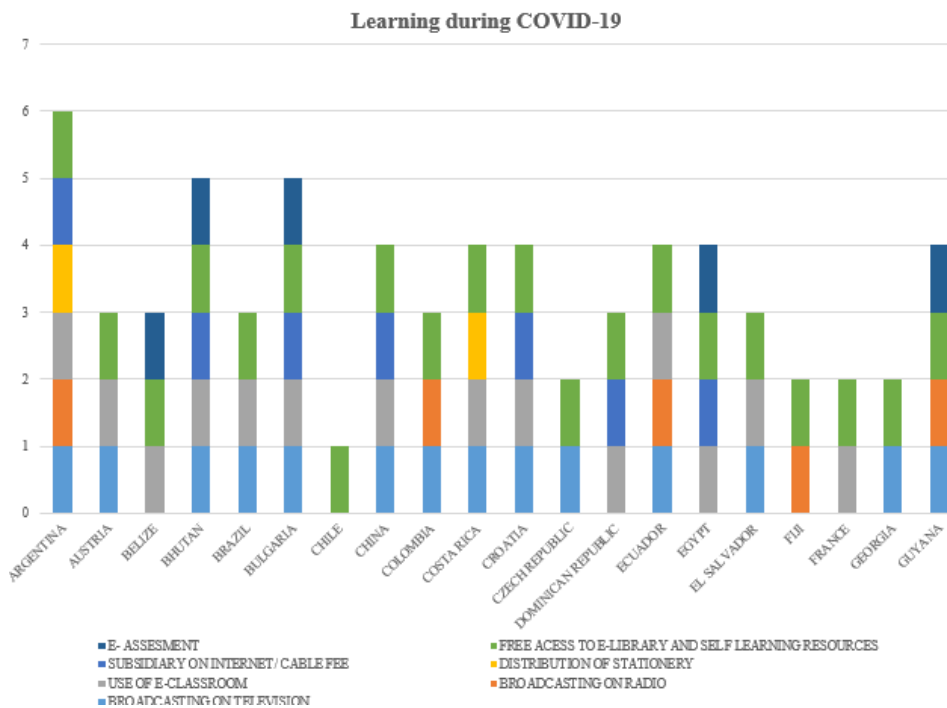


Figure 1: Analysis of 1-20 Countries from the above table

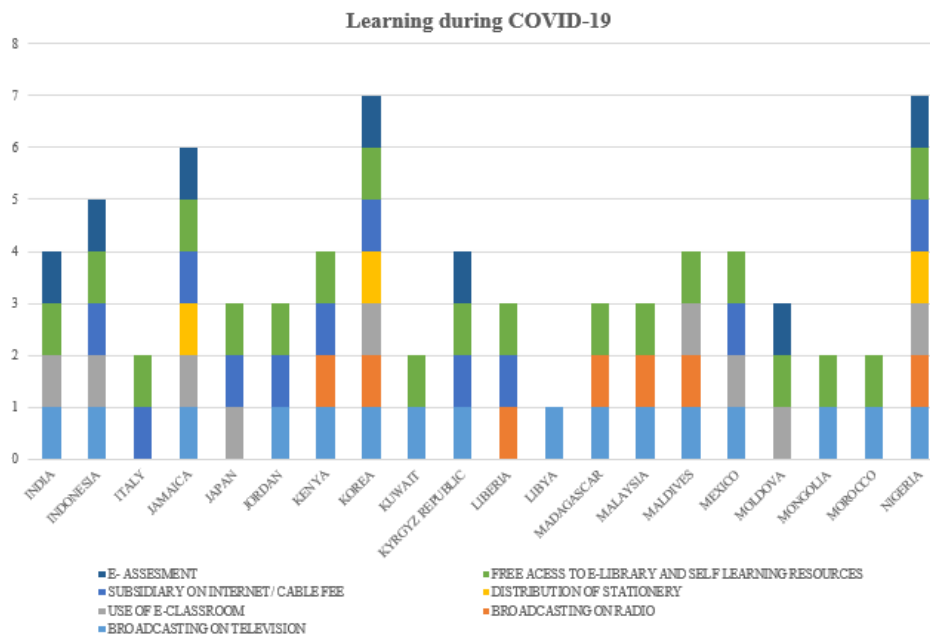


Figure 2: Analysis of 21-40 Countries from the above table

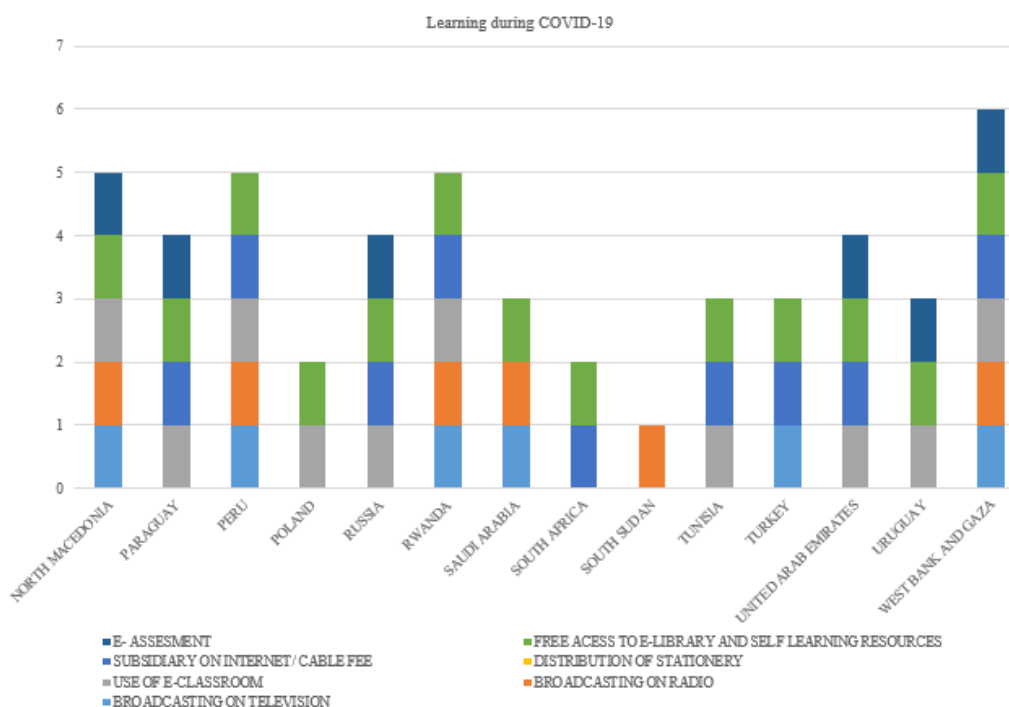


Figure 3: Analysis of 41-54 Countries from the above table

1. Study& Analysis: The world all over, except the continent of Antarctica is into the hands of the deadly pandemic COVID-19. An immense number of cases and deaths are spread all over the world leaving the origin of the epidemic, the state of China apart.

The pandemic is looming a threat to the education progress all-over the world with the following foremost shudders. They include-

- World-wide shut of the schools and colleges
- Fiscal recession related issues.

Focussing on the educational related aspects across the globe, closing of the schools is leading to loss in learning, increase in number of drop-outs, higher decline in the demand & supply of the education sector.

To overcome the above evasions, most of the countries have adopted to continue the learning through various approaches that helps to alleviate the damage caused and mend the situation to a prospect of vision. The world bank along with the several countries affected due to the virus spread has formulated a policy to achieve a positive node for the educational sector. They include-

- Coping
- Managing continuity
- Improving and accelerating

The countries have initiated in the implementation of the key terms mentioned above to not only improve the existing situation, but also to grow ahead with the physiognomies of little learning, high levels of inequality and slow progress from the pre-COVID situation. The countries are making an opportunity to “build back better” as the recovery strategy and progressing on long term improvements in the areas of pedagogy, technology, assessment, financial aspects, parental involvement, etc.

Among the countries of the world mentioned in the given Source:

<https://www.worldbank.org/en/topic/edutech/brief/how-countries-are-using-edtech-to-support-remote-learning-during-the-covid-19-pandemic>

, there are few countries that are successful in the implementation of the educational policies on a better platform by providing access through various sources while the other countries are not in a position to reach the target and be successful at the same pace due to innumerable aspects including the infrastructure availability, financial status, presence of high COVID cases all across the country.

According to the focus on the policy, the measures taken by different countries are categorised and marked bestowing the Logistic regression in areas of –

- Broadcasting on television

- Broadcasting on radio
- Use of e-classroom
- Distribution of stationery
- Subsidiary on internet/ cable fee
- Free access to e-library and self-learning resources
- E-assessment

Amongst the countries taken into consideration(Source: <https://www.worldbank.org/en/topic/edutech/brief/how-countries-are-using-edtech-to-support-remote-learning-during-the-covid-19-pandemic>

), Korea and Nigeria (**Error! Reference source not found.**) are the only countries in the world to score the highest mark containing all the fulfilments or 7 categories to achieve the good rank in the educational status across the globe even with a considerable number of epidemic cases and the economic status comparatively. It is further followed by Argentina(**Error! Reference source not found.**), Jamaica(**Error! Reference source not found.**) and West bank & Gaza(**Error! Reference source not found.**) which has a 6-point rating in the logistics. The countries which are under the least ratings for the progress in the policy devising are Chile(**Error! Reference source not found.**), Libya(**Error! Reference source not found.**) and Sudan(**Error! Reference source not found.**) which has only 1-point rating due to their economic status & the importance given to the education sector in the country.

In case of India(**Error! Reference source not found.**), though an emerging nation, it stands at a platform with 4-point scale where trying hard to overcome the epidemic situation is considered more necessary. Thus, providing the basic access for the pupil across the country to engage themselves during the summer break is provoked sufficient to generate a better life for the citizens of the realm.

3. Conclusion

Thus, during the catastrophe, expressly in case of India, we have to behold the effective educational practices needed for younger generations mind building capacity rather than the curriculum-based learning limited only to the school or college level. It will thus help in the advancement of the skills to ensure an overall progress in India in the sectors of employability, health, well-being, productivity, and many more aspects in the decades to come.

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HOW TO SKILL-UP IN PANDEMICS

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Abstract

The outbreak of coronavirus named COVID-19 has disrupted the education system in the entire world. The evolution of the disease and its impact on health and education is highly uncertain which makes it difficult for students to design their future plans and it crushed many teaching faculty income by closing educational institutions. In order to better understand possible sources of learning and teaching, this paper explores different tools and knowledge sources developed by the HRD department and various organizations. This paper helps students to be active in online classes and gather knowledge from different online courses and sources to learn. COVID-19 finally showed us a doorstep opportunity to learners for learning.

1.Introduction

COVID-19 is one of the virus diseases which originated in Wuhan city in china is termed as corona virus or COVID 19 by World Health Organization (WHO). WHO declared that it is a novel virus. Its spreads through saliva droplets or mucus from nose of the diseased person when he/she sneeze or coughs. As this doesn't have any vaccine for prevention it became panic among the public. To keep the situation under control the Indian government has passed the guidelines of social distancing, utilizing of sanitary products like Dettol, Lifebuoy for cleaning hands and alcoholic sanitizer to the entire population in the country by means of different channels. Another step it took is controlling mass gathering. For that it stopped working of all educational institutions in the entire country. As they are having huge gatherings and where the spread will be elevated very fast.Indian government declared lockdown on 22nd March 2020. So, all the company's transports, railways and many other sectors have been closed.

2.COVID-19 Impact onFaculty

Any crisis in nation shows its impact on the education system to minimum or maximum extent. Due to this many institution's management people started terminating and nullifying the staff from their institutions and some institutions to save money. All of sudden many faculty members from schools to colleges were dragged on to the roads. Survival became a challenge to the faculty in the lockdown period. The condition became serious and it made to start a petition named "#KeepTeachersSafe.". This was asked to the Indian Ministry of Health and Family Welfare (MoHFW) and Health Ministry and the Human Resource Development Ministry (MHRD). Software company's gave employees a provision to do work from home. By taking inspiration from software company's educational institutions also started work from home for faculty and online classes for students. Online mode is a kind of flexible learning. Learners are provided with a different kind of choices for their learning. E- Learning allows learners to take more responsibility for their self-learning. Many of the Engineering faculty are having good knowledge and they are familiar with online tool, so their confidence towards active online engagement of their students is inevitable. Ministry of Human Resource Development, UGC, AICTE and many other societies encouraged all the institutes to make learning through online classes. Here are some tokens for increasing and ensuring higher levels of student engagement in online teaching.

3.How Students can be active in online classes duringPandemic

Students who are self-motivated and self-directed can easily hold new technology and online course work which enables positive learning. But the remaining people may facesome challenges. In the below lines you can find some of the tips which can help all the students learnhowtobesuccessfulandgrabknowledgeinonlineclasses–evenduringtheseuncertain times.

- i. Set a Milestone:Set a milestone or benchmark for what success you want to catch. After that, develop a plan to work toward the goal like What to study? When to study? and How to study? If you're getting behind with reaching those goals, take a short break and relax. Re-focus on your intended accomplishments, by taking help from a friend or classmate to share your doubts and goals.
- ii. If its stumble its ok:If you're new to e-learning and are disordered how to be successful in online classes, it's important that you give yourself time to learn, grow and permission to stumble. You're going to have to take a few shots to connect your video-conference, you may worry with new learning formats,

or observing to a schedule while being at home. This is all usual as you adapt to new habits of doing things. Just give yourself the autonomy to experience a few knocks along the way, but stay positive and adjust to get back on track.

iii. Set up Non-Conducive Environment: When you want to study just start searching for a tedious space, where you will not be distracted. Look for a peaceful spot in your home and arrange a table and chair which are near to an electric socket. Have headphones to wipe out the outside noise, especially while participating group discussions or meetings.

iv. Avoid Interferences: As we have multiple jobs our mind is not connected to a particular profession, Distraction is very common. Keeping the mobiles in silent mode. Sitting in a closed room can help us to avoid distraction. Circumventing social sites notices is much useful to eradicate disruptions.

v. Keep in touch with your classmates: Connecting with classmates reduces stress and quarantine depression. Simultaneously if we are attached to mates then knowledge sharing is also possible. You can connect with your classmates and friends through skype, Google hangouts and other online chat sites. Doubt clarification or explanations can be done through video conferencing. Project discussions, sharing ideas are also effective. By doing these you will be less isolated and more connected.

vi. Maintain Relationship with your faculty: If you are handling remote learning, you can still maintain relationship with your faculty. Take their advices by calling them in their free hours. remind to take appointment before calling. Faculty are always supportive to the students. So, students can be connected with them without hesitation to improve their skills and knowledge.

vii. Be Cool and Be Positive: As we are in lockdown situation, we have to stay at home always in between four walls for a certain period only. After everything becomes fine, we can lead normal life. So, don't get panic about the future. Stay cool and calm at homes. Help them to the needy, contribute to the poor communities from your pocket money. Be brave and be positive always and focus on your goals.

4. Benefits of Online Learning

E-Learning is the best way for those who are having good technical knowledge and devices. According to some teaching experts 25%-60% more material will be gained through online learning rather than offline learning. Students are being able to learn faster in offline. Main reason is because of presentations, Animated videos and slide shows. Recorded videos are helpful to the students because they can access them at students' times, they can skip the known subject or fast-track some concepts. It

not only benefits the student it also benefits the faculty and educational institutions.

4.1 Here are some of the benefits from online learning:

- Information & Communication Technology Offer highly effective learning environments.
- It allows students to study all the complete day and work at their own place.
- It is flexible scheduling.
- Available in any location with an internet connection; students can attend using their own devices like computers, tablets, Mobiles and etc.
- Direct teacher feedback.
- Real-time student monitoring and corresponding reports.
- Allow franchises to share schedules and classes online (to increase class attendance).
- Improve the image of your center by offering technological solutions that solve real problems.
- More exposure to ppts rather than chalk and talk.
- School transport has been stopped as it is lockdown. It even saved fuel, electricity and other maintenance charges.
- Covers large count of students.
- More Discipline & Less Disturbance.
- As teacher is not getting disturbed Effective teaching will be there rather than classroom.
- Parent impact in learning is more
- Student feels more comfort and sit in his like posture.

4.2 Smart Teaching Smart Learning Tools:

As a result of digital world online education has brought it inevitable beginning from Kindergarten students to Post graduate and Ph.D. students. It extended its wings to all the educational institutions. Remote learning tools like Google classroom, Blackboard, ZOOM and Microsoft teams and WebEx etc plays a key role. Information and Communication Technology is rooted in every student mind by the way of watching videos, challenging puzzles, Simulation games, animations and educational apps etc. Most of the metropolitan students are depending upon learning and knowledge testing apps like BYJUS, VEDANTU & SUGAR MATHS and etc to know their caliber and enhance their knowledge and skills.

Here are some of the eminent tools and productive apps used for online teaching. There

has been a great increase in the number of free-learning courses in recent times. The COVID-19 led lockdown has triggered users to learn new skills. Be it scheduling e-classes or reducing distractions, there are apps to promote good learning habits and help learners stay motivated. Here are top apps that will help you study smart, stay productive, and be efficient

a. **istudiez**: This app lets you manage your e-learning course schedule and link assignments. The app packs live sessions, discussion forums, exams etc. Having all the necessary things in one place makes it easy for learners to stay on top of everything required. The app is available on mobile and web platforms. It helps you track your progress by integrating everything you need onto a single dashboard.

b. **Evernote**: The Evernote-keeping app has been around for years. Everyone lets you take notes during an online course. Since the tool's syncs across platforms, it helps in switching between your phone and laptop with ease. It also doubles down as an organizing tool, arranging all your research and study inputs in one place.

c. **Brainly**: This tool is great for beginner online learners. The app helps in plugging one of the main disadvantages of digital studying - a vibrant peer network. Since most courses promise some level of a peer-to-peer network, Brainly allows learners to ask questions, clarify doubts from experts, and engage in online discussions with a community of learners.

d. **App Block**: The platform offers plenty of distractions to break your focus while studying online. This app will take care of some of these distractions. App Block allows you to block out social media, and news apps, including notifications. The service helps you concentrate on your course. It is very simple to create a profile, log in the names of the apps, days of the week or time period when you don't want to use them. You can also tweak your plan and whitelist the apps that you may need.

e. **MindMap**: The app offers a seamless expense to create attractive mind maps that organise complicated ideas. You can even collaborate with others on the mind maps that you are working on. MindMup makes studying for a subject much easier.

f. **Zoom**: This is one of the Online lecture software which can be made more interactive by separating the whole group into sub-groups with restricted number of students. This will help teachers to monitor their student's participation and can make them actively involve by questioning and soliciting questions.

g. **'Vox vote'**: Software like this can be used for conducting online quizzes, opinion polls on a daily basis.

h. 'Testmoz': It's an Online multiple-choice question (MCQ) and other objective type tests may be administered daily using this software.

i. 'Canvas' & 'Google Classroom': Teachers assign topics for assignment to students and can ask them to submit before a target date. Students can submit their assignments using email or other e-platform like this two software's. Students can either forward their scanned copy of the written assignment or directly post the electronically typed one.

j. 'Google Docs': This is used by teachers and resource persons for engaging their students or participants in collaborative writing where a group of participants or students can contribute for a single topic both synchronously and asynchronously. The faculty moderator can monitor participation and will also be able to identify and evaluate individual participants contributions.

k. 'Podcasts': Podcasts are digital audio files which are available on the Internet. These can be downloaded to a computer or a mobile device. Students can answer a self-assessment questionnaire or rubric finally after listening to the podcasts. Podcasts of 'Medical Educator' are quite popular among medical student.

5. How Indian Govt Promoting Online learning?

The Human Resource Development (HRD) Minister on March 21st, 2020 and the Union HRD Minister shared various free digital e-Learning platforms by the Ministry of HRD that students take advantage of continue their learning during COVID-19 school terminations.

The website called **DIKSHA** encompasses e-Learning stuff for students, faculty's, and parents affiliated to the curriculum, with video lectures, worksheets, textbooks and assessments. This site was developed under the guidance of national board of education i.e. (CBSE) and NCERT. More than 250 teachers who teach in multiple languages involved in creating these stuffs. Textbooks with Quick Response codes inspire students to go beyond the book. This app can be used in offline too.

This application **E-PATHSHALA** is also one of the e-Learning apps **developed** by NCERT for students of classes 1 to 12 in multiple languages. This app also has Books, video lectures, audio lectures, etc. It also for students, faculty and parents and it is in multilinguals including Hindi, Urdu, and English.

The **NROER** (National Repository of Open Educational Resources) is another portal which provides a platform for students and teachers in many languages including books, communicating modules and videos including Science, Technology, Engineering and Mathematics based games. This is for students of class 1 – 12, including affiliated resources for teachers.

The Portal **SWAYAM** is designed by IIT's. Before it is NPTEL, later MHRD collaborated with IIT's and turned to SWAYAM. It is having 1900 complete courses, with video lectures, weekly assignments, certificate exams and credit transfers, designed for both school from class 9th to 12th and higher education (undergraduate and postgraduate) levels. Here we can find different Subjects according to the curriculum of engineering, humanities, social sciences, law and management courses including robotics.

The **SWAYAM PRABHA** is DTH (Direct to Home) channel dedicated to telecast educational programs round the clock and accessible all across the country. These channels provide courses for school education (class 9-12), higher education (undergraduate, postgraduate) and for out-of-school children, vocational education and teacher training. Arts, science, commerce, performing arts, social sciences, humanities, engineering, technology, law, medicine, and agriculture subjects are included. Schedule for the broadcasting as well as archived programs are available on the website.

6. Conclusion

The COVID-19 pandemic has interrupted the routine learning schedule of the day-scholars. Because of this COVID-19 lockdown across the country, the lively hours which day-scholars spend in their college for learning is being spent at home which left them behind their routine learning activities. If we apply these online engagement tactics for teaching, learning and assessment purposes then they will help learners to continuously involve themselves in the learning process and will also help them to adopt good study habits without negotiating their professional attitudes. All these required for good learning outcomes are faculty involvement, identification of appropriate digital learning platforms, designing of educational activities and proper planning and scheduling of activities based on the proposed learning experiences. If we follow these tactics, they will help any education institution to effectively overcome the educational crisis situations like lockdown due to public health emergencies or any other disaster for this matter.

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CHALLENGES AND OPPURTUNITIES FOR TEACHERS DURING LOCKDOWN

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Abstract

Education is one of the most powerful instruments for National building and social reformation. Technology has changed the scenario of traditional education system globally, where teaching is considered as a noble profession that shapes the character and future of an individual and teachers as the backbone. But the sudden lockdown due to Covid-19 affected deep roots of education system especially the teachers and their livelihood. Whereas higher education has created revolution in India the underprivileged schools were not well equipped with necessary infrastructure to adapt to the technology. At initial stages there was a lot of resistance in teaching fraternity towards online teaching for different reasons. Though there were many challenges, as lockdown continued teachers started adopting technology and the 3 mantras of Education-Learn, Unlearn, Relearn. We in this paper would like to address challenges teachers faced during lockdown and how they have overcome the situation for the better feature of Students and the Society.

1. Introduction

The COVID-19 is declared as a pandemic health crisis all over the world by World Health organization. Slowly it started affecting the entire world not only in health but also various sectors including transportation, tourism, health sector, agriculture, real estate, education system etc. After honorable Prime Minister announcing Lockdown all over India, there was a serious impact on Education System. This stagnant majorly effectson students, teachers and institutional management by various factors.After few days the institutional management and teachers started thinking on this pandemic alternative solution to enrich student knowledge

2. Impact on Education

For a student going to school can be a fun and nurture social skills and awareness by increasing their learning ability. But these uncertain times have created more problems to teachers. Almanac for Indian students has been affected for around two months with no clear determination of the situation. With this uncertainty, primary and upper primary children have already been promoted to next grade based on

internal assessments. In most of the Indian states due to the lockdown effect, high-school and senior secondary level examinations were postponed and rescheduling of exams is awaited. As all universities and colleges are closed due to national lockdown, the teaching – learning process and research activities have been badly disrupted.

Academic sessions (like placements) are hanging at various stages depending on the individual institute's or university's calendars. One of the bigger concerns in everybody's mind is how this will effect on the employability. The Centre for Monitoring Indian Economy's (CMIE) estimates on unemployment shot up from 8.4% in mid-March to 27.11% in May 11, 2020. At this stage most of the institution and teachers are taking most steps towards alternative teaching methodologies. Only a handful of private and government institutions could adopt online teaching methods. On the other hand, institutions with low-income have completely shut down for not having access to e-learning solutions such as the rural schools, colleges. From coping with basics like internet connectivity and India's notoriously undependable power supply to more structural issues such as curriculum and teaching methods, educators have come under tremendous stress since India's schools began shutting down sometime in mid-March.

The closure of schools, colleges and universities not only interrupts the teaching for students around the world; the closure also coincides with a key assessment period and many exams have been postponed or cancelled. Teachers have been expected to integrate digital technologies over the past decades. We see students are technology savvy, but they depend on teacher to learn through digital means. Teachers have played a vital role during this lockdown transforming their homes to virtual classrooms.

2.1 Technology adaptation

Change is not always easy to accept and adopt, as different people from different profession react differently as per situation. Due to lockdown many choose to get adapt to technology willingly or unwillingly. One of the areas that got highly impacted of lockdown is Education. Indian higher education institution has exercised various pedagogies for innovations and engagement of teachers and students in online learning. Though the e-learning has been practiced by teaching fraternity since long, many faculties had resisted when asked to go for virtual teaching for students. For the betterment of students and their future, teachers have to change their mindset towards the virtual classroom. Adoption of technology became bliss to everyone, as teachers are using virtual modes for Teaching, Meetings, Faculty Development Programs, Online surveys, Online quiz and various competitions for faculty and students. In

many schools and institutions, the management took special interest in purchasing new digital tools and provided necessary training to their faculty to adopt the new evolving technologies.

2.2 Digital Teaching and E-Learning

The pandemic has transformed the conventional chalk–talk teaching model towards digital platform. This disruption in the provision of education is pushing the academicians' to figure out how to drive engagement at scale while ensuring inclusive online teaching platforms as solutions in tackling the digital teaching. The faculty used various tools during lockdown for teaching through online modes such as Zoom, Cisco WebEx, Google Meet, Skype Meet up, Microsoft Teams Discord, Go to Webinar, Google classrooms, LMS, YouTube Live, etc. Still there were some drawbacks such as unavailability of digital devices, lack of internet facility and unable to reach the students staying in rural areas. However without pedagogical principals learning will be hampered. E-learning requires a different approach to pedagogy especially in areas such as individual and group interaction and online assessment.

2.3 Student Engagement

The next challenge for faculty was whether students will attend online classes, if so what would be the percentage of attending. As students are the most important stakeholders for any institution and reaching to them during lockdown was given highest priority. But in digital classrooms, it hard to identify whether the student belong to the same class or not as unknown people enter in online classes and identifying is a bigger task. Higher education made it mandatory to choose digital modes to complete syllabus and consider attendance and assessments online. However teachers started slowly shifting towards student centric teaching and engaging students with various online modes to make students comfortable as well drag their interest towards digital classrooms.

2.4 Bridging with other Organizations

Most teachers are equipped with knowledge but lack confidence while taking virtual classes. For some teaching online is an excuse, whereas for some, lack of technical skills in managing the classroom virtually. Joint teaching as been evolved where a class is monitored by one teacher and lecture is delivered by other. But again this becomes a burden on technical teachers who assist others. However, collaborative work has been always proved to be beneficial. New initiatives depend upon people's motivation, their willingness, and their ability to share knowledge and use the knowledge of others.

Therefore, if we wish to see greater involvement of teachers and pupils with such learning, it would seem that we need to have in place a structure which can provide the required levels of training. During this pandemic stage all stakeholders should communicate more openly about needs, issues, and concerns that will make a difference in the lives of both teachers and students.

2.5 Parent involvement & Expectations

One big challenge teacher's face today in online teaching is involvement and expectations of parents. It's been observed that parents who never were exposed to classrooms in schools or colleges are now able to see teachers teach, communicate on a real time basis. At times parents are questioning the ability of teachers. As the involvement of parents mount, stress increases and threatens the teachers' mental and physical well-being ultimately leading teachers to quitting or burning out. Virtual meetings can be hosted with parents and teachers to understand the issues and reach to parent's expectations. It's highly recommended to encourage the teachers and their efforts in engaging the students in learning even during this lockdown.

2.6 Copy Right & Intellectual Property (IP)

Teachers are concerned about their work and material developed using ICT (Information, Communication & Technology) tools for online teaching. Copyright and patent rights are always a debatable issues as e-content is globally accessible by anyone. As part of the learning process, teachers often use copyright materials to instruct students, without awareness of copyright laws for education. The essence of managing knowledge is concerned with deciding with whom to share, what is to be shared, how it is to be shared, and ultimately sharing and using.

3. Teachers changing role in online teaching

To be a successful teacher in this rapidly changing digital environment of online teaching and learning, teachers face many demands and challenges beyond "just teaching". To progress as a good teacher, you have to:

- Design learning activities to capture the attention and involvement of students.
- Be patient in addressing their questions on online, as every student should be given chance
- Choose online platforms that do not restrict to time constraint, as they make class end abruptly and students in confusion.
- Inspire and engage students with knowledge, understanding and empathy
- Challenge students with innovative thinking, quizzes, ideas, and assignments online

- Deliver a value added mentoring to encourage students to come back to the online classrooms
- Monitor students in virtual classroom and also assure security concerns in using tools

4. Conclusion

The pandemic Covid-19 situation has made drastic changes in the lifestyle of human beings teaching us a life time lessons. One of the prominent areas it affected is Education and the role of teachers. Shifting from the traditional classroom teaching to technologybased teaching; teachersare expected to stay current with learning technology. For, many using ICT was never an option in teaching became mandatorily to teach online. The educational institutions managed to get training to teachers for coping up the academic year as its uncertain how long this pandemic continues. There is no doubt that, in future teacher selection will be based on how good they are in par with technology. The profession and livelihood, of teachers are being challenged. It is essential to train teachers and address the teacher's technological struggles, or else there is a higher risk of creating a generation of ill-prepared students for a digital future.

A teacher's job never ends with just teaching, they also need to be a Facilitator and a Mentor

American writer Alvin Toffler said that: "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn."

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VIRTUAL TEACHING -THE NEW NORMAL

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Abstract

As per the present scenario, there is an uncertainty when Schools and Colleges are going to reopen. As the days pass by with no immediate solution to stop the outbreak of Covid-19, schools and colleges have planned for a “Virtual Teaching”. Teachers need to keep on acquiring and updating knowledge of what they teach in classrooms, periodically, it gives teachers more confidence, keeping up with the changing world, infuses classrooms with digital learning tools, such as computers and hand held devices, expands course offerings, experiences, learning materials, using different platforms to teach like zoom, Web ex, YouTube live etc., It helps students achieve greater results. In this paper we focus on how teachers make use of modern technologies in making the students understand the concepts.

1.Introduction

Coronavirus disease 2019 (COVID-19) is infectious disease caused by severe acute respiratory syndrome. It was first identified in December 2019 in Wuhan, China, and has since spread globally, resulting in an ongoing pandemic. WHO is continuously monitoring and responding to this outbreak, On 24 March 2020, Prime Minister Narendra Modi ordered a Nationwide lockdown, limiting movement of the entire Nation which has given rise to the fall in the Indian economy and has significantly disrupted various formal and Informal sectors in India including oil and gas, automobiles, aviation and tourism, agriculture, retail, etc. We can't ignore that hardly a sector would remain unaffected by the crisis. The impact may be more or less. Same is with the education sector in India. Let us find out the impact of coronavirus on education in India.

Due to coronavirus pandemic the state governments In the second week of March, 2020 across the country announced for shutting down the schools and colleges temporarily to avoid spreading of the disease. And

since march is the crucial month for all the educational institutions to complete the syllabi and get students prepared for the board examinations, entrance tests of various universities and competitive examinations, school admissions among others, are all held during this period. The closure of schools, colleges and universities not only interrupts universities the teaching for students around the world, the closure also coincides with a key assessment period and many exams have been postponed or cancelled. Since there is an uncertainty when schools and colleges will reopen, they have decided to go for a “Virtual Teaching”.

Technology ushers in fundamental structural changes that can be integral to achieve significant improvements in productivity. Used to support both teaching and learning, technology infuses classrooms with digital learning tools, such as computers and hand held devices; expands course offerings, experiences, and learning materials

Traditional classrooms shifted to distance learning (live classes) for which internet and phone/ laptops are needed but not all Indians can afford to take digital classes. Most of the Poor families whose children study in Government schools and Colleges cannot go for internet services.

The new normal of life under lockdown includes job interviews on video conferencing apps, ‘meetings’ at work, live movie streaming with online companionship or a live charity concert of your favourite popstar performing from his or her home. With the young discovering old ways to connect and the old connecting with the new, the Covid-19 outbreak has turned some assumptions about technology and the demographics of the Internet on its head.

2.Objectives of the Study

- To understand the perception of teachers and lecturers
- To study whether students prefer traditional teaching or digital teaching

3. Scope of the Study

It is restricted to the students of Kasturba Gandhi College, Marredpally, Secunderabad.

4. The challenges of online learning

There are, however, challenges to overcome. Some students without reliable internet access and/or technology struggle to participate in digital learning, this gap is seen across countries and between income brackets within countries.

Practical education includes fieldworks, lab works etc., are not possible and the technical education includes medical, engineering etc are also not possible similarly students in sports, NCC, NSS can also suffer other students who take coaching for JEE, NEET other competitive exams are also affected due to the impact of lockdown and delays in conducting the exams and thereby delaying the results.

We always talk about innovations which came into force after the lock down and Since there is no other option for the teachers to teach, everyone started adopting the online teaching methods but, school teachers and College staff are facing burdensome and also worried about the privacy issues when they are online, people can misuse them so always guided students to go for genuine educational links. MHRD also helps in guiding students in this perspective. Across the world schools colleges have been closed and no one is actually sure when they are able to reopen, this covid-19 pandemic has devastated lives and became an eye opener for all of us and I must admit it is through this that we discovered what is online teaching ,in the last 60 days we have got the school classrooms to the homes of the children. The Coronavirus (COVID19) is preventing students and staff from meeting face-to-face, learning institutions are developing alternative educational delivery methods to move the classroom online. To fully engage in Online Learning, students need access to the internet. Some students may struggle with affording access once they leave campus. Now we need to keep in mind we all are talking about online teaching and learning initially it was a bit difficult but now as days goes on it became easier and easier we are using different platforms like zoom, WebEx, meetings, YouTube, teams etc., we are able to adapt to change because of the continuous efforts of the teachers their commitment and dedication who continuously helped in engaging the students using their skills as best as possible. Initially it was a bit slower but they ensure the concepts are clear and trying to make it fun and easy by using different modes to explain in detail using PPT's, live video classes, recorded video classes, audios, documents, PDF, YouTube links etc., and students are really enjoying going through different platforms having different methods to learn. so, teachers are striving hard from bringing the physical class rooms to online classrooms. The instructions-based teaching and mentoring in classrooms physically has become more Collaboratory and participatory or experiential form of learning.

5. Virtual Teaching

Virtual teaching takes as much if not more preparation than teaching in a traditional classroom. Be prepared to take what you've learned in the classroom and re-construct it for a virtual setting. This means re-thinking how you are going to present materials, coursework, and daily assignments. Virtual learning is a learning experience that is enhanced through utilizing computers and/or the internet both outside and inside the facilities of the educational organization. The instruction most commonly takes place in an online environment. The teaching activities are carried out online whereby the teacher and learners are physically separated (in terms of place, time, or both). The quality of online education depends on the proper use of digital technologies in accordance with modern educational theories.

When we talk about establishing effective online teaching systems, we are really talking about facilitating flexible learning dynamics within a structured, sometimes private, yet always open environment. As online teachers I believe that we can mostly succeed when we understand the nature of group dynamics when utilising multi-media, discussion threads and asynchronous communication networks.

Creating one's online teaching system can be both exciting and daunting. The exciting part lies in the freedom to shape and grow classroom dynamics with students all over the world, the good news is that we can harness the richness of educational technology within simple frameworks. This brings me to the first characteristic of highly effective online teaching systems.

5.1 Characteristics and benefits of Virtual Teaching

- Remote access to an unlimited array of educational services offered worldwide
- Simple and streamlined
- User friendly
- Individualized learning process that takes into consideration the personal level of competence, individual needs, and different learning styles
- Safe and secure learning environment
- Attractive interface
- Flexible learning in terms of time, location and pace
- Social sharing capabilities
- Effective and efficient Time Management
- Cost-effectiveness, time-effective, easily scalable and much more

5. Virtual Learning

Virtual learning has many forms and related terms. These seem very similar but represent different aspects of learning and teaching and can help us understand the essence of “virtual learning.” Here are the most commonly used ones:

- **E-learning**: eLearning (short for electronic learning) is an umbrella term that refers to all types of training, education and instruction that occurs on a digital medium, like a computer or mobile phone.
- **Web-based learning**: Web based learning is often called online learning or e-learning because it includes online course content. Discussion forums via email, videoconferencing, and live lectures (video streaming) are all possible through the web. Web based courses may also provide static pages such as printed course materials.
- **Online learning**: Online learning is when you take courses online instead of in a physical classroom. If your schedule makes it hard to attend classes, if you prefer studying at your own pace or if you live far from campus, online learning might be for you. With online learning, you can work full-time while you study.
- **Distance learning**: Distance learning does not have to use electronic and web-based technologies. It means learning from a distance; in other words, the participants are physically separated a way of studying in which you do not attend a school, college, or university, but study from where you live, usually being taught and given work to do over the internet. They offer advanced degrees or professional certification through distance learning.
- **Blended learning**: Blended learning is an instructional approach that includes a combination of online and in-person learning activities. For example, students can complete online self-paced assignments by a certain date and then meet on-site or online for additional learning activities.

Providing instruction to a person who is learning in a place and at a time different from that of the teachers and the other learners. Nowadays, with the development of digital technologies, distance learning is increasingly associated with online learning. The use of virtual classrooms for live online teaching brings distance learning closer to the traditional form of learning by reproducing its main characteristics in the online environment. The learning content should be digitalized and made available online. Thus, learners are able to control the learning process in terms of time, place, tempo, and method of learning.

- As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms.
- Research suggests that online learning has been shown to increase retention of information, and take less time.
- With this sudden shift away from the classroom in many parts of the globe, many are in a dilemma whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the world.
- There is a huge demand on many online learning platforms which are offering free access to their services.

7. Role of MHRD during the lockdown

In the time of lockdown and social distancing, when schools and colleges are switching to digital classrooms, the Ministry of Human Resources and Development (MHRD) has released an official notice, asking students to utilize their time productively by engaging in the online learning.

In a notice addressed to all students and teachers on Wednesday, the University Grants Commission (UGC) secretary Prof Rajnish Jain said that students and teachers could opt for online courses on the digital platforms during the Covid-19 lockdown.

MHRD has provided a list of ICT initiatives in the digital platforms which can be accessed by the teachers, students, and researchers in universities and colleges for broadening their horizon for learning. MHRD Plans anew setup for Schools Post COVID-19 Lockdown guidelines are being prepared for schools, which need to be followed when they reopen post COVID-19 lockdown, officials of the Ministry of Human Resource Development (MHRD) have said to news agency Press Trust of India (PTI). The guidelines are being formed by the Ministry's Department of School Education and Literacy, the PTI has quoted officials saying.

HRD Minister Ramesh Pokhriyal 'Nishank' had also deliberated upon the issue of safety guidelines in a meeting with State Education Ministers. Whenever schools and colleges reopen, proper social distancing norms will have to be followed as health and safety of students has to be the priority, officials have said.

The Ministry is likely to introduce guidelines and safety measures on the seating arrangement of students in classes which is one of the biggest factors to be considered in connection to social distancing. On an average one classroom accommodates 30-40 students. In most of the schools, two students share a seat or a bench-desk. The number of students sharing one bench-desk is even more than two in many schools. If social distancing is created between students, then MHRD should also look into the seating capacity of each school. With proper social distancing measures, it may be difficult for schools to conduct classes in the same way like they were conducting before lockdown.

Usually in our country, schools are held in the morning shift for primary classes and in the day shift for secondary level classes. In many school's senior secondary level classes are also held in the day shift.

"The guidelines will include a checklist and recommended measures to ensure student and staff safety. However, the COVID-19 situation in a particular area will also be have to kept in mind and the institutions will have flexibility to adapt to the guidelines accordingly. The minister has reiterated many times that the safety and health of students has to be prioritised," a senior official told PTI.

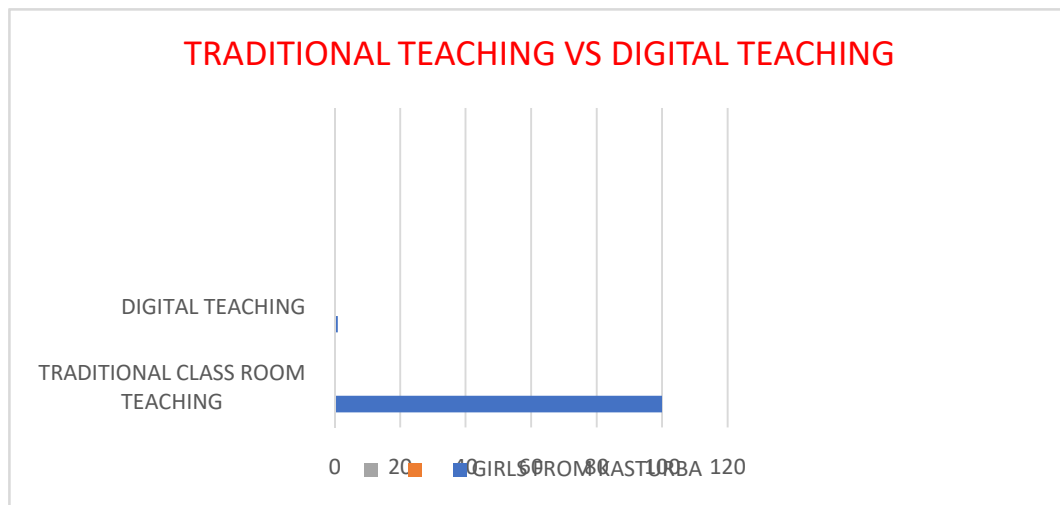
"The guidelines are being formed and will also be shared with states so they can prepare accordingly before reopening schools and colleges. Districts will be tasked with the implementation of the guidelines and certain spaces in the campuses will have to be revamped to ensure social distancing,"

For higher education institutes, the University Grants Commission (UGC) has already released the guidelines in which it has recommended that academic session for freshers may begin in September and for enrolled students in August. It has emphasized on use of online teaching tools for conducting classes.

8. Data Analysis and Interpretation

A Study was conducted with the help of a WhatsApp group on a small sample size of 100 and the following results were obtained. The data consisted of Students from Kasturba Gandhi College for Women, Marredpally.

The question was whether they prefer Traditional class room teaching or Digital teaching



Reasons for dissatisfaction

- a) No face to face contact
- b) Internet Issues
- c) Not affordable
- d) Limited participants in some platforms
- e) Lack of clarity in the subject
- f) Environment
- g) Missing friends
- h) Sitting in the same place with the same set of people everyday

9.Suggestions/Recommendations

- Though students have opted for traditional teaching, Teachers/lecturers and School/college administrators have been advised to continue Communication with students through Virtual lectures or portals like Massive open online courses to avoid the spread of coronavirus.
- Teaching online demands realistic support from your Institution to facilitate quality production before u consent to teach online, ascertain that you have adequate institutional resources to do this well.

- The online delivery of a course can be a challenging prospect, as switching from on-site to online. An opportunity to create a more engaging, interactive experience for your students if you take full advantage of the available technology.

10. Conclusion

Modern technology of teaching is good for both teachers and students, it has become a challenging role for the teachers to finish their syllabus through digital mode and it helped them and the students by gaining knowledge using different platforms and modes. And are now ready to take digital classes whenever there is a need for it but still after using all the digital techniques students prefer traditional class room teaching than digital classes. From the above table it is clear that all the students though using technology these days opted for Traditional Class Room Teaching.

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16

IMPACT OF LOCKDOWN ON HEIS AND STRATEGIES TO ADOPT

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Abstract

COVID-19 is a pandemic caused by coronavirus impacting health, education, economy, environment, politics and various other sectors. The impact of lockdown on HEIS was drastic converting chalk–talk teaching model to one driven by technology. The chapter discusses the impact of lockdown on HEIs and various strategies one can adopt to manage the crisis and strengthen Indian education system. The challenges and the lessons learned by everyone need to be taken seriously and implement the right best practices and policies in education reforms by introducing e-Teaching, e-Learning, e-Training and e-Mentoring to develop more number of quality educational institutions.

1.Introduction

The COVID-19 pandemic caused by coronavirus is the defining global health crisis and the greatest challenge we are facing in today's world. Since its emergence in china in December last year, the virus has spread to every continent and swept almost the entire planet. COVID-19 is much more than a health crisis and has potentially created devastating social, economic and political crises that will have large impact on human life. This is a crucial time for the education sector—board examinations, school/college admissions, entrance tests of various universities and competitive examinations, among others, to be held during this period in 2020. As the days pass by with no immediate solution to stop the outbreak of COVID-19, schools/colleges and universities closure will not only have a short-term impact on the continuity of learning for more than 285 million young learners in India but also endanger far-reaching economic and social consequences across India.

2.Impact of Lockdown on HEIs

The COVID 19 pandemic has significantly disrupted the higher education sector, which is a critical determinant of a country's economic future. The education sector, including teaching and assessment methodologies, was the first to be affected by these closures due to lockdown. Needless to say, the pandemic has transformed the centuries-old, chalk-talk teaching model to one driven by technology. Technology is playing an important role in the lockdown period like study from home and work from home due to COVID-19. This disruption in the delivery of education is pushing policymakers to figure out how to drive engagement at scale while ensuring inclusive e-learning solutions and tackling the digital divide at Colleges / Universities. It is mandatory to explore digital learning, high and low technology solutions, etc. through digital skills of teachers and students and internet connectivity.

Only a handful of private colleges could adopt online teaching methods by having advance technologies. Their low-income private and government college counterparts, on the other hand, have completely shut down for not having access to e-learning solutions due to genuine reasons. The students, in addition to the missed opportunities for learning, no longer have access to healthy meals during this time and are subject to economic and social stress. Another major concern is job opportunities and employment. Students those have completed their graduation may have fear in their minds of withdrawal of job offers from the corporate sector due to the current situation. The Centre for Monitoring Indian Economy's estimates unemployment shortage from 8.4% in mid-March to 23% in early April.

A large number of Indian students—second only to China—enroll in universities abroad, especially in countries worst affected by the pandemic, the US, UK, Australia, Canada and China. Many such students have now been barred from leaving these countries due to COVID-19. If the situation persists, in the long run, a decline in the demand for international/overseas higher education is expected. Maybe there is a possibility that students will not take admissions there in future and if the situation extend, in the long run then there will be a decline in the demand for international higher education also. Hence there is an ample chance and growth for Indian Institutions/Universities to expand PG courses in respective specializations/branches providing quality education with right best infrastructure/facilities, faculty, right skill development and career/job opportunities to map and match the Industry requirements, exigencies, expectations and satisfaction.

3.Strategies to be Adopted

Central and State Governments need to act promptly to prepare, respond, and recover from the situation and thus take some proactive measures to ensure the overall progress in the country. A multi-pronged strategy is necessary to manage the crisis and build a resilient Indian education system in the long term.

i) Immediate measures are essential to ensure continuity of learning in government colleges and universities. Open-source digital learning solutions and Learning Management Software should be adopted so teachers can conduct teaching online as a new teaching methodology.

ii) Inclusive learning solutions need to be developed and adopted especially for the vulnerable and marginalized sections of the society. Mobile-based learning models are adopted for effective delivery of education. Technology is enabling ubiquitous access and personalization of education even in the remotest parts of the country with a rapid increase of mobile internet users in India. This can change the higher education system and increase the effectiveness of learning and teaching, giving students and teachers multiple options to choose from.

iii) Strategies are required to prepare the higher education sector for the evolving demand–supply trends across the globe—particularly those related to the global mobility of students and faculty and improving the quality of and demand for higher studies in India. Measures should be taken to mitigate the effects of the pandemic on job offers, internship programs, research projects and employment opportunities.

iv) It is also important to reconsider the current delivery and pedagogical methods in school and higher education by seamlessly integrating classroom learning with e-learning modes to build a unified learning system as best teaching methodology. The major challenge in Education Tech reforms at the national level is the seamless integration of technology in the present Indian education system, which is the most diverse and largest in the world with more than 15 lakh schools and 50,000 higher education institutions. The quality of courses may differ across different e-learning platforms by multiple players. Therefore, it is important to establish quality assurance mechanisms and quality benchmark for online learning developed and offered by India Higher Education Institutions as well as e-learning platforms (growing rapidly). Many e-learning players offer multiple courses on the same subjects with different levels of certifications, methodology and assessment parameters.

v) Indian traditional knowledge is well known across the globe for its scientific innovations, values, and benefits to develop sustainable technologies and medicines where R&Ds need to expand. The courses on Indian traditional knowledge systems in the fields of yoga, Indian medicines, architecture, hydraulics, ethno botany, metallurgy and agriculture should be integrated with a present-day mainstream university education to serve the larger cause of humanity.

4. Conclusion

In this time of crisis, a well-framed and effective educational practice is what is needed for the capacity-building of young minds across India. To provide support for digitalisation to teachers and students, the necessity to explore digital learning platforms at Higher Education across India need to be mandated. This will help develop skills that will drive their employability, productivity, health and well-being of learners in the years to come, and ensure the overall progress of India.

Time never waits, this tough time will also pass, hence take this COVID-19 as positive approach and avail the maximum opportunities to implement the right best policies and practices in Education system across India and produce more and more quality IT's (Indian Talents) across Universe who are proud to be Human Capitals - Make In India.

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17

IMPACT OF COVID-19 ON EDUCATION – CURRENT SCENARIO AND FUTURE CHALLENGES IN INDIA**G. Vijaya Lakshmi^{1*} and B. Lavanya²**

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Abstract

Ever since the outbreak of pandemic Covid-19, there has been evident impact on the world across, claiming more than 2.3 lakh reported deaths and number of positive cases at about 3 million lives. The devastating Covid-19 has affected the people from all walks of life and from large parts of the world bringing it to standstill due to global lockdown besides imposing human, social and economic crisis. The experts of the scientific and medical community and government representatives irrespective of caste, creed, religion, country, etc have since been working closely to handle the health emergency with preparedness and resilience to protect lives of the people and prevent its spread. One of the consequences of this unwanted situation is paralysing of the educational system in India with more than 285 million young learners by giving forced vacation to the students globally from educational institutes to the university level. There are several issues which need to be understood and clarified with emphasis on the key aspects such as conducting examinations, delay of the new academic year, entrance examinations, precautionary measures at institutions, etc apart from safety concerns when academic institutions reopen. These aspects garner attention in the wake of control of the pandemic through physical distancing and maintaining personal hygiene. In this chapter, the impact of the pandemic Covid-19 on educational sector in India has been focussed to highlight not only the current critical crisis but the challenges of the future with our alertness to handle them.

1.Introduction

A pneumonia like condition was first detected in Wuhan city of China on 31st December 2019 which was declared as an Outbreak on 30th January 2020 by Public Health Emergency of International concern. World Health Organization (WHO) declared the outbreak as Covid-19 on 11th February 2020 for the new Corona Virus disease. Due to the emergency pandemic situation, several efforts are being made to contain the outbreak of the virus in the country. At the same time, world has adopted lockdown thereby shutting educational institutions, markets, public transport, entertainment zones, etc bringing the world to halt

except the emergency services while following physical distancing and home quarantine to prevent community spread of the virus. Deadly impact of the virus across the 212 countries was witnessed through the dwindling numbers showing number of people affected, through daily health updates.

According to UNICEF monitoring, 177 countries are currently implementing nationwide closures and 13 are implementing local closures, impacting about 73.5 percent of the world's student population. Closure of educational institutions impact not only students, teachers, and families, but have far-reaching economic and societal consequences. Before the outbreak of the global coronavirus pandemic, the world was already dealing with a learning crisis, as evidenced by high numbers of Learning Poverty. With the spread of the coronavirus, the education system is facing a new crisis, as more than 160 countries (as of 24th March 2020) are affected.

The most important factor in preventing the spread of the virus locally is to empower the citizens with the right information and taking precautions as per the advisories being issued by Ministry of Health & Family Welfare. The rate at which coronavirus has spread to different regions in India has forced the Central and State governments to shut down educational institutions as a precautionary measure resulting in the disruption of studies. The pandemic being a health crisis, shutting down educational institutes became indispensable. The closure of educational institutions not only interrupts the teaching for students around the world; the closure also coincides with a key assessment period and many exams have been postponed or cancelled. Importantly, the lockdown of institutions not only affects internal assessments but also all exams for the main public qualifications. Because such assessments are used as a key qualification to enter higher education, the move to unblind subjective assessments can have potential long-term consequences for the equality of opportunity¹. Teaching is moving online on an untested and unprecedented scale. Student assessments are also moving online, with a lot of trial and error and uncertainty for everyone. As we still are combating the virus, it becomes imperative to take a stock of the situation and its effects on the educational system in the country.

2. Discussion

The Covid-19 has induced an unprecedented economic, cultural, health and social crisis touching all the nations and communities across the globe. Not to mention that there have been quantum changes in the *lives, lifestyles and livelihoods* of the people for the years to come and we are still learning bountiful

lessons from the pandemic situation. Also, let us remember that it is every individual's responsibility to maintain physical distance and personal hygiene to win the war against Covid-19 situation.

This problem is prevalent everywhere. In a well-thought-thorough move by almost 10 US organizations to the Federal Government, they said, "While closing campuses or moving entirely to remote instruction have been necessary steps in slowing the spread of the virus among students and staff, these shifts have caused massive disruption to students, institutional operations and institutional finances. The "substantial" financial impacts on colleges and universities will ripple through local communities, the group said, given the wide economic role higher education plays in much of the country." Similarly, in India, unless contingency measures are undertaken, students looking for admissions in 2020 could face hard times.

While academic experts are pushing for online models of education - be it classroom teaching or tutorials, we are yet to see how effectively a nation that primarily relies on an offline mode of teaching can seamlessly transgress to an online medium of teaching and education. So, the question is the Coronavirus pandemic result in a new solution for education? Given the digital gap in India, how successful will the digital education model be in a country like ours? Will India be able to embrace learning anywhere, anytime? Will it lead to innovation in the field of education? Or will it fall flat on the face for the lack of a more agile infrastructural setup?

The conventional and ancient Indian education system follows face-to-face or physical teaching, even though the trend of audio-visual aids in classrooms was introduced a decade ago. The pandemic's impact on higher education is to be seen in different ways. Many universities all over the world are switching over to online teaching wherever possible. The following are the

3. Issues pertaining to the impact of COVID-19 on education in the current scenario with more focus on the future challenges

3.1 Abrupt closing of the academic year and effect on examinations

The World Bank's education team is working to support countries as they manage and cope with the crisis today and is advising on remote learning at scale in the immediate to short term as well as supporting operations to facilitate learning after the pandemic is over. The Bank is also providing ongoing support to systemic education.

Countries around the world have responded to coronavirus (COVID19) driven closures of educational institutions by adopting remote learning approaches, with many deploying online learning programs. However, online learning has exposed deep digital divides between and within countries, including high-income countries. The situation is far worse for lower resource environments in middle- and- low-income countries with Internet penetration rates typically less than 50% and a large share of students without devices to enable online learning at home. Countries are therefore turning to television to significantly increase access to remote learning. Low- and middle-income countries have been using education television since the 1950s including interactive television lessons more recently. The World Bank's EdTech team has catalogued examples of education, television being used by countries during COVID-19 and has developed a rapid response guidance note on using educational television programming.

With board exams, university exams, college exams, the entrance test being postponed, it will be a big challenge for colleges to complete their syllabus on time without compromising on the education quality. From delay in board exams to college being shutdown to delay in national level entrance tests, it is the academic year of the students that will suffer. Also, practically, it is going to be a mammoth task to conduct various semester end examinations including competitive examinations and make the necessary arrangements for the students and faculty in the examination halls like clean drinking water, sanitizer, access to clean washrooms, mobilization of human resources for smooth conduct of examinations, logistics and infrastructural facilities, etc. It is a welcome signal from the University Grants Commission (UGC), New Delhi to reduce the time of examination of UG and PG courses from 3 hours to 2 hours. No doubt that there will be delay in the forthcoming academic year but for the greater good. Every individual's contribution is valuable in building up the shattered dreams of the students from scratch.

To deal with the effects of Covid-19 lockdown on higher educational institutions, HRD minister Shri Ramesh Pokhriyal Nishank took the decision to form the panel that would chart out the academic calendar of universities and will look into aspects related to online learning and online exams. HRD minister also held meetings with Vice-chancellors of various Universities to motivate their faculty and students to use SWAYAM and SWAYAM PRABHA educational platforms in mission mode and also through other online digital mediums

A committee under the chairmanship of Prof. RC Kuhad, Vice-Chancellor, Central University of Haryana, has been constituted to look into the issues of examinations and academic calendar. The UGC directed all universities and affiliated colleges to postpone examinations. Among other issues discussed in the

meeting were measures to be taken regarding health of students residing in hostels, academic and non-academic staff of the university, adherence to social distancing and isolation instructions and provision for testing of suspected cases of Covid-19 in the educational institutions.

Aspects like role of the management in dealing with mental health challenges of students, salary related problems of all employees (permanent, temporary and daily wage earners) and research on Covid-19 were also discussed. Banaras Hindu University (BHU) and Aligarh Muslim University (AMU) informed that they have created facility of 40-bed isolation rooms. Most of the universities continue to run courses digitally so that academic session is not delayed.

3.2 Digital / Online classes

In a country like China that practices a much more centralized education system, a switch to digital learning will be easier. Whereas even in a country like the U.S.A, there are many low-income students who do not have access to broadband and laptops, digital learning might not be the ideal solution. The same is the case with India, not every student has access to the high-speed internet and will therefore suffer. When classes actually commence online, many students will suffer because of their inability to bear the cost. Unless India makes internet available to all, there are chances that the gap in education quality may widen.

China launched a Rain Classroom Teaching Platform in 2016 - one of the most advanced online teaching platforms which have more than 19 million users. It has three sessions each of 30 minutes and students are encouraged to submit questions during live interactions. The software is effective and can easily collect and classify the answers.

A committee under the chairmanship of IGNOU Vice Chancellor Prof. Nageshwar Rao has been constituted to look into the issues in promotion of online classes. Due to the sudden lockdown and home quarantine of the individuals, all the educational institutions were shut affecting the academic year at all the levels. To complete the syllabus, faculty have engaged the students in digital / online classes in theory using Apps available. Courses like Physical Education and Creative Arts are conducted online in various parts of the world. Teachers use online tools to monitor the students and conduct classes.

While it is difficult to understand the concepts for the science students using digital mode, it requires installation of the App using the internet or Wi-Fi facility. About 70 to 80 % of the students have access to the internet facility with proper connectivity, while the remaining percentages of students are denied of

the access to these digital classes. There can be several reasons for this marginalised access such as non-availability of internet facility, smart phone / laptop / personal computer, poor connectivity in the remote areas, shutdown of online shopping / shopping centres to purchase, etc. Hence, this group may experience economic or psychological burden to some extent. Students have been promoted to their next level by the cancellation of exams and removal of the concept of detention in the present situation. It is unlikely to use the same formula at the other levels as the impeccable quality of the educational system cannot be compromised under any situation.

Internal assessments are perhaps thought to be less important and many have been simply cancelled. But their point is to give information about the child's progress for families and teachers. The loss of this information delays the recognition of both high potential and learning difficulties and can have harmful long-term consequences for the child².

Especially, students in the final years face uncertainty as to their future because their next steps further education or careers are dependent upon them clearing their exams. These students are in a bigger quandary because of the Covid-19 pandemic because not only their education process is disrupted, but they also face a big challenge of proving themselves for their next journey. In the absence of hard academic indicators such as grades and marks, many of these students find themselves in a situation where they are unable to differentiate themselves and lack a cohesive framework to get themselves ready for the jobs and education tasks, they face next. A great platform to look for those projects is the idea and project library. Education disruption impacts our readiness for the future and also has huge economic and lifestyle costs.

3.3 Preparedness for reopening

As seen from previous health emergencies, most recently the Ebola outbreaks, the impact on education is likely to be most devastating in countries with already low learning outcomes, high dropout rates, and low resilience to shocks. While educational institute's closures seem to present a logical solution to enforcing social distancing within communities, prolonged closures tend to have a disproportionately negative impact on the most vulnerable students. They have fewer opportunities for learning at home, and their time out of educational institutes may present economic burdens for parents who may face challenges finding prolonged childcare, or even adequate food in the absence of educational institutes meals.

The delay in academic year is also another problem. Though UGC indicated August-September as beginning of the academic year, we still can't say how things will turn out going forward. When students will feel comfortable to come back from home by bus, train or flight, we don't know now. But if things improve, it may be advanced. The situation is dynamic now.

All the educational institutions are expected to display resilience and restrain before the proper reopening and during the regular classes. All the necessary precautionary measures have to be followed without concession in these institutions as steps to prevent the spread of Covid-19 with respect to every individual of the organization.

3.4 Advisories on reopening of educational institutions by the Government

It is essential that the Government issues the Advisories / protocols on how to run the educational institutes / colleges / Universities from time to time to the educational institutions mentioning clearly about the instructions to be followed by every individual in the institution upon the commencement of the new academic year. It is also essential that the situation in these institutions is monitored regularly by conducting health drives, maintaining physical distancing, conducting sensitization programs on precautions to be followed, medical services, etc.

3.5 Campus placements

Students awaiting placements have been hit by the coronavirus (Covid-19) threat. Generally, most business educational institutes conduct campus placements between December-April every year. But now, as that coronavirus has led to a shutdown of educational institutions as well as businesses, the placement process has been halted or left incomplete at different stages for different institutions. On the general trend of hiring, the experts say that contrary to fears about a slowdown since October, IT and consulting firms have shown good hiring with about 5-10 per cent hike in pay packages compared to last year.

Several students will have difficulty in getting their degrees on time and employers who have offered them jobs may not be able to wait till they get the degrees. This is the problem faced by students who have campus placements. Definitely, out-of-the-course content, about one-tenth of it, could not be learnt by them. There could be some gaps, which will have to be bridged. However, now there is uncertainty among some quarters about the possibility of delay in honouring campus placement commitments given

by recruiters to students. We need to factor in the duration of the Covid-19 threat for India and the economic and business fallout of the virus on the global economy too. There is uncertainty surely.

4.Economic burden and unemployment

The coronavirus has touched every aspect of lives³. The downturn in the economy is observed at the global level affecting the financial component of the educational institutions not to mention about the family budgets. In order to maintain the core mission of the institutions, it may not be surprising to take certain difficult decisions in the days ahead to cope up with the crisis of economic fallout. While prioritizing the health of the staff and students the most in every organization, decisions need to be taken to maintain the academic excellence without any compromise, continue to provide better learning and teaching resources, generate novel methods to improvise the resources to envision the achievement of goals, stress on discretionary spending, delivery of essential services by cost-effective methods, be more creative, etc.

The new found pandemic has significantly disrupted the higher education in the country which is a critical determinant of the country's future economy also putting the international higher education on uncertainty as well. The Centre for Monitoring Indian Economy's estimates on unemployment shot up from 8.4% in mid-March to 23% in early April and the urban unemployment rate to 30.9%. Immediate measures are needed to mitigate the perilous effects of pandemic on unemployment, research opportunities and internship programs. To face these new economic realities, we all collectively should thrive to pass on the superior academic resources to the future generations and for this to happen, should work closely on systematic and well-panned strategic principles.

5.Psychological Impact

The Indian education system, which is the most diverse and largest in the world, has more than 15 lakh educational institutes and 50,000 higher education institutions. As the coronavirus pandemic rapidly sweeps across the world, every individual particularly students are experiencing severe psychological impact such as elevated rates of stress or anxiety besides increased levels of loneliness, depression, harmful alcohol and drug use, and self-harm or suicidal behaviour are also expected to rise.

Over 90% of enrolled learners (1.5 billion young people) worldwide are now out of education. The UNESCO Director-General Audrey Azoulay warned that "the global scale and speed of the current

educational disruption is unparalleled". In a survey by the mental health charity YoungMinds⁴, which included 2111 participants up to age 25 years with a mental illness history in the UK, 83% said the pandemic had made their conditions worse and 26% said they were unable to access mental health support.

While UGC has directed all the Universities and colleges to set up mental health helplines to address psychosocial concerns of students, the students have been reported to experience increase in loss of appetite and sleeplessness during this lockdown period due to the uncertainties of delayed exams, academic burden felt by final year students as they are going to lose job market, financial burden by weaker sections and task of staying healthy by continue to have healthy eating habits, personal hygiene and lifestyle.

Few key things have to be implemented in the education field to face this unprecedented situation. They are:

- Use a mix of live broadcasts, pre-recorded (on demand) content and edutainment programs. Broadcasting live lessons in mock classroom settings is the fastest way to get started for countries with limited or no education television experience (e.g. Morocco, Spain, South Africa). Broadcasting existing pre-recorded material (possibly available as on-demand content) from private and non-profit organisations (e.g. Khan Academy) is a useful option for countries with existing educational television programs (e.g. Croatia, Spain, India). One has to consider sourcing, curating and obtaining intellectual property rights for existing content from local or international sources (e.g. Ubongo used in 33 African countries, Sesame Workshop used in 40 countries).
- Identify channels for broadcasting programs. Some countries have existing national education television networks with a wide reach. For those without this, partnering with state television networks is a quick-start solution. Morocco's national channel dedicated to sports is now being used to broadcast educational television as well. Partnering with private broadcasters can further amplify the reach of this programming across communities and allow simultaneous broadcasts for students across grade levels (e.g. Mexico). Rebroadcasted content is another way to amplify its reach using livestreaming or as on-demand content (e.g. Kenya uses YouTube, Pakistan uses an app).
- Develop schedules for educational television programming. Broadcast schedules must clarify where and when such broadcasting can be accessed. Some countries are providing student-friendly daily and weekly

schedules on their education ministry's website (e.g. Mongolia), some on their education television network websites (e.g. China, India) and some on institutional websites (e.g. Kenya).

- Develop a communication strategy and communicate regularly. To amplify awareness, communicate schedules continuously and widely using every available media including television, radio, mobile phone via text messages or WhatsApp (e.g. Peru), social media like Facebook (e.g. Rwanda) and websites of education ministries and education television networks (e.g. Korea). Organizing all programming related resources in one place makes it easier to access them and increases uptake. This can be done on the education ministry website, national television network website, etc. (e.g. India, Nigeria, Uganda).
- Provide support for students, parents and educators. Throughout this programming, students, parents/caregivers and educators will require technical support (e.g. toll-free helplines or low cost Chabot's can be employed), pedagogical support and socio-emotional support (e.g. Spain). Teachers can be mobilized to provide this (e.g. China). Education television can be made more interactive by answering questions during lessons. Questions can be collected by phone calls, text messages, email or social media, and answered during live lesson recordings. Keep multiple communication channels open (e.g. Jamaica has 36 helplines) and encourage feedback to improve the programming (e.g. China, Russia).

Video has one great advantage. Students can review the content multiple times, thereby possibly increasing its effectiveness. Archive all the education television programming on online platforms (e.g. education television website, YouTube) and reuse them for regular educational institute's lessons and to reach out-of-educational institutes children (eg. Mexico). Consider supplementary actions like text messages and print material. Consider diversity, equity and inclusion.

UNESCO shared important recommendations to ensure that learning remains uninterrupted during this period like

- One has to decide on the use high-technology and low-technology solutions through integrated digital learning platforms, video lessons, MOOCs, to broadcasting through radios and TVs.
- Implement measures to ensure that students including those with disabilities or from low-income backgrounds have access to distance learning programmes.
- Assess data security when uploading data or educational resources to web spaces, as well as when sharing them and applications and platforms does not violate students' data privacy.

- Mobilize available tools to connect educational institutes, parents, teachers and students with each other. Create communities to ensure regular human interactions, enable social caring measures, and address possible psychosocial challenges that students may face when they are isolated.
- Organize discussions with stakeholders to examine the possible duration of educational institutes closures and decide whether the distance learning programme should focus on teaching new knowledge or enhance students' knowledge of prior lessons.
- Provide support to teachers and parents on the use of digital tools. Organize brief training or orientation sessions for teachers and parents as well, if monitoring and facilitation are needed.
- Blend appropriate approaches and limit the number of applications and platforms. Blend tools or media that are available for most students, both for synchronous communication and lessons, and for asynchronous learning.
- Develop distance learning rules and monitor students' learning process. Define the rules with parents and students on distance learning. Design formative questions, tests, or exercises to monitor closely students' learning process.
- Define the duration of distance learning units based on students' self-regulation skills. Keep a coherent timing according to the level of the students' self-regulation and metacognitive abilities especially for livestreaming classes. Create communities and enhance connection.
- Create communities of teachers, parents and educational institute's managers to address sense of loneliness or helplessness, facilitate sharing of experience and discussion on coping strategies when facing learning difficulties.

6. Conclusion

The pandemic Covid-19 situation has taught the world many lessons and will continue to teach to be remembered for the years to come. One of the most significant lessons is changes in mindset that brought the advent of the technology and technology-based teaching and evaluation in the field of education, increasing the scope to explore and expand new avenues in teaching and learning process. Our educational system is not fully furnished with the required technology to the extent needed. In order to meet the requirements of technologically challenged educational system, it needs to be upgraded to welcome this novel modification in the rural and urban areas and involves allocation of more budget to the educational sector by the Government.

Given that the traditional focus has been on offline centres of education, we believe a mix of online and offline is what will work in the coming months, which can hopefully be converted to a permanent module. COVID-19 will impact higher education in India but what it has taught us is to build resilience to face such threats in the future. Students need to make the most of the uncertainty that prevails and use this time to prepare for exams or take up online courses that may help them in their future. We all are going through perhaps the most trying circumstances of our lives. The outbreak of Coronavirus has reminded us that change is inevitable.

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18

CHARACTERISATION AND COMPARISON OF ONLINE TEACHING AIDS

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Abstract

Covid19 has affected Teaching Learning process throughout the world. As a knee jerk reaction Schools, Colleges and Universities across the world shifted to online teaching without properly assessing the effectiveness and feasibility. Not much research has been done about the effectiveness and its long term consequences on student growth and mental health. Before pandemic sending child to school was the best way to educate. Due to social distancing it may not be possible to send children to school or college every day in future. As a replacement many online Teaching & Learning tools have emerged. This chapter tries to categorise deferent Teaching Learning tools available. The changing scenario of education and post Covid19 prospects also discussed.

1. Introduction

In this century with evaluation of World Wide Web and smart phone everything has become online. First online shopping was started way back in 1972 (Teletext). After that all most all services and sales became online. The term e-learning is coined in in 1999 in a seminar on CBT. Sebastian Thrun and Peter Norvig who developed the first MOOC in 2011 when they taught their artificial intelligence course at Stanford that drew 160,000 online registrants. But online teaching hasn't picked up until 2013. Udacity and Coursera were the first companies to launch online courses.

In India few scholars consider Distance education as first step in remote learning which is launched in 1985 by Andhra Pradesh Open University (now B R Ambedkar Open University).The first online undergraduate and graduate courses were initiated by several universities and schools. In the late 1980s some Educational institutes turned to commercial courses and offered through the then-new satellite technology. Conducting classes over Television became a norm with few specially establishing TV channels for education.

But it has got a boost when internet and smart phones became affordable. Without any ambiguity, the future of learning will be more online compared classroom teaching

2. Impact of Coronavirus on Education in India

Covid19 pandemic has brought in a significant change in around the world, needless to mention the various sectors effected in India including oil and gas, automobiles, aviation, agriculture, retail etc. One amongst them is our educational sector.

As we know that due to coronavirus pandemic the Central, State Governments and private educational institutions across the country are temporarily shutting down schools and colleges. With the present situation persisting, there is an uncertainty about reopening of schools and colleges. This being the crucial time for education asend semester/year examinations, entrance exams for admission in to higher education are being scheduled in these months. If the situation continues with closure of school and colleges can cause far-reaching economic and societal consequences.

3. Online Teaching before COVID-19

Teaching process through online has gained a prominent space but the development of online courses in higher education doesn't happen overnight.

As per study conducted by (NCES) in 2008, National Centre for Educational Statistics found that the main factors influencing higher-education institutions to offer online courses included.

- Meeting students' demands for flexible schedules (68%),
- Providing access to college for students who would otherwise not have access (67%),
- making more courses available (46%), and
- Seeking to increase student enrolments (45%).

After 2008 economic slowdown with lack of funding and interest in conventional teaching more and more universities and colleges appear to have shown increasing interest in online education.

The success of online courses depends on developing quality content and setting up robust delivery system. India, not reaching a state of quality so as to ensure sound delivery of online classes to students across the country is due to undeveloped infrastructure in terms of technology.

As required infrastructure including laptops, tablets, smartphone and internet is not available either to students or to teachers. Hence the majority of faculty and students are unable to access online the teaching learning platforms.

This lockdown has affected teaching learning in Schools, Colleges and Universities. It also affects homework and assessment. Few international & private institutions have already adopted online teaching

methods whereas the on the other hand Low income Private and Government schools got affected due to shut down.

Several platforms created to enable online education in India which are supported by the Ministry of Human Resource Development (MHRD), the National Council of Educational Research and Training (NCERT), and the department of technical education. There also are initiatives like e-PG Pathshala (e-content), SWAYAM (online courses for teachers), and NEAT (enhancing employability). Other online platforms aim to increase connectivity with institutions, and accessibility to content. These are utilised for course materials and classes, and running of online modules. They include the National Project on Technology Enhanced Learning (NPTEL), National Knowledge Network, (NKN), and National Academic Depository (NAD), among others.

Digital Learning Management Systems coupled with High-Speed Internet and Education delivery platforms and well-equipped skilled faculty are the major requirements. Students also need High-Speed Internet and Computers/Mobiles to attend these sessions or watch pre-recorded classes.

4. Teaching and Learning during COVID19 Lockdown

To have uninterrupted teaching and learning everyone started a search for use full Online Tools to develop content and deliver them to Students.

The two ways to conduct online classes are:

1. Prerecord class and post on some media
2. Live online classes as webinar

Other than this, there are many Learning Management Systems to monitor Students and to conduct Online Classes, Assignments and Tests. In every category, Open Source and paid options are available. These Tools are broadly classified and listed below in table 1 and 2

TABLE 1: ONLINE TEACHING AND LEARNING TOOLS

Name of the Software	Examples/Types available
Learning Management System	Moodle, Google Class Room, MS Teams, Canvas, Edex, Edmodo, Blog, WordPress
Text Editing Software	Notepad++, Ms-Office/Office 365, LaTeX
Software for Remote	YouTube, Skype, GoToMeeting, Zoom, WebEx, Cisco,

Online Classes	Uberconference
Questionaries' and Assessment Software	Google Form, Mentimeter, Kahoot, Socrative, Quizlet, Edpuzzle, Microsoft Office Forms
Presentation Software	Prezi, Metimeter, Google Slides, Zoho Show, Powtoon, Slides
Software for peer Learning	Wetransfer, BookType , AWW, Peerwise, , Miro
Video Recording Software	Flashback recorder, Zoom, Screencast-O-Matic, Prezi Video, YouTube, OBS, Powtoon, EpicPen
Online Coding Platform	GeeksForGeeks, Lintcode, HackerEarth, TopCoder, CodeChef, CodeTantra, Coderbyte, Codewars, LeetCode, Interview bit.
Live Streaming Software	OBS Studio, Streamlabs, Lightstream

TABLE 2 :MIND GAMING TOOLS

Rubrics creation Software	Quick Rubric, Rubric Maker, iRubric, RubiStar
Gamification Learning Software	Quizlet
Mind Mapping Software	Infographic, Freemind, iMindMap, Xmind, Conceptdraw MindMap, Mindjet Mind Manager
Visual Effect Softwares	Cooltext, Pinterest, Cheat Sheet, Snipping Tool, Stutterstock, Infographic

The above list is not complete and every day many tools are added to the list. Above software can be easily downloaded on any Windows/Android/iOS operating systems. Most of them have web and App versions. There is lot of competition in field to dominate the Online Teaching & Learning Market. All the leading Software Companies, elite educational institutes are in to the field, and many start-ups are coming with innovative ideas. In every category open source software are available. Even commercial platforms are also providing with free versions with limited options. Electronic Gadgets like Mics, Speakers, and Video capturing devises are very important in developing and delivering content. Many quality devices

with varying prices are available in the market. With so many options available in the market, it is very difficult for a teacher to choose the best one. The following thumb rule may help in choosing the best one.

1. User friendly (Teacher and Student should be able to concentrate on class rather than Technology).
2. Scope of like white board, provision to conduct tests, give and receive assignments, monitor attendance etc.
3. Security of the software is most important aspect as the privacy of our students will be at stake.
4. Cost and validity period.

5. Going forward

In order to overcome the technical hurdles, (as these technical infrastructure glitches), which in turn create inequality, the entire channel shall involve in an effort to bring the concept of online Education to all sections of students. But the downside is that, if done badly, it will be another legitimisation of bad, meaningless Education”.

Possible alternatives or solutions for interrupted education during COVID-19

- With the help of Digital Skills of Teachers and Students and Internet Connectivity, it is necessary to explore digital learning with high and low technology solutions, etc.
- For Students those are coming from low-income groups or with no access to internet connectivity, an attempt should be made to develop tools which are less dependent on internet.
- To provide financial support for digitalisation to teachers and students.
- Measures should be taken to mitigate the effects of the pandemic on job offers, internship programs, and research projects.

This pandemic transformed the traditional Chalk-Talk Teaching Model in Blended Teaching Model. This change in the delivery of education is pushing Teachers and Institutions to adopt new ways to engage students while ensuring inclusive e-learning solutions.

6. Conclusion

In any crisis situation, strategies are pre-requisite to formulate our educational sector for the evolving trends & to cope up with challenges. Further, immediate measures are required to mitigate the effects of the pandemic on job offers, internship programs, and research projects. In the current scenario it becomes highly important to restructure the current methodology in schools and

higher education by integrating & synergizing classroom learning with e-learning modes to build an amalgamated learning system.

With about 1.5 Million schools & 50 thousands higher education institutions, the stiff challenge is Integration of Technology with Teaching.

As many E-learning Portals have started offering multiple courses on the same subjects with different levels of certifications, methodology and assessment, it becomes far more important to establish & maintain high quality assurance mechanisms and quality benchmark for online learning at our institutions. A well planned and effective educational practice is need of hour for the capacity-building of young minds. Structured courses should be offered online for Indian traditional knowledge systems in the fields of Yoga, Indian Medicines, Architecture, Hydraulics, Ethnobotany, Metallurgy and Agriculture and should be integrated with a present-day mainstream university education to serve the larger cause of humanity.

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INDIA STARES AT A LONG ROAD FOR ECONOMIC REVIVAL

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Abstract

There are certain events which remain etched in one's memory for a lifetime, for its impact is not limited to a particular geography and neither is it restricted to a particular aspect of social living, but encompasses almost every aspect of human life. The outbreak of coronavirus which has taken the form of a pandemic affecting more than 180 countries across the globe is one such event. Starting from a small cluster in the capital of China's Hubei province, it has now affected almost everyone in one way or the other and has brought the world to a screeching halt. For any economic activity there has to be a supply side and a corresponding demand side and absence of either of the party stops the activity. With people staying at home, there has been a substantial dip in the supply side of the economic chain. The productivity has declined as there are no workers running the factories and mills and no carriers to take goods from their source to destination. Secondly, because of this slowdown in the economic activities the financial institutions are facing liquidity issues and a credit crunch is being felt everywhere. While almost all the industries have been impacted because of this pandemic, the ones which have been hit hard are the Airlines and Tourism, Hospitality, Automobile, and Power. Aviation and Tourism. The COVID-19 became a pandemic primarily because it is novel and till date no proven cure for this disease has been found out. The government need to keep the economic activities to such a sustainable level from which it can be rebound easily once the pandemic is over.

1. Introduction

To combat with COVID-19, On 24 March 2020, the Government of India under Prime Minister Narendra Modi ordered a nationwide lockdown for 21 days, limiting movement of the entire 1.3 billion population of India as a preventive measure against the COVID-19 pandemic in India. It was ordered after a 14-hour voluntary public curfew on 22 March, followed by enforcement of a series of regulations in the country's COVID-19 affected regions. Lockdown was placed when the number of confirmed positive coronavirus cases in India was approximately 500. On 14 April, Prime Minister Narendra Modi extended the nationwide lockdown until 3 May, with a conditional relaxation after 20 April for the regions where the spread had been contained. On 1 May, the Government of India extended the nationwide lockdown further

by two weeks until 17 May. This paper is an attempt to understand the effect of this lockdown on Indian economy.

2.Objectives

The objective of the paper is

- To understand the Impact of lockdown on Indian economy
- To analyse the effect of lockdown on some industries
- To know the Measures taken by Indian government to face the crises

2. Impact of Lockdown on Indian Economy

The impact of lockdown on Indian economy has been largely disruptive. The World Bank and credit rating agencies have downgraded India's growth for fiscal year 2021 with the lowest figures India has seen in three decades since India's economic liberalization in the 1990. The former Chief Economic Advisor to the Government of India has said that India should prepare for a negative growth rate in FY21 and that the country would need a Rs.710 lakh crore (US\$10 trillion) stimulus to overcome the contraction. However, the International Monetary Fund projection for India for the Financial Year 2021-22 of 1.9% GDP growth is the highest among G-20 nations. Within a month, unemployment rose from 6.7% on 15 March to 26% on 19 April. During the lockdown, an estimated 140 crore (140 million) people have lost employment. More than 45% of households across the nation have reported an income drop as compared to the previous year. The Indian economy is expected to lose over Rs. 32,000 crore (US\$4.5 billion) every day during the first 21-days of complete lockdown which was declared following the coronavirus outbreak. Under complete lockdown, less than a quarter of India's \$2.8 trillion economy was functional. Up to 53% of businesses in the country were projected to be significantly affected. Supply chains have been put under stress with the lockdown restrictions in place; initially there was a lack of clarity in streamlining what is an "essential" and what is not. Those in the informal sectors and daily wage groups are the most at risk. A large number of farmers around the country who grow perishables are also facing uncertainty. Various businesses such as hotels and airlines are cutting salaries and laying off employees. Vendor of greens, essential supply chains and logistics. Life under lockdown. Bangalore spring 2020.

Major companies in India such as Larsen & Toubro, Bharat Forge, UltraTech Cement, Grasim Industries, Aditya Birla Group and Tata Motors have temporarily suspended or significantly reduced operations.

Young start-ups have been impacted as funding has fallen. Fast-moving consumer goods companies in the country have significantly reduced operations and are focusing on essentials. Some defence deals have been affected/delayed due to the pandemic, such as the delivery of DassaultRafale fighter jets. Stock markets in India posted their worst loses in history on 23 March 2020. However, on 25 March, one day after a complete 21-day lockdown was announced by the Prime Minister, SENSEX and NIFTY posted their biggest gains in 11 years, adding a value of Rs.4.7 lakh crore (US\$66 billion) crore to investor wealth

The Press Information Bureau brought out a fact check that stories about a financial emergency being imposed in India are fake. A financial emergency has never been imposed in the history of India as yet. On 4 April, former RBI chief RaghuramRajan said that the coronavirus pandemic in India may just be the "greatest emergency since Independence". On 28 April, former CEA Arvind Subramanian said that India would need Rs.720 lakh crore (US\$10 trillion) stimulus to overcome the contraction caused due to the pandemic

The Indian economy was expected to lose over Rs.32,000 crore (US\$4.5 billion) every day during the first 21-days of complete lockdown which was declared following the coronavirus outbreak. Under complete lockdown, less than a quarter of India's \$2.8 trillion economy was functional Up to 53% of businesses in the country were projected to be significantly affected. Supply chains have been put under stress with the lockdown restrictions in place; initially there was a lack of clarity in streamlining what is an "essential" and what is not. Those in the informal sectors and daily wage groups are the most at risk. A large number of farmers around the country who grow perishables are also facing uncertainty. Various businesses such as hotels and airlines are cutting salaries and laying off employees

The major impact of lockdown on Indian economy can be summarised as follow

- Sharp rise in unemployment
- Stress on supply chains
- Decrease in government income
- Collapse of the tourism industry
- Collapse of the hospitality industry
- Reduced consumer activity
- Plunge in fuel consumption.

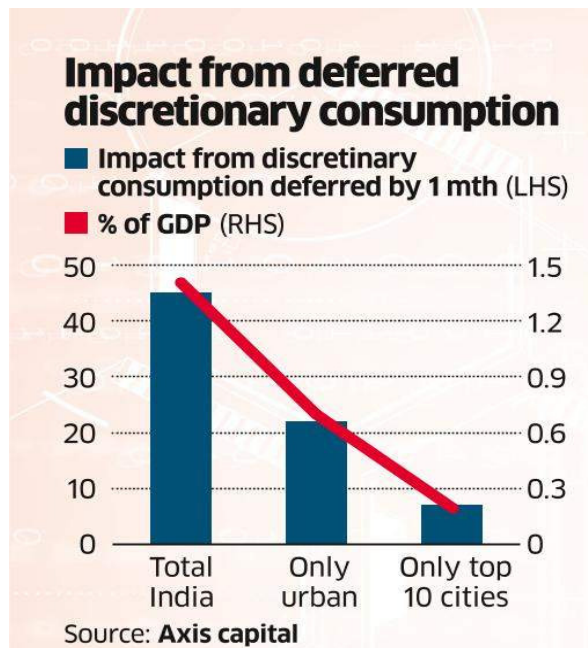


Fig. 5: GDP impact of lockdown: exempt and affected sectors

	Share in gross value added (%)
Manufacturing: Food Products & Beverages	4.3
Manufacturing: Pharmaceutical	1.0
Storage	0.1
Telecommunication	0.9
Communication and Services Related to Broadcasting	1.6
Cable Operators & Broadcasting Services	0.4
Electricity, Gas, Water Supply and Other Utility Services	2.7
Financial Services	5.4
Public administration & defense	6.1
Total exempted sectors	22.4
Total affected sectors	77.6

Note: Data reflect gross value added of each sector in FY18.
Source: CEIC and Nomura estimates.

3. The Industries effected by Lockdown

3.1 MSME Sector

The Micro, Small and Medium Enterprises (MSMEs) are literally the backbone of all Indian sectors and often engaged in manufacturing and export activities — two key drivers of the Indian economy. Almost all MSMEs are out of action due to the lockdown, chocking all production activities at major firms across sectors. There are several reports that indicate how MSMEs are reeling under crisis and have no money to pay their employees.

From leaders to experts and industry bodies, everyone has appealed the government to increase its relief package for the MSME sector, which contributes to over 30 per cent of India's GDP. It is worth mentioning that a majority of the small units may have to shut shop if they do not get a relief package soon. The government is planning to release Rs 20,000 crore relief package, divided into two funds, for helping MSMEs.

Describing the risks MSMEs face, the director of a firm that provides integrated services for MSMEs told India today.in about the current sector outlook and the challenges.

Rajesh Gupta, Co-founder and Director, BUSY Infotech, said, "The world is going through something unprecedented. Nearly a third of the globe is in lockdown. Due to this lack of trade and shrinking sales, MSME's are feeling the burden of loans, repayments, GST filings, etc." Even after getting support from

the government, many of them are almost on the verge of losing their control over losses and unable to generate revenues as well and fighting for their survival. It will be very important for the government to take initiatives and announce more relief packages for MSME's and measures. "Saying that MSMEs will enter "uncharted territory" after the lockdown ends, he urged the government to provide cash infusions that allow MSMEs to give workers jobs and buy raw materials. "The government will also need to increase the insolvency limit for SMEs and MSMEs to 1 crore from 1 lakh. Most businesses today are not earning revenues; hence they cannot meet their obligations to creditors," Gupta added.

3.2 Tourism and Hospitality Sector

MakeMyTrip co-founder and CEO Deep Karla in a recent group interaction told India Today TV that the tourism sector was the first to get disrupted by the impact of Covid-19 and will be the last to see a resumption of activities. Several reports indicate that the tourism sector will be worst affected due to the virus pandemic. The government also knows how bad the sector has been hit and acknowledged the same through a press release. A KMPG report already predicted the Indian tourism and hospitality sector to lose more than over 3.8 crore jobs. That figure is bound to increase after the lockdown was extended to May 3, but to overcome the temporary situation.

3.3 Aviation Sector

An article on the Economic Times said India's aviation sector may lose as much as Rs 5 lakh crore along with 4-5 crore job losses. As the outlook of the industry is expected to stay under pressure for at least next few months owing to increased uncertainty, there are many calls for a minimum wage package for affected workers who have been rendered jobless since the lockdown. The crucial aviation sector that connects nations across the world is witnessing a flurry of layoffs and pay cuts. Some workers have been asked to go on forced unpaid leaves by aviation companies, who have been hit equally hard as the tourism and hospitality sector. Each day, there are reports of global airlines announcing furloughs or layoffs as operational strains deepen in the wake of the lockdown. CAPA India, a leading travel and tourism consultancy firm, said last in a report last month that global aviation activity has sunk over 66 per cent in the wake of the Covid-19 crisis. In India, the decline in aircraft movements has been even more dramatic. With the exception of a handful of cargo and repatriation charter flights, India's skies are largely empty," the April 2020 report said. Demand will be suppressed due to economic dislocation; slow or even negative GDP growth; broken supply chains; low consumer confidence; and concerns about lingering

outbreaks of COVID-19, especially if travel insurance companies refuse to provide cover for associated medical expenses or travel disruption costs.”The sector, like the travel and tourism segment, is also in urgent need of financial help to support employees.

3.4 Automobile Sector

The automobile sector in India has been forced to stop key manufacturing activity and has led to a sharp drop in production and sales. With most of the plants shut, big automobile manufacturing companies have announced pay cuts and are waiting for a decision on resumption of dealerships.

However, RC Bhargava, an industry veteran and Maruti Suzuki Chairman, told India Today TV how the automobile sector is interlinked with many other small sectors that manufacture key parts, which are then used for manufacturing vehicle components. Therefore, Bhargava like many others from the industry is urging the government to at least open a few dealerships to resume businesses. He also said that a package for the industry, especially for the ones at the bottom of the manufacturing chain, is necessary.

3.5 Real Estate Sector

Finally, the real estate sector outlook has also suffered immensely due to the lockdown, which was announced to prevent the spread of the deadly Covid-19 virus. ANAROCK Group in a report last month said housing sales will fall 25-35 per cent while office absorption will fall in the range of 13-30 per cent on a year-on-year basis. In the long run, such a reduction in commercial and residential property could reset the future of real estate in India, the report added. Besides, while construction activities have resumed in some areas, there are many hotspots areas in urban areas where key construction projects have been put on hold for several weeks due to the lockdown. This has led to unemployment among millions of migrant labourers in India, who are engaged primarily in construction activities. Hardly anyone of these labourers, who live on daily wage, have additional savings to see off the lockdown period. The government has urged employers to not cut wages or lay off such labourers, reports suggest that companies are left with no choice but to let their workers go due to cash flow issues. World's biggest lockdown may have cost Rs 7-8 lakh crore to Indian economy.

4. Measures taken by Indian Government to face the crises

The government has announced several relief measures for them, but it is hard to ensure whether the benefits are reaching all. In such a scenario, the government could announce a job security scheme that covers certain employees, similar to what some countries including the UK have done. While there are

the five sectors that need urgent help, the outlook of other sectors in India are also deteriorating. A larger job security scheme for those who have been laid off could be the only way to protect affected citizens. The Government of India has announced a variety of measures to tackle the situation, from food security and extra funds for healthcare, to sector related incentives and tax deadline extensions.

On 26 March a number of economic relief measures for the poor were announced totaling over Rs.170,000 crore (US\$24 billion). On 27 March the Reserve Bank of India also announced a number of measures which would make available Rs.3,74,000 crore (US\$52 billion) to the country's financial system. On 29 March the government allowed the movement of all essential as well as non-essential goods during the lockdown.

On 3 April the central government released more funds to the states for tackling the coronavirus totalling to Rs.28,379 crore (US\$4.0 billion). The World Bank and Asian Development Bank have approved support to India to tackle the coronavirus pandemic.

On 14 April 2020, the Prime Minister of India extended the lockdown to 3 May. A new set of guidelines for the calibrated opening of the economy and relaxation of the lockdown were also set in place which would take effect from 20 April.

On 17 April, the RBI Governor announced more measures to counter the economic impact of the pandemic including Rs.50,000 crore (US\$7.0 billion) special finance to NABARD, SIDBI, and NHB.

On 18 April, to protect Indian companies during the pandemic, the government changed India's foreign direct investment policy. The Department of Military Affairs has put on hold all capital acquisitions for the beginning of the financial year. The Chief of Defence Staff has announced that India should minimize costly defence imports and give a chance to domestic production; also making sure not to "misrepresent operational requirements".

These are only temporary strategies to help the needy and make the economy stable but to overcome the actual economy situation to it will take decades.

5. Conclusion

It is an understatement to say that the world has changed dramatically over the last few months. The novel coronavirus pandemic has resulted in unimaginable loss to the global economy and the loss of

human lives has been unprecedented in an era of global peace. Not only are the numbers alarming but, the speed at which the challenges have emerged is intimidating. Going by the damages estimated by some legal firms, the figure goes up to an unimaginable \$6.5 trillion. Back home, the Indian economy is being battered as well. Under complete lockdown less than a quarter of India's \$2.8 trillion economy is functional. We are estimated to lose over Rs 32,000 crore (\$4.5 billion) every day during the lockdown. Luckily for India, the agricultural sector the backbone of the economy accounts for almost 14% of our GDP can recover quickly and in fact, even grow next year. But they must be supported by logistics and storage. The expected normal monsoon this year will help the sector maintain its momentum. Once the threat of the virus recedes, the service industry, the number one contributor to our GDP will start cruising again. We cannot underplay the impact of the COVID-19 pandemic but unlike geophysical disasters and wars, the physical infrastructure of the industry has survived without damage. Therefore, most industries can quickly become operational with a new work culture, if they have the labour force back and the working capital to restart their business. Indian economic recovery and rebound hinges upon ensuring that the population's health and productive. It will take decades for India to stabilise the economy.

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ECONOMIC REPERCUSSIONS OF THE PANDEMIC (WITH SPECIAL REFERENCE TO MSMEs)

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Abstract

The Economic impact of Corona virus pandemic in India has been largely disruptive and the resultant lockdown has dealt a severe blow to millions of small businesses in the country. The disruption of the flow of materials and goods is having negative implications on other aspects of business, with an abrupt end to incoming cash flows and unavailability of workforce due to the migration. The MSME stands for Micro, Small and Medium Enterprises. In a developing country like India, these industries form the backbone of the economy, is experiencing a worst hit due to the outbreak of the pandemic and the consequent lockdown. As this sector relies on day-to-day business to stay afloat, continues to be the most vulnerable one owing to the lockdown, coupled with factors like credit deficit, shortage of working capital, and a decrease in demand for non-essential goods. It is important that the government introduces a policy framework to soften the economic blow rendered to the MSME sectors, not just in the short-term but also for the long term, considering both supply and demand side impacts. It should suggest appropriate measures to mitigate the impact on the workforce, provide deferments on utility and social security payments, enhance access to credit and other specific measures for self-employed. Since it is unclear as to when life will come back to normal, government and businesses will have to work together towards phased re-starting of business operations and be prepared for structural changes in business activities.

1.Introduction

The world is battling with one of worst deadly, devastating and insurmountable modern horrors like the COVID-19, which has left the entire world grappling for life. This devastating pandemic virus has taken over almost 213 countries in its grip. This virus is resulting in a serious threat to the global economy as well as to the Indian economy, which is already struggling with the lowest growth rate as compared to the last six years. With COVID - 19 a new set of economic challenges unleashed by this virus is leaving many sectors in tatters especially the MSME (Micro, Small and Medium Enterprises)

2. MSME – A Major Contributor to the Economy

MSME forms the backbone of the Indian economy and is one of the most crucial segments that helps the Indian economy to grow by leap and bounds. The sector which provides employment to over 114 million people and contributes to more than 30 per cent of the GDP is going through one of the tough phases. Small industries are the most vulnerable ones. This is because of their size, scale of operation, limited financial&managerial resources.

In accordance with the provision of Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 the Micro, Small and Medium Enterprises (MSME) are classified into two Classes:

A. Manufacturing Enterprises-The enterprises engaged in the manufacture or production of goods pertaining to any industry specified in the first schedule to the industries (Development and regulation) Act, 1951) or employing plant and machinery in the process of value addition to the final product having a distinct name or character or use. The Manufacturing Enterprises are defined in terms of investment in Plant & Machinery.

B. Service Enterprises:-The enterprises engaged in providing or rendering of services and are defined in terms of investment in equipment.

3. Impact of COVID-19 On MSMEs

It is a well-known fact that in the context of supply chain, China plays a very pivotal role for India and the MSME sector in particular, is largely dependent on China for its raw material. A complete lockdown of China and partial lockdown of India has led to various issues ranging from shrinkage of exports, cessation of production, non-availability of manpower, the uncertainty of consumption, and liquidity squeeze in the market.

According to the Confederation of All India Traders (CAIT) around 70 million traders in India are majorly MSME in nature. Micro, small and medium enterprise is the sector which was already under huge distress because of demonetization, poorly implemented GST followed by the prolonged economic slowdown and finally, the biggest of all - the COVID-19 has aggravated the crisis in this specific sector.

Manufacturing in India has stopped, except for the rice milling sector where production has reportedly dropped by half. In several sectors, including automotive components, MSMEs are already experiencing a pre-lockdown decline in business, due to a stagnating economy and market demand and the disruption of international supply chains due to the lockdown in China. Some communications, sales, administrative and other support activities are being undertaken from home but on a rather limited scale. Migrant workers, particularly semi and unskilled workers, have returned in large numbers to their home towns.

The movement of materials, as well as fuels and people, has by and large come to an abrupt standstill. Manufacturing MSMEs almost exclusively supply other industries, which have also stopped operating, resulting in reduced demand and cancellations of orders, with the exception of essential industries.

4. Governmental Policies to Revive MSME

The most immediate concerns currently on the minds of MSMEs are cash flow and working capital. Most are concerned that survival is only possible with a substantive financial and/or fiscal support package from the government specifically for MSMEs. The government has broadened the definition of Micro, Small and Medium Enterprises (MSMEs) by revising the limit of investment in machinery or equipment and introducing “turnover” criteria — a reform measure that seeks to reverse the traditional policy bias in favour of units staying small in order to qualify for benefits.

As per the above revisions, micro enterprises will be those with investment of up to Rs 1 crore and turnover of up to Rs 5 crore — the earlier definition classified investments of up to Rs 25 lakh for manufacturing and up to Rs 10 lakh for services.

For small enterprises, the classification covers up to Rs 10 crore in investment and Rs 50 crore in turnover, against investment of up to Rs 5 crore in manufacturing and up to Rs 2 crore in services.

For medium enterprises, the investment limit has been doubled for manufacturing enterprises from Rs 10 crore to Rs 20 crore and quadrupled for services from Rs 5 crore to Rs 20 crore, in addition to the turnover criteria of up to Rs 100 crore for both sectors in this size.

Prime Minister Mr. Narendra Modi has announced Rs 20 lakh crore economic package with an assurance to provide stressed MSMEs with equity support and facilitate the provision of Rs. 20,000 Crores as subordinate debt. In a bid to provide support to the struggling MSME sector, the government announced collateral-free automatic loans worth Rs 3 lakh crore. These have a 4-year tenor and will be

valid up to October 31, 2020. Though government has taken favourable measures, it needs to think innovatively to save the sector that has been growing tremendously and contributing considerably to the economy.

5. Measures to Provide an Impetus for the recuperation Of MSMEs

5.1. Financial Assessment and Security

This is the first major issue of every business, be it small or big. In the case of SME's and MSME's, it is important to first make a final assessment of the current financial situation of the company to understand deficits, future inflow of funds, potential expense and liabilities etc., and draw up a fresh 3/6-month plan of action. At this point, getting reliable and accurate information about government relief packages, financial support initiatives and support extended from trade bodies like CII etc is very helpful before planning and executing a financial strategy.

5.2. Make-In-India

Now is now the right time for the Government to roll out sops to MSMEs that manufacture locally. The Government eMarketplace (GeM) will be of great use to suppliers looking for purchasers and vice versa. Investing in online infrastructure while also encouraging small businesses to source locally will help improve manufacturing while also cutting on the import costs. Global tenders will have to be disallowed in Government procurement up to Rs 200 crores. Indian MSMEs and other companies have often faced unfair competition from foreign companies. This will lead to make India self-reliant.

5.3. Delay MSME Loan Repayments or Extend Tenures

Even though banks have given moratorium options, they are still adding interest for the months which MSMEs have not been able to pay. RBI should direct Banks to avoid charging interest for these months. Also, some exemptions in GST will be a great relief. To ease financial stress as businesses get back to work, the government has decided to continue EPF support for business and workers for 3 more months providing a liquidity relief of Rs 2,500 crores.

5.4. Inventory Management for Exporters

MSMEs that are into exports could get some help with inventory management. In the Union Budget 2020, Finance Minister Ms. Nirmala Sitharaman proposed building warehouses at block/taluk level. If the

government can allot subsidized warehouses to exporters while figuring out the supply chain side of things, it could potentially help support the economy.

5.5. Create a Strong Digital Ecosystem

If one thing that the COVID-19 has taught businesses, it is the power of digital engagement. Every SME/MSME has to make efforts to be present and active on the digital media, through the website, blogs, and social media. This helps to create a positive brand recall and also helps generate business through channels, especially for brands that are into retail, which can get benefitted impressively through online sales. Apart from online sales, a consistent and positive social media presence can prove a boon for the consumer and stakeholder engagement, not only in times of social distancing and lockdown but long after that as well.

5.6. Put A Crisis Management Strategy in Place

It is important to chalk up an effective crisis management plan that will take into consideration both immediate and long-term impact. Hence, from creating a financial back-up and reservoir of funding, to having a robust digital and technology-enabled ecosystem that can ensure minimum damage to productivity needs to be in place.

6. Conclusion

The Covid-19 situation has put all businesses of the economy in a tight situation especially the MSMEs. Taking into consideration the widespread havoc wreaked by the COVID-19, the government needs to come up with a constant tracking mechanism and should ensure implementation of relief measures to build up confidence of this very important sector which has taken a severe blow due to the disruptions created by the pandemic. A stimulus financial package announced by the government needs to be pressed into action on a war footing to re-energise the market economy. Many countries like the USA and China have rolled out many new measures to save MSMEs from the COVID-19 casualties.

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LOCKDOWN-INDIA'S RURAL ECONOMY

(Challenges-opportunities-Turnaround strategy)

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Abstract

'Life is full of surprises', on 1st February 2020, when union finance minister introduced union budget in parliament, the focus was on the theme and priorities of the government for 2020-21. But within a month and half all the priorities were wiped out and government started focusing only on survival of lives rather than livelihoods irrespective of economic class due to COVID-19. A pandemic without vaccine pushed the governments to look an alternative namely 'corona lockdown' to save the lives of people, which in turn hampered Indian economy and global economy as a whole. Meanwhile central government announced a relief package worth of Rs.1.7 lakh crore to safeguard the interests of the public.

1. Introduction

1.1 Indian Rural Economy

India is predominantly a rural country. As per the 2011 Census, 68.8 per cent of country's population and 72.4 per cent of workforce resided in rural areas. But the continuous transition to urbanization over the years is leading to the decline in the rural share in population, workforce and GDP of the country. Rural masses were migrated to urban pool and started working for various construction and infrastructure works. From 2001 to 2011, India's urban population increased by 31.8 per cent as compared to 12.18 per cent increase in the rural population. Over fifty per cent of the increase in urban population during this period was attributed to the rural-urban migration and re-classification of rural settlements into urban (Pradhan 2013). Population projections indicate that India will continue to be predominantly rural till the year 2050 after which urban population is estimated to overtake rural population (United Nations 2012).

The unplanned migration from rural to urban, especially in search of economic opportunities is creating severe stress on urban civic infrastructure and attracting a big number of low wage workers from rural areas to stay in poor conditions. Thus, to control unplanned migration i.e. shifting rural to urban and to improve socio economic dimensions of large number of population in the country, there is an urgency to transform Indian rural economy stronger and create opportunities for employment in rural landscape. The enrichment in economic conditions of rural households is imperative for thinning the gap in rural and urban per capita income which has remained steadily high. Hence, government requires putting an action plan for achieving higher growth in rural economy than urban.

2. Corona lockdown: An Unprecedented challenge to Indian rural economy

Rural India has been struggling for many years due to continuous droughts and demonetization of two currency notes in 2016 and now it is facing hardest hit due to nationwide corona lockdown. Unemployment in rural India is going above 20% soon after lockdown & about 40crore workers in the informal sector of economy are at risk of pushing deeper into poverty.

To sort out the situation government of India announced relief programs to provide free food grains, fuel and gas and money transfers for the under privileged. The government's interim support so far of Rs.1.7 lakh crores is less than 1% of India's GDP, which is very less than many other countries.

In rural areas, the risk of hunger and malnutrition is true. Over concentration on urban development rather than rural development created the disturbance and now showing hard hit on rural underprivileged sections. Moreover, the government is facing many problems in distribution of relief package for the poor, due to inactive ration cards and also some people put their ration cards as collateral to money lenders for their borrowings.

There are a few positive rays of hope for farmers that the monsoon will be on time and rain forecast to be normal this year, as per IMD report. Recently government also relaxed some lockdown restrictions, particularly in rural areas. RBI also granted a three-month moratorium on loans for farming, and assured to extend additional financial support for crop loans.

3. The opportunity for Indian rural economy

A challenge is also a great opportunity too. Covid-19 has changed all psychological theories where people replaced all their hierarchy of needs where every need connoted as physiological need. Even after

lockdown, the farm sector has been delivering functions; and with the right stimulus, it could lead to revival of the rural economy. Vegetables, fruits, food processing, live stock, fisheries and dairying are labor-intensive and high yielding economic activities; it requires high attention to move forward so quickly. After many decades of neglect in research, lack of access to markets, no proactive policies for exports, lack of fixed value chain, and the present adversity may be a timely opportunity for this rural sector, where government should adopt a right turnaround strategy.

Liquidity is one of the biggest barriers for the revival of business. It requires support of a suitable policy framework and changes in pricing, taxation, access to market, credit availability and infrastructure, like storage points, cold storages and warehouses. The coming one year or so of how people learn to stay with corona virus can reshape the economy towards better and more sustainable manufacture and consumption, with farming and non farming sectors will strengthen rural economy.

4. Nine step Turnaround strategy- to revive India's rural economy

a) Bridging the gap between urban – rural opportunities

Government has to urgently bridge the gap between urban-rural divide. Welfare schemes do not cure the root cause of rural poverty. It only gives temporary relief. The root cause of rural poverty is lack of skills and expertise and missing economic opportunities. The growing urban-rural division is evident with inequalities in consumption expenditure of public, quality of living standards, and availability of social and economic infrastructure. To achieve inclusive economic growth, the government needs to focus on transform the agriculture based economy to accommodate the maximum number of people to be employed in farming activities with better remuneration opportunities. The government has to take a mission to implement fast track reforms. It needs to focus on agriculture-technology interventions which can push agricultural productivity. Government needs to set up value-added agriculture products and tap agriculture supply chain opportunities to ensure better payoffs for farmers. It will also need to create thousands of micro-enterprises and hundreds of economic value clusters in rural India, besides investing in rural road network development, expansion of rural electricity, irrigation network chains and national cold chain hubs.

b) Loan waivers

India quickly needs to reboot its current policies for alleviating rural economic distress; most of policies are in the form of either waivers or freebies. These policies have been mostly failed to deliver the desired outcomes and miserably lost to reduce poverty and guarantee sustainable income and security for a

majority of Indian households employed in rural India. There is plethora of reports about farmer suicides across the country. The Accidental Death and Suicide in India report for 2015 showed that every day on an average 34 farmers committed suicide in India (12,602 suicides in the year), mainly because of indebtedness. Hence government should change the way they are looking at welfare funding on various schemes.

c) Reboot MGNREGA

Mahatma Gandhi National Rural Employment Guarantee (MGNREG) programme/act, which ensures at least 100 days of guaranteed wage employment each fiscal year to every rural household to do unskilled manual work. But the very nature of the programme ensures 100 days of sustainable livelihood. For remaining 265 days no guarantee to earn. And also the wage which is paid by government is not sufficient to make them come out of rural poverty. Hence the government has to rejuvenate this scheme by altering it from labour-oriented job creation to learning-led job creation, i.e. the programme should motivate the farmers to learn about more sophisticated technology, and make them to implement technology in their livelihoods to increase their earning potential. In this modern era, using labour to dig wells or lay roadways is not a smart way of using human resources. Unless human capital is empowered with technical know-how and skills, there is no use of such a valuable resource. So it is need of the hour to reform MGNREGA. Policy makers have to change their approach towards rural workers from laborers to key human resources.

Approximately one-third of the farm land in India is essentially uneconomical from an investment point because they are small land holdings. These marginal farmers and agricultural labourer produce small for survival, but most of them are depend on daily wage employment. Hence they need a safe net to survive by overcoming the negative effects of the Covid-19. The primary alternative to provide safe net is the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which should be funded adequate to meet the survival requirements. This funding will help rural households to have cash in hand, which will create demand, more importantly, it will stimulate demand for food, and in turn it will give incentives for high agricultural production.

d) Boosting credit arrangements to farmers

Every economic activity requires capital push irrespective of size. Today, it is absolutely critical to the government to deliver financial support directly to the farmers through the primary agricultural co-operative societies, commercial banks and kisan credit cards. Whatever routes are available should be

used to keep cash into the hands of farmers so that funds will be available to the kharif season. There will be arrival of excess labor in rural areas soon, because the migrant workers that have been forced to stay in urban areas will soon be come back into their home places. The only way that these people can be used optimally is through a combination of increased investments on the agriculture and expansion of MGNREGA.

e) Increase in entrepreneurship

To revitalize the rural economy, the government of India has been incorporating many policy reforms like the Model Contract Farming Act, 2018, e-mandis and farmer producer organizations (FPOs). As Indian farmers have the smallest landholdings in the world, they are lack in individual bargaining power in the market for their small farming output. In this situation, the establishment of FPOs can give them an advantage because they can pool in their output, invest in storage facilities and better negotiate with large sized buyers. And also FPOs need to transform themselves into entrepreneurship hubs. The FPO model should be expanded with large size incentives. The government needs to step in to create a few model FPOs in the country. A careful plan for FPOs will nurture agricultural entrepreneurs to go ahead and follow the success footprints of the famous milk cooperative brand like Amul. FPOs need to tie up with higher educational institutes to build and enrich their knowledge for creating a strong entrepreneurial network that leads to the design a vibrant Indian rural economy.

f) Tech-savy rural economy

While government policies for digital India, financial inclusion schemes and spending on broadband infrastructure can help, increase in use of technology can motivate the entrepreneurial spirit and ignite rural innovation in India. Technology can also help farmers to procure best-quality inputs, crop and soil health and output data and more importantly weather related insights. Moreover, using technology can build more robust supply chains that connect all stake holders from farmer to retailer. Social media can play a vital role to connect farmers to major parts of economy. Social media platforms can be used to educate farmers and may transform them into rural micro-entrepreneurs and create access to national and international markets. Emergence of food and grocery order delivery apps created a positive hope to farmers to use technology to sell their produce and to enjoy high dividends.

g) Explore exports aggressively

For a last few years we have been hearing about Make in India for the globe. The emergence of COVID-19 driven our country to include agriculture, and look at the globe as a market for our agricultural produce. The seriousness of COVID-19 is very high in the countries of Europe and increasingly, North America. Agriculture supply chains and production mechanisms in nations like France, Germany and Italy have been severely affected and will take much time to restore. Our country has been fortunate enough that our rural areas seem to have missed the worst hit of pandemic. Indian agriculture production system will restore faster than that of Europe, and it should be leveraged. Hence it is an opportunity for our country to capture the global food market as a captive supplier. To make this to happen, government need to upgrade our farming infrastructure with respect to technology to reach world class standards. This is the right time to start in a new direction to become a global country to fulfill the hunger of the world.

h) The surplus labor to be used to build rural infrastructure

It is looking evident that the industries like real estate, tourism, hospitality, and other low level service industries will take much time to recover. This signifies that much of the migrant labour force which is employed in these sectors in urban areas will likely remain in their villages for at least 1-2 years. This surplus labor in rural areas should be taken as an opportunity to upgrade our rural infrastructure like rural roads, schools, healthcare facilities in remote areas. Government should make this happen by using returning migrant labor and public money. It cannot be materialized by attracting private investment at this point of time, because many companies will be focusing to cover the financial losses due to the corona lockdown.

i) Create a proactive policy environment

The final and most important step in reviving the Indian rural economy is a stimulus package to boost the rural economic situation. While agriculture is certainly the key driver of the rural economy, along with agriculture the policy makers need to focus at non-farm sectors like rural SMEs, handicrafts and handlooms to unleash the full capacity of rural employment. Government must be able to capture the unexpected opportunity by building a robust supply chain with strong backward and forward linkages supported by technology- can create a strong rural economy.

5. Conclusion

Despite of various corrective measures to revive the rural economy, government should start making plans to control the virus risk in rural areas, it is real that currently the problem is very serious in urban clusters because of high population density. But there is a high probability that it can spread to rural areas due to the return of migrant workers from urban to rural. So here is a high proximity for the spread of Covid-19 spreading to farmers, landless laborers, and workers of food processing units and others who are part of food supply chains. Before Covid-19 outbreak, rural incomes were partially affected because of lower growth rate of wages. Now the biggest challenge to rural workforce is decline in rural wages due to the arrival of migrant workers from urban areas. Hence government should keep all these unprecedented challenges in their mind to formulate appropriate contingent policy by protecting lives of people to restore, revive and rejuvenate the Indian rural economy.

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ECONOMIC IMPACT OF COVID-19 – A CASE STUDY OF INDIA**Kota Pratyusha**

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Abstract

The outbreak of the Covid-19 pandemic is an unprecedented shock to the Indian economy. The economy was already in a parlous state before Covid-19 struck. With the prolonged country-wide lockdown, global economic downturn and associated disruption of demand and supply chains, the economy is likely to face a protracted period of slowdown. The magnitude of the economic impact will depend upon the duration and severity of the health crisis, the duration of the lockdown and the manner in which the situation unfolds once the lockdown is lifted. In this paper we describe the state of the Indian economy in the pre-Covid-19 period, assess the potential impact of the shock on various segments of the economy, analyse the policies that have been announced so far by the central government and the Reserve Bank of India to ameliorate the economic shock and put forward a set of policy recommendations for specific sectors.

1.Introduction

Corona viruses are a large family of viruses which may cause illness in animals or humans. In humans, several corona viruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered corona virus causes corona virus disease COVID-19.

COVID-19 is the infectious disease caused by the most recently discovered corona virus (severe acute respiratory syndrome corona virus 2 or SARS-CoV-2). This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. The economic impact of the 2019–20 corona virus pandemic in India has been hugely disruptive and is likely to impact the country's economy across industries and business formats. It is said that businesses are grappling with "tremendous uncertainty" about their future.

2. Impact on Market

The present section includes insights on impact that this virus has made on various segments and its consequences on India's outlook, and possible steps and responses to mitigate risks in these uncertainties. The pandemic has set foot in India and is expected to lead the country towards a major slowdown. Major financial institutions (Moody's*, OECD, UBS, Barclays, Fitch) have lowered growth estimates for India by 0.5–1.5 percent. This is likely to put a downward pressure on the markets and industries. The major markets that are impacted are Automotive, Power, IT, FMCG, HealthCare, Telecom.

The pandemic is likely to impact the country's economy through the following four vectors:

- Supply disruptions
- Global and Domestic Demand
- Stress on Banking and Financial Sectors
- Falling Oil Prices

2.1 Supply Disruptions:

Since India is dependent on China for imports on raw materials and intermediate materials, China's slowdown is expected to significantly impact various industries in India. Higher input prices and lower profitability, leading to decline in capacity building. The United Nations Conference on Trade and Development (UNCTAD), has suggested that India's trade impact due to the COVID-19 outbreak could be around US\$ 348 million. In terms of trade, China is the world's largest exporter and second-largest importer. It accounts for 13% of world exports and 11% of world imports.

Up to a large extent, it will impact the Indian industry. In imports, the dependence of India on China is huge. Of the top 20 products (at the two-digit of HS Code) that India imports from the world, China accounts for a significant share in most of them. India's total electronic imports account for 45% of China. Around one-third of machinery and almost two-fifths of organic chemicals that India purchases from the world come from China? For automotive parts and fertilizers China's share in India's import is more than 25%. Around 65 to 70% of active pharmaceutical ingredients and around 90% of certain mobile phones come from China to India.

In terms of export, China is India's 3rd largest export partner and accounts for around 5% share. The impact may result in the following sectors namely organic chemicals, plastics, fish products, cotton, ores, etc. We also can't ignore that most of the Indian companies are located in the eastern part of China. In China, about 72% of companies in India are in cities like Shanghai, Beijing, provinces of Guangdong, Jiangsu, and Shandong. In various sectors, these companies work including Industrial manufacturing, manufacturing services, IT and BPO, Logistics, Chemicals, Airlines, and tourism.

Therefore, we can say that due to the current outbreak of coronavirus in China, the import dependence on China will have a significant impact on the Indian industry. As per UNCTAD estimates, exports across global value chains could decrease by US\$ 50 billion during the year in case there is a 2% reduction in China's exports of intermediate inputs. The supply-side disruption may be temporary with revival of production units in China.

2.2 Global and Domestic Demand:

Closing of cinema theatres and declining footfall in shopping complexes has affected the retail sector by impacting the consumption of both essential and discretionary items. As the consumption of any product or services goes down, it leads to an impact on the work force in the current scenario, with all the retailers closing their services, the jobs of the employees are at a huge risk.

- Consumer spending took a hit due to movement restrictions and fear of falling sick.
- Reduced wealth effect due to falling share prices. Hospitality and aviation sectors are the most impacted at a short span.
- Low profitability and production disruptions impact business investments.
- Loss of employment in informal sector for contractual workers, reduced consumer spending.
- Demand in top export destinations (China, United States and Europe) to be severely hit.

2.3 Stress on banking and Financial Sector:

- Exposure to stressed industries and MSMEs
- Rise in consumer loan defaults and increase in NPAs.
- Stress on banks impact credit growth.
- Fall in stock market with the spread of pandemic in west.

- Sharp depreciation of rupee against dollar worsening trade deficit as exports contribution to GDP goes low.

Banking services in India are classified under the essential services list. Banking and financial institutions were under immense pressure to ensure business-as-usual amidst the lockdown and health crisis. Banking operations such as cash deposits, withdrawals, clearing of cheques and other traditional teller services had to be executed by maintaining a safe distance of at-least a meter. Social media was abuzz with a bank employee's effort to handle cheques with tongs and sanitize them with a steam iron.

Keeping the physical challenges of bank employees, rating agency Moody's on April 1st revised the outlook for the Indian banking system to negative from stable, citing disruptions in economic activity caused by the covid-19 outbreak and an ensuing decline in asset quality.

It said asset quality will deteriorate across corporate, small and medium enterprises (SME) and retail segments, leading to pressure on profitability and capital for lenders. While funding and liquidity at public sector banks (PSBs) will be stable, Moody's said, the growing risk aversion in the system following the Yes Bank default will increase funding and liquidity pressure on small private sector lenders.

A deterioration of global economic conditions and lockdown imposed by the Indian government to slow the spread of coronavirus will weigh on domestic demand and private investment. A sharp decline in economic activity and a rise in unemployment will lead to a deterioration of household and corporate finances, which in turn will result in increases in delinquencies. Bankers and analysts expect significant spike in NPAs going ahead. The pain may not be visible immediately since the Reserve Bank of India (RBI) has extended regulatory relaxations. But, that cushion won't be around for long.

The moratorium period will end soon and companies and individual borrowers will have to resume repayments from June. With no business happening, workforce availability remaining an issue and rampant pay cuts, it is doubtful how many borrowers will have repayment capacity, bankers said. According to a report by ICRA, about 328 companies have sought moratorium from banks. That tells us about their financial position. It is obvious that we are not going to see improvement anytime soon. The worst part is that there is no assessment on the likely impact.

After a prolonged bad loan clean-up exercise, Indian banks' total gross NPAs stood at INR 7.97 lakh crore as of December-end compared to INR 8.02 lakh crore a year ago. Banks are already giving distress signals to investors. On April 28, the mood at Axis Bank's media conference call after the bank's Q4 results was that of high caution. There was no clear guidance from top management on what lies ahead.

"If you look out of the window, all you can see is that the economic activities have come to a standstill," said chief executive officer, Amitabh Chaudhury. What caught analysts by surprise was the unexpected INR 3,000 crore (out of the INR 7,730 crore total provisions) provisions set aside to cover the likely impact of COVID-19. The signal was clear. It is almost certain that the industry will see a big spike in bad loans. Several companies are feeling the heat. This stress is not reflecting so far because of the present RBI relaxations such as moratorium on loan payments. But, once this is lifted, the real picture will emerge.

RBI measures so far: The central bank has announced a slew of measures to help banks and borrowers' tide over this crisis. In the first round of measures, RBI announced a 75 basis point rate cut, liquidity measures to the tune of INR 3.74 lakh crore, including a targeted long term repo operation (TLTRO) worth INR 1 lakh crore, deferment of interest on working capital facilities and three month moratorium for all term loans extended by lending institutions. In the second round, it announced TLTRO 2.0 worth INR 50,000 crore, specifically targeting small companies.

The last credit cycle for banks had seen sharp surge in bad loans. Indian banks are at the end of a prolonged NPAs clean-up cycle. The hidden stock of bad loans buried deep in the balance sheets, accumulated over the years of easy money era, prompted the RBI to initiate an Asset Quality Review (AQR) in 2015. By now, that process is almost over with banks having disclosed most of the problematic large corporate accounts. Many large cases of corporate loan defaults have been pushed to the Insolvency and Bankruptcy Code (IBC) court for quicker resolution.

Among the loan categories, fresh loans given to companies including those given to small and medium enterprises (SMEs) face risk if the cash flows of companies remain under pressure, thus impacting their loan repayment ability. Banks remain highly risk averse and the consensus among industry leaders is that most companies in consumer-oriented sectors at the moment are now operating with less than 70 percent of their capacity. The banking sector's health depends on how soon the economy recovers.

2.4 Falling of Oil Prices:

Oil prices have fallen sharply (US\$68.5 on 3rd Jan to US\$28.2 on 20 March) and should be a boon to India's twin deficit (fiscal and current amount) giving policymakers some headroom to act. Rupee depreciation partially offsets the gain through fall in oil prices. Rupee has fallen from (INR71.7 per US\$ on 3rd Jan to INR75 per US\$ on 20 March).

3.Impact on Tourism and Hospitality:

The Government of India and the respective governments of the states have announced the lockdown to reduce the spreading of the infectious pandemic COVID-19 disease. Since the decision, there has been a massive decline in the restaurant and food service business. The impact is growing exponentially as the country comes under a lockdown for 21 days – food delivery has become the major means of revenues in the food service business.

Similarly, the hotels and linked businesses (guest house, townhouses, banquet halls, etc.) have been direly impacted amid the lockdown. Business stays, leisure stays, family holidays, get-togethers, social occasions, etc. are being completely curtailed and in such a scenario the hospitality sector is taking a hard hit. Layoffs seem inevitable in the restaurant sector as cash flows have dried up almost completely. Small and mid-size restaurants would be the worst affected as they struggle to cover fixed costs.

COVID 19 has resulted in one of the severest downturns for the travel and tourism sector in India. The aviation and tourism sectors are direly impacted leading to a near collapse of the sector, majorly owing to the cancellation of inbound Visas and stringent restrictions on domestic or international travel. The Indian tourism and hospitality sector comprising of hotels, restaurants, tour and travel operators, wedding and conference planners, etc. contribute more than US\$250 billion or nearly one-tenth of the GDP. In case the COVID situation prolongs, we may witness a complete halt in the sector's operations and it may take initial government support for revival post the situation concludes.

4.Impact on Agriculture:

Lot of families in India depend on agriculture as source of income and even consider the way of life. First, the standing kharif crop during the 2019-20 season was damaged due to unseasonal and heavy rains during September and October 2019. To make up for these losses, farmers across major rabi growing states increased acreage sharply. Acreage under rabi crop had increased by 9.5 per cent by January 31, 2020. It must have been higher as the rabi sowing season continues till mid or end-February but, the Ministry of Agriculture and Farmers' Welfare stopped releasing data for progress of rabi sowing after

end-January. Wheat, Paddy, gram, rapeseed & mustard are some of the major crops sown during the rabi season. Farmers were expecting a bumper harvest of wheat, gram and Paddy. Advance estimates from the Ministry pegged wheat output at an all-time high of 106.2 million tonnes during 2019-20.

However, the Covid-19 induced nation-wide lockdown announced from March 24, 2020 for 21 days and later extended for another 19 days till May 3 have led to uncertainty regarding harvesting and procurement activities. The government did exempt farm activities from the lockdown but the shortage of labour and lack of transport facilities is expected to impact the rabi crop adversely. Procurement activity normally commences on 1st April every year in most of the States. However, following the lockdown, procurement was postponed in many of the states. Delay in crop harvesting due to postponement of procurement activities can bring down yield as the temperature starts rising. Farmers could not register themselves for the procurement process in the state because the e-governance service platform in many states especially Rajasthan as E-mithra was suspended during lockdown. Besides the shortage of machines and labour, there is also a shortfall in the availability of jute bags required for storage of foodgrains across states. In Rajasthan, the price of gunny bags has more than doubled. State governments have intervened to solve problems of the farm sector. State Governments have announced doorstep purchase of few crops. Increase in purchase centers and allotting coupons or online tokens to avoid the crowd gathering.

The Government of Telangana has decided to temporarily store the harvest in government schools and junior colleges until the stocks are transported. The government has promised to buy paddy from farmers at minimum support price @ Rs. 1835/- per quintal. It has promised that it would buy all the harvested crops from the villages and farmers would not have to venture out to sell their produce. Accordingly, the Govt. of Telangana has opened a total No. of 6,554 Paddy Purchase Centers all over the State and purchased a quantity of 64,19,401 MTs of paddy out of total production of 1.00 crore MTs. The value of the Crop purchased is Rs.11,670 Crores. The amount to be paid to the farmers will be deposited directly in the accounts of the farmers. The Govt. of Andhra Pradesh had started buying paddy directly from farmers at MSP. It opened around 1,280 purchase centres across the state in the first week of April for buying the rabi crop.

5. Government Intervention

Steps needed to be taken by government to minimize the impact on consumer Industry.

5.1.Ensuring Stock Availability:The government must try to ensure that there is none to minimal disruption in the supply chain of consumer products, and their distribution follows normal course, else the panic may lead to mass shortage of essential products and commodities.

5.2.Facilitating E-Commerce: One of the major steps for the government to ensure minimum disruption is to encourage and facilitate e-commerce. There are various players in the consumer industry who have launched contact-less pickup and delivery models to ensure zero contact with consumers, and thus minimize the risk of contagion. Such contact-less methods are apt in the current scenario and could also lead to greater employment in the logistics and distribution departments for e-com players and retailers.

5.3.Incentivizing and assisting logistics and delivery: While the risks associated with COVID-19 are common for all citizens, the government can offset its impact in the consumer sector by incentivizing logistics and delivery personnel, and increasing its delivery fleet. Further, assisting such personnel by way of distribution of essential precautionary and protective healthcare products, and mandating timely disbursements of salaries could boost their morale.

5.4. Boosting non-urban consumption: The government resorts to direct-benefit transfers and direct-account transfer of wages. This could allow immediate cash in hands of consumer. Ensuring digital infrastructure in non-urban areas for consumers for ordering products online is also critical during such times.

5.5.Offering Unified Solutions: Large organised consumer companies, retailers and food service providers are likely to be amongst the most severely impacted lot owing to the closure of malls, restaurants, and people avoiding super and hypermarkets, etc. The government can encourage these players to unite with smaller retailers and e-commerce marketplaces and supply their stocks to ensure product availability. This will not only ensure revenue generation and inventory circulation for the larger players, but will also lead to better availability of products for consumers.

6.Conclusion

The measures suggested will hopefully help the government and other concerned departments in taking up the challenges and propose definite measures to ensure the revival of the economy.

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Indian economy braces for corona virus-induced shock as curbs set to pull down growth

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United Nations Conference on Trade and Development

Several local, national and international Media Articles

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EFFECT OF CORONA ON SECTORS OF INDIAN ECONOMY

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Abstract

The coronavirus pandemic's hit to economic activity has led many institutions to slash their forecasts for the Indian economy as well globally. To curb the spread of the coronavirus, authorities around the world implemented lockdown measures that have brought much of global economic activity to a halt. It has also sparked fears of an impending economic crisis and recession. Social distancing, self-isolation and travel restrictions forced a decrease in the workforce across all economic sectors and caused many jobs to be lost. Schools and educational have closed down, and the need of commodities and manufactured products has decreased. In contrast, the need for medical supplies has significantly increased. The food sector has also seen a great demand due to panic-buying and stockpiling of food products. It effected all the sectors of economy. The Demand for online teaching increased and with a increased rate of cybercrime also.

1.Introduction

Before coronavirus entered in India or anywhere globally people used to work according to their standards, freedom, will and wish, but now there is a complete change in scenario where people have to follow some required rules for their survival. Social distancing has become part of life. Previously people used to move with freedom either it can be work, education, social gathering, entertainment, etc. It all used to generate money and heavy cash flow in various forms. But now people are thinking to spend even one rupee with complete consciousness. It effected all the sectors of economy and all the classes of economy.

2. Objectives

- 1) To highlight the effects on various sectors of economy
- 2) To suggest some measures to improve current pandemic situations.
- 3) What people can do on their level to improvise their situations.

3. Effects on Primary Sector

As the world comes to a standstill and public life shuts down across the globe, all have their eyes on the healthcare systems which are buckled under the strain of the COVID-19 pandemic. With the lockdown anticipated to extend for some more time, there are now concerns rising over food supply and people are now scared. The potential negative impacts of Corona on agricultural production, market stability, food supply may now be seen from the surface but it is still difficult to predict quantify the exact damage accurately. However, viewing the current scenario and based on the floating news, here is an overview of the impact on agricultural production and economy. Due to a lack of transportation and logistics facilities, the produce remains to lie on the fields at the grace of Almighty. This leaves the crestfallen farmer with no alternative other than feeding the fresh produce to the cattle. The absence of transport facilities clubbed with vigilant blocking roads has a limiting effect on the movement of migratory harvest labour and agri-machinery. Also, trucks and tractors are not inclusive of 'farm machinery' by definition. Although, many state governments have regulated the free movement of trucks, a nation-wide regulation is yet to be seen.

The Centre and State Governments are now working in harmony to redress the grievances of farmers by introducing a handle of measures every day such as subsidies, including crop insurance to farmers, free flow of agricultural credit, unemployment allowance to rural landless/migrant workers under MANREGA, etc. Although equipped with smartphones, the uneducated and naïve farmers are not able to reap the benefits of this ingenious measure. As a result, streamlining of crop procurement and mandi operations continues to be a challenge

To pump up the morale of the farmers, more such creative yet safe and pragmatic solutions are needed, like NGOs can volunteer to educate the farmers on the usage of these new features of the National Agriculture Market (e-NAM) Platform. Fellow citizens and media to come together to appreciate the farmers of India as much as the doctors and nurses, who are risking their lives to ensure that food reservoirs are well stacked amid the lockdown. Amid border closures, quarantines, and market, supply chain and trade disruptions, the food reservoirs are not going to last forever. Despite a purported food crisis, the trial and error based experimental cooking are trending, causing enormous food wastages. At such a time when some people are running out of food and are on the brink of starvation due to the lockdown, it is our moral duty to restrict our diet to plain and simplistic food. With a 16.5 percent contribution to GVA (Gross Value Added) and 43 percent population engaged, the food and agriculture sector has immense potential to wean India out of the economic crisis abyss. The incessant fast lane

solutions and swift actions by the govt. to empower the farmers, will surely succour India in winning the war against the life and livelihood pulverising coronavirus pandemic.

4. Effects on Secondary Sector

The secondary sector of the economy includes those economic sectors that create a finished usable product and hence depend on primary sector industries for the raw materials. This sector includes mining, manufacturing, and construction. The secondary sector contributes 24% of the share in Indian economy. India's industrial sector accounts for 27.6% of the GDP and gives employment to 17% of the total workforce. Though agriculture is the foremost occupation of the majority of the people, the government had always laid stress on the industrial development of the country. Thus, policies and strategies were framed to give a boost to India's industry. The government aims at achieving self-sufficiency in production and protection from foreign competition. Since independence, India is marching ahead to become a diverse industrial base. A pandemic like COVID-19 is naturally expected to damage the economy the world over, as governments across various continents have issued lockdowns. However, it is necessary to ensure that Indian businesses are less exposed to disasters happening elsewhere, as that would minimise problems related to production. It has been seen that coronavirus has especially affected those manufacturing industries that India is relatively stronger at such pharmaceuticals, electronics, and automobiles. This is because while the country does well in producing the eventual finished product, it does so by importing an intermediate or a component from China, and other countries therefore, production has been affected by the unavailability of raw material. This calls for the government to develop a new manufacturing strategy where not only finished goods are made in India, but also the entire value chain so that the country's production units are not exposed to setbacks happening in other countries. In the case of pharmaceutical industry, that would include the active pharmaceutical ingredients and intermediates. In the case of electronics and automobile industry, that would include all the various components that need to be assembled in order to produce a functional gadget or vehicle. The production of these several new products in these value chains will lead to several new jobs that would reduce the unemployment level of the country. For those sectors in which India is not a strong manufacturing player, the country should ensure that in a strategy to develop manufacturing in that sector in India, the entire value chain is built and not just the final product.

This can be done by developing special economic zones catering to particular industries, in which the entire value chain will be manufactured. This will be extremely attractive to companies planning to set up new manufacturing units due to the ready availability of raw material and buyers of their finished goods.

A week ahead of the scheduled end of lockdown, India is faced with the crucial question of restarting the economy in the face of unprecedented destruction of the global value-chain by Covid-19. The scale of destruction can further rise, depending on the impact on the US. Tasked with conducting policy-making in this evolving situation, the government is expected to keep faith on old warhorses' — agriculture and infrastructure — for immediate revival of demand. As a longer-term strategy, it is likely to focus on manufacturing to strengthen domestic value-chain in select sectors. The efficacy of the strategy will depend on scores of secondary sector reforms. The most important of these are finding a mechanism for fast-track implementation of infra projects and resolving issues with infrastructure finance, by reviving development finance institutions (DFI). To keep the export economy going in the face of global recessionary trend, India should explore the opportunity of local currency-based trade with neighbours. To ensure quick and heavy spend in infrastructure, the government should ready fully-funded DFIs, which . This calls for the government to develop a new manufacturing strategy where not only finished goods are made in India, but also the entire value chain so that the country's production units are not exposed to setbacks happening in other countries. In the case of pharmaceutical industry, that would include the active pharmaceutical ingredients and intermediates. In the case of electronics and automobile industry, that would include all the various components that need to be assembled in order to produce a functional gadget or vehicle. The production of these several new products in these value chains will lead to several new jobs that would reduce the unemployment level of the country. For those sectors in which India is not a strong manufacturing player, the country should ensure that in a strategy to develop manufacturing in that sector in India, the entire value chain is built and not just the final product. This can be done by developing special economic zones catering to particular industries, in which the entire value chain will be manufactured. This will be extremely attractive to companies planning to set up new manufacturing units due to the ready availability of raw material and buyers of their finished goods.

5. Effects on Tertiary Sector

The tertiary industry is the segment of the economy that provides services to its consumers, including a wide range of businesses such as financial institutions, schools and restaurants. It is also known as the tertiary sector or service industry/sector. Tertiary activity consists of all service occupations. Transport, communication, trade, health, education & administration are important examples of tertiary activities. These tertiary activities help in the development of the primary and secondary sectors. So these are also known as support services. Services sector, the lifeblood for economic growth and jobs, contracted in March as new business and export demand fell sharply as the

coronavirus pandemic wreaked havoc globally, a private survey showed. The following are some of the areas under which tertiary sector effected.

5.1 Education

COVID-19 has also affected all levels of the education system from pre-school to tertiary education. Some of these impacts include on nutrition due to the lack of free school meals provided in many countries to children from low-income families, social isolation, dropout rates with students less likely to return once closures are ended, and an impact on childcare costs for families with younger children. Additionally, there exists a wide disparity amongst populations with higher-income families able to access technology that can ensure education continues digitally as of social isolation, Furthermore, the impact continues into the tertiary sector. As well as the impact on undergraduate education, the most significant impact is on the postgraduate research community with research into many non-COVID related topics paused or suspended. Additionally, concern has been raised about the number of scientific conferences that have been cancelled or postponed. These conferences are the key to scientific research in many disciplines, allowing dissemination of research as well as providing networking opportunities for collaboration and job-seeking. Many conferences have moved online, however these ‘virtual conferences’ are often not as amenable to networking and a more informal means of scientific communication.

5.2 Finance Industry

COVID-19 has impacted communities, businesses and organisations globally, inadvertently affecting the financial markets and the global economy. Uncoordinated governmental responses and lockdowns have led to a disruption in the supply and demand chain The decline in global stock markets has festered a volatile environment with critical liquidity levels

5.3 Healthcare

The COVID-19 pandemic has caused an unprecedented challenge for healthcare systems worldwide. In particular, the risk to healthcare workers is one of the greatest vulnerabilities of healthcare systems worldwide. Considering most healthcare workers are unable to work remotely, strategies including the early deployment of viral testing for asymptomatic and/or frontline healthcare staff is imperative. High healthcare costs, shortages of protective equipment including N95 face masks, and low medical capacity, ICU beds and ventilators have ultimately exposed weaknesses in the delivery of patient care

5.4 Pharmaceutical Industry

Profound changes to the dynamics of healthcare are likely to ensue, leading to massive investment into disease prevention infrastructure, and the accelerated digital transformation of healthcare delivery

5.5 Hospitality

The hospitality and travel industry have perhaps been most hard-hit, with hourly workers facing potential devastating hardships the COVID-19 crises has led to international distortions for the hospitality industry, and significant slumps for the Indian hotel market.

5.6 Aviation

The travel industry is grappling with an unprecedented wave of cancellations and a significant drop in demand amid strict governmental instructions to implement social distancing and the restriction of unnecessary travel. Globally, border closures are on the rise on of positive cases.

5.7 Real estate and Housing sector

The real estate industry is facing great uncertainty due to COVID-19. At an individual level social distancing precautions have reduced house views, a key part of the selling process, and both buyers and sellers are having to reconsider their plans. Increasingly, sellers are looking for reassurance regarding the health of potential buyers coming to view properties. Some brokers are offering house tours via Skype and FaceTime to minimise the risk of infection propagation.

5.8 Sports industry

COVID-19 is having a significant impact on sporting schedules as some of the world's largest sporting events come to view in 2020. Football's much anticipated Euro 2020 tournament has been postponed for 12 months while play-offs have been postponed till June 2020 at the earliest. The international Olympic committee was committed to staging the Tokyo 2020 Olympics this summer without delay. However, they have now made the decision to postpone the games to 2021, a decision that is supported by athletes and their respective nations.

5.9 Information Technology, Media, Research & Development

With the WHO raising COVID-19's status to a pandemic, 35 companies and academic institutions are racing to develop an effective vaccine. Four potential vaccines are currently being tested on animals with the biotech firm Moderna preparing to enter human trials imminently.

5.10 Food Sector

The food sector, including food distribution and retailing, has been put under strain as a result of people panic-buying and stockpiling on food. This has led to increased concerns about shortages of food products such as long-life milk, pasta, rice and tinned vegetables. Panic-buying has resulted Independent

supermarkets have also been affected by the high demand on food products. Measures implemented by these local stores include free delivery of food products to customers to avoid panic-buying, putting restrictions on the number of customers allowed in at any given time to avoid overcrowding, and expanding on the number of suppliers whom they buy their products from to avoid food shortage. Other stores such as restaurants and cafes have been forced to close. As a result, many of these food stores have been put at risk of permanent closure and many of their employees have lost their jobs.

5.11 Social Impact & Home Video – gaming

A significant impact of the coronavirus pandemic has been seen within the video-gaming industry. With many individuals self-isolating and/or remaining home under strict governmental regulations, online gaming has seen the emergence of record numbers of players, which has facilitated a boost in revenue for many companies. Family bonding also increased as all family members are at home during lockdown.

6. Conclusion

It has been observed that every sector of economy effected very badly .It is being observed by economist, analyst, policy makers that with corona virus effect we lagged back around five to six years .At present situation most important is save our self by maintain social distance, taking all precaution and move ahead with our regular activities ,it also predicted to come to normal situation of pre corona it may take around 5 yrs. Being true citizens of India we all should follow the rules and regulations issued by govt from time to time, which will make India a safe place to live again.

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IMPACT OF COVID-19 ON VARIOUS SECTORS OF ECONOMY

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Abstract

The COVID-19 pandemic has brought about unprecedented changes in our socio-economic and cultural lives. The world as we know it has taken a spin, and more so is the case of our Economy. Global supply chains have disrupted and national lockdowns are in place, bringing a sharp contraction in production of goods and services. The economy was already in a parlous state before COVID-19 outbreak. With the prolonged country-wide lockdown, global economic downturn and associated disruption of the demand and supply chains, the economy is likely to face a period of slowdown. Various sectors have been affected due to the lockdown. In this paper, we described the state of Indian economy in the pre COVID-19 period, analyzed the economic impact of this pandemic in the short run as well as the long-run, assessed the potential impact of this shock on various sectors of economy. The last part of the paper consists of concluding remarks wherein we have put in our point of view about the present situation.

1.Introduction

In 2019, there was anxiety about the impact of a US-China trade war, the US presidential elections and Brexit on the world Economy. On account of these, the IMF had predicted moderated global growth of 3.4 percent. But COVID-19 – the disease caused by SARS-CoV-2, a novel strain of corona virus from the SARS species – changed the outlook unexpectedly. Due to fear and uncertainty, and to rational assessment that firms' profits are likely to be lower due to the impact of COVID-19, global stock markets erased about US\$6 trillion in wealth in one week from 24th to 28th of February. The S&P 500 index lost over \$5 trillion in value in the same week in the US while the S&P 500's largest 10 companies experienced a combined loss of over \$1.4 trillion, although some of these were recovered in the subsequent week. Some of the loss in value was due to rational assessment by investors that firms' profits would decline due to the impact of the coronavirus. The impact has immediately addressed the poor whose food security is at the lowest level and then the middle-wage earners. A potential cure, control or

vaccine is not possible at present and the time period is also unpredictable. Thus, a month, three months, or further lockdown will disturb the economic activities of different countries in a different manner and will result in different outcomes. Yet, it is clear that billions of people across the world will run into poverty as a result of an ongoing halt in economic activities. Especially, service economies which are mainly based on intangible economic activities are predicted to be adversely affected. The impact can be seen both in the short run as well as the long run.

1.1 Impact in the Short Run: The economic waves of the COVID-19 outbreak can be quite uneven from the previous pandemics such as SARS, MERS, which effected livestock sectors, leading to food shortages and food price hikes in affected areas. There is severe food shortage since past few months. In contrast, the morbidity and mortality rates are quite lower compared to earlier times. The COVID-19 has harshly affected older people with poor immunity, the majority are not in the workforce. However, the healthcare expenses of the countries increased and the number of active labours in the manufacturing and service sectors dropped down. The impact of this pandemic on women is forgotten by many. The infected number of women is less compared to men. However, majority of women around the world work in low-paid positions compared to men. Unfortunately, these sectors are hit worst; millions are left in poverty. On the other hand, women and girls face a significant risk of infection with their type of engagement in the workforce i.e. women make up over 70 percent of the global health and social workforces.

A significant impact on the global economy is clearly visible with social distancing and lockdown decisions in many countries. The agriculture sector is operating continuously in many countries; however, the productivity is not as during the pre-pandemic condition. There is a visible shock on the labour productivity since the workers are unable to perform their jobs which implies an average decline in labour productivity of 1.4% and a drop of 1.4% labour supply during 2020. Millions of business operations are not operating around the world. Subsequently, the interruptions on the supply chain make it difficult to provide sufficient inputs and services, which in turn lead to the decline in production. Firms have extended labour downsizing policies and reduced monthly wages due to the unseen profit. Key foreign exchange sources such as foreign remittance and export income in many underdeveloped and

developing countries have significantly reduced. Most of the income-generating possibilities are kept on-hold. This will negatively impact on income, wages and key commodity prices across the world. The informal sector of the economy isn't functioning due to this outbreak. This led to reducing the household

income and it implies sensitivity on consumption patterns, which will, in turn, result in lower commodity prices.

1.2 Impact in the Long Run: The COVID-19 will seriously hit the non-monetary indicators in the developing economies. Some of the non-monetary indicators are infant and maternal mortality rate, under-nutrition and malnourishment, and educational achievement. Reduced demand for labour in urban service sectors may push the workers in these sectors to return to the agriculture sector and it would significantly contribute to the rise in domestic food production. Though, the individual income may remain lower. The World Food Programme (WFP) has warned that 265 million people could be pushed into acute food insecurity by COVID-19, almost doubling last year's total. The most acute challenges that the world has in 2019 were food insecurity, climate change and economic crises; this pandemic has made it even more complicated and threatens to worsen others. Majority of operations in firms are transformed into digital platforms and virtual operations in order to maintain social distancing. This might reduce the operational cost. This also reduces the use of some facilities in business and will lower the income of some service organizations such as cleaning, security, transport, electricity etc. The shortage of imported raw materials due to the distractions of the supply chain will affect many underdeveloped countries. Travel and tourism sector are dramatically challenged for the next few years due to the threat of the virus. With the reduced imports, many industries are affected in the short run as well as long run. The COVID-19 affected other sectors as well.

2. Impact of COVID on various sectors

Initially, there was a perception that the COVID-19 pandemic would be confined to China only. The economic pain became severe as people were asked to stay at home, and the severity was felt in various sectors of the economy with travel bans affecting the aviation industry, sporting event cancellations affecting the sports industry, the prohibition of mass gatherings affecting the events and entertainment industries. The sudden economic disruption caused by COVID-19 is not only destructive but also has spill over implications because it created demand and supply shocks in almost every area of human endeavour

2.1 Impact on travel and tourism: Travel, as we knew it, before the COVID-19 outbreak, will take several months to bounce back. The cascading effect of COVID-19 is crippling the travel and hospitality industries. Foreign tourist arrivals (FTA) dropped 9.3 percent month-on-month and 7 percent year-on-year, according to government data. In February 2020, there were 10.15 lakh FTAs, against 10.87 lakh in February 2019 and 11.18 lakh in January 2020. This outbreak has led governments to impose restrictions

on nonessential travel to countries affected by COVID-19, indefinitely suspending tourism, travel, visas etc. These restrictions imposed by the governments subsequently led to the reduction in the demand for all forms of travel which forced some airlines to temporarily suspend operations. Such travel restrictions cost the tourism industry alone a loss of over \$200 billion globally, excluding other loss of revenue for tourism travel.

2.2 Impact on sports: The global economic slump triggered by the COVID-19 pandemic could change the entire sports industry in ways thought unthinkable now. Some sports will hit harder than others. The economic structure of international cricket is likely to change and lower-ranked nations will face a crunch in funds. The COVID-19 pandemic has also upended the sporting calendar, with professional leagues everywhere suspending their activities to limit the spread of the virus. Social distancing measures taken in order to limit the spread of the virus have had a significant effect on sporting fixtures. The key revenue generation for sports bodies is through licensing of television broadcast rights. With the stoppage of all the sporting activities and events, most sporting bodies will likely face financial hits.

2.3 Impact on oil-dependent countries: Early in 2020, the price of oil fell due to the oil price war between Russia and Saudi Arabia. The coronavirus pandemic worsened the situation through the reduction in the demand for oil. The imposed travel restrictions during the pandemic led to the reduction in movement of people and goods which in turn resulted in a fall in demand for aviation fuel, coal, and other energy products which subsequently led to a fall in oil price due to low demand. The coronavirus crisis also affected a wide range of energy markets such as the coal, gas and renewable energy markets, but its impact on oil markets was more severe. The global decline in oil price combined with low demand for oil products in the international market has led to a significant shortfall in oil revenue to these dependant countries, which increased the current account deficits and worsened the balance of payment position of many oil-dependent countries such as Venezuela, Angola and Nigeria. These countries also faced increasing pressure on their foreign exchange reserves, which subsequently leads to the devaluation of local currencies against the dollar. The sustained decline in global oil price due to the COVID-19 pandemic meant that the current national budget became outdated for most oil-dependent countries, and has to be revised because it did not reflect the current economic reality since the budget was priced at a higher oil price from 2019. Consequently, the national budget of oil-dependent countries ran into massive deficits which forced some countries to either seek a foreign loan from the IMF, World Bank and other lenders to fund their budget deficits or create a new budget that was priced using the current low oil price in the global market.

2.4 Impact on import-dependent countries: Many import-dependent countries are severely affected during the coronavirus pandemic. Many countries imported their essential commodities from major exporting countries like China, India and Japan, and depend largely on these countries for the consumption of essential commodities. The reduction in goods flowing through the global supply chain, and substantial reliance on China for imported goods, led to shortages of supplies to import-dependent countries as China shut down many of its export factories. This led to increases in the price of the remaining stock of imported supplies already in import-dependent country, which also triggered inflationary pressures on the price of basic commodities despite the general low demand for imports due to the coronavirus pandemic. It was difficult to find alternative imports after China's shut-down because many countries had partially or fully closed their borders which stifled international trade at the time. Import shipping ports reported year-on-year drops in cargo between 10% and 20% in February. Over 50 countries have changed port protocols, ranging from port closure and quarantine measures to additional documentation requirements and examination. Some countries have also set up "green lanes" at ports of entry and border crossings, to accelerate the processing of cargo shipments.

2.5 Impact on finance sector: Banks in the country are likely to witness a spike in their non-performing assets ratio by 1.9 percent and credit cost ratios by 130 basis point in 2020, following the economic slowdown on account of COVID-19 crisis. The macroeconomic slowdown led to a rise in nonperforming loans in the banking sector by 250 basis points. Private sector banks had the highest exposure to credit risk during the outbreak. 14 nonperforming loans arose from loans issued to small and medium scale enterprises (SME's) airlines, hotels, tour operators and real estate businesses. There is a general decline in the volume of bank transactions, a decline in card payments and a fall in the usage of ATM cash machines due to the pandemic. This led to fewer fees collected by the banks, it affected the equity investment of venture capitalists that funded existing and new FinTech firms adversely. On the other hand, the demand for online services increased than usual.

2.6 Impact on healthcare industry: The healthcare sector is at the epicentre of this unprecedented global pandemic challenge, and the private sector has risen to the occasion by offering to the government all the support it needs. In many countries, the services of public hospitals grew in high demand but the majority of the testing equipment was in private hospitals. The outbreak has also affected the pharmaceutical supply chain. Drugmakers around the world relied heavily on ingredients made in Chinese factories. Many pharmaceutical companies did not store up substantial amounts of Active Pharmaceutical Ingredients (API) prior to the COVID-19 outbreak, as a result, few essential drugs were in short supply.

Health insurers were also affected by this. Many health insurers could not cope with the insurance payments to hospitals and the insurers sought to be included in the planned federal relief stimulus package as a health sector's economic outlook was negative. The investment bankers that invested heavily in health care companies and medical supply firms to consider ways through which they can profit from the crisis by increasing prices. The effect of the outbreak on the health sector was the increase in the number of deaths due to the short supply of drugs, lack of vaccine to cure the patients, insufficient number of hospital beds and insufficient isolation centres to cater for the rising number of COVID-19 cases.

3. Conclusion

The socio-economic repercussions of the COVID-19 pandemic are varied, as listed above. The pandemic has brought to light the ugly side of a globalized world, a world where each country is dependent on a set of other to fulfil its requirements. The cutting off of global supply chains due to the virus outbreak is serving as an eye-opener to the governments of countries around the globe to become more self-sufficient and self-reliant, as underlined by the Prime Minister of India, Shri Narendra Modi. The crisis has also created a vacuum in the world stage, to be filled by a competent power, exposing India to novice opportunities. The various political, regional and economic forums are coming together in search of a cure/vaccine for the virus, opening the gate to greater collaborations and innovations taking place. The pandemic has opened up altogether a new set of challenges as well as opportunities. How swiftly and how efficiently the economies will swing back to their normal pace will entirely depend on the national leadership and the socio-economic policies adopted by them.

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OUTBREAK OF COVID 19 CRISIS: EFFECT ON INDIAN ECONOMY AND BUSINESS**Ms. Smriti Nagaria**

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Abstract***“ECONOMY DOESNOT LIE IN SPARING MONEY, BUT IN SPENDING IT WISELY “******THOMAS HUXLEY***

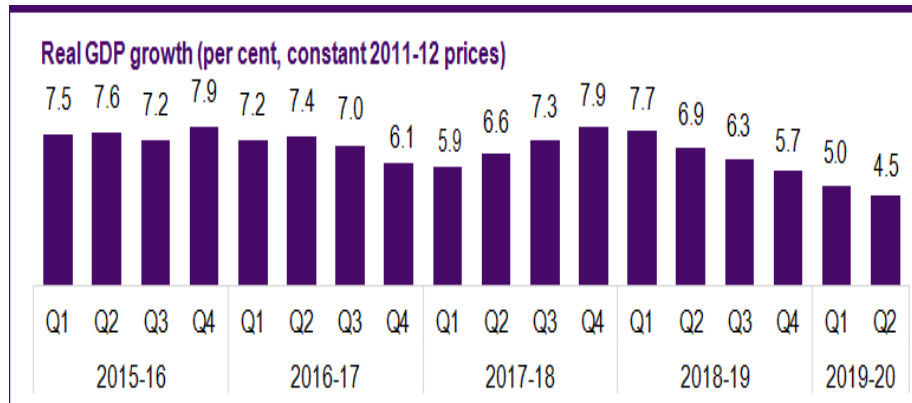
An economy of any country plays a significant role in carrying out various production and consumption activities which is essential for its survival. A stable economy drives economic growth for business expansion, job creation and improves quality of life. GDP is an accurate indicator of size of economy and economic growth is measured by GDP growth rate. The year 2019 has witnessed the spread of deadly disease COVID 19 which has left a remarkable impact on the functioning of individuals and businesses. The economic impact of corona virus 19 has been disruptive which has led to temporary suspension of operating activities with supply of essentials only, hotel and tourism industries are cutting salaries and laying off employees and young startups are facing financial crunch. The paper focuses on the impact of Covid19 on the sectors and businesses along with the best and worst affected sectors and sectors which will perform better after lockdown. It also deals with the various measures taken to revamp the existing position of businesses. At the end the current situation the economy is facing is discussed. It will definitely take 6 – 12 months of time for businesses to come to normalcy.

1.Introduction

The spread of COVID 19 is having a high to very high impact on the economy and businesses which has created a major road block in economic activities. Businesses are operating in the fear of collapse of financial market with sluggish economic growth leading to volatility in the market. Novel Corona virus which has shaken and reduced Indian trade market depending on China for imports.

2. Impact of COVID-19 on Indian Economy

The real GDP Growth of India is the lowest in 2019 – 20 Q2 due to Covid 19 having an impact on consumption and investment pattern.



Source: Quarterly estimates of gross domestic product for the third quarter (Q3) of 2019-20, Ministry of Statistics and Programme Implementation (MoSPI), 28 February 2020, accessed on 24 March 2020

Figure 1 – Real GDP Growth

Potential economic spillovers to the rest of the world from China

The outbreak of corona virus was in China which spread to various countries of the world which has a huge impact on the businesses

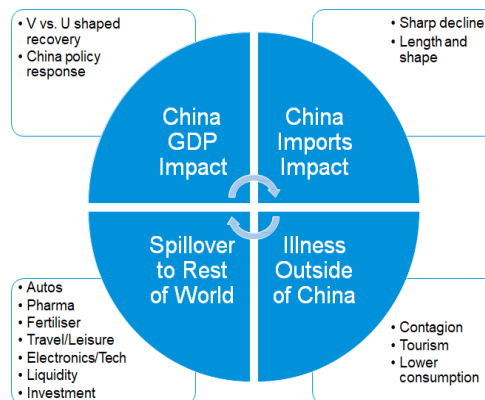


Figure 2 - Spill over of COvid 19 to the rest of the World

Source: KPMG

The Four Vectors through which Covid 19 may affect Economy – The first 3 vectors will adversely affect economy whereas increase in oil price may be a boon.

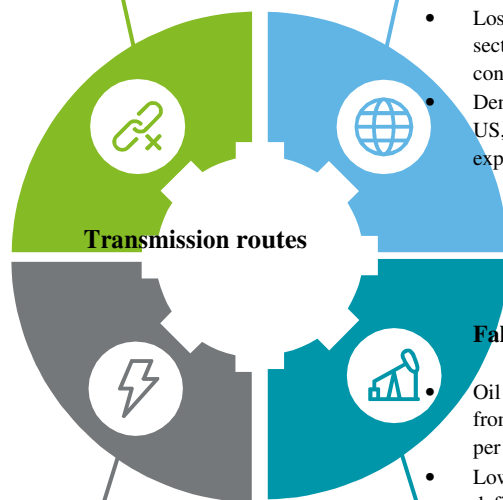
Figure 3: The four transmission vectors through which COVID-19 may affect the economy

Supply disruptions

- Dependence on China for the import of raw and intermediatematerials
- Higher input prices and reduced profitability, leading to decline in capacitybuilding
- Supply-side disruptions may be temporary as China revives productionunits

Global and domestic demand

- Consumer spending to take a hit due to movement restrictions and the fear of fallingsick
- Reduced wealth effect due to falling shareprices
- The hospitality and aviation sectors are affected the most at a short span oftime
- Low profitability and production disruptions affect business sentiments and investments
- Loss of employment, especially in the informal sector and for contractual workers, reduces consumerspending
- Demand in top few export destinations (China, the US, and Europe), accounting for 40 percent of India’s exports, is severelyhit



Stress on banking and financial sectors and parameters

Banks

- Exposure to stressed industries and MSMEs
- Rising consumer loan default because of high unemployment and householdleverage
- Stress on banks’ impact credit growth

Capital market and financial parameters

- The stock market has fallen 30 percent since the pandemic started spreading in theWest.
- A sharp depreciation of rupee against the dollar worsens trade deficit as export’s contribution to GDP islow.
- Rising bond yields make borrowing more expensive, thereby reducing bank margins.

Falling oil prices

- Oil prices have fallen sharply. Brent crude oil fell from US\$68.5 per barrel on 3 January to US\$28.2 per barrel on 20March.
- Lower oil prices could be a boon for India’s twin deficit (the fiscal and current account).
- This gives policymakers some headroom toact.
- The rupee depreciation may partially offset the gains. Rupee has depreciated from INR 71.7 per US\$ on 3 January to INR 75 per US\$ on 20March.

Figure 3 – Impact of Covid 19 on Economy
Source: Data is from CMIE

2.1 Impact of COVID-19 on economic variables

(a) Demand and Supply

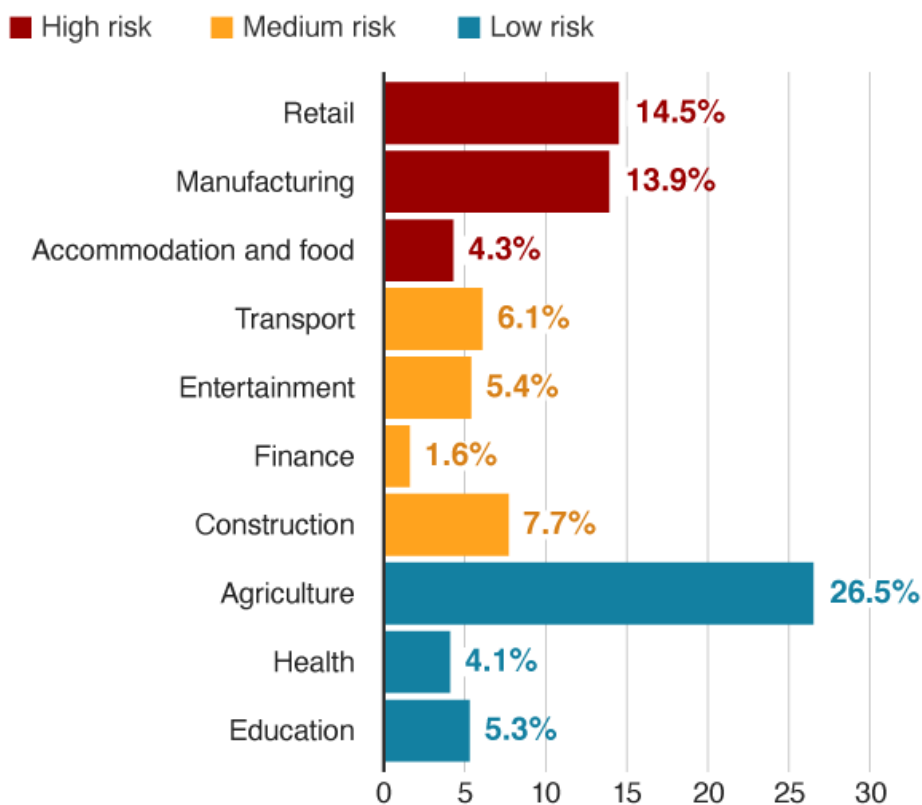
Demand and supply chain has been disrupted where tourism and hospitality sector are facing the impact of this crisis and retail sector is affected by consumption of essentials and discretionary items. Sectors such as automobile, pharmaceutical has experienced the shutting down of factories which has resulted delay in supply from China impacting manufacturing sectors.

(b) Workforce

The reduction in production or service is going down where job losses and salary cuts of employees is at huge risk

Workers at risk by sector

Share in global employment by industry and risk level



Source: International Labour Organization

BBC

Figure 4 – Workers at Risk Sector Wise

(c) Stock Market

There is fall in sensex where investors are selling as future is uncertain and cases of corona virus is increasing

(d) Trade

India's trade impact due to the COVID-19 outbreak was around US\$ 348 million .overall trade impact is estimated to be the most for the chemicals sector at 129 million dollars, textiles and apparel at 64 million dollars, the automotive sector at 34 million dollars, electrical machinery at 12 million dollars, leather products at 13 million dollars, metals and metal products at 27 million dollars and wood products and furniture at 15 million dollars.

3. Best Performing Sectors

3.1. Telecom

This sector is said to be the golden child of the economic slowdown where video conferencing and tele communication technology has enabled business operations to be carried out smoothly which is not interrupted as it is included in essential services during lockdown . Stream lining services such as Netflix has become a source of entertainment and has seen 20% increase in viewership and 10% increase in traffic

3.2. E- Commerce

High demand for personal hygiene products such as handwash, sanitizers and wet wipes has increased where e – commerce players are ensuring the supply is available. Work from home concept has boosted in house consumption and e- commerce firms are mitigating the spread of risk of corona virus by providing groceries and food items delivery at doorstep.

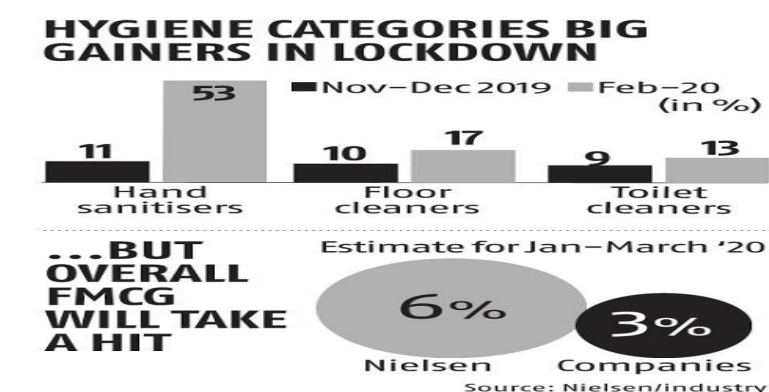


Figure 5 – Gainers of Hygiene Products

Source: www.business-standard.com

3.3 Entertainment

80%- 90% are viewing news and entertainment channels almost 24 hours in a week where social distancing has increased in home media consumption

3.4. Distant Learning

Use of e- learning platform has increased the retention of information and takes less time to learn. Apps such as BYJU's and Think and learn has seen 200% increase in new students using these apps

4. Worst Performing Sectors

4.1 Aviation

This sector is a worst hit as domestic and international flights have been cancelled and this has increased liquidity crisis due to travel restrictions and behavioral changes in public spending which also affected Tourism and Hotel industry.

4.2 Banking

Increase in bad loans has resulted in more than 20% loss to bankers and economic activities are at a standstill which has led to cash crunch for house holds.

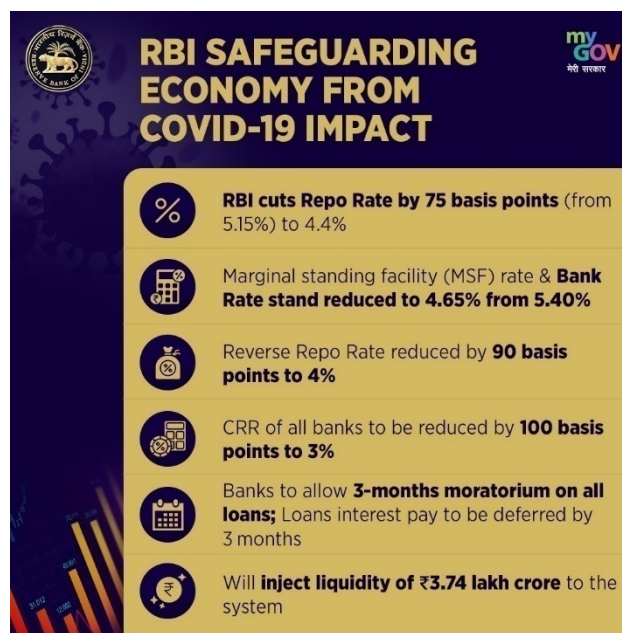


Figure 6 – RBI safeguarding measures to protect economy

Source: www.google.com- my gov. corona hub

4.3 Auto Sector

There has been contraction in vehicle production in India by 8.3% in 2020 after a decline of 13.2 in 2019. India depends on China for 27% of automotive parts and closure of manufacturing units have delayed the production, delivery and declined sales

4.4 Retail

Decline in sales of more than 50% of consumer products, shutting down of malls and shops have led to job loss.

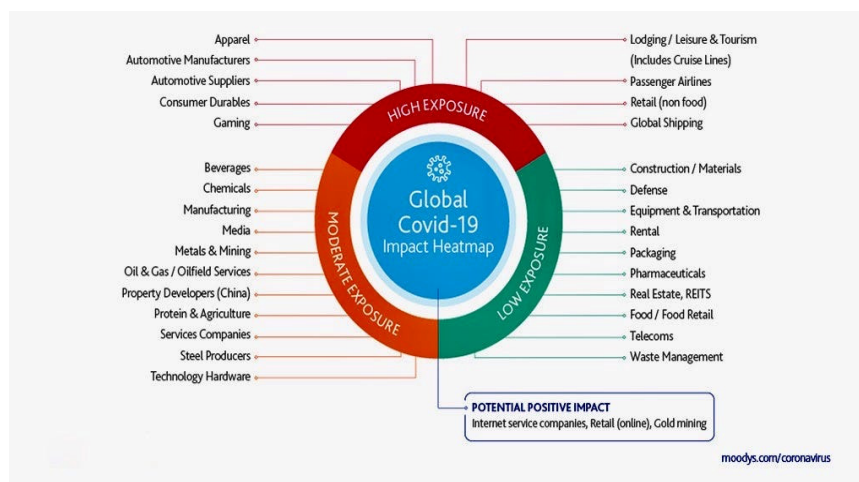
4.5 Micro, Small and Medium Enterprise's (MSME)

It is facing a serious financial crisis and has no money to pay to their employees. The Government has extended help by infusing cash and increasing their insolvency limits from ₹ 1 Lakh to ₹ 1 Crore.

4.6 Real Estate

This has witnessed a decrease of 25-35% in house sales, construction activities have been stopped as migrant workers are restricted.

Figure 7: Glimpse Of Industries With Extent Of Risk



5. Businesses which will perform better after Lockdown

5.1 Restaurant

Large number of people will be interested to go out for eating and order of online food will increase will as people might be bored eating at home

5.2 Retail and Multiplex Sector

New movie release where public will be ready to relax themselves and have a good time.

6. Measures suggested to revamp the Indian Economy

Our Finance Minister of India Nirmala Sitharaman announced measures under Atmanirbhar Bharat Abhiyan – Economic Self Reliance which is a financial package to revive economic growth which includes:

Collateral free automatic loan of Rs 3 Lakhs for small businesses that have an outstanding loans upto 25crores and turnover of 100 crores	MSME and NPA to get 20,000 crore liquidity as subordinated debt	Special liquidity window of 30,000 crores for NBFC, housing financiers and mney lenders will be launcheod
Statutory PF contribution of both employer and employee to cut to 10% from 12% for all establishments covered by EPFO for 3 moths	6 Months extension to railways, highways and Central Public Works Department contractors	Extenson of due date for income tax returns for assesent year 2020-21 is extended till 30th November

These measures will help increase the confidence of the economy which will boost liquidity, increasing consumption demand and investment.

7.Current Position

About 53 % of businesses have specified the impact of shutdown caused on their operations, increase in unemployment rate from 19% to 26%. Companies are taking measures to ensure safety of their employees where Hero Moto Corp has conducted video townhall meeting and Tata group has set up task force to make work from home effective. Recently in the second week of May companies have restarted operations with maximum permitted strength of 33% and cautious approach of as low of 5 %.

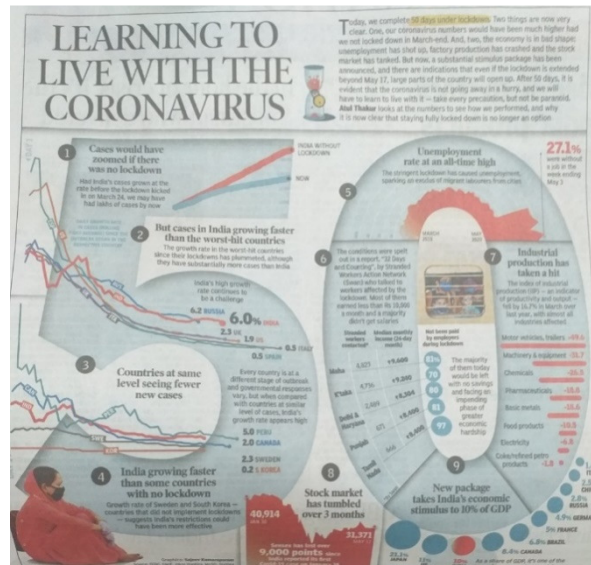


Figure 8 - INDIA'S SCENARIO DURING LOCKDOWN

Source: The Deccan Chronicle – 14th May 2020

8. Conclusion

The stability in economic recovery from this deadly disease is possible in 2021 as it has left a tremendous impact on the various businesses which have become vulnerable. Multiple closure of businesses could lead to inflation where demand and supply are affected and Foreign direct inflows may fall between 5 - 15%

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COVID-19 AND SDG's 3- GOOD HEALTH AND WELL- BEING IN A HEALTHY ENVIRONMENT.

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Abstract

The Sustainable Development Goals, SDG's -17 had offered an elaborative perspective to solve the global crisis. They aim to "ensure healthy lives and promote wellbeing for all at all ages". As the world continues to grapple COVID-19, SDG 3 acts as a linchpin, which in turn all the other SDG's will be affected in one or more ways than the other, cutting across issues of the economy, society and environment. The corona virus disaster undoubtedly interrupted the SDG's Agenda 2030 at the very core .The targets for goal 3, was to reduce the global maternal mortality to less than 70 per100.000 live births, end the epidemic of AIDS Tuberculosis, malaria and other tropical diseases combat hepatitis ,water-Borne diseases and other communicable diseases. Sudden outbreak of COVID -19 is a big blow globally. The pandemic has affected vulnerable societies the most, and it has shown prevalence of poverty, weak health systems, lack of education and lack of global cooperation exacerbate the crisis. According to WHO, the number of global deaths were due to unhealthy environmental conditions and weak Immune system. A healthy life style helps to tackle pathogens and in a great way reduces opportunities for viruses to jump from animals to people. The degradation of natural habitat is the key to the emergence of infectious diseases from the wild. The need of the hour is to restore healthy planet and healthy people and securing a sustainable future. Protecting ourselves against future global threats requires sound management of biodiversity and a clear commitment to "building back better".

1.Introduction

There has been historic record and achievements in attaining SDG-3 since the creation of Millennium Development Goals, but at the outbreak of the pandemic Covid-19. The health and wellbeing of all age groups of people is at stake. Education has an enduring, consistent and growing effect on Health. Fear, Anxiety and stress were the responses to uncertainty. SDG's represent a unique opportunity to enhance well being of public health with an integrated approach. In coordination and cooperation with the International think tanks the World should get connected to foster global health in the areas of Research and dissemination of activities to accelerate the SDG-3 objectives of health –related goals of the 2030 Agenda.

2.Challenge

A group of Biodiversity experts had warned, Pandemics like COVID- 19 could occur more frequently unless we stop rapid destroying nature,1.7 million unidentifiedviruses, existing in birds and mammals known to infect humans. Deforestation, agricultural expansion infrastructural development brought us closer to catching them. Future pandemics are on the horizon, a group of Biodiversity experts revealed the need of the hour is to stop rapid destruction of nature. The greenery and the blue areas affect human health directly or indirectly. Quality time with natural environment enhances the immunity level of the individuals. The well being is directly connected to the surrounding environment. The greatest challenge is to create green belts in urban areas.Restoration of the biodiversity is the greatest challenge across all parts of the World.

3.Arrival of New Pathogens

Destruction of Natural Environment is at an alarming rate. Between 1980 and 2000, more than 100 Million hectares of tropical forest were felled. Ecological niche of an animal population was disturbed due to human intervention, since the beginning of Industrial era about 85% of wetlands were destroyed. In all these situations human population is in precarious health, in contact with new pathogens.

The World Health Organisation in unison with SDG's had formulated few objectives. The purpose of the initiative was to remind us that human beings cannot live in an artificial Cocoon and the World will not be the same after COVID -19. In a real situation like this, every individual must be proactive and integrate a great respect for Environment and Biodiversity .

4. Management of Environment, Animal and Human Health, Environment Health

Over last century Human population had dominated the Earth, expanding, developing, interfering, growing, polluting and exploiting the natural resources creating irreversible losses to biodiversity. The health of our planet and human health are interlinked and it is evident through COVID -19.The damage we have done to the our planet is having a direct impact on the spread of COVID-19.This year the 50th anniversary of **Earth Day**was celebrated on 22April,which was established in1970. Objectives of the

earth day, is to protect environment. Since then many of the International bodies collectively worked and are working with innovative strategies to make a better place for all to survive. With COVID-19 pandemic all sectors of society are rallying together. This period of physical distancing let's take time to green our living spaces, enhance the greenery in and our community by plantation and reduce the levels of CO₂ in the atmosphere. The studies have shown exposure to the trees boosts our immune system. **Phytoncides** have antibacterial and antifungal qualities which help plants fight diseases. When people breathe in these chemicals, Our bodies respond by increasing the number and activity of a type of white blood cell called natural killer cells or NK cells, which fights invasion of any bacteria or virus into our body. The other benefits of trees around us are:

- Lowers blood pressure
- Reduces stress
- Improves mood
- Increases energy level
- Improves sleep
- Accelerates recovery from surgery

Studies have revealed that spending time in nature, looking at plants, water and birds and other aspects gives us focus. Hence exposure to trees improves human health. The places with higher air pollution had recorded more COVID-19 Cases. During the lockdown, and reduced human activities air quality has improved. In Jalandhar, India the Dhauladhar mountain range of Himachal Pradesh has become visible after 30 years with the drop in pollution. The cleaner the environment the healthier is the population.

4.1 Animal Health

As habitats and biodiversity loss is increasing, the corona virus outbreak is the beginning of mass pandemics. Research suggests that out breaks of animal-borne and other infectious diseases such as Ebola, Sars, bird flu and Covid-19 are on the rise. Pathogens are crossing from animals to humans. The origin and transmission of COVID -19 is yet to be asserted. Because of the intervention of human activity the world saw an unprecedented destruction of wild habitats, zoonotic diseases are on the rise. The destruction of pristine forests and rapid urbanization and population growth had brought people to closer contact with animal species. The Centre for Disease Control and Prevention estimated that three – Quarters of new or emerging diseases that infect humans originate in animals. Shrinking of natural habitats and changing behaviour added to the risk of diseases spilling from animal to humans. During the

lockdown Animals were freely moving in their natural habitat and were at the peak of their freedom, reclaiming their space. Animals were breeding, Endangered turtles hatched on deserted Brazilian beaches, wild cats and boars were found strolling freely on the roads and peacocks dancing to the tune of nature. In Hong Kong Pandas mated for the first time in 10 years after their Zoo was closed for public.

4.2 Human Health

As countries across the globe join hands to battle COVID-19, and as the attempts for the vaccine are in progress, with no definite cure in sight, the focus is shifted from the arrival of the vaccine to boosting immune system. Health and wellbeing is discussed at every level.

There are five types of wellbeing

- **Physical wellbeing:** Diet, emotions, sleep cycle and mental health.
- **Social wellbeing:** Connected to the family and friends.
- **Community wellbeing:** Doing good to the society.
- **Career wellbeing:** Getting connected with work in a possible way.
- **Financial wellbeing:** Making sound financial decisions.

Food supplements- Vitamin D, Vitamin C, Zinc, Vitamin B6, B12, Magnesium and Vitamin E and Foods with high Oxygen Radical Absorbance Capacity Oxygen (ORAC) value to be included in the diet as they are rich antioxidants. Seasonal fruits, vegetables, Pulses and millets supply the nutrients required to build a good immune system. Regular physical exercises and breathing exercises boost immunity.

5. Conclusion

COVID -19, a new deadly respiratory illness has now established in 177 Countries around the world and is rapidly expanding. As the WHO declared the corona virus outbreak “A public health emergency of International concern” As the effective treatment is on the way, researchers across the globe are on the job trying to find a solution. Its time to rethink, reshape, reboot, the health of the Environment which impacts human life.

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**ENVIRONMENTAL IMPACT OF SANITIZERS AND DISINFECTANTS USED
DURING COVID-19****Dr. Christine Jeyaseelan¹, Dr. Debarati Paul² and Dr. D. Madhusudan Reddy^{3*}**¹Department of Chemistry, Amity University, New Delhi²Department of Biotechnology, Amity University, New Delhi^{3*}Department of Microbiology, Palamuru University, Mahabubnagar, Telangana. *Corresponding authorEmail ID: drdmsr@gmail.com

Abstract

The present pandemic caused by the coronavirus or the COVID-19 disease has caused a major turmoil all over the world. With no immediate drug, vaccine or cure in view people have been looking for alternatives to protect themselves from getting infected with this virus. The simplest, easily available and economic method adopted has been the use of Sanitizers/disinfectants. These chemicals have proved themselves to be effective in maintaining hygiene and as an immediate sanitizing agent generally used during washing of hands, after touching surfaces or just to disinfect surfaces around an individual. There are a large variety of these which have come up in the recent few months in a large way. But they have not had all beneficial effects. Their excessive use has led to an imbalance in the ecosystem thus affecting the environment at large. We need to find more greener or effective methods to prevent ourselves from getting affected by the virus and protecting the environment as well.

1. Introduction**1.1 Background**

Tyrrell and Bynoe in 1965, first could able to passage virus named B814, obtained from respiratory tract of an adult suffering from common cold (Tyrrell and Bynoe 1966). In late 1960s Tarrell along with his group of virologists worked on infectious bronchitis virus, mouse hepatitis virus and transmissible gastroenteritis virus of swine. All these viruses were morphologically similar under electron microscope and hence placed under new genus “Corona” (crown like appearance of the surface projections – Corona

in Latin means halo or crown) (McIntosh et al., 1967 ; Witte et al.,1968, and Tyrrell et al., 1975). Coronaviruses belong to the family Coronaviridae and subfamily Coronavirinae.

Reports are available that over past seven decades, these viruses are infecting mice, dogs, cats, pigs, horses, camels etc., and also occasionally these infected animals transmit the virus to humans (Jeffrey S. Kahn and Kenneth McIntosh, 2005).

Corona viruses affect the respiratory tracts of birds, mammals including humans. They cause Common cold, bronchitis, pneumonia, severe acute respiratory syndrome (SARS), middle east respiratory syndrome (MERS), and coronavirus disease 2019 (COVID-19). Most prevalent Human Coronaviruses are 229E and NL63 which are called alpha corona virus, OC43 and HKU1 which are called beta corona virus. Rare strains of Coronavirus like MERS-CoV and SARS-CoV cause more severe illness like MERS and SARS. SARS CoV outbreak was in southern China, in 2002 where it rapidly spread to more than 24 countries with mortality rate of 9.6% (8,098 infected out of which 774 died) and the disease was controlled in July 2003 (WHO WEEKLY EPIDEMIOLOGICAL RECORD, NO. 12, 21st MARCH 2003). MERS –CoV outbreak was in Saudi Arabia, in 2012 spread to more than 27 countries. According World Health Organization (WHO), by the end of November 2019, there are 2494 laboratory confirmed MERS cases reported out of which 858 succumbed to death with mortality rate of 34.4% (WHO report on MERS situation update, November, 2019). Coronavirus infections often occur during winter and early spring.

1.2 SARS-CoV-2

Since late December 2019, a novel corona virus that causes acute respiratory illness has received worldwide attention. On 30th January 2020, the World Health Organization (WHO) officially declared the Corona virus disease (COVID-19) epidemic as a public health emergency of international concern. The Virus has spread 213 countries and by May 16th 2020, there are 46,64,569 cases of which 3,09,781 deaths and more than 44,817 in serious or critical condition (WHO report on COVID-19, latest update dated 16th May, 2020).

1.3 Structure

Coronavirus virions are spherical to pleomorphic enveloped particles. The envelope is studded with projecting glycoproteins and surrounds a core consisting of matrix protein enclosed within which a single strand of positive-sense RNA is associated with nucleoprotein (Leila Mousavizadeh and Sorayya Ghasemi,

2020). The envelope glycoproteins are responsible for attachment to the host cell and also carry the main antigenic epitopes, particularly the epitopes recognized by neutralizing antibodies.

Vaccines or specific treatments for COVID-19 are still under trail. However, there are many preventive measures suggested by WHO, NIH(National Institutes of Health), ICMR(Indian Council of Medical Research) etc., which are being practiced globally.

2. Prevention

2.1 Types of chemicals used for disinfection/sanitization

Biocides are chemical substances or microorganisms which can deter, inactivate or even kill living organisms like bacteria, fungi, insects, rodents etc. These biocides not only destroy the pathogenic microorganisms but also others which are non-pathogenic or maybe useful for living organisms. If these biocides are toxic to everything it comes in contact with, it can be toxic for humans also (Paul et al., 2019). Disinfectants, which fall under the category of biocides, have been declared as a preventive method to avoid getting the Corona virus (Table-1). They are generally applied to inanimate objects due to their strong chemical properties. Although these disinfectants used on hard surfaces, they do not kill the virus they help prevent the transfer of microorganisms. (Directorate general of health services website).

Different countries have different protocols for disinfection, but alcohol and bleach are the commonly accepted disinfectants. If the surface is soiled it first must be cleaned with a cleaning agent and then disinfected. A disinfectant cannot be used as a cleaning agent and vice versa. Bleach is a commonly used disinfectant which is 5% sodium hypochlorite which is diluted to about 1%. Alcohol (70%) is considered to be better than isopropyl alcohol due to its broad spectrum but it is inflammable and thus should be used in small areas with good ventilation. Excessive use of alcohol leads to discolouration, swelling, hardening and cracking of rubber and plastics. Bleach with sodium hypochlorite as the main ingredient is much more effective but gets inactivated in the presence of organic compounds. It is easily available and disinfects within 10-60 min but in excess it causes irritation of mucous membrane, skin and airways, decomposes under heat and light and can react with other chemicals. Improper use can decrease its effectiveness and affect health care workers (World Health Organization, Geneva, 2015). Some common disinfectants used are given in Table 2.

Washing with soap and water for 20 seconds is the best suggested method for hand sanitization. Alcohol based hand sanitizers can be used if soap and water are not available. There are basically two types of

hand sanitizers, alcohol based and alcohol free. The alcohol based sanitizers have 60-95% alcohol in the form of ethanol, isopropanol and n-propanol. Alcohol free sanitizers are generally disinfectants which contain benzylalkonium chloride or antimicrobial agents like triclosan (Ewen and Todd, 2015; Li, 2015).

2.2 Mechanism of action

Alcohols destroy bacteria by the process of denaturation. Alcohols have both water and fat attracting properties. The bacterial cell membrane also has a fat based and a water-based side. Thus, when the micro-organisms come in contact with the alcohol molecule, it breaks the protective membrane and the components inside are dissolved or destroyed and thus they cease to function. Micro-organisms like bacteria and viruses generally are made up of water and have fat containing protein in them, which in the presence of alcohol makes them ineffective (website 1).

Alcohol at 70% concentration is more effective as a disinfectant since the presence of water acts as a catalyst and plays an important role in the denaturation of the protein of the cell membrane. The water content also slows the process of evaporation which increases the surface contact time and thus makes it more effective. If the concentration is over 90% it coagulates the spores and it remains dormant and not destroyed. This would require longer contact time for disinfection. If it is too dilute, the effectiveness of disinfection decreases.

2.3 Disadvantage of using disinfectants

It has been generalized that killing of all microorganisms based on the present scenario is essential. This has led to an indiscriminate use of sanitizers, disinfectants etc which is causing a major hazard. Overuse of disinfectants can cause acute and chronic health issues. Chemicals like acids, ammonia, bleach etc are asthma irritants and at higher exposure levels may also lead to reproductive issues (website 1).

Spraying of disinfectants on individuals or animals is not recommended as they are toxic chemicals and can cause a lot of side effects. Spraying of chlorine leads to irritation of eyes and skin and may lead to nausea and vomiting, Other chemicals like sodium hypochlorite can lead to irritation of mucous membrane of the nose, throat, respiratory tract and even cause bronchospasm. Spraying on the external parts of the body is not going to destroy the virus which is inside the body (website 2) Excessive use of hand sanitizers disrupts our microbiomes, killing good bacteria. It can also create stronger bacteria which become antibiotic resistant. They do not remove dust and grime from the hands and also make the skin excessively dry. Ingestion of these can lead to alcohol poisoning in the body and for a person who is working with chemicals it can prove dangerous as the components of the sanitizer can react with the

chemicals. Also going in the kitchen after using a hand sanitizer increases the risk of fire as it is highly inflammable (website 3).

Table 1: Examples of common disinfectants suggested for disinfecting surfaces; adapted from websites 4 & 5.

S No	Name of product	Active Ingredient	Medium of usage
1	Citrus disinfectant	Benzalkonium chloride, Alkyl dimethyl ethylbenzyl ammonium chloride	Solution
2	MickroQuat	Benzalkonium chloride	Solution
3	Triple D Liq 4.5%	Didecyl dimethyl ammonium chloride	Solution
4	Asepticare Aerosol Disinfectant	Benzalkonium chloride, Alkyl dimethyl ethylbenzyl ammonium chloride, alcohol anhydrous	Solution
5	Persept Disinfectant tablets 2.5 G	Sodium Dichloroisocynurate	Tablet
6	Vikron	Potassiumperoxymonosulphate	Powder for solution
7	Spray Nine	Benzalkonium chloride, Alkyl dimethyl ethylbenzyl ammonium chloride,	Spray
8	Sporicidin Brand Disinfectant Towelettes	Phenol, phenolate sodium	Wipe
9	SC-NDC-64, Barbicide, Lysol Laundry Sanitizer	Quaternary ammonium	Solution
10	T-bone	Citric acid	Solution
11	PELS422	1,2 Hexanediol	Solution
12	Mold Armor Formula 400	Sodium hypochlorite, sodium carbonate	Solution
13	Peraclean 15	Peroxyacetic acid	Solution
14	CBW	Glycolic acid	Solution
15	Suretouch, Oxy-Res	Hydrogen peroxide	Solution

Table 2: Common hand sanitizers recommended (adapted from website 6)

S No	Name of product	Active Ingredient	Medium of usage
1	Rubbing alcohol compound	Ethanol	Solution
2	Hibitane skin cleanser	Chlorhexidine Gluconate	Solution
3	Antimicrobien 0.3%Triclosan	Triclosan	Lotion

4	Antiseptic hand soap	Bronopol, triclosan	Liquid
5	Alcare	Ethanol	Aerosol
6	Florafree gel 0.3%	Triclosan	Gel
7	Webcol Alcohol Prep 70%	Isopropyl alcohol	Pad
8	Antiseptic swabs	Benzalkonium chloride	Pad

2.4 ICMR guidelines for disinfection and sanitization

As per the ICMR, the following guidelines have been suggested for COVID-19 (website 7). Surfaces which are frequently touched by hands should be sprayed with Lysol periodically, as many times as possible. The Lysol spray used for disinfection is known as Lysol IP (50% Cresol and 50% liquid soap). For bus stands, railway stations, bus, train, vehicles, etc 2.5% Lysol (1 L Lysol in 19 L of water) can be used while for hospitals, clinics and ambulances 5% Lysol (1 L Lysol in 9 L water) can be used.

For disinfection of floors and ambulances 1% hypochlorite solutions can be used. To spray these disinfectants different types of sprayers can be used like power sprayers and water wash pumps etc. But the use of metal sprayers must be avoided in case of hypochlorite solution.

1% hypochlorite solution can be prepared using bleaching powder by mixing 320 g of bleaching powder (33% available chlorine) dissolved in 10 L of water or 1 kg bleaching powder in 30 L of water. After mixing, the clear supernatant liquid is used for spraying. 1% hypochlorite solution or 4% solution is also available in the market. Liquid chlorine containing 1% chlorine or surgical spirit (95% alcohol) is used in hospitals.

As per WHO guidelines the hand sanitizer can be prepared by using Isopropyl alcohol (75%), Glycerol (1.45%) and hydrogen peroxide (0.125%).

2.5 Impact of indiscriminate sterilization: radical changes in microbiota and future implications

Worldwide efforts to minimize the risk of viral infection and contamination of common contact surfaces in food distribution sectors, local mandis, and retail centers is being undertaken, using several types and various amounts of antimicrobial agents such as sanitizers and disinfectants (Jain et al., 2016; Eggers, 2019). However, an improper choice of the antimicrobial and unwarranted use of sanitizers and disinfectants plays a significant role in the rise of resistant microbes, especially pathogens. This is possible due to the cross transfer and spread of pathogenic properties and resistance genes by lateral gene transfer and / mutations induced in the genetic framework due to prolonged exposure to various biocides (Paul et al., 2019). Such an activity would lead to the survival of resistant strains of the microbe in questions and also increase risks from other microbes which gradually develop drug/ biocide resistance

(Hirose et al., 2019). The process would risk the survival and efficiency of useful and symbiotic organisms. It is well known that in any habitat the balance between various populations of microorganisms is maintained, which is shattered by prolonged or overuse use of biocides, mostly xenobiotics (Table 1 & 2).

Contamination doesnot stop here. It has far reaching and late responses and repercussions. Antimicrobials that are injudiciously sprayed in healthcare facilities and urban or rural localities for the safety purposes easily enter the aquatic and terrestrial ecosystem and even leach down to contaminate ground water resources, resulting in significant impact on the existing microbiome. Soil organic matter forms the principal pool of carbon and other nutrients in soil and is maintained by microorganisms which consume or degrade it (Schimel, 1995), although the rate of organic matter degradation is determined by both the indigenous microbial community and the environmental conditions (e.g., temperature, pH, soil water capacity, etc.) (Schmidt et al., 2011). The dependences of these biogeochemical activity rates on environmental conditions such as pH, moisture and temperature have been frequently studied (Schmidt et al., 2011).

We also need to identify the factors governing biogeochemical activities and if it results in feedback mechanisms that alter the growth, activity and interaction between primary producers and microorganisms (Treseder et al., 2012). By determining how different groups of microorganisms respond to individual environmental conditions for using carbon to produce biomass, obtain nitrates from atmospheric nitrogen, solubilizing calcium and phosphate, etc, a mechanistic as well as quantitative understanding of the global biogeochemical cycling pattern can be obtained, both in terrestrial and aquatic environments (FIG 1). Steinweg et al. (2013) have shown how environmental variables that are affected by climate change can modulate microbial activities by e.g. their influence on the production and activity of enzymes (Steinweg et al., 2013). Several activities of microbes and other forms of life starting from fixing carbon, nitrogen, sulphates and phosphates to production of methane gases and breakdown of organic matter from dead plant/animal tissues have their own importance to maintain the balance of life in nature. The interaction of plant- microbes and animals are fine-tuned and eradicating populations due to the unregulated use of biocides break the tuning and result in chaotic and unpredictable microbiota structure and functioning.

The judicious use of other effective antimicrobial virucides may lower the burden of illnesses and hamper the spread of COVID-19. Since food production, distribution, healthcare facilities and retail are essential services that require human interaction, the disinfection of surfaces, skin, and air is of high importance and should be restricted to suspected or contaminated areas alone.

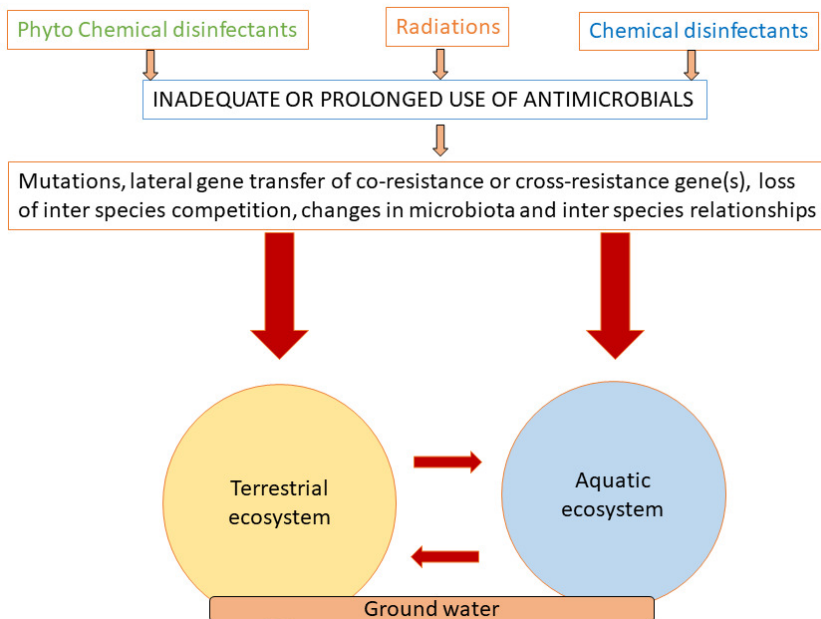


Figure 1 Impact of inadequate usage of antimicrobials/biocides on the ecosystem

3. Future recommendations for safety and maximal benefit

The virus can spread directly from person to person when a COVID-19 case coughs or exhales producing droplets that reach the nose, mouth or eyes of another person. According to the currently available evidence, transmission through smaller droplet nuclei (airborne transmission) that propagate through air at distances longer than 1 meter is limited to aerosol generating procedures during clinical care of COVID-19 patients.

Indirect contact is via surfaces and clothes touched by the infected people and may remain active for several days. Alternatively, the droplets released by sneezing and coughing are heavy and cannot be airborne, so they settle down on objects and surfaces surrounding the person. People who later come in contact with these surfaces and then touch their nose, mouth or eyes become infected with COVID-19.

To avoid getting COVID-19 or spreading it, one should practice “social distancing”, by avoiding gatherings and crowded places. We should also avoid touching common areas e.g. lift buttons, door knobs, etc, refrain from hugging or holding each other and stay home as much as possible. Good habits such as washing hands properly with soap, using masks, hand sanitizers and surface disinfection is one way to help combat the CoVID-19 pandemic. The biocides sector is well placed to assist if appropriate products can find their way to users with sufficient speed. Two types of products have been authorized;

(1) products for human hygiene consisting of alcoholic gels or solutions, (2) products for disinfection of surfaces.

It should be well understood that all chemical disinfectants are biocides, meaning that they have been made to kill and destroy organisms, both big and small. Therefore, even commonly used cleaning agents such as disinfectants and sterilants may directly or indirectly harm workers in healthcare facilities and elsewhere. Looking at the dangers that lie ahead because of irresponsible usage of biocides, it is necessary to understand and get educated about the impact and safety guidelines first. Firstly, they should always be stored in their original containers having proper labels and guidelines about usage and instructions on safety measures to be taken during accidental spillage. This should be done not only for safety but is also a legal requirement. Spillage or over use (thinking about additional benefits) should be avoided and after use they should be stored in a safe place, out of reach of children and pets.

All disinfectants might not work on all surfaces and application of excessive amounts does not help in increasing the percentage of disinfection. The disinfectants might also be irritable for human if they come in contact with skin or eyes/nose, etc and therefore proper protection for skin (wearing gloves/ long sleeved dress and long pants) and for face (mask) should be used. During the process of disinfection of rooms or open areas, children, pets and elder people should be kept away, for the entire duration of treatment. The instructions sometimes strictly good ventilation after sanitation through windows allowing odours to escape. Hands should be definitely washed after using all forms of disinfectants, including wipes and these should never be used as facial wipes or baby wipes because the disinfectant causes irritation in skin and is not safe. After use, the masks, gloves, wipes etc should be appropriately discarded.

4. Conclusion

Irresponsible and inadequate use of biocides are a threat to the environment and the society as a whole. Biocides can impact the biogeocycling of nutrients e.g. C, S, P and N, which contribute to balance in the ecosystem, be it terrestrial or aquatic. The impact of over use might lead to the emergence of mutated and resistant strains and pose further threat to the society. Since use of antiseptics and biocides cannot be stopped, we should look at alternatives which are safer or greener and preferably degradable. Also judicious and calculated use following directions on the label is recommended until suitable biocides are available. Societal concerns may be clarified through mass education and creating awareness on pesticides and antiseptics and their effects and longterm impacts.

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THE PANDEMIC'S IMPACT ON THE ENVIRONMENT

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Abstract

An environment is a natural unit consisting of biotic factors in an area functioning together with all of the abiotic factors of the environment. Environment plays an important role in healthy living of human beings. It matters because it is the only home that humans have, and it provides air, food and other needs. Humanity's entire life support system depends on the wellbeing of all the environmental factors. When India imposed a nationwide lockdown a week ago, it was designed to stop the imminent spread of the novel corona virus. The sudden fall in pollutants and the subsequent blue skies signal a dramatic shift for India- which has 21 of the world's 30 most polluted cities, according to the IQAir Air visual's 2019 world Air Quality report. COVID-19 and the consequent lockdown underscore the fact that equity has to be fundamental to improving the environment and is central to any vision of sustainable development. And this means equity between nations, within generations, and across generations. It is our collective duty to find a way forward on the environmental question that does not put the burden of resolving it on the workers of the world. Our national environment makes human life possible and our cultural environment helps define who we are. It is therefore essential that our population and economic growth are environmentally sustainable. The corona crisis also presents India with an opportunity to invest in a clean energy future.

1. Introduction

India is currently under the biggest lockdown. In view of the outbreak of **Coronavirus**, about 130 crore people have been asked to stay home. As the Coronavirus pandemic spreads globally, threatens lives and destroys the world economy. It also has a profound impact on the environment. India is home to 21 of the world's 30 most polluted cities. While the complete shutdown of India's economy was designed to stop the spread of Covid-19, it is having an ancillary health benefit of cleaning the air that millions of people were choking on. The world's largest Coronavirus lockdown is having a dramatic impact on pollution in India.

The lockdown order **shut down** offices, schools, movie theatres, malls, markets and non-essential service providers. All modes of public transport such as metro trains, buses, inter-state trains, domestic and international flights for civilian movement have also been stopped. In a matter of months, the country has been transformed. It is all aimed at controlling the spread of Covid-19, and hopefully reducing the death toll. But all this change has also led to some unexpected consequences. As industries transport networks and business has closed down, it has brought a sudden drop in Carbon emission. In order to curb the spread of new Coronaviruses, pollution and greenhouse gas emission have declined across the country (Fig II).

As lockdown kept more people at home and the traffic was overwhelmed, the streets plagued by pollution all over the country became empty, tiresome and quiet spaces (Fig I). The pandemic has turned the world outside our doorsteps into a newly formed wilderness. Now in addition to the necessary workers, public spaces are areas that can be ventured into, so for most of us, our world has shrunk to the size of houses.



Fig I: LOCKDOWN ROADS IN INDIA Fig II: POLLUTION FREE INDIA

All of these are unexpected upward trends in the Coronavirus crisis. Facts have proved that global air quality can be significantly and rapidly improved. The change has been created by lockdowns that have grounded flights and shut factories. But **environmentalists** warn it could be temporary. The central government that is our **Honourable Prime Minister Shri Narendra Modi** has urged people to avoid unnecessary travelling, significantly reducing the traffic movement across the country.

It is the lockdown impact which resulted in local factories like shutting down of industries and construction and traffic have contributed in improving the air quality. Rain is also helping, but the curbs on local emissions are playing a significant role.

According to the data of the **Central Pollution Control Board (CPCB)**, the air quality in the national capital is presently in **“good”category**. Under the “good” category, pollution is considered to be at the lowest and the air is believed to be the healthiest to breathe. Moreover, 92 other cities with CPCB monitory centers have recorded minimal air pollution, with the air quality in the range of “good” to “satisfactory”.

Amidst gloom, there is a silver lining. **Mother earth seems to have rejuvenated itself**. Smog has given way to blue skies(Fig III), marine life is seeing an increased activity and pollution levels have dropped and animals as well as birds are moving about on their own accord(Fig IV).The load of **plastic and non-biodegradable waste was reduced**.The recent heavy rains in the north and west of the country have also helped the country’s pollution levels. Rain is a very effective aerosol removal process from the atmosphere and can bring down particulate matter values.



Fig III: BLUE SKIES DUE TO LOW POLLUTION Fig IV:DOLPHINS APPEAR DUE TO AMIDST LOCKDOWN

Due to the lack of cars, emissions of **Carbon dioxide, Nitrogen dioxide** and other pollutants and fine particulate matter. Its impact on oil prices has not caused much implosion.The pandemic’s impact on the environment has been staggering. Carbon emissions from the burning of fossil fuels are heading for a record 5.5-5.7% annual drop.In Delhi, air quality is usually the worst city in the world. Due to traffic congestion, the pollution has dropped by 59%, and pollution caused by PM 2.5s has been reduced by about 75%.India’s capital is one of the world’s most polluted cities, wild animals are roaming boldly in locked down cities(Fig V), and many people can see the Himalayas(Fig VI).



FigV: ANIMALS RECLAIMING CITIES

Fig VI: CLEAR VIEW OF HIMALAYAS

The data from the **Central Pollution Board (CPCB)**, part of **India's Environment Ministry**, was collated by the **Centre for Research on Energy and Clean Air (CREA)**. Nitrogen dioxide also have a 71% fall. Mumbai, Chennai, Bangalore and Kolkata have also recorded a fall in their air pollutants.

According to the center run **System of Air Quality and Weather Forecasting and Research (SAFAR)**, the impact of the measures taken due to the Coronavirus outbreak has resulted in a drop in fine particulate pollutant by 30% in Delhi and by 15% in Ahmedabad and Pune. The level of Nitrogen oxide pollution, which can increase the risk of respiratory conditions, has also reduced. Nitrogen oxide pollution is mainly caused due to high motor vehicles traffic. In Pune it has reduced by 43% and in Mumbai by 38% and in Ahmedabad by 50%. Welcoming the reduction in pollution, environmentalists urged the government to treat it as a **“wakeup call”** and stop its **“obsession”** with **“development”** at the cost of the environment.

On **22nd April, Earth Day** catalyzed calls for the current crisis to be a turning point in our relationship with nature. We need to turn the recovery into real opportunity to do things right for the future. Just like Coronavirus, green home gases do not respect national borders. Cleaner air has perhaps been the single greatest positive effect of the lockdowns on the environment. But not all the environmental consequences of the crisis have been positive. Volumes of non recyclable waste have risen, severe cuts in agricultural and fishery export levels have led to the generation of large quantities of organic waste, maintenance and monitoring of natural ecosystems have been temporarily halted, and tourism activity to natural areas has ceased. Due to the decline in exports of agricultural and fishery products and the decline in production levels, the unemployment rate in both sectors has increased significantly.

Our homes will need to change too. In an effort to make them more energy and heat efficient, many workspaces, flats and apartments, blocks don't have operable windows. But if we are going to be spending more time indoors, our homes will need to be better ventilated and offer more light. There is a need to avoid something called "**Sick Building Syndrome**" which happens in entirely sealed and start re-circulating pathogens through their systems. All food generates greenhouse gases to reach our plates, but when nearly a third of it is thrown away as waste, each spoonful of food was responsible greenhouse gas emissions before it even got to your plate. The **cultivation, processing, packaging and transportation** of the food we eat all cause climate change.

Air Quality Index (AQI) is a very reliable indicator that reflects the level of air pollution and is therefore a good way to understand the impact of the lockdown, at least on our lower atmosphere. Due to the Coronavirus pandemic and the subsequent social and economic impact, attention must be paid to the threats to the environment and natural resource base from the environment and natural resource base.

2. Conclusion

Many of the environmental challenges caused by Coronavirus crisis will gradually resolve on their own once the crisis comes to an end and previous levels of economic activity resume. The present generation will discover the critical importance and need for a focus on public health and the quality of air we breathe. Centre has provided the list of districts falling under **the red, green and orange zones** to the state. The classification depends on the number of active cases and the doubling rate.

All India Institute of Medical Sciences Director **Mr. Randeep Guleria** said India should brace itself for a jump in cases, with modelling showing the peak of infections and the community support is needed to fight the virus and contain it. Health Ministry Joint Secretary **Mr. Lav Agarwal** said it is possible that with adherence to social containment, India may never hit the peak. But as we talk about relaxations and return of migrants, it is important that we learn to live with the virus and practice behavioural changes. So "**learn to live with the Coronavirus**". The environment and economy are really both two sides of the same coin. If we cannot sustain the environment, we cannot sustain ourselves.

"Be a part of the solution not part of the pollution".

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**AIR QUALITY BEFORE AND AFTER COVID-19 IMPACTED LOCKDOWN
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Abstract

Air quality index before and after COVID-19 influenced lockdown is evaluated from three monitoring stations at Hyderabad. An improvement of air quality by way of average reduction in concentration of PM_{2.5} varying from 41 to 54% is characteristic of the lockdown period. However, the pre-lockdown levels are much higher than the maximum safety limits of 10 µg/m³ recommended by the World Health Organization.

1.Introduction

The coronavirus disease COVID-19 has created an unprecedented situation, infecting millions of people globally. On 11 March 2020, the World Health Organization (WHO) made an assessment of the spreading rate of the disease and declared COVID-19 as pandemic. As the virus spread through human-to-human contact, there was an appeal from the WHO to make arrangements to limit the number of cases and retard its spreading rate. This has prompted many nations to declare an emergency lockdown thereby affecting nearly one third of the global population, who were forced to stay home (Kaplan et al., 2020). The coronavirus lockdown in India was implemented on March 25, 2020 in three different phases. The first phase of lockdown lasted for 21 days and the second phase followed immediately after, for an additional 19 days till 3rd May, 2020. The first two phases of lockdown have enabled the Indian government to contain the spread of the disease, besides identifying various affected zones. Subsequently, a third phase of lockdown for a period of 14 days was imposed further with more strict norms for the containment (infected) zones. Following the guidelines of the Ministry of Home Affairs (MHA), Government of India, conditional relaxation and resumption of various activities started in different areas of each state during the third

phase. The decision of resumption of activities within each district was handed over to the respective state governments.

During the extended period of lockdown in India, all educational institutes, offices, industries, shopping malls, cinema halls, hotels and restaurants, air, rail and road transport services for movement of passengers, and many other facilities were completely withdrawn. Such a situation is unprecedented and perhaps the first of its kind. This has facilitated environmental rejuvenation and reports have started pouring in, where people have acknowledged to have better air and water qualities (Jain, 2020). In fact, inhabitants residing in the city of Jalandhar and surrounding areas in the northern state of Punjab have shared photos of peaks of the Himalayas, which they have seen after a gap of almost 30 years. Such environmental recharge by way of reduced air pollution has been attributed to prolonged lockdown effect (Picheta, 2020).

In this context it is significant to note that the city of Hyderabad has grown with time and presently a large number of diverse industrial activities are in operation. The major industries in the city include electronics, electrical, pharma, nuclear, defence, aero, biotechnology etc. In addition, a gamut of other industrial activities that come under the purview of MSME sector (Ministry of MSME, 2014) are also functional in the twin cities of Hyderabad and Secunderabad.

2. Objectives

The purpose of the present article is to examine the effect of lockdown on the air quality of greater Hyderabad based on collated information from various sources that include the public domain data, published information and other related facts. The results are evaluated and discussed in the light of role of lockdown. In other words, our aim is to investigate (i) whether or not the air quality of Hyderabad has seen any improvement due to prolonged lockdown and (ii) if so, by how much? Implication of the results obtained in this study is discussed in the light of impact of air quality vis-a-vis human health. Finally, how the ancient monuments and heritage buildings of Hyderabad are getting affected due to air pollution is also discussed.

3. Data & Method

The Telangana State Pollution Control Board (TSPCB) operates six stations on a regular basis to monitor the air quality of Hyderabad. These monitoring stations are distributed over the city and are sited at

different locations (Fig. 1). Besides these six stations, Hyderabad US Consulate located at Begumpet also monitors the air quality. Data pertaining to three stations, namely, A, C and F (Fig.1) are examined. Importantly, these stations are located in the north-western, north-central and south-eastern part of greater Hyderabad (Fig. 1).

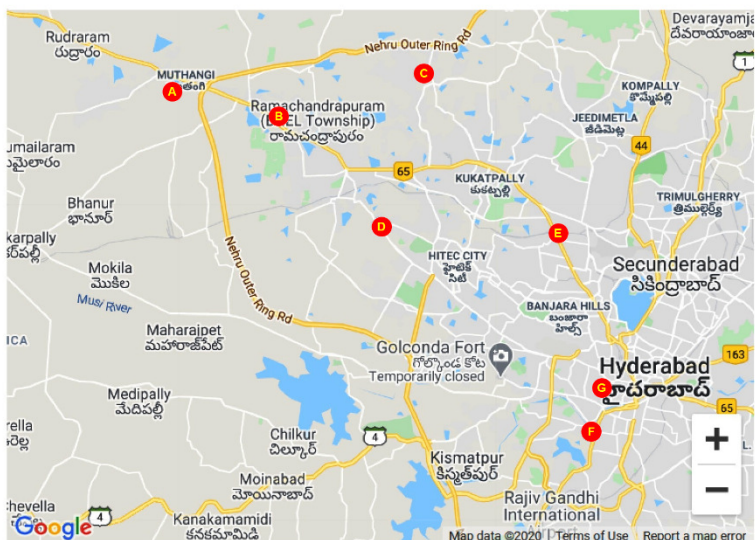


Fig. 1 Distribution of seven air quality monitoring stations (A-G) located at Hyderabad. A=IDA, Pashamylaram, B=ICRISAT, Patancheru, C=Bollaram Industrial Area, D=Hyderabad Central University, E=Sanathnagar, F=Zoo Park in west Bahadurpura and G=Begumpet.

There are seven major atmospheric pollutants, namely the suspended particulates smaller than $2.5 \mu\text{m}$ in diameter ($\text{PM}_{2.5}$), suspended particulates smaller than $10 \mu\text{m}$ in diameter (PM_{10}), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ground level ozone (O_3) and lead etc, which are generally measured at a monitoring station. However, $\text{PM}_{2.5}$ is a pollutant (having a size of about 3% the diameter of a human hair) that is widely considered as most harmful to human health (Xing et al., 2016). Its microscopic size renders the particles to enter the blood stream via the respiratory system and travel throughout the body. Prolonged inhalation in excess of safety limit can have far-reaching health effects causing asthma, lung cancer and heart disease etc. Therefore $\text{PM}_{2.5}$ AQI data that are available in the public domain are considered for analysis in the present study.

4. Results and Discussion

Air Quality Index (AQI) data starting from January 1, till first week of May, 2020 are used in this study. Daily AQI is based on the 24 hours average of hourly readings. Fig. 2 shows the temporal variation of AQI pertaining to the three monitoring stations. Based on the disposition of data points in each panel, some major observations are apparent:

(i) the data points before lockdown (black circle) are characterized by higher average $AQI_{PM_{2.5}}$ values (IDA, Pashamylaram= 79 ± 34 ; Bollaram Industrial Area= 76 ± 28 ; Zoo Park= 110 ± 30), (ii) there is discernable drop in AQI (green triangle) during the lockdown period (IDA, Pashamylaram= 52 ± 13 ; Bollaram Industrial Area= 46 ± 11 ; Zoo Park= 74 ± 15),

(iii) the data points before lockdown is characterized by more scatter, which is evident from their standard deviation values of 34, 28 and 30, respectively for IDA, Pashamylaram, Bollaram Industrial Area and Zoo Park and (iv) air quality index at Zoo Park station before and after lockdown is much higher than the other two stations.

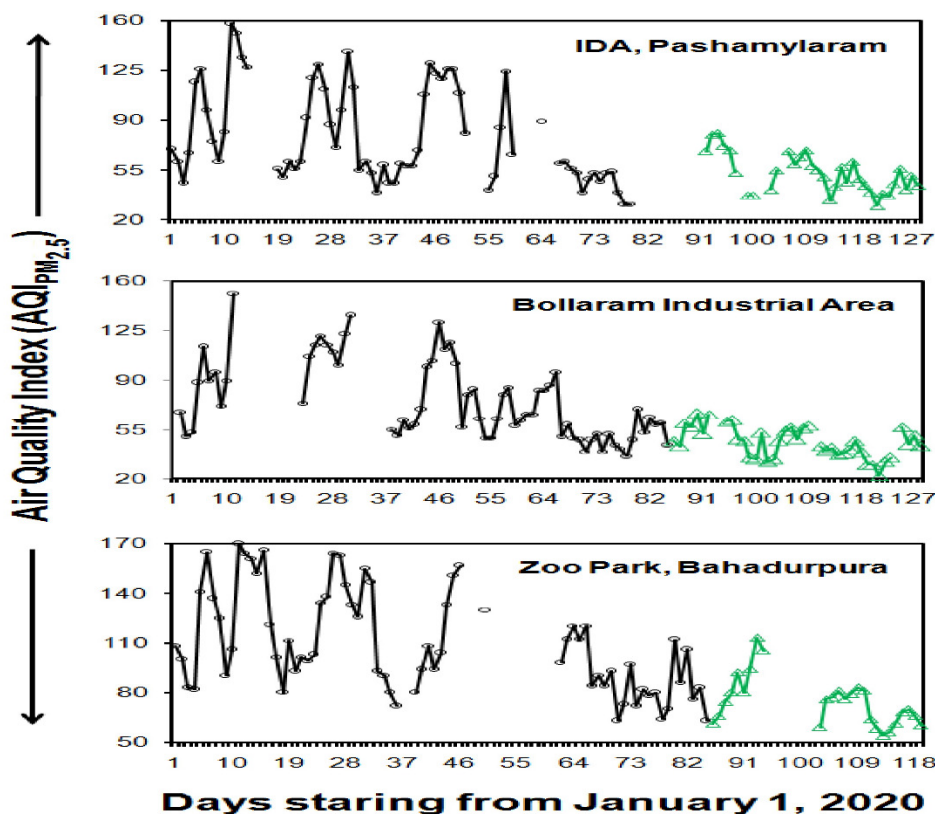


Fig. 2 Temporal variation of average Air Quality Index ($AQI_{PM_{2.5}}$). Daily AQI is based on the 24 hours average of hourly readings. The break in the solid line connecting data points indicates either non-availability of data or insufficient data to estimate AQI. The black circle and green triangle denote data before and after the lockdown.

In order to communicate to the common public in simple word as to how clean the air is, the concept of AQI as a number was introduced by the US Environmental Protection Agency (Vallero, 2008). As $AQI_{PM_{2.5}}$ value increases, the health risks to lung and heart become high. Usually a 500 point scale is used to report air quality. Any rating between 0 and 50 is considered good. A score between 51 and 100 indicates a satisfactory level. An AQI number between 101 and 200 is considered moderately polluted and is unhealthy for sensitive groups like the elderly or people with heart or breathing problems. Scores between 201 and 300 are considered as poor and unhealthy. A range from 301 to 400 is considered as very poor causing respiratory problems on prolonged exposure, and finally, air quality in the 401 to 500 range is deemed severe (cf. Vallero, 2008).

Therefore the lockdown impacted air quality of Hyderabad, in general, has improved, from satisfactory level to good with $AQI_{PM_{2.5}}$ centred close to ~50 for stations at Pashamylaram and Bollaram area. In the case of Zoo Park the improvement is from moderately polluted level to satisfactory level.

In order to estimate the average concentration of $PM_{2.5}$ before and after lockdown, the estimated average $AQI_{PM_{2.5}}$ values are converted to their respective concentration levels using the standard formula:

$$I_{PM_{2.5}} = \frac{I_{High} - I_{Low}}{BP_{High} - BP_{Low}} (C_{PM_{2.5}} - BP_{Low}) + I_{Low}$$

Where $I_{PM_{2.5}}$ = the index for $PM_{2.5}$

$C_{PM_{2.5}}$ = observed 24 hour average concentration of $PM_{2.5}$ in $\mu g/m^3$

BP_{High} = the concentration breakpoint that is greater than or equal to $C_{PM_{2.5}}$

BP_{Low} = the concentration breakpoint that is less than or equal to $C_{PM_{2.5}}$

I_{High} = the AQI value corresponding to BP_{High}

I_{Low} = the AQI value corresponding to BP_{Low}

The three stations, viz., IDA, Pashamylaram, Bollaram Industrial Area and Zoo Park exhibit respective pre-lockdown average concentrations of $PM_{2.5}$ equal to 25.4, 23.9 and 39.1 $\mu\text{g}/\text{m}^3$. These concentration values get improved during the lockdown period and decrease to 12.5, 11.0 and 23.0 $\mu\text{g}/\text{m}^3$ for these three stations. In terms of percentage drop of $PM_{2.5}$ during lockdown, the stations at IDA, Pashamylaram, Bollaram Industrial Area and Zoo Park record about 51, 54 and 41% drop, respectively. While the lockdown impacted reduced levels at Pashamylaram and Bollaram areas are comparable to the maximum safety levels of 10 $\mu\text{g}/\text{m}^3$ recommended by the World Health Organization (WHO, 2005), the Zoo Park $AQI_{PM_{2.5}}$ is much higher. In view of pre-lockdown AQI values being much higher, a brief discussion of excessive particulate matter in air vis-a-vis human health is presented below. This is followed by an account of damage of ancient monuments and heritage buildings in the city, which is being caused by excessive suspended particulate matters ($PM_{2.5}$ and PM_{10}).

In view of the results presented above, it may be pointed out that nearly 8% of all deaths globally arise from ambient air pollution. Such incidence seems to exhibit an increasing trend even in low-income and middle-income countries due to presence of large concentration of $PM_{2.5}$ in the air (Cohen et al., 2017). Further, systematic reviews conducted by a large number of researchers have yielded convincing evidence of the effect of short-term exposure to particulate matter on hospital admissions and cardiorespiratory mortality, myocardial infarction, heart failure, and stroke (Mustafic, et al, 2012; Shah et al., 2013, 2015).

Apart from the adverse effect of presence of particulate matter in air on human health, it may be also be pointed out that more than 425-years-old heritage monument Charminar and other ancient monuments within the heritage zone of Hyderabad city are turning black due to excessive air pollution. A portion of ornamental stucco fell from a minaret of the Charminar on May 1, 2019 (see Fig. 3).



Fig. 3 The minaret of over 425-years old Charminar from where a huge chunk of plaster ($2.5 \times 0.8 \text{ m}^2$ shown by arrow) fell down on May 1, 2019 (adapted from The Hindu, May 3, 2019).

While investigating the cause of crumble, the experts from the Archeological Survey of India (ASI) found layers of black deposits in between the samples of lime plaster. The ASI experts opined that the black deposit is formed due to excessive suspended particulates in air ($\text{PM}_{2.5}$ and PM_{10}) due to pollution. Such deposits form a gap within the lime plaster. Due to absorption of rainwater over the years, the plaster eventually loses its grip (see Moulika, 2019).

5. Conclusion

The air quality index of Hyderabad city estimated before and after lockdown exhibits a drastic decrease in the concentration level of $\text{PM}_{2.5}$ particulate matter. The study therefore brings out the role of anthropogenic input in polluting the environment of the city.

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RESILIENT RECOVERY OF NATURE**Dr.P. Padmalatha**

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Abstract

Nature is a divine gift for mankind to flourish. It satisfies all the needs of the species existing on the planet earth. It bestows happiness all the time but human beings try to find happiness in nature only when they are in distress due to their own destructive activities. Mankind has faced a number of challenges when the balance of ecosystem was distorted by them. Covid -19 is one such challenge which human beings are now facing. There are evidences which show high mortality rate in Covid - 19 is due to air pollution and we are exposed to pathogens carried by wildlife due to deforestation. Change in climate can release frozen undiscovered viruses by melting ice. Apart from this Covid- 19 had a positive effect on environment where NO_2 , CO_2 levels have dropped drastically, water bodies became cleaner, wildlife were spotted at various places, aquatic species increased in number during lockdown was observed by all nations. This indicates that a shift towards a more resilient and sustainable economy is needed. New Strategies, ideas, use of cleaner technologies, strict implementation of environmental policies, Educating and joining hands of younger generation with Earth schools, investing in green energy and public transport, maintenance of high standard personal hygiene, proper treatment of industrial effluents, following reduce, recycle, reuse in solid waste management are required. Nature – positive development path helps mankind to live a sustainable, climate friendly in harmony with nature. We need to change our attitude and the entire world as one should be committed in saving our planet.

1. Introduction

Nature can be referred to be the physical world as well as life in general. Humans are part of nature. For several centuries it was organized, moved by divine laws and was considered as decorum for divine providence. With the advent of industrialization and modern scientific methods it has lost its divinity and became a passive reality [1] The only planet in the universe that supports life is earth and the key factor that sustains the ecosystem is its atmosphere. Due to various factors earth has undergone drastic climatic change. [2].

The major things happening worldwide are increase in temperature and noticeable change in regional climate.[3]. Air an essential element of nature supports life on earth. The World Health Organization (2019) reported that more than 90 % of people in the world live in areas where air pollution levels do not

meet safe standards. Atmospheric pollution has a negative impact on terrestrial, marine and coastal areas, and causes disturbances in regulatory ecosystems that are fundamental for the overall quality of life of human societies and other living species.

Reducing air pollution is about protecting the environment, preserving biodiversity, and mitigating climate change, which make up some of the most pressing challenges of today. Human activities have caused serious threats to water resources. According to the World Water Development Report (WWDR 2020), global water use continues to grow steadily. Climate change manifests itself in the increasing frequency and magnitude of unprecedented extreme events such as heat waves, precipitation and thunderstorms [4]. Due to the high temperatures of the water and the reduction of dissolved oxygen, the quality of the water will be adversely affected and therefore there will be a reduced self-purification capacity of the freshwater bodies.

Soil, a vital component of the earth, is essential for human survival as it serves the major supply of food production for all life forms. Developmental activities deplete the natural resources and large amount of wastes which is produced leads to soil, air, water pollution, acid rains and global warming. The poorly treated or untreated waste is one of the major causes of river pollution and environmental degradation causes health problems and loss of crop productivity. Almost 25% of the world's soil is said to be highly degraded, while 44% of the soil is moderately degraded.

Biodiversity is the sum of life variability forms existing on planet earth. Recent scientific reports (2016) indicated that currently 1 trillion species exist on the earth.[5]. It forms the bases for all ecosystem functions, that include nutrient cycle, climate regulation, pollination, air, water purification, fuel, water cycle regulation, and food production, and therefore is intimately related to human well-being [6,7 and 8]. This base is now in danger when the human activities have increased and biodiversity decreased. Biodiversity loss will have dramatic effects on human well-being through the collapse of ecosystems.

2. Exploitation of Natural Resources

The natural resources are important for the survival and growth of the human population. On the other hand, earth's ability to renew these resources is less. Many effects of overexploitation are seen locally, the growth demand as well as sustainable management of these resources has become a global issue due to dependence of national and international trade on these valuable natural resources. If the balance in nature is disturbed, then the destructive role of nature starts. There are many examples which the human race has

faced from time to time. In recent past diseases like Influenza, AIDS, Swine flu, Zika fever, West African Ebola, Chikungunya and Corona virus 2019 is of the latest viral infectious disease emergencies which are of natural origin. From comparison of available genome data sequence to corona virus strains known, it was confirmed that origin of SARS-CoV-2 was through natural processes," said Kristian Andersen, [9]. Severe illness which corona virus cause is similar to Severe Acute Respiratory Syndrome (SARS) epidemic in China (2003) and Middle East Respiratory Syndrome (MERS) in Saudi Arabia (2012). The transmission of viral disease between animals and humans threatens economic development, animal and human well-being, and ecosystem integrity. This indicates that nature has its own way to maintain the balance.

3. Response to this Pandemic by Human Race:

COVID-19 is threatening the whole of humanity as well as wildlife and we must fight back. Solidarity and global action are crucial. Individual country responses are not going to be enough. Regulations such as compulsory quarantining or isolating of symptomatic people have been carried out. Nationwide lockdown, social distancing, use of facemask and hand sanitizers is observed by all nations throughout the world to prevent spread of disease.

4. Effect of Pandemic on Environment:

The decline in human activity during corona virus pandemic had a positive effect on the environment, although there has been an overall reduction in economic activity. Transport, Industrial emissions as well as effluents have been drastically reduced. Measurable data from central pollution control board showed the removal of pollutants from the atmosphere, soil and water. The European Space Agency's Copernicus Sentinel 5P satellite measures NO₂ levels globally (fig1). showed decline in NO₂ levels. The global decline in NO₂ levels was observed in China, where levels plunged dramatically when rigorous quarantine measures were applied in late January [10]. As nations in Europe and North America followed China's example in late February and March there was a 30% reduction of NO₂ in March 2020, compared to the monthly average from 2015 to 2019 (NASA). There has been a 25 % drop in energy use. Similar trends have been seen globally.

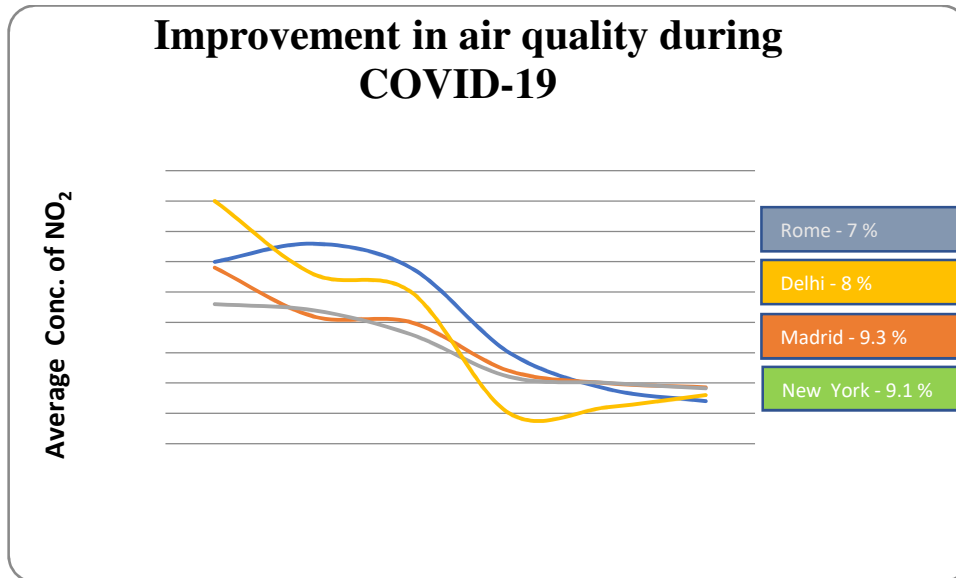


FIGURE 1. CONC OF NO₂ IN AIR DURING COVID-19 [11].

Source: World Air Quality Index(WAQI) statista

With a nationwide lockdown, India continued to breathe easily as pollution levels dropped dramatically. The lower the AQI, the better the air considered. In major Cities like Delhi, Calcutta, Lucknow and Bangalore, Air Quality Index (AQI) remained in double - digits. The current estimate levels of CO₂ have decreased by about 5.5 % in 2020 compared to 2019 but global CO₂ emissions must decrease by 7.6 % each year. Due to atmospheric clean air people of Jalandhar, a city in Punjab state, witnessed a view of the Dhauladhar mountain range located at a distance of 213 kilometers and which were not visible from the city since longtime.

Ever since the implementation of a national lockdown, cleanliness of water bodies has been observed and the Yamuna and Ganga rivers have improved significantly. Central Pollution Control Board showed that the average water quality of Ganga was 27 points in the past days and it was suitable for bathing.[12]. Water quality test was conducted by Uttarakhand Pollution Control Board at Har-ki-Pauri in Haridwar and the results reveal that the water was classified as 'safe to drink after chlorination', for the first time after decades. Visuals of a cleaner Ganga have emerged from Kanpur as well as Varanasi; the clear water is a result of the shutdown of most industries. In a rare sighting, fish have also been seen near the ghaat steps in Varanasi, likely because of the absence of crowds and presence of clean water.

Wild life started enjoying freedom of a quitter world. In the month of April, 1.5 lakh flamingos flocked to Navi Mumbai, creating a dazzling sea of pink. According to wildlife experts, there was a 25 % increase in the number of these graceful birds.



FIGURE 2. Thriving of marine life during lockdown

Source: <https://edition.cnn.com/travel/article/marine-conservation-uae-spc-intl/index.html>

Spotting of various wildlife in cities, improved air quality, and clear water bodies with increase in aquatic species, is an indication that human activity will have ever lasting impact on the Earth's sustainability. We human beings very often forget that we dependent on Mother Nature for our survival and become ignorant to take care of it. We have forgotten the beauty of the Earth completely and became so reluctant to the preservation of natural resources and sustainable development. After weeks of being locked into homes people have now began to realize that our future as a species demands a drastic rethink of our present style of destructive and exploitative living – a living which thrives on development. The corona virus pandemic is a reminder to all that all forms of life are necessary and must be protected for our survival. The lockdown imposed throughout the world has made us stand still in all aspects and given us a chance to think the importance of nature in our life

5. Strategies to be Taken:

It is essential for the government to pay attention to climate change despite of COVID -19 crisis. Government announced plans that were structured for a pre-COVID19 world needs a learning of the lessons of the pandemic, which includes:

- Strictly implementing environmental policies.

- Educating and joining hands of younger generation with Earth schools. This helps in understanding of the environment while considering their role within it .This leads to a better balance between human and Nature.
- Reconsidering our development paradigms, economic pursuits.
- Need for absolute symbiosis between human and nature.
- A simple material lifestyle.
- Shift to digital communications technologies.
- Investing in green energy.
- proper treatment of industrial effluents, following reduce, recycle , reuse in solid waste management.
- Prioritizing social distancing.
- Transitioning back to work, back to business in the new normal in the aftermath of the COVID-19 pandemic.
- Consider installation of protective screens at workstations.
- Walkways and other thoroughfares within and between work and non-work areas may require visible demarcations (signposts, roped or taped boundaries, etc.) to reduce physical interaction, prevent the build-up of crowds or queues, etc.
- Staff at workplace may be required to be screened prior to entry.
- Shift-working patterns may be introduced. .
- Rethinking and potentially repositioning the layout of offices, meeting rooms, desks etc.
- Active participation of stakeholders is needed.
- Government, NGO and every individual is responsible for addressing environment issues.
- UN theme “Our Solutions are in Nature” emphasizes how solidarity and the importance of working together to build a life harmony with Nature.

6. Discussion

In 2006 biologists found a dramatic ‘boot print’ of changes in the ecosystem, indicating nature in trouble, and inevitably, humankind. However, governments ignored it all, to deliver greater cities, more technology, fast cars and faster trains. In the process, waste piled up, the air was poisoned, and the water foamed. Overcrowded and dirty cities are sitting ducks for viruses and vector-borne diseases alike.

Nations all around world have experienced series of epidemics from time to time. Unsurprisingly, new research suggests that people already exposed to long periods of polluted air are more vulnerable to COVID-19. The present drop in air pollution levels will prevent some of the annual deaths due to air pollution exposure and also protect a significant amount of lives from being susceptible to Covid-19. Therefore it depends on how we tackle this challenge from ecosystem stability affecting human health, to our ability to grow food and create thriving communities for our future. This requires the world's infrastructure to be more resilient and better equipped to withstand increasingly frequent extreme weather events. But to get there, now more than ever, the world needs fresh ideas, solutions and technologies. Apart from these, the government should be committed to implement the existing policy pledges. New technologies are needed to accelerate a shift towards a nature –positive development path so that mankind can live a sustainable, climate friendly in harmony with nature.

7. Conclusion

Our efforts to control the Corona virus pandemic has contributed to improvements in air and water quality but reduced economic activity. Lack of access to clean air and water affects vulnerability to disease and ill health. Now it is the time to consider how effectively we can make use of economic packages for environmental friendly practices. We need to change our attitude and the entire world as one should commit in saving our planet.

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ENVIRONMENTAL IMPACTS OF COVID 19 LOCKDOWN IN INDIA

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Abstract

COVID-19 is a pandemic caused by Corona virus and its effects are seen in the entire world. The pandemic has potentially impacted education, business, politics, environment and all other sectors of human life. Though there have been many natural disasters at regular intervals, the pandemic COVID-19 did make man rethink the way he has orchestrated his presence on this wonderful and amazing planet. Mankind has been forced into a realization of his ways and their impact on nature. One of the impacts of lockdown is carbon emissions have fallen drastically which can be viewed as optimistic change for the environment. Though there has been a reduction in pollution and lot of improvement in the natural ecosystems, it should be taken as a subtle warning by nature and man must be wary of their activities impacting environment.

1. Introduction

COVID 19 is a pandemic caused by corona virus that has affected human population globally. This virus transmits mainly through droplet mode of transmission, once internal to a human body it affects respiratory system and in severe cases it is fatal. As of date there are multiple variants spreading and vaccine research is still in progress. Societies all across the world have in general accepted that the only way to prevent wide spread transmission is to impose a lock down and observe social distancing besides personal hygiene. These measures have become mandatory to contain the transmission and challenging for all the regulatory bodies and government machinery in implementing the measures. The implications of these measures are huge and have shown both positive and negative impacts in various sectors of life across the globe. Lockdown has a distinct impact on environment; perhaps in the history of mankind the world wide lockdown is the biggest social experiment that produced environmental effects.

2. Impacts on Environment

Deforestation, industrialization, urbanization, disrupting and over exploiting natural resources and other human activities led to the loss of precious wild life habitats across the globe, increased pollution affecting human health and many other environmental consequences. COVID-19, the pandemic has

displayed long lasting consequences on human civilization. Its time humans realize that they are not indispensable and need to take this as a warning to amend their ways. This pandemic has brought about a widespread implementation of the lock down concept and for once humans are made to ponder and realize the impacts of their activities on nature.

2.1 Positive Impacts: The planet earth has healed as a result of the lockdown imposed during the Covid-19 pandemic and is considered as a silver lining in terms of this awful crisis. Closure and non-functioning of industries and factories has caused reduction in waste, and toxic emissions into atmosphere, water bodies and soil. Many vital environmental changes are seen during this period which brought about a significant positive impact in the nature.

2.1.1 Improvement in Air Quality: India accounts for the highest pollution-related deaths in the world with more than 2 million people every year, according to a December 2019 report by the Global Alliance of Health and Pollution. Industries, power plants, construction activities, road dust, transportation and residential activities are the major sources contributing to air pollution. India and Indians have forgotten to breathe right and easy for quite a long time. People are more vulnerable during a pandemic in areas with high pollution and thus a closer look at change or response in air pollution levels was the need of the situation. A drastic reduction was seen in pollution levels as a result of the stringent lockdown measures imposed due to Covid-19. During lockdown, most public transport was suspended and industries were closed and construction works halted and citizens were asked to stay home. Nearly 1.3 billion people of India have come to almost halt and have provided a temporary remedy to increasing pollution levels. Under the nationwide lockdown, all transport services (road, air and rail) educational institutions, industrial establishments and hospitality services were all suspended with exceptions for essential services. As a result, many towns and cities across the Indian nation have noted air quality improvement according to the analysis reports by Central Pollution Control Board (CPCB).

The main cities have recorded much lower levels of harmful microscopic particulate matter known as PM 2.5, and nitrogen dioxide released by vehicles and industries. PM 2.5 are dangerous as these are particles with size less than 2.5 μm in dm and can lodge deep into the lungs and pass into other organs and the bloodstream causing serious health risks. The major change was witnessed in the industrial cities of northern India where AQI dropped by more than 50 per cent (Table 1). According to standard values of CPCB, Air Quality Index (AQI) values of 0-50 is Good, 51-100 is Satisfactory, 101-200 is Moderate and 201-300 is Poor. Around 78% cities were found to have good and satisfactory levels of air quality when recorded during the lockdown period which was high when compared to pre-lockdown phase records which was only 44%. This is mainly because of fewer vehicles on the road, reduction in consumption of petroleum products and reduction in power demand from the commercial and industrial sectors. The sudden fall in pollutants and the subsequent blue skies signalled a dramatic shift in pollution levels in India. For example, in New Delhi which was ranked as the most polluted city in the world by World Health Organization (WHO) in May 2014, the average concentration of particulate matter reduced from 91 to 26 $\mu\text{g}/\text{m}^3$ (71%) within one week after the lockdown began. Greater reduction in air pollution helped to visualize clearer skies in cities and even Himalayan peaks from cities where the view had been

concealed by fog for decades. For example, in Jalandhar, people could see the 250 km away Dhauladhar mountain range of Himachal Pradesh, for the first time in 30 years.

Many companies shifted their work to online mode during the lockdown which had clearly made us visualize the impact of commuting on air pollution. Vehicles are not plying and fossil fuel resource consumption has greatly decreased. The reduced fossil fuel emissions due to the transport sector and slowdown in other emissions-related activity have slowly reduced the air pollutants. An important outcome of lockdown is the drastic reduction in carbon emissions to near zero as a consequence of minimal transportation and stringent measures. Industries in lock down means that the electricity consumption is drastically reduced thereby impacting the consumption of coal and other non-renewable resources. Thus the lockdown has ensured less use of fossil fuels and revival of ozone layer due to less carbon and other green house gas emissions thus reducing global warming.

Table 1: Comparison of Air quality index of some Industrial Hub cities in pre and post lockdown

S.No:	Cities	AQI Pre lockdown (March 2020)	AQI Post lockdown 25 days (April 2020)	Percentage reduction (%)
1.	Noida	152	71	54
2.	Ghaziabad	188	81	57
3.	Bhiwadi	207	42	80
4.	Ballabgarh	102	51	50
5.	Khanna	73	34	54
6.	Manesar	123	46	63
7.	Mandi Gobindgarh	117	42	64

Source: Central Pollution Control Board (CPCB)

2.1.2 Improvement in water Quality: A cleaner and greener surrounding will help increase in ground water level. Effluents/ waste water from various industries when released into water bodies' cause pollution making water blackish and affecting aquatic life and risking humans. The lockdown has imposed stringent measures on close down of industries due to which there was a drastic reduction in water pollution. This is exemplified by various facts across the country. Critically endangered, South Asian River Dolphins also known as Ganges Dolphins have been spotted at various Ganga Ghats of Kolkata after 30 years. A massive increase (25%) in the numbers of flamingo birds has been observed in the city of Mumbai. The lockdown also brought a significant change in the water quality of rivers in

Haridwar and Varanasi the drainage of industrial waste into the river water has stopped. Fish have also been seen near the ghaat steps in Varanasi, a rare sight, most likely because of the absence of crowds and presence of clean water.

2.1.3 Reduction in Land Pollution: The lockdown imposed a complete shutdown of public gathering places like malls, theatres, beaches etc. This drastically reduced the human generated waste majorly including disposable plastic ware thus reducing land pollution. Even the e-commerce services are closed, and as such, the impulsive buying habits of people have calmed down. Because of this, the middle-income category of our population has learned the art of minimalism. These have greatly revived and recovered the Ecosystems and biodiversity.

2.2 Negative Impacts: Though the lockdown during the Covid 19 pandemic has been considered as a blessing in disguise for the environment reducing the pollution levels, there are a few negative impacts. Lockdown has converted regular chalk and board classrooms into online classes and also most of the companies shifted working and meeting via online modes. This led to a huge surge in the consumption of data and internet which not only caused the speed of net to fall down but also have an impact on biosphere and ecology. Electromagnetic field from various sources such as that from cell towers, cell phones, cordless phones, power lines and Wi-Fi would negatively impact birds and bees and thus disturbing the ecological balance.

3. Conclusion

Humans should strive towards establishing a peaceful and harmonious existence and work together to restore and protect the earth from the destruction that had been caused over the several years and thus contributing towards a balanced and sustainable ecosystem. The various positive impacts of lockdown on environment will encourage governing bodies to practice a periodic lock down to enable nature to revive. Hopefully these hard times will surpass and help us to adopt better lifestyle choices in future to preserve and restore our nature.

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POSITIVE IMPACT OF LOCKDOWN ON ENVIRONMENT IN INDIA**Ms. Paleena Thulimilli**

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Abstract

As we know that the coronavirus cases are increasing rapidly. Not only India but the whole world is going through this Coronavirus pandemic. Due to this situation, the government extended the lockdown for more days. Along with India, many countries around the world have enforced quarantine and lockdown to slow down the spread of the infectious coronavirus. Whether it is industry, companies, or schools, everything is temporarily shut down because of widespread coronavirus infection. It canceled the flights and other journeys. Some people lost their job while others are struggling to earn their daily meals amid the lockdown. Most of the major conferences and events like the Indian Premier League (IPL), World Athletics Indoor Championships, etc are canceled because of this pandemic situation. Several countries have restricted the issuing of visas and tighten their borders. Nowadays, social distancing and work from home have become the new standard in everyone's lives. Apart from these things, there are several positive and negative effects of lockdown on the environment. The worldwide disruption caused by the COVID-19 pandemic has evoked numerous impacts on the environment and the climate of India. In this chapter Positive impact of lockdown on air pollution and sound pollution in India are discussed in detail.

1. Introduction

1.1. Pre –Lockdown Status of Environment in India: India is one of the nations with the highest rates of respiratory diseases and the highest number of tuberculosis cases in the world. Due to air pollution, there are very high levels of respiratory disease, even young children are suffering from asthma. The nebulizer has become an essential thing to have in the house for families who can afford them. After seeing all these pathetic conditions many of the Green activists say, it's a lesson that is badly required in India. During winter big cities in the north like New Delhi are covered by a blanket of smog as farmers' burn crop residue and the air tends to clear a little during spring. Even in the Month of November 2019, hundreds of Indians took to the streets in New Delhi to protest the levels of air pollution, after the city

was blanketed in a dark yellow haze for several days. Air pollution hit extreme levels forcing academic institutions and industries to close and flights to be diverted in many cities of India.

1.2. During Lockdown the Environmental status of India: While the complete shutdown of India's economic system is designed to stop the spread of COVID-19, it is having an ancillary health advantage of cleaning the air that millions of people are choking on. As vehicles stay off the road, construction is put on hold, and factories stop production, the pollution levels of the environment start to drop below microscopic particulate matter or PM 2.5.

However, in the last few months of the year 2019, India has experienced a significant decline in some pollutants. Five months later, that is during the month of March, and April the skies are now clearing up due to lockdown. But the impact of living in such worse polluted conditions has left a severe respiratory disease for citizens of India which is a potential vulnerability to the coronavirus pandemic. According to the WHO, older people and people with pre-existing medical issues like asthma, pneumonia appear to be a higher risk of becoming severely ill with the Coronavirus.

India is home to 21 of the world's 30 most polluted cities, but grinding this country of 1.3 billion people to a near halt amidst coronavirus fears, has also provided a temporary remedy to another pressing health issue: suffocating pollution levels. Recently air pollution levels have started to drop dramatically as the second-most populated nation endures the 55 days of lockdown till 17th of May.

While we are taking every possible step to tackle the Coronavirus outbreak, you'll be surprised to know that this pandemic is affecting our environment in ways that will startle you.

2. Positive Effects of Lockdown on Environment:

2.1. Air Pollution Dropped Suddenly: Due to the lockdown, air pollution suddenly dropped all over the world. This is one of the major positive effects on the environment because of the coronavirus outbreak. Because several industries are temporarily shut down, there is only an emergency vehicle on the road; that's why the whole world is pollution-free. For today's generation, this is the first time for them to see such a dramatic change in the environment. The satellite shows a drop in polluting gases like nitrogen dioxide over the last few weeks. This harmful gas is mostly generated by power plants, car engines, and other industrial processes. It believed that air pollution causes many health problems, especially

respiratory illnesses like asthma. As per The World Health Organization (WHO) survey, every year 3 million people are died because of air pollution. So in this manner, lockdown is good for the environment. Data from Central Pollution Control Board (CPCB) shows that the main cities are recording much lower levels of harmful microscopic particulate matter is known as PM 2.5 of nitrogen dioxide which is released by vehicles and power plants. PM 2.5 is smaller than 2.5 micrometers in diameter, is considered particularly dangerous as it can lodge deep into the lungs and pass into other organs, and the bloodstream, causing serious health risks. But during Lockdown the air pollution levels have dropped 71 percent in just one week. On March 20, the air had an unhealthy 91 micrograms per cubic meter of PM2.5. Just a couple of days into the lockdown, that level has fallen to 26 micrograms per cubic meter. According to the World Health Organization, anything above 25 micrograms per cubic meter is considered as unsafe.

2.2. Water Is Clean Once Again: This is another unexpected effect on the environment due to lockdown. Because of the coronavirus, the number of tourists reduced so that all the water of seas and rivers is cleaner than they have been in living memory. When the massive number of tourists visit the beaches, they pollute the seawater by spreading garbage, swimming, and motorboats. But over the last few weeks, all the journeys are canceled due to lockdown, and many economic activities stopped that cause water pollution. This amazed the people that how clear the water has become. The change in the water is amazing for marine life. While the Coronavirus pandemic is dangerous for humans on the other side, it becomes productive for animals.

2.3. Greenhouse Gas Emission: As the economic activities are halted so this also drives down the emission of Greenhouse gases. While the whole world shuts down the schools, factories, and shops, then the emission is expected to fall. This lockdown period lowers oil demand. The international energy agency said that this year global oil demand is expected to decline because the impact of coronavirus spreads all over the world. The coronavirus pandemic broadly affects the energy markets all over the world. People are going through huge losses due to this lockdown this is the major effect of lockdown on the environment. But lockdown is only the solution to prevent the spread of coronavirus.

2.4. Rising Use of Domestic Energy: In the whole world, more and more people are at their homes due to the lockdown. So in this situation, the use of domestic energy is increasing. This also becomes one of the major effects of lockdown on the environment. Now many people are working from home, so the domestic energy consumption is anticipated to have increased rapidly. Due to the lockdown, all the family members are at home, and they also consume a lot of domestic energy. This will eventually save energy

as the rise in domestic use is more than recompensed by the huge drop in educational, and commercial building uses.

2.5. City chirpier as the sound of birds replaces honking: For nearly two months since the lockdown is clamped, there has been no honking, no whirl of vehicular engines, no echo of loudspeakers, and no clanking of machinery in factories. Hence, the cities have been waking up to the chirping of birds. The most polluted cities like Delhi's noise pollution has drastically fallen. According to the recent submission of noise pollution levels between April and October 2019 from six selected regions across India to the National Green Tribunal the highest average daytime and night-time noise levels were recorded at 65.7 dB (A) in October. But it has now reduced to around 50-60 decibels due to the less number of vehicles on the road. Actually noise levels above 20 dB (A) are known to disturb birds. However, as we are now in self-isolation with reduced human activity and noise the sounds of birds chirping is being heard clearly which is a blessing for humanity.

3. Conclusion

Going Forward We must agree that pollution levels are falling down and will continue to be lower and the air quality is being turned into good quality as a result of lockdown. It is like a silver lining in terms of this pandemic crisis that we can step outside and breathe. The tops of skyscrapers are visible and we can spot more stars than usual. Obviously, Lockdown is not the most ideal way to bring down air and noise pollution, but it proved that the Environmental pollution is man-made. It is to be noted that this positive impact is a temporary reprieve that will return.

It's crucial that when India's lockdown inevitably ends, and people return to their normal routines, they are not forced to revert to their old behaviors. To make the current drops in air pollution levels permanent, serious policy change needs to be enacted. The restrictions in road transportation and the consequent decrease in air pollution have highlighted that gas-powered cars are the key cause of air pollution. Electrifying transport, expanding public transportation, building more bike lanes, and finding other ways to incentivize people to ditch their cars would drastically reduce India's emissions from its primary human source of air pollution. It is also crucial that these electric vehicles and the cities of India more broadly are powered by clean sources of energy rather than fossil fuels which gives a lot of encouragement and hope that we can bring down pollution of our country.

This lockdown period is a difficult challenge for all of us, but it is the only way stay at home to be safe and prevent the widespread of Corona virus. Soon we shall overcome this Pandemic crisis.

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**MOTHER EARTH IS TAKING A DEEP BREATH AND NATURE IS
RECUPERATING – A POSITIVE IMPACT OF LOCKDOWN ON
ENVIRONMENT IN INDIA****Ravi Kiran S^{1*} and Ravi Kumar B. S²**¹Department of Biochemistry, Aurora's Degree & PG College, Chikkadpally, Hyderabad-500020,
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Abstract

The covid-19 pandemic is measured as the most critical global health calamity of this century and the utmost ever challenge faced by mankind worldwide which is responsible for more than 90,000 deaths. Despite of large dependency on Mother Nature, human beings ignored to conserve the natural resources for future generations by sustainable development and because of this the beauty of earth has lost. This led to the nature to take revenge and showcase its feelings to the mankind. In this regard, Covid-19 lockdown which was introduced by the Government of India has struck a chord in every person to rethink on the importance of nature in day to day living. Because of this lockdown, tangible improvement has been taken place in nature which is an eye opener to human beings. This is the need of the hour that everyone to join hands and save the mother earth. This aim of this paper is to highlight the tremendous environmental changes that took place in the lockdown period in India.

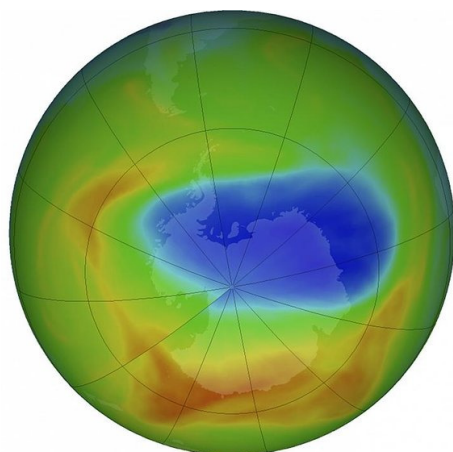
1. Introduction

In COVID-19, 'CO' means 'corona,' 'VI' means 'virus,' and 'D' represents disease and 19 signifies the year. The covid-19 pandemic is known to be a great threat to the public across the globe and considered to help as an indicator of discrimination and paucity of social progression. Eventually every continent got affected by this and approximately 2.6 million affected cases and 183,820 deaths have been documented worldwide because of this calamity (Chakraborty and Maity, 2020). It is well known that human beings are very good at manipulating the nature for their own benefits since time immemorial. The increasing population, rapid industrialization and urbanization have been proved to be detrimental to the environment and led to the cause of pollution, climate change, depletion of water and other natural resources etc. (Bremer et al., 2019; Coutts et al., 2010). Global warming a serious alarm worldwide is because of high levels of greenhouse gases such as CO₂, CH₄, N₂O etc. Human beings started destroying

the nature in many ways as per their own whims. This change in the climate is a major threat to human beings and animals as well and it is predicted that it can cause 5 lakhs death by 2050 and this issue should be addressed meticulously. At this situation, the covid-19 pandemic lockdown has given a clear indication on the relationship between human and planetary health. Significant observation in the lockdown is human beings are staying inside their houses while wild animals are roaming on streets. As a result, the smog filled sky is looking very clear and there is an improvement in the environment. The best example for this is the people residing in Punjab could able to perceive the Himalayan snow peaks where the scenic view has been blocked for many years due to air pollution. Moreover, there is a 60% reduction in the fine particulate matter in New Delhi. Breathing pure air, lot of greenery and spotting of wildlife are some of the important environmental changes. People are driving less, pollution has come down and some animals have changed their movement patterns and these are only short term benefits and can bounce back to the same situation once these restrictions get revitalized.

2. Impact on Air pollution

In India pollution-related deaths of 2 million every year has been recorded according to the reports of Global Alliance of Health and Pollution. Air pollution has dropped down to exceptional levels across the major cities in India because of lockdown due to corona virus (Davidson, 2020; Kumar et al., 2020). A significant depression or dip in the levels of air pollution was observed across all the cities wherein, a decrease in their Air Quality Index (AQI) was observed. As the world scrambles the spread of the virus, many human activities have come to a standstill situation, leading to noticeable reduction in the air pollution and climate riddles are solved particularly with respect to aerosols. Aerosol emissions vary greatly from place to place i.e., fossil fuel burning to spraying of fertilizers and have wide influence on the climate in rise in temperature, cloud formation and also monsoons. At present there is a drop in the aerosol emissions and this offers valuable information to scientists to work on the background levels of aerosols, studying the properties of clouds and temperature differences before and after the drop in the emissions. Air is becoming cleaner and cleaner and mother earth is taking a deep breath of fresh air. The people residing in Jalandhar, Punjab woke up to a sight of the Dhauladhar mountain range, which is rare normal times making them memorable.



Courtesy: From NASA website : By Goddard Space Flight Center/NASA via AP in October 2019

A large hole in the Ozone layer was detected by scientists in 1985 and this can be correlated by the indiscriminate use of chlorofluorocarbons (CFCs) which is found in refrigerators, hair sprays etc. These CFCs are responsible for major damage to the ozone layer and therefore, an international treaty called the “Montreal Protocol” was adopted in 1987 where 197 countries worldwide had signed with the aim to ban them. Now after three decades, we are earning the benefits from it. At present many people are staying indoors due to the lockdown and this situation is evidencing to be beneficial of ozone layer. The industries are shut down and usage of aerosols got minimized resulting in the improvement of ozone layer which might bring a positive impact on various regions in general and drought regions in particular by producing more rainfall. According to a study, the international cooperation on ozone-depleting chemicals is serving the southern jet stream to come back to normal state because of covid-19 pandemic lockdown (Banerjee et al., 2020). Now this is the golden opportunity for the Government to channelize the funds to a renewable energy sector mainly to clean the air, reduce the greenhouse emissions and air pollution and make India a pollution free country

3.Impact on water bodies

The impact of covid-19 on water bodies can be apparently visualized by the published reports (Malik, 2020; PTI News, 2020; Shukla and Srivastava, 2020) and appears to have a positive impact on lakes and rivers in India. Water bodies such as Yamuna and Ganga rivers have been improved significantly since

the implementation of covid-19 lockdown. The water is looking cleaner and brighter as the level of BOD has come down to below 2.0. Further, the data of the Pollution Control Board (PCB), reveals that the average quality of water in the Ganga river is found to be 27 points because there is no dumping of industrial effluents into the river and this and made it suitable for suitable for drinking, bathing and also for wildlife propagation. The remarkable purity level is due to the lack of pollutants and garbage from industries. Further, improvement in the quality of water can be attributed to the melting snow which is amalgamating into the river. Also the Environment Protection and Pollution Board of Uttarakhand (UEPPB) reported that there is 34% reduction in faecal coli forms in the Ganga river water. However, this is with the upstream of Varanasi and much more efforts are needed to purify the downstream water. Similarly, Cauvery River and its tributaries are also regaining the water quality and this lockdown has breathed life into polluted rivers and streams even in Mumbai. A subtle but noticeable improvement in the quality of water in HussainSagar Lake, Hyderabad has been noticed.

4. Impact on Forest and Wildlife

Forests are very important for living organisms and cover more than 32% of the Earth's space. Unfortunately, due to human activities and industrialization, the country has lost the forest cover and many endangered flora and fauna. The profound effect of this can be seen with respect to land ecosystem and human health (Ruscio et al., 2015). Moreover, this deforestation can also result in different types of disease due to the birds, animals, and other outbreaks including viral (Afelt et al., 2018; Olivero et al., 2017). Afforestation often regarded as a primary tool of prevention is being neglected and also need for respecting the wildlife habitats. Therefore, there is a need to understand the importance of the forests and wildlife and methods to conserve them. Further, the cut down of trees and other forest products got reduced which is a good sign for the country. In many parts of India, essential conservation work is still going and moving forward where, all the National parks, protected areas and vulnerable wildlife are being guarded. This sustained protection is an evidence of the dedicated staff at protected area staff during this hard and challenging time. Now during this covid-19 lockdown, the nature has chosen to underscore the urgency of environmental actions wherein, flora and fauna are breathing sufficiently without fear and enjoying the beauty of mother earth which human beings don't know. The best examples include researchers and environmentalists after 30 years have spotted the Ganges Dolphins also known South Asian River Dolphins in the Ganga River and also at Ganga Ghats in Kolkata. Further massive increase in their numbers of Flamingos visiting Mumbai city was also observed by the local people. As human beings are socially isolated, the Olive Ridley Sea turtles in India have been nesting on the beaches in Odisha and

also at deserted beaches in India. On the other hand, approximately 4.1 lakhs turtles laid eggs freely in the marine sanctuary in Orissa in March 2020 as their predators humans are in complete lockdown. There are circumstantial reports of reduced pressures of human beings on wild life. Also the number of people visiting the protected areas, forests and sanctuaries got declined during this 3 months period. It is cropping up in news channels and papers that wild animals are venturing into various urban and rural areas including parks and beaches, where this sight has not been visualized for many years. Especially in South India, so called one of the hot spots of 20 mega biodiversity of the world is rejuvenated like anything. Almost many threatened animals and birds have reoccupied their habitats without fear. Lot of wild animals is moving in their corridors as if they are the king of the forest. Recent reports in Kodaikanal, a tourist hill station of south India, many rare, endangered and endemic birds and animals have appeared and moving everywhere without fear as there are no visibility of their enemies, human beings. Elephants, Deer, Tigers, Leopards and Bison are moving in the highways and even in human settlement area. It means that our environment is so crystal clear without pollution, poaching and threatening animals by human activity and disturbance in the habitats. The forest wildlife of course may be feeling happy at this condition because of pollution free air and no hunting and this is a positive correlation for habitat restoration.

5. Conclusion

The change in the environment is one of the great and dynamic challenges of this century. However, during the last 3-4 months because of covid-19 pandemic consequences, there has been a remarkable improvement in the environment and it is definitely a positive impact on climate change. This is to urge the people in India to rethink comprehensively on the linkage links between health, ecosystem and human well-being. It is too early to answer the effect of lockdown on biodiversity. It is too early for the assessment of the overall impact of covid-19 lockdown on biodiversity and the human capabilities to protect the same. However, all the protected areas appear to be safe and, in many places, biodiversity is benefitting from reduced human activities. The forest ecosystem and protected areas seem to be safe and the biodiversity in India is benefitting from decreased human activities. With the hope in heart to beat the hard times, we have to step forward to a cultured and sophisticated lifestyle to preserve our Mother Earth for future generations. Let us all join hands and work together to restore our planet earth for a better tomorrow.

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COVID 19-A BLESSING IN DISGUISE TO MOTHER NATURE

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Abstract

“Earth provides enough to satisfy every man’s needs but not every man’s greed”- Mahatma Gandhi

The nature always restores its balance through ways unanticipated. Man’s curiosity to explore nature turned into greed and supervened the tranquility of the nature. In the course of quenching the thirst for excellence, man started creating various means that resulted in his own destruction. Covid-19 pandemic is one of such consequence of man’s imprudence. The governments around the world have been attempting to curb the spread of the virus through various strategies. One such attempt is lockdown which obviously showed remarkable change. Lockdown definitely created a major halt in all the sectors but gave mother nature to breathe a sigh of relief. We witnessed a concatenation of amazing events in the nature. The case study of Delhi and advent of the animals on the streets of India shows how man occupied all the territories depriving the other animals of their habitats. Lockdown also gave man to rethink about his undesirable intervention into nature. Now the prime responsibility of man should be to follow practices that cater to the peaceful coexistence of all the organisms in the ecosystem. As a responsible son man should fulfill his responsibilities and safeguard the integrity of mother nature. Hence lockdown is for sure a blessing in disguise to mother nature.

1.Introduction

Covid 19, the dreadful pandemic created havoc in the whole world and brought the world to a standstill. For the first time in the history of human existence the world is completely in the dormant state. All the domains of our life at once have come to a halt. People started believing in the philosophy of survival first rather than experiencing the luxurious lifestyle. Minimum has become today's maximum. The spiritual awakening made man to ponder and rethink the priorities in his life. The economy, the education sector is experiencing new challenges and more turbulent demands. On the other hand, Mother nature is experiencing a blissful resilience. It's been ages man stopped appreciating the beauty of the nature as he was too busy in recreating it.

The nature has been exploited by man for his own comforts. Nature is considered as our second mother after the mother who created us but the selfish motive of man has been ignoring this fact and continuously exploiting the nature without realizing that one day it will result in his own loss. If we look at the calamities that devastated the geography of many nations we can realize it is all because of the excess exploitation of nature that caused imbalance in the environment. Environment comprises both biotic and abiotic components that are interdependent and maintain the dynamics of the environment. The biotic components include all the living organisms and the abiotic components include physical factors such as temperature, Atmosphere (composition of various gases), humidity, rainfall etc. Environment can be defined in simpler terms as the surroundings in which the human beings and other living organisms survive. Any imbalance in the elements of the environment can lead to deleterious effects. The industrialization and modernization on one hand marked the progress and intellectual and economic evolution of man but on the other hand caused a lot of undesirable changes in the environment.

2.Lockdown and its impact on the environment in India

Covid-19, the most unexpected and disastrous pandemic affected the entire population in the world. The pace at which the virus is spreading urged the governments to take an emergency step of complete lockdown till the situation comes to normalcy. Lockdown was taken as a precautionary measure to curb the spread of the dreadful corona virus. India, one of the nations in the world with highest population densities and always booming with activity at once got paused. People had to stay indoors, Industries had to shut down, supply chains got faltered, Indian Railways stopped operations and Road transport services were also withdrawn. In this alarming situation, only pollution responded positively to the lockdown. Lockdown gave an unprecedented opportunity to the environment to take a sigh of relief and breathe fresh after ages of suffocation. The lockdown gave a scope and hope of a cleaner environment as everyone started witnessing bluer skies, better air quality in most parts of the country.

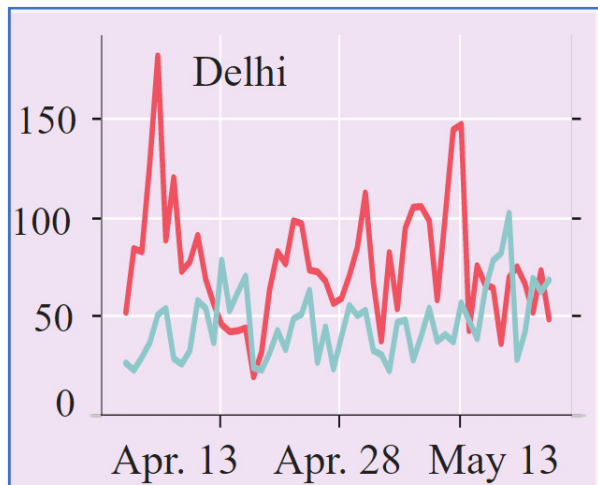
2.1Delhi Pollution –A Case study

According to a report given by a Private weather Forecasting Agency, Skymet, Delhi is declared as the most polluted city in the world with the air quality index of 527. Lockdown has shown a miraculous effect on Delhi pollution. The data on the first day of the second lockdown 15th April, 2020 is a clear indication of what lockdown has done to the air quality in Delhi. Delhi is the only city with a good number of operational air quality monitors to assess the levels of pollutants.

Let's see how six different pollutants showed remarkable changes during the lockdown

PM2.5: PM2.5 means the particulate matter air pollutant with size of the particles around 2.5 micrometers. It is one of the most critical pollutant of Delhi. The monthly average of 100-140 $\mu\text{g}/\text{m}^3$ has come down to 35 $\mu\text{g}/\text{m}^3$, the lowest average possible that is attributed to the minimized local emissions. This also implies that 70% of the particulate pollution is locally generated.

The graph given below shows daily PM2.5 levels between April 1 and May 24 in 2019 (red colour) and 2020 (blue)



PM10: This particulate pollutant with particle size of around 10 micrometers mostly comprises of the road dust and second major pollutant of Delhi. With a limited traffic and complete ban on construction activities the levels have shown a notable decrease from a daily average of $200 \mu\text{g}/\text{m}^3$ to $35 \mu\text{g}/\text{m}^3$

SO₂ (Sulphurdioxide): There is no discernible change noticed in the levels of sulphur dioxide during the lockdown as the capital city already has access to BS-6 fuel.

NO₂ (Nitrogen dioxide): The main source of this pollutant is vehicle exhausts. With 90% vehicles are off the road, there has been a dramatic drop in the levels by 40%.

CO (Carbon monoxide): The changes in the carbon monoxide levels could not be monitored significantly as the gas has the longest tropospheric lifetime of approximately 2 months. Anyways the daytime average during March that ranged from 600 to $1000 \mu\text{g}/\text{m}^3$ reduced to an average of 500 - $800 \mu\text{g}/\text{m}^3$ during the lockdown.

Ozone: The levels of ozone gas showed an incredible increase as it is the secondary pollutant that is destroyed in the presence of Nitric oxide. Due to the reduced transport that resulted in the low emissions of NO, the ozone gas got accumulated.

According to the satellite data given by The European Union Satellite Copernicus Sentinel-5P this year Mumbai and Delhi witnessed a significant drop in the pollution levels by 40-50%. Though there has been a major positive impact of lockdown in Delhi and other major cities in India, the NO₂ levels were found to have increased in the North Eastern India due to the emissions from coal-based plants such as Vindhyachal Super Thermal Power station. The aerosol levels are also found to be at the lowest levels in the compared to the past 20 years due to the restricted human activity as reported in NASA's Marshall Space Flight Center. The data was collected using Moderate Resolution Imaging Spectroradiometer (MODIS) on Terra satellite.

2.2 Unique Intruders or the Original Stake holders – on a freedom stroll

Lockdown has not only created a positive impact on pollution in India but also facilitated emancipation and paved way to a pleasure trip to some of the animals, the original inhabitants. Lockdown gave an opportunity for some spectacular scenes of animals paying a visit to various places in the country. Some of the incidents include:

- The appearance of Antelopes in Noida reminds us about the human folly and greed in converting the major farmlands and forests into urban cities in UP.
- The empty ghat roads in Tirumala had their new visitors, the spotted deers haunting the place at dawn and dusk without the fear of human threat.
- At Mepperyar in Kozhikode an Unusual officer, a small Indian Civet caught the attention of the policemen during its patrol.
- Around a dozen Peacocks from Doongarwadi forest had a pleasure trip at Parsi colony in Tardeo, Mumbai causing delight to the residents.
- Usually animals do not venture out of their homelands but lockdown gave them confidence of no threat from the humans and as a result a one horned Rhino ambled into Sonapur town, east of Guwahati from Pobitora Wildlife Sanctuary.

3. Conclusion

This time of Lockdown made us realize how the anthropogenic intervention with nature has led to irrevocable effects on the mother nature. It reemphasized the importance of our love towards our fellow beings and our responsibilities to preserve the beauty and protect the integrity of the nature. Every citizen should reaffirm his faith in nature's healing and derive true aesthetic pleasure from nature. All the policies made by the government for the Environment should be renewed and amended according to the paradigm shifts in the nature and strive towards sustainable development. Man should finally appreciate the fact that he is an integral part of the nature and has always been codependent. He should reestablish this mystic connection with nature and respect nature as his own mother.

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**IMPACT OF COVID-19: CHALLENGES AFTER LOCKDON ON ECONOMY,
EDUCATION AND ENVIRONMENT****Anunya Deshpande**

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Abstract

It is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, China, and has since spread globally, resulting in an ongoing pandemic. As of 14 May 2020, more than 4.34 million cases have been reported across 188 countries and territories, resulting in more than 297,000 deaths. More than 1.54 million people have recovered. The lockdown is the temporary solution and as lockdown is a temporary solution it showed a major impact on economy as banks and other financial institutions all downgraded and it also shoed impact on education like uncertainty over the exam cycle .and other environment changes as give positive results

1.Introduction

COVID 19is a pandemic and has severely affected different countries. Common symptomsinclude fever, cough, fatigue, shortness of breath, and loss of smell and taste. While the majority of cases result in mild symptoms, some progress to acute respiratory distress syndrome (ARDS), multi-organ failure, septic shock, and blood clots. The time from exposure to onset of symptoms is typically around five days but may range from two to fourteen days.

Stages of transmission

Speaking about a spread of disease among humans, the term transmission refers to the transmission of microorganisms from one infected individual to another uninfected person, either through direct contact, through droplets, or through indirect contact such as surface contamination. The novel coronavirus has four stages of transmission — in line with other infectious diseases.

Stage 1 is the first appearance of the disease through people with a travel history, with everyone contained, their sources traced, and no local spread from those affected. The number of those infected would be quite low at this stage.

Stage 2 is local transmission, when those who were infected and have a travel history spread the virus to close friends or family. At this stage, every person who came in contact with the infected can be traced and isolated.

Stage 3 is community transmission, when infections happen in public and a source for the virus cannot be traced. At this stage, large geographical lockdowns become important as random members of the community start developing the disease.

Stage 4 is when the disease actually became an epidemic in a country, such as it was in China, with large numbers of infections and a growing number of deaths with no end in sight. It is then considered to be endemic or now prevalent in the region.

One of the most recent community events through which transmission took place was the Tablighi Jamaat congregation in Delhi, with the total number of infected from this event at over 600 so far, across 14 states in just two days. Authorities continue to aggressively trace everyone who attended the event or came in contact with attendees. The virus is primarily spread between people during close contact, most often via small droplets produced by coughing, sneezing, and talking. The droplets usually fall to the ground or onto surfaces rather than travelling through air over long distances. Less commonly, people may become infected by touching a contaminated surface and then touching their face. It is most contagious during the first three days after the onset of symptoms, although spread is possible before symptoms appear, and from people who do not show symptoms. The standard method of diagnosis is by real-time reverse transcription polymerase chain reaction (RT-PCR) from a nasopharyngeal swab. Chest CT imaging may also be helpful for diagnosis in individuals where there is a high suspicion of infection based on symptoms and risk factors; however, guidelines do not recommend using CT imaging for routine screening.

2.Objectives of the study

1. To analyse the Impact on economy in India
2. To study the Impact on education in India
3. To understand and analyse the Impact of lockdown on environment

3.Impact of Lockdown in India



As there is no vaccine yet to cure from this disease the only solution is lock down. Our country is vast populated to stop spreading of virus.

3.1 Impact on Economy

The economic impact of the 2019–20 coronavirus pandemic in India has been largely disruptive. The World Bank and credit rating agencies have downgraded India's growth for fiscal year 2021 with the lowest figures India has seen in three decades since India's economic liberalization in the 1990s. The former Chief Economic Advisor to the Government of India has said that India should prepare for a negative growth rate in FY21 and that the country would need a 10 trillion stimulus to overcome the contraction. However, the International Monetary Fund projection for India for the Financial Year 2021-22 of 1.9% GDP growth is the highest among G-20 nations. Within a month, unemployment rose from 6.7% on 15 March to 26% on 19 April. During the lockdown, an estimated 14 crore (140 million) people have lost employment. More than 45% of households across the nation have reported an income drop as compared to the previous year.

The Indian economy was expected to lose over Rs.32,000 crore (US\$4.5 billion) every day during the first 21-days of complete lockdown, which was declared following the coronavirus outbreak. Under complete lockdown, less than a quarter of India's \$2.8 trillion economic movement was functional. Up to 53% of businesses in the country were projected to be significantly affected. Supply chains have been put under stress with the lockdown restrictions in place; initially, there was a lack of clarity in streamlining what an "essential" is and what is not. Those in the informal sectors and daily wage groups are the most at risk. A large number of farmers around the country who grow perishables are also facing uncertainty. Various businesses such as hotels and airlines, are cutting salaries and laying off employees.

Major companies in India such as Larsen & Toubro, Bharat Forge, UltraTech Cement, Grasim Industries, Aditya Birla Group, BHEL and Tata Motors have temporarily suspended or significantly reduced operations. Young startups have been impacted as funding has fallen. Fast-moving consumer goods companies in the country have significantly reduced operations and are focusing on essentials. Some defense deals have been affected/delayed due to the pandemic, such as the delivery of Dassault Rafale fighter jets. Stock markets in India posted their worst loses in history on 23 March 2020. However, on 25 March, one day after a complete 21-day lockdown was announced by the Prime

Minister, SENSEX and NIFTY posted their biggest gains in 11 years, adding a value of Rs.4.7 lakh crore (US\$66 billion) crore to investor wealth.

The Government of India has announced a variety of measures to tackle the situation, from food security and extra funds for healthcare, to sector related incentives and tax deadline extensions. On 26 March a number of economic relief measures for the poor were announced totaling over Rs.170,000 crore (US\$24 billion). On 27 March the Reserve Bank of India also announced a number of measures which would make available Rs.374,000 crore (US\$52 billion) to the country's financial system. On 29 March the government allowed the movement of all essential as well as non-essential goods during the lockdown. On 3 April the central government released more funds to the states for tackling the coronavirus totaling to Rs.28,379 crore (US\$4.0 billion). The World Bank and Asian Development Bank have approved support to India to tackle the coronavirus pandemic.

On 14 April 2020, the Prime Minister of India extended the lockdown to 3 May. A new set of guidelines for the calibrated opening of the economy and relaxation of the lockdown were also set in place which would take effect from 20 April. On 17 April, the RBI Governor announced more measures to counter the economic impact of the pandemic including Rs.50,000 crore (US\$7.0 billion) special finance to NABARD, SIDBI, and NHB. On 18 April, to protect Indian companies during the pandemic, the government changed India's foreign direct investment policy. The Department of Military Affairs has put on hold all capital acquisitions for the beginning of the financial year. The Chief of Defence Staff has announced that India should minimize costly defense imports and give a chance to domestic production; also making sure not to "misrepresent operational requirements".

The Press Information Bureau brought out a fact check that stories about a financial emergency being imposed in India are fake. A financial emergency has never been imposed in the history of India as yet. On 4 April, former RBI chief Raghuram Rajan said that the coronavirus pandemic in India may just be the "greatest emergency since Independence". On 28 April, former CEA Arvind Subramanian said that India would need a Rs.720 lakh crore (US\$10 trillion) stimulus to overcome the contraction caused due to the pandemic

3.1.1 Economic situation in India

In India up to 53% of businesses have specified a certain amount of impact of shutdowns caused due to COVID-19 on operations (FICCI survey). Various business such as hotels and airlines are cutting salaries and laying off employees. By 24 April the Unemployment Rate had increased nearly 19% within a

month, reaching 26% unemployment across India, according to the "Centre for Monitoring Indian Economy". Around 140,000,000 (14 crores) Indian lost employment in the lockdown. More than 45% households across the nation have reported an income drop as compared to the previous year. Live events industry has seen an estimated loss of ₹3,000 crore (US\$420 million). A number of young startups have been impacted as funding has fallen. A Data Labs report shows a 45% decrease in the total growth-stage funding (Series A round) as compared to Q4 2019. According to a KPMG report venture capital in Indian startups has fallen over 50% in Q1 2020 from Q4 2019. On 4 April, former Reserve Bank of India chief Raghuram Rajan said that the coronavirus pandemic in India may just be the "greatest emergency since Independence." The former Chief Economic Advisor to the Government of India has said that India should prepare for a negative growth rate in FY21 and that India would need a ₹720 lakh crore (US\$10 trillion) stimulus to overcome the contraction.

Numerous companies are carrying out measures within their companies to ensure that staff anxiety is kept at a minimum. Hero MotoCorp has been conducting video townhall meetings, Tata Group has set up a task force to make working from home more effective and the task force at Siemens also reports on the worldwide situation of the COVID-19 pandemic.

3.1.2 Possible alternatives or solutions for interrupted economy during COVID-19

- i. Every citizen of our country has to contribute their part to the nation by making in India
- ii. Buying goods directly from farmer
- iii. Encouraging entrepreneurship to avoid unemployment

3.2 Impact on Education

As we know that due to coronavirus pandemic the state governments across the country temporarily started shutting down schools and colleges. As per the present situation, there is an uncertainty when schools and colleges will reopen. No doubt, this is the crucial time for education sector because entrance tests of several universities and competitive examinations are held during this period. Along with them how can we forget about board examinations, nursery school admissions.

All major entrance examinations are postponed including engineering, medical, law, agriculture, fashion and designing courses, etc. This situation can be a ringing alarming bell mainly in private sector universities. Maybe some faculties and employees may face salary cuts, bonuses and increments can also be postponed.



The lockdown has generated uncertainty over the exam cycle. May be universities may face impact in terms of a slowdown in student internships and placements, lower fee collection that can create hurdles in managing the working capital.

Another major concern is that it can affect the paying capacity of several people in the private sector, which is catering to a sizeable section of the students in the country.

Student counselling operations are also affected. Several institutions may pause faculty hiring plans for existing vacancies which in turn affect quality and excellence. Structure of schooling and learning includes teaching and assessment methodologies and due to closure, it will be affected.



- 1) Technology may play an important role in the lockdown period like study from home and work from home. In India, some private schools could adopt online teaching methods. Low-income private and government school may not be able to adopt online teaching methods. And as a result, there will be completely shut down due to no access to e-learning solutions. In addition to the opportunities for learning, students will also miss their meals and may result in economic and social stress.

- 2) Higher education sectors are also disrupted which again pave an impact on the country's economic future. Various students from India took admissions in abroad like the US, UK, Australia, China etc. And these countries are badly affected due to COVID-19. Maybe there is a possibility that students will not take admissions there in future and if the situation persists, in the long run then there will be a decline in the demand for international higher education also. Isn't it!
- 3) Another major concern is employment. Students those have completed their graduation may have fear in their minds of withdrawal of job offers from the corporate sector due to the current situation. The Centre for Monitoring Indian Economy's estimates unemployment shortage from 8.4% in mid-March to 23% in early April. In the urban unemployment rate is 30.9%.

We can't ignore that technology plays a crucial role in the educational system and the demand for the current situation is this only.

3.2.1 Possible alternatives or solutions for interrupted education during COVID-19

With the help of power supply, digital skills of teachers and students, internet connectivity it is necessary to explore digital learning, high and low technology solutions, etc.

1. Students those are coming from low-income groups or presence of disability, etc. distance learning programs can be included.
2. To provide support for digitalization to teachers and students.
3. The necessity to explore digital learning platforms.
4. Measures should be taken to mitigate the effects of the pandemic on job offers, internship programs, and research projects.
5. ED-tech reform at the national level that is an integration of technology in the present Indian education system.

We can't ignore that at this time of crisis effective educational practice is needed for the capacity-building of young minds. Central Government and State need to take some measures to ensure the overall progress in the country. Time never wait, this tough time will also pass. Till then stay safe, stay at home

3.3. Impact on Environment

New Delhi

1. The nationwide lockdown that brought 1.3 billion people to a stop has apparently caused positive changes in the environment, at least temporarily. Skies are clearer and river water seems cleaner.
2. Visuals of a cleaner River Ganga have emerged from Uttar Pradesh's Kanpur as well as Varanasi. The clear water is a result of the shutdown of most industries.
3. In a rare sighting, fishes can be seen near the Varanasi ghaat steps. This seems to have happened because of absence of crowds and clean water.
4. The lockdown has also led to better air quality. According to the World Air Quality, the average concentration of PM 2.5 in New Delhi came down by 71 per cent for a week last month. Nitrogen Dioxide, a pollutant, has also witnessed a decline of 71 per cent.
5. While in most parts of Delhi, the water of River Yamuna has also started to appear clearer in southeast Delhi's Kalindi Kunj, the heavy amount of toxic foam that is usually seen around the year still continues. The toxic foam is caused due to a mix of sewage, detergents and chemicals from industrial waste.
6. AamAadmi Party MLA and Delhi Jal Board Vice-Chairman Raghav Chadha said absence of people has made the Yamuna cleaner.
7. "Many industries and offices are closed due to the lockdown these days and therefore the Yamuna is looking cleaner. The stoppage of industrial pollutants and industrial waste has definitely had a positive effect on water quality. We will conduct testing of the water to ascertain the percentage of improvement in the quality," he said.
8. In the case of River Ganga too, the lab results of the water quality are awaited. Experts say that along with the lockdown, other factors too have contributed to cleaner water.
9. Himanshu Thakkar, co-ordinator at South Asia Network on Dams, Rivers and People (SANDRP) told NDTV, "Alongwith lockdown there is increased waterflow due to unseasonal rainfall and snowfall in some parts. Religious activities have decreased, especially in Varanasi, where lesser cremations are happening. The current scenario should shape our future approach of how authorities should minimize industrial effluents in the water bodies."
10. While the relatively cleaner Yamuna, atleast based on appearance, is good news for people, the true picture of the impact of the lockdown will come out only when the lab results of the water samples are out.
11. The country has been in a 21-day lockdown from March 24 to tackle the spread of the deadly coronavirus that has affected thousands in India
12. Air pollution has dropped to unprecedented levels across the world as major cities and countries impose lockdown measures to curb the spread of the coronavirus.

13. More than 2.6 million cases of Covid-19 and at least 183,820 deaths have been documented worldwide, according to Johns Hopkins University.
14. As humans stay inside, the environment is temporarily changing: wild animals are roaming in the streets and some typically smog-filled skies are clear.
15. People in Punjab, India say they can see the snow peaks of the Himalayas, a view that for decades has been blocked by air pollution. New Delhi alone has recorded a 60% drop in fine particulate matter, the world's deadliest air pollutant.
16. Los Angeles, the traffic-congested city with some of the highest smog levels in the U.S., has seen nitrogen levels drop significantly and rush-hour traffic essentially vanish.
17. Despite the rare glimpse of natural beauty like snow-crested mountains and clearer skylines, scientists warn against celebrating any short-term benefits from the decline in air pollution since levels will rebound once global restrictions lift.



The top picture shows the India Gate war memorial on October 17, 2019, months before the nationwide lockdown. The bottom picture shows the memorial after air pollution levels began to drop during the lockdown in New Delhi on April 8.

Langtang range seen from Kathmandu



The Langtang range is visible from Kathmandu during the sixth day the nationwide coronavirus lockdown in Nepal on March 29. The restrictions have decreased air pollution in Kathmandu Valley, which consistently ranks among the most polluted areas in the world.

4. Conclusion

As we all know for every aspect there is a positive as well as negative impact here comes to positive impact is the environmental changes is it improved in quality of air and water and negative impact is twice in other sectors like education , economy so on and here comes to lockdown is taken as solution to prevent the spread of disease and Recommended measures to prevent infection include frequent hand washing, maintaining physical distance from others (especially from those with symptoms), quarantine (especially for those with symptoms), covering coughs, and keeping unwashed hands away from the face. In addition, the use of a face covering is recommended for those who suspect they have the virus and their caregivers. Recommendations for face covering use by the general public vary, with some authorities recommending for them, some recommending against them, and others requiring their use. There is limited evidence for or against the use of masks (medical or other) in healthy individuals in the wider community.

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AN EMPIRICAL STUDY ON THE AFFECT OF LOCKDOWN ON ACADEMICS, FINANCE AND ENVIRONMENT IN INDIA

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Abstract

The eruption of Covid-19 pandemic has drastically overturned the globe with its massive nature in spreading. No single area in any sector has left unaffected. Right from the smallest to the tallest nobody is forgotten and forgiven by Covid-19. So far the attempts in finding the vaccine has been futile due to dynamic nature of virus in changing its shape rapidly and its adaptability to fit in different weather conditions. As no medicine has developed to curb this universal pandemic and by the fastest increase of the infected number of cases throughout the world, every country has practiced the method of lockdown to restrict the movement of people so as to control the pandemic and save the lives. In this regard, the present study highlights the effect of lockdown particularly on Indian academics, financial aspects and environment. Though this study identifies the adverse effect of Covid-19 on academics and finance, it is a blessing in disguise to the environment by bringing back to original shape of environment through the restricted movement of human beings led to the decrease of pollution in every form in the nature. However, this unimaginative incident has led to some unpredicted consequences at national and global perspective.

1.Introduction

As a matter of fact, after the eruption of Coronavirus from the city of Wuhan, China in December 2019, the world is changed completely which has never been predicted. In a very few days, thousands of people are dead, countless people across the world have fallen ill and the life style of millions of people who have not been affected by this disease is drastically changed in the process of governments action to curb this universal pandemic, COVID 19. All the streets in India are desolated after the announcement of stringent lockdown in all the states. Normal life in all the areas is badly affected by the closure of business malls, theaters, places of worship and so on and so forth and particularly people are ordered to

stay home. All sorts of transportation are barred right from the cut off of international airways to inter and intra state connections are broken. In fact, it is intended to control the spread of Covid-19 and reduce the death toll. However, this unimaginative incident has led to some unpredicted consequences at national and global perspective.

Though the implementation of lockdown is a global loss in economy, it is a blessing in disguise in bringing back the environment in its original equilibrium. Since this paper is aimed at writing the impact of lockdown on three particular areas such as education, economy and environment, the authors try to focus light on these areas in specific.

2.The impact of lockdown on Academics, Finance and Environment

As we are aware that the attack of Covid-19 has tremendously upset the earth with its mighty nature in spreading. No single area in any sector has left unaffected. Right from the smallest to the tallest nobody is forgotten and forgiven by Covid-19. So far, the attempts in finding the vaccine has been futile due to dynamic nature of virus in changing its shape rapidly and its adaptability to fit in different weather conditions. As no medicine has developed to curb this universal pandemic and by the fastest increase of the infected number of cases throughout the world, every country has practiced the method of lockdown to restrict the movement of people so as to control the pandemic and save the lives. In this regard, the present study highlights the effect of lockdown particularly on Indian academics, financial aspects and environment.

2.1 Impact on Academics

The COVID-19 pandemic is first and foremost a health crisis. On the outbreak of this pandemic, many countries have decided to close schools, colleges and universities. The idea on the closure of institutions is to reducing the physical contact and saving lives. This disruption is felt around the world as home schooling is not only a massive shock to parents' productivity, but also to children's social life and learning. Teaching is moving online, on an untested and unprecedented scale. Student assessments are also moving online, with a lot of trial and error and uncertainty for everyone. Many regular assessments have simply been cancelled. Importantly, these interruptions will not just be a short-term issue, but can also have long-term consequences for the affected cohorts and are likely to increase inequality.

Carlsson et al. (2015) studied a situation where youngsters in Sweden had exhibited contrasting number of days to plan for significant tests. These distinctions were restrictively arbitrary permitting the authors

to gauge a causal impact of tutoring on aptitudes. The authors showed those even only ten days of additional tutoring altogether raised scores on trial of the utilization of information ('solidified insight') by 1% of a standard deviation. As a very unpleasant proportion of the effect of the present school terminations, on the off chance that we were to just extrapolate those numbers, twelve weeks less tutoring (for example 60 school days) infers lost 6% of a standard deviation, which is non-trifling. They don't locate a huge effect on critical thinking abilities. An alternate route into this inquiry originates from Lavy (2015), who appraises the effect on learning of contrasts in instructional time across nations. Maybe shockingly, there are extremely generous contrasts between nations in long periods of instructing. For instance, Lavy shows that absolute week after week long periods of guidance in arithmetic, language and science is 55% higher in Denmark than in Austria. These distinctions matter, causing noteworthy contrasts in test score results: one more hour of the week over the school year in the fundamental subjects expands test scores by around 6% of a standard deviation. For our situation, the loss of maybe 3-4 hours out of each week instructing in maths for 12 weeks might be comparative in size to the loss of an hour out of every week for 30 weeks. Along these lines, rather unusually and definitely unintentionally, we end up with an expected loss of around 6% of a standard deviation once more. Leaving the nearby similitude aside, these examinations perhaps recommend a possible impact no more prominent than 10% of a standard deviation however unquestionably over zero.

As a matter of fact, going to school is the best public policy tool available to raise skills. In the academic point of view, the school time can be fun to every pupil and it develops social skills and social awareness and in the primary point of being in school is that it increases a child's ability in every aspect. Hence even a relatively short time spent in school brings out great outcome and even a relatively short time of interruption in school will have bad consequences for skill growth. Basing on the present Covid crisis, we can understand how the learning is affected. Though it may not state in precise due to the new situation in the world we can estimate by referring other studies to get an order of magnitude to some extent.

Especially the vocation of the current year's college graduates might be seriously influenced by the COVID-19 pandemic. They have encountered significant showing breaks in the last piece of their examinations, they are encountering significant breaks in their appraisals, lastly they are probably going to graduate toward the start of a significant worldwide downturn. Proof proposes that poor economic situations at work showcase passage cause laborers to acknowledge lower paid occupations, and this has perpetual impacts for the professions of a few. Oreopoulos et al. (2012) show that moves on from programs with high anticipated income can make up for their poor beginning stage through both inside

and over firm profit gains, however moves on from different projects have been found to encounter lasting profit misfortunes from graduating in a downturn.

Therefore, we can conclude by saying the worldwide lockdown of training establishments has affected to cause significant break in understudies' learning and interruptions in interior appraisals and the wiping out of open evaluations for capabilities or their substitution by a mediocre other option. Consequently, all the instructive foundations are required to make reasonable arrangements appropriately to adapt up to this uncommon circumstance winning in the current situation and scholastic organizations need assets to revamp the misfortune in learning, when they open once more. How these assets are utilized, and how to focus on the kids who were particularly hard hit, is an open inquiry. Given the proof of the significance of evaluations for learning, schools ought to likewise consider deferring as opposed to avoiding inward appraisals. For new alumni, approaches should bolster their entrance to the work market to stay away from longer joblessness periods.

2.2 Impact on Finance

The impact of lockdown is undoubtedly a massive blow on Indian economy. Lockdown in nations like India is progressively more grievous for human government assistance and economies since there is no assistance for independent companies nor are there joblessness benefits. It can be easily observed in sudden fall of small-scale business industries as they miss opportunities for product sale and subsequently leading to the financial crisis to pay to employees who have been in service of them with loyalty and commitment. It is also important to note that India, with youthful socioeconomics, lockdown causes increasingly human enduring that Covid-19 itself. This proceeding with lockdown is, tragically, making it always inescapable that India will endure a customer loaning cycle. It is likewise a developing danger of forbearance on nearby loan specialists. Country is additionally worried about the proceeding with shortcoming in the rupee in the midst of negative outcome of lower settlements from the Middle East as a negative result of fall in unrefined petroleum costs. It doesn't sound good to claim Indian banks in such a large-scale condition. Unfortunately, our country has not so much had a negative buyer credit cycle since the beginning of his portfolio in 2002 yet this is likely going to change. The world's biggest lockdown that shut a majority of the factories and businesses, suspended flights, stopped trains and restricted movement of vehicles and people. The world's biggest lockdown may have cost the Indian economy Rs 7-8 lakh crore during the first phrase of 21-days.

With the intent to contain the spread of COVID-19, Prime Minister Narendra Modi with effect from March 25 announced a nationwide complete lockdown that brought as much as 70 per cent of economic activity, investment, exports and discretionary consumption to a standstill. Only essential goods and services such as agriculture, mining, utility services, some financial and IT services and public services were allowed to operate. The rapid spread of COVID-19 has not only disrupted the global economy but also triggered a partial shutdown in many parts of India from early March and an almost complete shutdown from March 25. Stating that the pandemic came at the most inopportune time for India whose economy was showing signs of recovery after bold fiscal/monetary measures, Centrum Institutional Research said the country again stares at the possibility of low single-digit growth for (April 2020 to March 2021). By these prevailing circumstances, this nationwide complete lockdown is likely to shave off at least 7-8 trillion.

2.3 Impact on Environment

As India finishes nearly 3rd phase of a legislature commanded lockdown to control the spread of the coronavirus, urban areas with poor air quality have been announcing cleaner air and lower contamination a normal result of the across the country conclusion. With less vehicles out and about, decrease in utilization of oil based goods and decrease in power request from the business and mechanical division, around 78% urban areas where air quality is recorded have detailed "great and palatable" levels during the lockdown time frame, contrasted with 44% urban areas with these degrees of air quality in the pre-lockdown stage.

On April 21, the National Aeronautics and Space Administration (NASA) likewise released a picture, as per which its satellite sensors watched vaporized levels at a 20-year low for this season in northern India after only seven days of decreased human exercises. As indicated by an information tracker created by the Energy Policy Institute at the University of Chicago, India's power utilization has fallen by 18.72% (till April 3) because of the lockdown. Likewise, according to the information ordered by the Center for Research on Energy and Clean Air (CREA), an autonomous research association dealing with clean air and clean vitality, there has been an away from of utilization of oil-based goods and coal by businesses in areas inside and around urban communities.

The CREA report stated, "all coal-based force plants in 300 kilometers span of Delhi (Haryana, Punjab, and Uttar Pradesh) aside from two units at Dadri Power Plant have been closed down because of low interest." It underscored that there has been a "decrease in general force request and related coal

utilization by the force age offices the nation over." The report thought about force age in India during the fourteen days before March 24 (the day of the lockdown) and fourteen days after and found a 19% in general decrease in power age in India. Coal-based force age specifically decreased by 26% during a similar period, said the CREA report. Because of the decrease in utilization and age, the report arranged by Lauri Myllyvirta and Dahiya of CREA indicated that "exceptional and clear decreases in contamination levels, which are an aftereffect of diminishing petroleum derivative utilization in transportation, businesses and vitality part."

Though the impact of lockdown on education and economy show negative signs by giving a stop to 1.3 billion individuals in their activities, it has evidently caused positive changes in the environment as Skies are more clear and stream water appears more clean. The River Ganga has risen up with crystal clear water. In an uncommon locating, fishes can be seen close to the water steps at every pond. This appears to have happened in light of nonappearance or groups and clean water. The lockdown has additionally prompted better air quality. As indicated by the World Air Quality, the normal grouping of PM 2.5 in New Delhi descended by 71 percent for seven days a month ago. Nitrogen Dioxide, a toxin, has additionally seen a decay of 71 percent. While in many pieces of Delhi, the water of River Yamuna has additionally begun to show up clearer in southeast Delhi.

3. Conclusion

Therefore, by observing impact of lockdown on education, economy and environment, it can be concluded that the effect of lockdown is very severe on education and economy and it is indeed a blessing in disguise to the environment as it is turning back to its original form in every aspect.

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SOCIO-ECONOMIC IMPLICATIONS OF CORONA VIRUS PANDEMIC WITH PARTICULAR REFERENCE TO INDIA**Dr. Padmalatha Gummalla**

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Abstract

The previous year (2019-20) was a mixed bag in terms of economy seen in form of a ticking debt bomb, slowdown with non-efficacy of leadership in trade war politics and the Brexit. However, the current year (2020-21) had a rocky start with invasion of COVID-19 on human civilisation. The following work is intended to provide a perspective on the evolving situation due to ongoing pandemic and implications of lockdown on education, environment and economy. The following work is based on secondary data available in the midst of the pandemic and is subject to change as per responses of various stakeholders.

1.Introduction

A technological society has two choices. First it can wait until catastrophic failures expose systemic deficiencies, distortion and self-deceptions. Secondly, a culture can provide social checks and balances to correct for systemic distortion prior to catastrophic failures - Mohandas Karamchand Gandhi.

The coronavirus outbreak caused by SARS CoV-2 virus, which has manifested wide impact on global economy affecting thousands of people, is foremost a human tragedy. The mutation of the outbreak is swift, so much that the measures taken till now may fall rapidly out of date. As the pandemic continues to spread, almost every country has reported cases, but the burden is asymmetrically distributed. As on 15th May 2020, the countries are at different stages of the pandemic with 32 percent of total confirmed cases reported in the United States, the highest across the world, and India at 12th position with 1.8 percent.^[1] There is difficulty in debating the right approach to the containment, since the countries are in various stages from some being effective at initial containment but witnessing resurgence, some manifesting decline, some like Iran being at the peak of infection, to Russia and Turkey seeing a recent acceleration. India declared the controlling measures since 25th March, and evolved its response strategy, including extending the nationwide lockdown in response to increase in the cases.^[2]

The public-health tools and approaches to be deployed vary considerably in each country and have varying effects on education, environment and economy. Measures including physical distancing, travel restrictions, effective use of personal protective equipment (PPE), testing and tracing, and healthcare surge capacity, depending on epidemic phase and local context, have prompted widespread closure of primary, secondary, and tertiary schooling and various economic activities like restaurants, retail, tourism, transportation and logistics, entertainment, sports, etc.^[3]

On education front, since the Spanish flu pandemic of 1919, which is similar to the proportions of 2020 pandemic, India has undergone incredible development. From indigenous education widespread across the India, through the British introduction of western and modern education, today most of the schools follow a uniform school model in terms of tutoring, subject, syllabus, governance, extracurricular activities etc., with minor changes. The gross enrolment ratio ranges from 108.6% in primary education to 26.3% in higher education. The pandemic has affected every school in India from large and state of art campuses with thousands of students charging hefty fees to tuition-free schools where children are taught under a tree with a small or no campus.^[4]

The economic impact amplified with the lockdown and has taken form of “The coronavirus recession” with side effects like 2020 stock market crash on 20 February 2020 among others.^[5] Since the 2008 financial crisis, corporate indebtedness increased from 84% of gross world product in 2009 to 92% in 2019.^[6] The coronavirus recession has now pushed these corporates to the brink of restructuring due to failure of interest payments or debt refinancing.^[7] In 2019, the IMF had been continuously warning regarding the negative impacts of 'heightened trade and geopolitical tensions' like US-China trade war and Brexit, as the world economy started going through a "synchronized slowdown" and cracks were manifesting in consumer market through a 'sharp deterioration' of manufacturing activity.^[8] ^[9] The inverting of the US yield curve in 2019, tensions due to trade war, the involvement of federal reserve in role of investor to provide funds to spiked repo markets provided signs of the economic slowdown.^[10] ^[11] The emerging markets such as China, India, and Brazil, where 25-30% of bonds had been issued by high-risk companies are therefore at greatest risk.^[12]

In addition to above, since the beginning of industrialisation era, the increase in greenhouse gases emissions spiked the averaged global temperatures on the Earth leading to rising sea levels, melting glaciers, and consequently affecting vulnerable populations through increase in instances of forest fires and cyclones, etc.^[13] A significant observation during the pandemic was the fall in levels of air pollution and carbon emissions due to decline in travel and employment, complemented by disruption in

environmental diplomacy efforts, including the postponement of the 2020 United Nations Climate Change Conference, and the economic fallout suffered by the countries predicted to slow investment in green energy technologies. ^{[14][15]}

2.COVID-19 and Indian Education:

The impact and cost of the school closure varies across socioeconomic strata and is particularly felt by vulnerable and marginalised sections of the society, since the disruptions of scale of COVID-19 exacerbate not only existing disparities but also the following:

- i. **Suspended learning:** Though the government recommended shifting to online teaching, around 320 million students have been affected by school closures. For many students deprived by gender and economic division, schools are essential place of learning. With only 23.8 percent of households in India having internet access, there are fewer learning opportunities beyond school. ^[16] Disruptions to instructional time in the classroom can have a severe impact on a child's ability to learn. Also the transition to digital platform tends to messy and frustrating, thus creating both confusion and stress for the teachers, parents, and children.
- ii. **Malnourishment:** India recently received a score of 30.3 i.e., serious on Global Hunger Index, which indicates the level of hunger and nutrition in a country. ^[17] Mid-day meal scheme by the government, is one of the food safety net schemes, through which the children can access nutritious meal. Disruptions by the pandemic have therefore also compromised the nutrition needs of the underprivileged.
- iii. **Limited education of parents:** Parents with limited resources and education often depend on low skilled jobs pushing both the parents to depend on jobs for income. When regular schools are disrupted, the children and parents struggle to facilitate learning at home with limited resources. Working parents also need to leave their children alone and open to risky behaviours which can be amplified through peer pressure and substance abuse. Also, schools are hubs of productive social activity and human interaction, which the children in social isolation are likely to miss out.
- iv. **Strain on essential services:** Essential service workers such as doctors, nurses, and other healthcare workers are most needed during the pandemics. However, childcare obligations, particularly for women, have disruptions in work in form of absence, wage loss, and loss of productivity.
- v. **Increase in dropouts:** The gross enrolment ratio in primary education in India for 2015 was 108.6% in 2015, which shows the irregularity in form of some drop outs attending school again. The longer the

vulnerable children are out of school, the less likely they are to return, particularly those who were already attending school irregularly. It is a challenge for children particularly from distressed families, who need to work and generate income in face of economic shocks.

- vi. **Challenges in assessments of learning:** School closures in 2020 pandemic have led to deferment of most of the exams where students are most effected stakeholders. ^{[18][19]}Changes in schedules of or decisions to skip the examination assessments mostly affect the students from remote areas and create stress for students and disengagement to the families.

3.COVID-19 and Indian Economy:

The disruptions due to economic shocks by COVID-19 will have impact on all aspects of GDP i.e. private consumption, investment, government expenditure, exports, and imports. The urban inactivity will start with steep fall in consumption of non-essential commodities along with disruption in supply chain for essential commodities. ^[20] Lack of liquidity due to increase in unemployment and untimely access to credit and its facilitation by government will be key deciding factors. Due to the lockdown, around 37 percent of regular and salaried workers in urban areas who are informal workers will face uncertain income due to the stalling of urban activity. ^[21]

For the companies that are dependent on raw materials from countries like China, shutdown of factories and subsequent delay in supply of goods in China will affect their supply chains in both forward and backward linkages. ^[22] However, the disruption in supply chain in China can effect few industries and companies in India, as others are relatively protected due to lower dependence on Chinese raw materials and inventory stockpiling practice of Indian companies. The percent of trade in value added by Chinese components as part of gross manufacturing exports of India is around 26% compared to its peers such as Thailand, Vietnam, and Malaysia. ^[23]

A rush to assets like U.S. Dollars, Euro, etc., during increase in uncertainty has been a cause of concern since it depreciates other currencies. However, the dollar denominated debt in India is relatively lower than its peers like Indonesia, Mexico, Thailand, and thus India is in a low risk category making it less difficult to meet debt obligations. ^{[24][25]}

The survival of the companies is dependent on their level of debt and working capital requirements. The competition with the international players and dismal outlook in markets has led to fall in value of

commodities. Indian government has in particular used the price drop of oil, without passing the benefits to the consumer and thus used the excise duty charged for developmental needs.^{[26][27]}

Following are the key sectors and their respective economic impacts:

- i. **Banking:** The sector has total deposits of around 132 trillion INR with credit deposit ratio of 75.7%. With credit break up of 13% for agriculture, 31.7% for industry, 27.3% for services, the sector has been under high pressure in recent years due to recent NBFC crises and bank scams like that of Yes bank. The gross NPAs are 9.3% as in September 2019.^[28] Due to slump environment and cautious consumer sentiment there will be decrease in borrowings, increase in probability of defaults due to the lockdown, and less Net Interest Margin due to low interest rates. The fee income in capital market will be low and lower cross border transactions will decrease the transaction banking income. Demand for real estate, consumer goods, and working capital financing will be bleak in the short term. However, there will be increase in savings in short terms due to fear of uncertainty by consumers.^{[29][30]}
- ii. **Retail:** The sector contributes 10% of GDP and has around 8% workforce, with major segments of household, healthcare, and food and beverages. The non-essential categories production would be a huge challenge due to disruption of supply chain, primarily due to non-availability of raw materials. Cash rotation will be difficult for certain segments and rental contracts renegotiation would be followed up. Since there is cap on price for essentials by the government, it would be difficult to survive on margins primarily due to supply chain disruption. There is need for alternate distribution models since the buyers will less likely to visit frequently. Non essentials, however will face problems due to risking the shelf life and expiry, and fall in relative consumer demand.^{[31][32]}
- iii. **Aviation and tourism:** First to be hit in the pandemic, the aviation and tourism sectors contribute 2.4% and 9.2% of GDP respectively and employ around 410 lakh workers. The decline of foreign footfalls will lead to loss of blue collar and white-collar jobs, estimated to be around 70% in tourism sector.^{[33][34]} As seen recently in case of SpiceJet, the pandemic has worsened the challenges players primarily face in management of fuel costs, debt servicing, parking and maintenance of fleet, and government taxes and duties.
- iv. **Real estate and construction:** The sector as one of the largest employers has large multiplier effects on other industries and contributes around 13% GDP. The commercial market was going good in 2019 due to increase in private investment, however the residential market suffered due to NBFC crises, poor buyer sentiment, economic slowdown. The government launched Alternate Investment Fund in 2019 to bailout liquidity crunch suffering projects and upswing the consumption. The manufacturing sector, particularly

cement, steel, and construction materials will see halt. New constructions will be halted due to disruption in the supply chain. The migration of labour will create deep impact on availability of labour. The footfalls in commercial real estate will be decreased in the short term. ^[35] ^[36]

- v. **Textiles and apparels:** The sector is one of largest employers in the country with around 450 lakh workers and contribution of 2% to GDP. The prices have relatively been stable, however due to lockdown, the workers including contract employees face the wrath. The sector has been in problems with fall in exports of yarn and increase in imports, thus in the current situation global exports look bleak, while the local manufactures can depend on local sourcing. ^[37]
- vi. **Auto and auto components:** The auto sector and auto components contribute 7% and 2% GDP respectively and employ around 400 lakh workers. The sector was facing weak demand since 2019 and the pandemic has made it further worse. The liquidity availability is also constrained due to liquidity crisis being faced by NBFCs and banks. Further China contributes around 25% of imports and pandemic has disrupted the supply chain further. The availability of labour even after lockdown is bleak. The exports have been affected due to production shutdown in other countries and delay in purchases by consumers due to the pandemic. ^[38] ^[39]

4.COVID-19 and Environment

The industrialisation brought along it with the need for increasing employed population, urbanisation, and detriments to the environment like climate change, water pollution, air pollution, soil erosion, ozone layer depletion, ground water contamination and depletion, and change of biodiversity. ^[40] As popularly said these days, that COVID-19 has exposed weaknesses of capitalism, centralised leadership, similarly the pandemic has exposed the impact of human activities on nature. ^[41] With lockdown implemented in almost every country, the citizens mobility, transportation, travel, and industrial activity being arrested, the polluting activities have come to a temporary but beautiful standstill. Decrease in industrial production and emissions from vehicles have decreased the demand for fossil energy. On April 3rd within few days after national lockdown, the residents of Jalandhar, a city in Punjab state, woke up to a view of the Dhauladhar mountain range, a rare feat in normal times, considering the distance between the two places- lying nearly 213 kilometres apart from each other and have not been visible from the city in recent memory. Water bodies have also been clearing and the rivers Yamuna and Ganga have seen significant improvement since the enforcement of a nationwide lockdown. ^[42] The pandemic ironically on one hand

has destroyed a part of human civilisation and at the same time has had a very positive impact on recovery of nature.

5. Conclusion

The COVID-19 has manifested the deficiencies of systems the world runs on and the reparative actions needed. In case of India, the lessons learned in education are primarily useful given the country will be housing the largest young and working population. India need not aim for replacing low skill and wage worker jobs in China, but utilise the demographic dividend and make the next generation highly skilled and thus become a high output producing economy. India needs to address the digital and inherent gender divide among the population to unleash the universal quality education and learning outcomes. For that India needs to immediately focus on required infrastructure reach the poorest and remote communities as basic need rather than luxury. The focus on making curriculum and assessment digital friendly has to be the government's goal. Also, the distance learning due to lockdown has opened the curiosity of children, thereby leading them to understanding the options of self-learning, need for dynamism in teachers, and the ways digital connectivity can reach eventhe most remote, under privileged, and differently abled. The decentralisation tendency helps in creating small communities which can regularly interact, discuss and invent new solutions and pass it on to the other communities. However, given the amateur nature of users, the digital privacy and security needs to be prioritized by the government.

On economic front, the government will be expected to focus on economic recovery and take up following remedial course of actions:

- Tax compliance deadlines and rates will be relaxed in the face of fall in demand
- Tax booster in form of cuts in GST
- Deferment of GST payments to boost liquidity
- Efficiency in claims processing such as GST refunds
- Interest subsidy and income tax deduction in case of auto, home, and retail loans
- Rate cut by central bank for increasing consumption
- Cuts in VAT and excise duty for fuel
- Fuel infrastructure and airport parking charges to be almost be nullified

- Moratorium for loans
- Allow customers to postpone their travel rather than cancel, to sustain the demand
- Decrease in tax rates need to be considered for the consumers to increase the consumption.
- Monetary policy on inflation after government lifts the ban of price caps.

Due to fall in demand and increased debt obligation of the corporates, the governments will preferably be giving incentives like allowing production of Internal Combustion Engines with tax and interest incentives, deferment of BS-IV adoption deadlines to preserve the sentiment, however this have relatively higher detrimental effect on all the environmental cleansing that has been done till now by the nature. The beautiful effect of recovery is deemed to be temporary due to eventual restarting of transport and industries which as of 2020 are not 100% fossil free, and thus start producing incremental amounts of greenhouse gases.^[43] ^[44] However, the pandemic has impact on both sides, on behaviors like increase in digital communications which can decrease the emission but also preference towards private transport over public transport due to fear of infection.

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**ECONOMIC, SOCIAL, ENVIRONMENTAL, PSYCHOLOGICAL: CHANGES
AND CHALLENGES IN COVID 19 PANDEMIC****Dr. Sirisha Karavadi**

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Abstract

Society now needs to embrace the new normal where staying home is staying safe yet surviving economically, socially, psychologically and environmentally. There various aspects of life whose dynamics have completely changed due to current situation of the COVID-19 Pandemic. The said article tries bring a comparative analysis of various indicators in pursuit of individual's life. It highlights interdependency of various indicators and the challenges each will be facing post the control measures are revoked. The new normal will be masked faced, sanitized hands, sacred rules of proximity, the scale of anxiety in people going out for work, limited use of public transportation etc. will bring in a significant change in peoples life style. Coming times could become tougher and challenging with changing work environment not only in terms of productivity but companies would need to invest heavily on safety of its personnel. The change in international trade policies will affect not only in terms of market but also various business models of the companies. Different contributors of economic, social, psychological and environmental have been assessed on comparative basis in various scenarios like how the situation was before pandemic, during the lockdown and anticipation of what it would be like after the lockdown. The challenges that the country could face based on these parameters.

1.Introduction

Man being a social animal has been asked to live in a society which will now be bound by social distancing. Handshake, hugs and a peck on cheek are replaced by gently folded hands, a bow and grin or smile on a face. The economic norms, societal norms, behavior norms, family norms, education norms, business norms all will have different benchmarks. The new normal in the post COVID world where the economy needs to be fueled after a strict lockdown, the society needs to move on. The need of the hour is to coexist with the virus in such a way that its spread is contained and there would be complete eradication of the deadly virus. Over the years mankind has fought different battles but this time it's an unexpected one with varied dimensions and dynamics of world order. The change in the world order is that a strong and developed nation, a developing country and an under developed country all are hit equally by this global pandemic. The leader is the one who tackles it the best. Moving the economy in

positive direction yet beating the Pandemic by lowering the infections and decreasing mortality rate in the country.

In this paper we are going to assimilate the pre covid, lockdown and anticipate what changes and challenges we will see in the post Covid world. Economy, society, environment and psychology all have been impacted by this outbreak. The movement of people which could never be restricted had to come to halt. Nations and People are connected virtually but physical and social distancing has to be the new mandate. This situation has bought a lot of insights of our society and environment. The paper further shall deal with the new of norms of life and their significance on people's life economically, socially, psychologically and environmentally. Various news website also indicate the tough economic situation that the country is going through:

- “India's services collapsed in April with the coronavirus-led lockdown making the sector come to a complete standstill causing a historic spike in layoffs and reinforcing fears of a deep recession.”
- “The Indian services economy posted its worst ever month-on-month drop in business activity during April.
- The extreme slide in the headline index, which fell by over 40 points, shows us that the strict lockdown measures have led to the sector essentially grinding to a complete standstill," said Joe Hayes, an economist at IHS Markit.
- Highlighting that the economic damage of the Covid-19 pandemic has so far been “deep and far-reaching” in India, Hayes said: "Historical comparisons with GDP data suggest that India's economy contracted at an annual rate of 15% in April.

(economictimes.indiatimes.com)

2.Economic Indicators

An analysis of various economic indicators like GDP, Per capita income, Stock Market Indices, unemployment and oil prices given show up the challenge which will be faced by the economy once the lock down is lifted. The challenge is to make economic environment more viable post COVID or along with it. One of such measure of Self-reliant India Movement on five pillars for development of economy, infrastructure building, our vibrant demography, demand of our products would lead us through the challenges that are posed by various economic indicators. Strong economy is the key for healthy society, psychological and environmental positivity for any country. All the factors and indicators are bound to coexist and work in tandem to make a nation emerge as a victorious one beating the Pandemic.

Table 1: Economic Indicators

Economic Indicators	Pre covid	Lockdown	Post Lockdown anticipation	Challenges
GDP	Growing	Decline	Opening of full-fledged markets in the economy	Migration of workers, loss of jobs, closing of industries
Per capita Income	Steady growth	Decline	Steep decline due to recession phase	Local job creation and opportunities
Stock Market Indices	Normal	Downfall	Phased growth anticipated	Many sectors still would be facing problem as working with new COVID norms would take time.
Oil Prices	High	Negative	Steep rise	Public transportation a risky proposition
Unemployment	Existent	Increased	Decrease due to opening of economy	Mapping of skill and job.

3.Social Indicators

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An analysis of social indicators of a population is taken using various parameters liking housing, healthcare system of a country, education system, availability of jobs and working conditions, the gap between various strata of society are key social indicators. The society being the reflection of a nation will face the challenge without virus or coexistent with the virus based on different indicators. Change in economic scenario will also change social indicators. And the challenges would come along with it. The inclusion of technology in our day to day work and education system needs to be completely revamped. As everyone needs to be “e-educated” and should be provided with sufficient infrastructural facilities to combat with work and virus together. Along with this they also need to learn new skills for surviving where opportunities would become meagre and demand for jobs is going to decrease drastically. Using an online platform to sell you skill would become need of the hour for students and teachers. Survival will be

of the fittest. This applies not only to individuals but also to nations where the world is completely changing.

Table 2: Social Indicators

Social Indicators	Pre covid	Lockdown	Post Lockdown anticipation	Challenges
Housing	Growing	Stagnant	Decrease with income levels decreasing	Assimilating various factors
Health care	Reasonable	Improved for covid / other ailments and accidents decreased	Better system to tackle and contain COVID	High investment needed
Education	Schooling mandatory	Online mode	Increase in virtual learning	Making e resources accessible to majority of population
Work	Staggering	Work from home for few sectors/ other closed	Decreased opportunities	Creating alternate opportunities
Gap between rich and poor	Reducing	Started increasing	Wider	Can be reduced by job creation.

**4.En
viro**

Environmental Indicators

Environment plays a crucial role in representation of a healthy country. The one positive change has been on environment and atmosphere of our country. The air pollution levels have drastically come down due lower mobility of people and closed factories but keeping it on the same levels will be challenge faced by industrial norms. The conditions of our waterbodies have also significantly improved. The mission of cleaning rivers like Ganges and Yamuna there but was not happening, this lockdown has provided the

needed respite to our rivers. Sanitation in the cities has improved. Overall our mother nature got a chance to rest and restore itself. But the challenge would be in coming future as humans step out. Maintaining our environment which leads to an ecological balance for cohabitation with other species which were hibernating due to human intervention.

Table 3: Environmental Indicators

Environmental Indicators	Pre covid	Lockdown	Post Lockdown anticipation	Challenges
Air quality	Poor	Significant drop in pollution levels	Will go down again with vehicular, industrial emissions.	Maintenance
Condition of rivers, lakes and canals	Poor and non-potable water	Clean and see through water	Industrial emission, trash and garbage dumping	Maintenance
Ozone layer	Depletion	Repair started	High pollution and aerosols will start damaging it again	Control on other factors
Cohabitation with other species	Non existent	Return of migratory birds	Human intervention will increase	Maintenance

5.Ps

Psychological Indicators

Human behavior is the key factor in any society. The psychology of an individual to take a situation like of a pandemic into his stride and fight out shows the warrior like capacity of nation. A strong psychological nature having a positive inclination to get over a situation will drive the nation economically and socially. The pandemic situation has affected or shall affect people psychologically in many ways. The psyche of society which was completely a display of wealth is now stranded at home. The psyche was in a way leading to a driving force in the economy. The comfortable life style with lot of travelling, touring, shopping and display of lavish life have come to a full stop. The idea of socializing has changed, the way people need to behave has changed, and the meeting, greeting of people have changed. All of them have psychological impact on our life. Certain aspects of life like bonding with

family members, valuing them, valuing their contribution in the making the home have definitely left a mark on individual thought process as people have learned to share the load. On the contrary, there have been incidents in certain strata's showing increase in domestic violence. There is stress and anxiety in people but causes are different earlier it was running after money now along with that came the aspect of safety of our health and safety of people. Here challenge is to balance our mind and awaken the inner self to become tough to fight it physically, psychologically and emotionally. Social distancing should not become social isolation as this can be a cause of psychological stress. "The issue facing each and every one of us is how we manage and react to the stressful situation unfolding so rapidly in our lives and communities. Here we can draw on the remarkable powers of strength and cooperation that we also fortunately possess as humans. And that is what we must try to focus on to respond most effectively to this crisis as individuals, family and community members, friends and colleagues," said Dr Hans Henri P. Kluge, WHO Regional Director for Europe. (www.euro.who.int)

Table 4: Psychological Indicators

Psychological Indicators	Pre covid	Lockdown	Post Lockdown anticipation	Challenges
Stress and Anxiety	Related to work and work life balance	Stay home stay safe, loss of work, pressure of social media presence	Related being safe and keeping jobs safe	Psychological balance will be need of the hour
Lifestyle changes	Affluent	Economical	Being spend thrift again	Maintain a well-balanced and modest lifestyle and not being influenced.
Family values & Social Values	Depleting	Better bonding and work life balance, increased cases	Stress of work and loss of quality time	Valuing family relations, quality time,

		of domestic violence		and moving away from unnecessary wants.
Stigma of being quarantined	Non existent	Increased ostracization in the society	Staying safe, Saving ourselves from being tested COVID positive	Psychological counselling needed

6. Conclusion

The pandemic has changed the world impacting our industries, education system and the social fabric our lives. The mother earth got a chance to revive itself with less burden on it. At the sametime, we need move forward in retrospection of our lives and building a system where economy progresses showing all positive indicators. We as nation become strong psychologically, emotionally and nation which takes care of its environment. Stay home stay safe with moving economy. Build a nation which has a stronger economic immunity to these kinds of pandemics.

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DOMINO EFFECT ON COVID-19

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Abstract

COVID19- Pandemic effects of Corona virus:- How Global Economy is disturbed - The economic impact of the 2019–20 coronavirus pandemic in India has been hugely effected. The Government of India has announced a variety of measures to tackle the situation, from food security and extra funds for healthcare, to sector related incentives and tax deadline extensions. All the state governments of our country have collectively taken a decision to close down temporarily all the Academic Institutions to save from the spread of deadly virus. Keeping this in the view the situation has given a thought to start new revolution of education system through the online tools. The government's sudden enforcement of the lockdown seemed hastily prepared and immediately disadvantaged already vulnerable populations. Due to the Covid there is a heavy hit back on the Economy and Education. But blessing in the disguise. Pollution in the Environment decreased to the larger extent. During the first three weeks of March, the average nitrogen dioxide levels declined by 40-50% in the cities of Mumbai, Pune and Ahmedabad, compared with the same period in 2018 and 2019.

1.Introduction

The world's largest lockdown means all factories, markets, shops, Educational Institutes and places of worship are now closed, most public transport suspended and construction work halted, as India asks its citizens to stay home and practice social distancing. Lockdown in countries like India and Indonesia are more disastrous for human welfare and economies since there is no help for small businesses nor are there unemployment benefits, said Christopher Wood, Global Head of Equity Strategy at Jefferies.

2.Economy

The situation in countries like India and Indonesia is in contrast with the US where the Small Business Administration's Paycheck Protection Programme will provide up to \$349 billion in forgivable loans to small businesses to pay their employees for eight weeks during the health crisis. It does not make sense to own Indian banks in such a macro environment. India has not really had a negative consumer credit cycle since the inception of its portfolio in 2002 but this is probably about to change.

COVID-19 pandemic induced market instability and lockdown

- Sharp rise in unemployment
- Stress on supply chains
- Decrease in government income
- Collapse of the tourism industry
- Collapse of the hospitality industry
- Reduced consumer activity
- Rise in LPG sales.

The economic impact of the 2019–20 coronavirus pandemic in India has been hugely disruptive. World Bank and credit rating agencies have downgraded India's growth for fiscal year 2021 with the lowest figures India has seen in three decades since India's economic liberalization in the 1990s. The former Chief Economic Advisor to the Government of India has said that India should prepare for a negative growth rate in FY21 and that the country would need a Rs.710 lakh crore (US\$10 trillion) stimulus to overcome the contraction. However, the International Monetary Fund projection for India for the Financial Year 2021-22 of 1.9% GDP growth is the highest among G-20 nations. Within a month unemployment rose from 6.7% on 15 March to 26% on 19 April. During the lockdown, an estimated 140 million (140 million) people lost employment. More than 45% of households across the nation have reported an income drop as compared to the previous year.

Up to 53% of businesses in the country will be significantly affected. Supply chains have been put under stress with the lockdown restrictions in place; initially there was a lack of clarity in streamlining what is an "essential" and what is not. Those in the informal sectors and daily wage groups are the most at risk. A large number of farmers around the country who grow perishables are also facing uncertainty. Various businesses such as hotels and airlines are cutting salaries and laying off employees.

Major companies in India such as Larsen & Toubro, Bharat Forge, UltraTech Cement, Grasim Industries, Aditya Birla Group and Tata Motors have temporarily suspended or significantly reduced operations. Young startups have been impacted as funding has fallen. Fast-moving consumer goods companies in the country have significantly reduced operations and are focusing on essentials. Some defense deals have been affected/delayed due to the pandemic such as the delivery of Dassault Rafale fighter jets. Stock markets in India posted their worst losses in history on 23 March 2020. However,

on 25 March, one day after a complete 21-day lockdown was announced by the Prime Minister, SENSEX and NIFTY posted their biggest gains in 11 years, adding a value of Rs.4.7 lakh crore (US\$66 billion) crore to investor wealth.

The Government of India has announced a variety of measures to tackle the situation, from food security and extra funds for healthcare, to sector related incentives and tax deadline extensions. On 26 March a number of economic relief measures for the poor were announced totaling over Rs.170,000 crore (US\$24 billion). On 27 March the Reserve Bank of India also announced a number of measures which would make available Rs.374,000 crore (US\$52 billion) to the country's financial system. On 29 March the government allowed the movement of all essential as well as non-essential goods during the lockdown. On 3 April the central government released more funds to the states for tackling the coronavirus totaling to Rs.28,379 crore (US\$4.0 billion). The WorldBank and Asian Development Bank have approved support to India to tackle the coronavirus pandemic.

The Department of Military Affairs has put on hold all capital acquisitions for the beginning of the financial year.

- Economic situation
 - a. Energy
 - b. Agriculture
 - c. Manufacturing
 - d. E-commerce
 - e. Defence
 - f. Stock markets
 - g. Estimate of economic losses
- Concerns and commentary
 - Economic danger versus health risk
 - a. Supply chains and logistics
 - b. Salaries
 - c. Migrant workers and labour force
 - d. Lockdown extension
 - e. Suspension of MPLADS
- Post COVID-19 economic recovery

- a. Economic recovery suggestions
- b. Task forces
- c. State income and expenditure
- d. Liquor

3.Education

Most governments around the world have temporarily closed Educational Institutions in an attempt to contain the spread of COVID 19 pandemic. This crisis sheds light on the need for a new education model. Indian education cannot go online, only 8% of homes with young members have computer with net link. According to the 2017-18 National Sample Survey report on Education only 24% of Indian households have an Internet facility. While 66% of Indian population lives in villages, only a little over 15% of rural households have access to internet services. For urban households, the proportion is 42%.

Timeline

- On 19 March the formation of the COVID-19 Economic Response Task Force was announced by Prime Minister Narendra Modi on 19 March 2020 during his live address to the nation. The task force is led by the finance minister Nirmala Sitharaman. Though not formally constituted or no official date for relief packages being made, the consultation process with concerned parties has begun immediately. The Ministry of Finance immediately started consultations with the RBI and ministries to take stock of most affected sectors like aviation, hospitality, and MSMEs.
- On 21 March 2020, the Union cabinet approved incentives worth Rs.40,995 crore (US\$5.7 billion) for electronic manufacturing.
- Various state governments have announced financial assistance for the poor in the unorganized sector. On 21 March the Uttar Pradesh government decided to give a direct money transfer of Rs.1,000 (US\$14) to all daily wage laborers in the state and the following day Punjab announced Rs.3,000 (US\$42) each for all registered construction workers in state. On 23 March it was announced that Haryana labourers, street vendors and rickshaw pullers will be provided an assistance of Rs.1,000 per week directly deposited into their bank accounts. Below Poverty Line families will be provided rations (including rice, wheat, mustard oil, sugar) free of cost for the month of April.
- On 24 March, in his address to the nation, the Prime Minister announced a Rs.15,000 crore (US\$2.1 billion) fund for the healthcare sector.

- On 24 March at 2:30 pm, the Finance Minister made a number of announcements related to the economy such as extending last dates for filing GST returns and income tax returns. The due dates for the Sabka Vishwas (Legacy Dispute Resolution) Scheme 2019, customs clearances and for compliance matters under the Customs Act and associated laws has been extended to June 2020.
- On 25 March the Modi government announced the world's largest food security scheme for 800 million (800,000,000 people) across the country. Cabinet Minister Prakash Javadekar made the announcement in a press conference that the ration would be 7 kg every month (which includes wheat at a cost of Rs.2 (2.8¢ US) per kg and rice at Rs.3 (4.2¢ US) per kg.)
- On 25 March the Uttar Pradesh government banned the manufacture and sale of pan masala, stating in the order that "Spitting pan masala can help in spreading Covid-19". Following this, other states such as Andhra Pradesh, Rajasthan and Gujarat also banned spitting in public places.
- On 26 March the Finance Minister announced a number of economic relief measures for the poor. Rs.170,000 crore (US\$24 billion) will fund the Pradhan Mantri Garib Kalyan Yojana which will provide both cash transfer and food security; with the aim that no one goes hungry amidst the lockdown. Pradhan Mantri Ujjwala Yojana beneficiaries will get free cylinders for at least three months. This will benefit over 80 million Below Poverty Line families. The government will expedite payment of the first instalment (Rs.2,000) due in 2020–21 in April itself under the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN). For the organized sector worker, the government will pay the Employees' Provident Fund (EPF) contributions of both sides for 8 million employees of small companies who earn up to Rs.15,000 a month. The raise in the threshold from Rs.100,000 to Rs.10 million for triggering insolvency proceedings under the Insolvency and Bankruptcy Code (IBC) will help MSMEs. State governments were given various instructions and guidelines such as diverting district mineral funds for health needs relating to the pandemic.
- On 26 March India participated in the virtual 'Extraordinary G20 Leaders' Summit'. The G20 nations decided to inject over \$5 trillion into the global economy to counteract the pandemic's impacts. They agreed to work together, to strengthen the World Health Organization, develop a vaccine and make it available. They decided to share timely and transparent information, materials for research and development and data. Besides expanding manufacturing capacity for medical supplies, they agreed to ensure smooth flows of critical supplies.
- On 27 March the Reserve Bank of India (RBI) Governor Shaktikanta Das made a number of announcements including EMIs being put on hold for three months and reducing Repo Rates. Other

measures introduced will make available a total Rs.374,000 crore (US\$52 billion) to the country's financial system. Delhi government announced that from the 28th they will be providing free food to 400,000 every day. Over 500 hunger relief centres have been set by the Delhi government.

- On 27 March the Rajasthan government has decided to deduct the salaries of its officers and employees from one to five days.
- On 28 March the Prime Minister launched a new fund called PM CARES fund for combating such situations.
- On 30 March it was announced that the UP government would transfer Rs.611 crore (US\$86 million) to 2715,000 workers under MNREGA scheme.
- On 1 April the RBI announced more measures to deal with the economic fallout of COVID-19. WMA and short-term liquidity has been increased to provide relief to state governments; exporters have also been granted some relief in the form of relaxed repatriation limits.
- On 2 April the World Bank approved US\$1 billion emergency financing for India to tackle coronavirus labelled 'India COVID-19 Emergency Response and Health Systems Preparedness Project'.
- On 3 April the central government released Rs.17,287 crore (US\$2.4 billion) to different states to help combat coronavirus. The Ministry of Home Affairs approved Rs.11,092 crore (US\$1.6 billion) for states as relief under the State Disaster Risk Management Fund.
- On 6 April a 30% salary cut for one year was announced for the President, Vice President, Prime Minister, Governors, Members of Parliament and Ministers. It was also decided to suspend the MPLADS for two years and transfer the money, about Rs.7,900 crore (US\$1.1 billion), into the Consolidated Fund of India.
- On 8 April the Department of Expenditure, Finance Ministry, has allowed states net market borrowings of Rs.320,481 crore (US\$45 billion) between April to December. Rs.3,000 crore (US\$420 million) of funds under the PM Garib Kalyan Yojana have been given to over 20 million workers engaged in construction work by the various states and UTs. To provide relief to tax payers amid the covid-19 crisis, the government will release Rs.18,000 crore (US\$2.5 billion).
- On 10 April the Asian Development Bank (ADB) assured India of Rs.15,800 crore (US\$2.2 billion) assistance in the COVID-19 pandemic fight.
- On 14 April at 10 am the Prime Minister made a public speech in which he announced the extension of the nationwide lockdown, as well as a calibrated reopening. "From the economy's point of view, the

lockdown undoubtedly looks costly right now, but compared to the lives of Indian citizens, it is nothing" (*translation, original in Hindi*).

- On 15 April as part of the new lockdown 2.0 guidelines, the Ministry of Home Affairs announced, among other things, that all agricultural and horticultural activities will remain fully functional. Information technology companies can function with 50% staff. The partial lift of restrictions will take place from 20 April.
- On 17 April, RBI announced more measures to counter the economic impact of the pandemic including Rs.50,000 crore (US\$7.0 billion) special finance to NABARD, SIDBI, and NHB. Providing more relief to state governments, WMA limits have been increased by 60 per cent.
- On 18 April, India changed its FDI policy to protect Indian companies from "opportunistic acquisitions" during the COVID-19 pandemic.
- On 20 April limited economic activity is expected to resume outside of the COVID-19 containment zones. During this selective relaxation of restrictions, numerous activities will remain prohibited such as educational institutions, passenger movement by trains, cinema halls, malls, shopping complexes and gymnasiums.
- On 21 April it was announced that a team from "The Technology Information, Forecasting and Assessment Council" (TIFAC) under the Department of Science and Technology are preparing a white paper on the revival of the India economy. TIFAC has a "mandate to think for the future".
- On 23 April the Kerala government has decided to defer one month's salaries of employees. The government will reduce the salaries of all categories of government employees including teachers, university officers and employees in all PSUs, equivalent to a six days' worth salaries every month.
- On 23–24 April banks from the Shanghai Cooperation Organization (SCO) agreed upon a "joint roadmap for economic recovery".
- On 25 April the Ministry of Home Affairs allowed the re-opening of some shops under certain restrictions. As per the "national directives for COVID-19 management", liquor and other shops will remain closed. These relaxations do not apply to hotspots. (Official Communication)
- On 28 April the ADB approved a Rs.10,500 crore (US\$1.5 billion) loan to India to combat the pandemic.
- On 4 May India goes into its third stage of lockdown. The country has been divided into various zones (green, orange, red, containment) and as per the zone the economy has been opened up.
- On 5 May Maharashtra put a hold on capital works till March next year and imposed a 67% cut in development spend for 2020-21. This is the largest cut in expenditure since the state was formed.

- On 7 May in a telephonic conversation with Indian external affairs minister, the Minister for Foreign Affairs, Japan "requested cooperation for the resumption of activities by Japanese companies in India." Japan has around 1400 companies in India.

Preparedness:

The government's sudden enforcement of the lockdown seemed hastily prepared and immediately disadvantaged already vulnerable populations. There has been a mass exodus of migrant workers and concerns are rising about starvation among people who work in the informal economy. Implementing public health measures is difficult in places with overcrowded living conditions and inadequate hygiene and sanitation. Non-COVID-19 health services have been disrupted. Reports suggest that the government's efforts to provide financial support and a measure of food security to ease these pressures will be insufficient to meet demand. But better planning and communication could have helped avert this crisis.

Rates of testing have been low (0.28 per 1000 people as of April 20). However, efforts to reverse the situation are underway as hundreds of thousands of testing kits have become available, and more testing companies and laboratories have been approved. Testing needs to be expanded exponentially and strategically as a tool to provide epidemiological evidence. India's response has also been constrained by a shortage of health workers, but this should be remedied by new reforms that would mobilise additional health-care workers from different sources.

One threat to the COVID-19 response in India is the spread of misinformation driven by fear, stigma, and blame. There have been rising levels of violence against health-care workers and stigmatisation of people with or suspected of having COVID-19, which could impede reporting of illness. The pandemic has also been used to fan anti-Muslim sentiment and violence, after a gathering connected to the group Tablighi Jamaat was identified as being responsible for many cases. A welcome initiative to combat fake news is being led by a group of more than 400 multidisciplinary Indian scientists, who have voluntarily formed Indian Scientists' Response to COVID-19 to fight myths and misinformation about the disease.

In India's favour are its young population (65% aged <35 years) and, to date, a less severe pandemic than was feared. The lockdown is already having the desired effect of flattening the epidemic curve. From April 20, states began easing restrictions on the basis of district profiling of infection hotspots (a form of cluster containment). The immediate challenge is to keep infections at manageable levels and ensure the ability to test, trace contacts, isolate patients, implement COVID care plans, and disseminate timely

information. The central government should loosen its control and give states more autonomy over their funding and decision making. India must also pay much greater attention to the health sector and recognise the importance of having strong public sector capacity, especially in primary care and at the district level. India's public health-care system is chronically underfunded (at just 1.28% of GDP), leaving primary care weak. This pandemic could be the much needed wake-up call to the necessity of long-term changes to India's health system.

4.Change towards Ecosystem

Already, data shows that the main cities are recording much lower levels of harmful microscopic particulate matter known as PM 2.5, and of nitrogen dioxide, which is released by vehicles and power plants. PM 2.5, which is smaller than 2.5 micrometers in diameter, is considered particularly dangerous as it can lodge deep into the lungs and pass into other organs and the bloodstream, causing serious health risks. The sudden fall in pollutants and the subsequent blue skies signal a dramatic shift for India -- which has 21 of the world's 30 most polluted cities, according to the IQAir AirVisual's 2019 World Air Quality Report. **Lowest traffic pollution.** Even before the national lockdown started on March 25, the phased shutdowns in India were having an impact.

During the first three weeks of March, the average nitrogen dioxide levels declined by 40-50% in the cities of Mumbai, Pune and Ahmedabad, compared with the same period in 2018 and 2019, said Gufran Beig, a scientist with the System of Air Quality and Weather Forecasting And Research (SAFAR) under India's Ministry of Earth Sciences.

"The reduced fossil fuel emissions due to (the) transport sector and slowdown in other emissions-related activity is slowly reducing the air pollutants," Beig said.

The nationwide curfew in India on March 22 also resulted in the lowest one-day traffic pollution levels on record, analysis from CREA said. Other dangerous pollutants, PM2.5 and the larger PM10, which are less than 10 micrometers in diameter, also dropped steeply, the report added.

"It is most likely that even the record of March 22 will be broken, and we are seeing more and more cleaner days as industries, transportation and energy generation and demand are reducing across the country," said Sunil Dahiya, an analyst based in New Delhi for CREA.

Similar patterns showing drastic falls in pollution levels were seen in parts of Europe and China since their lockdowns, as industry and transport networks grind to a virtual halt.

5. Conclusion

With India caught between rising COVID-19 cases and a choking economy, education, and environment no conclusion for tomorrow can be drawn. The series of lockdown keeps prolonging, the end still unknown. The speck of hope not shattered, the individuals hope for the better tomorrow. Also the fighting over COVID-19 is inexplicable. Arrangements of Work-From-Home, online classes, online assignments, online meetings have brought an example of virtual living. Hoping to hear about the resilience of COVID-19 soon.

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PANDEMIC EFFECT ON INDIAN ECONOMY, EDUCATION AND ENVIRONMENT**Ms. K. Kala Bharathi^{1*} and Ms. K.V.M. Udaya lakshmi²**Department of Computer Science, St. Pious X Degree & PG College for Women,
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Abstract

COVID-19 pandemic is considered as the most critical health calamity of the century and it produced an unstable environment. COVID-19 pandemic is stopped many of economic activities and education sector, fortunately it benefiting our environment. Here, we are enlightened impact of covid-19 on Indian economy, education and environment and also discussed possible ways to treat the disruption.

1. Introduction

Corona virus disease 2019 (COVID-19) is an infectious disease, first identified in December 2019 in Wuhan, China, and has since spread globally, resulting in an ongoing pandemic. As of 14 May 2020, more than 4.37 million cases have been reported across 200 countries, resulting in more than 297,000 deaths. More than 1.56 million people have recovered(Reuters, 2020). At the outset mankind has seen many pandemics in the past and has affected socio-economic conditions for a considerable time before normalcy was restored. These epidemics have taught us lessons which need to be carefully looked and precautions to be followed to avoid huge devastation. For example, if you look at the Spanish flu which has killed more than 20-50 million people worldwide out of the infected 500 million, about 1/3rd of the world population, it came in 3 waves. While the first wave was very forgiving, the second was the most brutal, followed by the third (Kara N. Goldman, 2020). Corona virus has killed 2.97 Lakh people in initial 24 weeks, the number far higher than death caused HIV in 24 years(Reuters, 2020). A 2006 study in the Journal of Political Economy found that "cohorts in utero during the pandemic displayed reduced educational attainment, increased rates of physical disability, lower income, lower socioeconomic status, and higher transfer payments received compared with other birth cohorts (Douglas Almond Jr, 2006). Therefore, the impact of pandemic is on various sectors including transportation, tourism, health sector, agriculture, real estate, education system etc. which in turn effects on overall economy growth.

2.Objectives

The objectives are to discuss the severe effects of COVID-19 pandemic on our Indian system by disturbing economy, education and environment.

3. Effect of COVID-19 on Economy

As can be experienced, most of the airlines are grounded, many production lines are brought to grinding halt. This pandemic has created a huge stress on our economy and governments are finding novel methods to counter the same. From the Dun Bradstreet report on the economic effect on various sectors, there are some sectors that are affected in short term and some continue to have long term effects. Fields like MSMEs, Electronics, Tourism, Air travel, Gems and Jewelry, Entertainment, banking, and automotive are affected long term, there is going to be a severe effect on logistics, retail and wholesale in the short term. Some companies might disappear from the trading, the strong companies would post huge losses. Sectors like Fast Moving Consumer Goods (FMCG), Travel, Hospitality, Restaurants, and Shopping Malls will be hit the most. The reverse movement of migrant labor to their native places, sectors like real estate will be badly hit. There could be a huge shift in the way the world perceives discretionary spending and there could be huge cuts in budgets. Some companies would choose to cut down the salaries or the work force and realign their product line to a conservative mode. We can already see a huge change in multiple companies regarding the same. While the IT sector, software and chip manufacturers might see a good progress with WFH options, this wouldn't be feasible for various sectors which deal in person.

3.1 Projection of Indian economy in next few months: Lockdowns of varying strictness in various parts of the world have meant that economic activity has decelerated / come to a halt for a period of 2–3 months. The integrated supply chains mean that disruption in economic activity in one part of the world impacts other parts of the world quickly. India has implemented one of the strictest lockdowns in the world in an attempt to control the pandemic. While IMF has given an optimistic projection of + 1.8 % growth for the Indian Economy, most analysts expect India to register a negative GDP growth in 2020 (Estimates vary from -2.2 % to -0.5 %) (Diane Swonk, 2020). While the Government is expected to come out with a comprehensive fiscal package, the room for fiscal stimulus is limited because of the high level of accumulated public debt. Businesses have already started adopting a conservative approach. Expenditure is being curtailed, investment and growth plans are put on hold and the primary focus is on cash generation and conservation.

3.2 Management in Economic Sector: Managing Liquidity and optimization of cash flows will be very important. Cash will be most important for corporates. Fair valuation of assets and impairment will occupy a lot of time and attention of corporates and auditors.

Some measures which the Government can adopt to soften the blow and support the economy are:

1. Ensure that the liquidity infused by the RBI into the system is transmitted into the economic chain. Risk taking by bank managements should be encouraged so that they lend and do not hold on to reserves.
2. Direct Cash Transfers to BPL households
3. Increase in MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) activities
4. Aggressive Reforms – Bold Measures – Labour law reforms, sizing down the bureaucracy, creating an atmosphere where private enterprise is unshackled.
5. All the above could be achieved by the initiatives of the Govt. like huge packages being announced and utilizing them in major sectors getting affected.

4. Impact on Education

The months of March, April and May were crucial in the educational sector with board exams, competitive and semester exams and school admissions. Closure of schools and colleges will not only have a major impact on continuity in learning for young learners all over the world but also give rise to consequences related to society and economy. The original teaching methodologies implemented were the first which are going to be affected where many of them still believe direct contact with the students while teaching is always fruitful. Only a handful of educational institutions in India can adopt online methodologies in teaching as many of them are still under low income group who could not even afford e-learning solutions. Mid-day meals programs are also the major effected during this time where a significant no. of people in villages and cities depend in our country. Another major effected area is disruption in higher education sector which is actually the main determinant of our country's future. Placements and to an extent internships are going to get effected where there could be a delay for the onboarding students resulting even in unemployment from 8.4% to even 23% by mid of March and even to 30.9% by April (**Ajai Sreevatsan, 2020**). If the same situation continues a decline in the interest towards higher studies abroad can drastically increase. The reason for decline could also be the policies and measures taken up by those countries due to the same situation. There could also a decline in the admissions of HEI's in the next academic year depending on the situations pertaining in that particular state.

4.1 Management in Educational Sector: Some of measures are useful for recovery of education system:

1. In a work from home and learn from home situation involving enhanced use of Apps and IT tools, data privacy also will be a major concern and IT industry as well as educational institutions should take care to ensure compliance in this regard. Govt. should take active measures pertaining to current situation and enforce vulnerability scans and risk assessments in collaboration with private agencies.
2. Digital platforms pertaining to learning methodologies software's as well as management software's need to be implemented and further strengthened.
3. Innovative and mobile based learning models can be adopted by higher educational institutions for effective.
4. Immediate measures to lessen the effect of pandemic on research projects, internship programmes, job offers need to be taken.
5. Other traditional knowledge systems like Yoga, Metallurgy, agriculture, pharmacy need to be imbibed in current main stream education system.

For all the fore said above measures to get implemented Govt. should first ensure basic per capita income of a common man should increase to be able to afford the costs involved.

5. Impact on Environment

From the beginning of civilization, human beings started destroying the nature in numerous ways for their own benefit. The rapid increase of human population is putting an incredible strain on our environment. One of the largest environmental effects of human population growth is the problem of global warming and other including air pollution, water pollution and ozone layer depletion etc. by their daily activities. For this reason, the indirect impact of the virus on the environment has been little analyzed. The first studies estimated a positive indirect impact on the environment. Fortunately, after lockdown announcement most of the population struck in their homes, automatically it helping to our environment. At this situation, transportation ban reducing the evolution of greenhouse gases, most of the offices and shopping malls got shutdown automatically air conditioners are switched off, which in turn reducing depletion of chlorofluorocarbons. Improved Air quality by minimal activity from industries, factories and construction sectors reduced the risks for toxins to shot. Closing of few industries benefited to improve water quality because chemicals, waste, plastic, and other pollutants float in water got reduced, this credit definitely goes to COVID-19 (**Vinay Trivedi, 2020**)

Some of the unbelievable environmental changes witnessed in India are

i. New Delhi was ranked as the most polluted city in the world by WHO in May 2014. It deemed 25 percent above unsafe level in air quality. Due to lockdown roads are empty, industries, construction were ground to halt. AQI levels have regularly fallen below 20. The skies are suddenly piercing blue. Even the birdsong seems louder.

ii. Very rarely seen, South Asian River Dolphins also known as Ganges Dolphins have been spotted back in the Ganga River, due to the reduced pollution in water.

iii. Flamingos usually migrate to the area every year, but due to Covid-19, thousands of flamingos have gathered in the city of Navi Mumbai.

6. Conclusion

Even though much progress has been seen innovating new technologies over the last decade. The number and difficulty in global health challenges has persisted. Globalization has increased the interdependency on other countries, economies, and cultures, but also carrying infectious disease outbreaks that threaten all. To overcome such challenges government should take some actions in collaboration with other countries.

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COVID-19: IMPACT OF LOCKDOWN LEADS TODIGITALIZATION

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Abstract

The digitalization is one of major thing which is playing major role in day-to-day activities of citizen's as there is a lockdown due to corona virus. Digitalization is considered as a solution to continue their daily transactions from any place to any place without going outside and getting affected. Digital learning is also a solution to the students to continue with their academics by sitting in home. It is impossible to make them sit at one place and teach, as it is mandatory to maintain social distance. To overcome mental stress at this point of time people have adopted workouts like yoga, meditation through online modes. Digital payments and paperless transactions have become habituated after demonetization but now it is obvious to implement due to social distance. If it is related to health issues Telemedicine have also introduced. In this paper I have discussed current situation or need of the hour of Digitization and also emphasized on awareness among the people and its importance. Worldwide the virtual conferences and meetings instead of face to face meetings and various webinars and conferences have demonstrated the need of Digital era.

1.Introduction

According to research firm Gartner, digitization is “the process of changing from analog to digital format.” This process creates digitized data “without any different-in-kind changes to the process itself,” which can then be used for business purposes. That's where digitalization comes in, which happens when “digital technologies [are used] to change a business model and provide new revenue and value-producing opportunities.” Take counterfeit goods, for instance. Previously, companies had to rely on investigation agencies, legal counsel, local sources, distributors, and law enforcement in order to keep track of and monitor counterfeiting.

However, they had no effective way to let their consumers know how to spot counterfeits. The problem was twofold: this might potentially reveal trade secrets, and companies would rather not admit publicly they have an issue with counterfeiting. With the proliferation of e-commerce, this has only become more difficult for brands as consumers are faced with more platforms to purchase from, and as such, more opportunities to be swindled. The number of words you can make in combination with the word Digital

has only increased due to lockdown. It is quite understandable; we have had initiatives like Digital India, digitalization, Digitization, Digital world etc. impacting our day to day life.

Impact of Digital India

Digital India is an initiative by govt of India to help the country adopt digital initiatives. Initiatives which are expected to cut dependency on bureaucratic processes, decrease corruption and help cut down time in taking public services to the citizens of the country. The impact of Digital India on India's economic growth is supposed to be long-lasting. With the initiatives in the Digital India Scheme are all driven by technology?

2.Objectives of the Study

1. To Analyze the impact of Lockdown on Digital India
2. To study the digital and paperless Transactions and impact of lockdown
3. To understand the increasing of Digital Learning
4. To bring awareness among the citizens about digital health and change in life style

3.Research Methodology

In this paper I have discussed all the objectives theoretically and by collecting the information of secondary data. Through websites and articles published in journals are analyzed and interpreted.

4.Literature Review

Ting, D. S. W. et al. (2020) have emphasized that These digital technologies include the internet of things (IoT) with next-generation telecommunication networks big-data analytics artificial intelligence (AI) that uses deep learning and blockchain technology They are highly inter-related: the proliferation of the IoT (e.g., devices and instruments) in hospitals and clinics facilitates the establishment of a highly interconnected digital ecosystem, enabling real-time data collection at scale, which could then be used by AI and deep learning systems to understand healthcare trends, model risk associations and predict outcomes.

Alexander Muacevic and John R Adler (2020), discussed in light of rising concern about the current COVID-19 pandemic, a growing number of universities across the world have either postponed or canceled all campus events such as workshops, conferences, sports, and other activities. Universities are taking intensive measures to prevent and protect all students and staff members from the highly infectious

disease. Faculty members are already in the process of transitioning to online teaching platforms. In this review, the author will highlight the potential impact of the terrible COVID-19 outbreak on the education and mental health of students and academic staff. Crawford, Joseph; Butler-Henderson, Kerryn; Rudolph, Jürgen Glowatz, Matthias(2020) they have found that the responses by higher education providers have been diverse from having no response through to social isolation strategies on campus and rapid curriculum redevelopment for fully online offerings. We provide in our discussion a typology of the types of responses currently undertaken and assess the agility of higher education in preparing for the pandemic. We believe there are significant opportunities to learn from the pedagogical developments of other universities, in order to strengthen our collective response to COVID-19 now and into the future.

5. Discussions

5.1 Digital India

Some of the key initiatives of Digital India were

- Starting a Digital Locker to help Citizens of India store their important government ids such as PAN Card, Passport, Voter id card and education mark sheets. All the citizens need to use their locker is an Aadhaar Card.
- My Gov Portal to improve good governance by help from citizen engagement.
- ORS portal to help citizens of the country to handle online appointments, pay online fees of doctors and government hospitals.
- Design Framework to allow those were digital signing of documents and a few other initiatives were taken to grow the country with the help of latest technology.

The Impact of Digital India was expected to

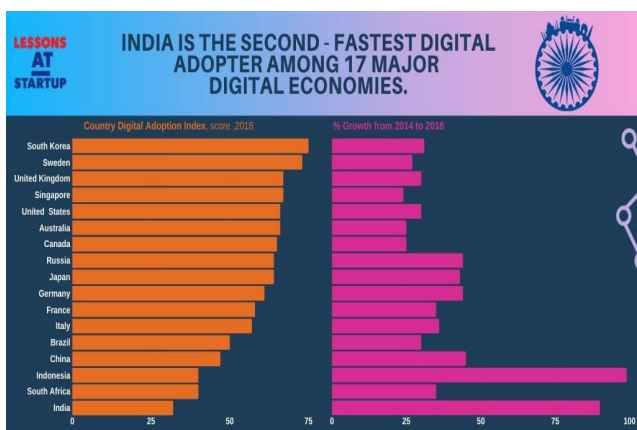
- Reduce Corruption.
- Increase speed of public sector services rendered to citizens of the country.
- Decrease documentation.
- Provide an easy to manage online storage to store all documents.
- Provide simple and easy to use cloud space on the internet.

Our governments for years have worked towards creating an economy which is more reliant on the internet and less on the paper-based economy. The incumbent govt provided a single name “Digital India” to all the digitization, digitalization and other initiatives taken by govt to have a positive impact on our economy.

5.1.1 Digitalization and Paperless Transactions

Initiatives towards Cashless Transactions

A “cashless transaction” is a purchase where payment is made electronically (such as ACH or wire transfer), credit card, or some other means that does not involve currency. In theory, barter would be a cashless transaction, but in modern use it generally refers to moving money without using currency. Here are numerous benefits to having a cashless economy. Although it will take India a few more years to be a completely cashless economy, cashless transactions in India have seen a steep upsurge since the first quarter of 2017.



- Being a cashless economy furthers the cause of digitization and takes us one step closer to utilizing technology at its finest.
- Physical thefts and robberies will reduce with a reduction in cash circulation.
- The printing cost for currency will come down by and large. Fake currency issues will also reduce.
- Cards and Mobile Wallets are handier to carry around and take up less space than cash.
- It becomes easier to follow your expenditure because everything is tracked online.
- Discounts and cash backs are being offered for making online payments. Reward points are also being offered by mobile wallets and UPI applications to entice more users.
- Service tax has been waived on card transactions up to Rs 2000.

- Transacting online improves your budgetary discipline. Having less cash in your wallet forces you to cut down on the smaller yet regular expenses that sneak up into your expenditure list.
- Transacting online can help you with exact amounts. This means that there is no fighting for small change or paying an extra rupee because you are short of coins.
- In case of loss or theft of cards, it can be blocked within minutes to prevent misuse.

Types of Cashless Payment Methods

There are numerous ways to go cashless. Here are some of the best methods to help you pilot your way into a cash-free world:

i. **UPI Applications** :UPI stands for Unified Payment Interface. UPI has changed the way we transact. At the core of a UPIs functionality is the fact that our mobile numbers are registered with our respective banks and linked to our accounts. A virtual payment address helps to send or receive money without entering any bank related information. Merchants would need to have a current account to receive UPI payments. UPI applications that are currently popular are BHIM, PhonePe, Google Pay/ Tez, ICICI Pocket, and SBI Pay.

ii. **Mobile Wallets** : Mobile wallets have become a convenient way of making payments without cash. Once you load money into your mobile wallet, you can use it wherever it is accepted. The most popular mobile wallet that is trending is Paytm. The disadvantage with mobile wallets is that it isn't linked to your account. Once you load the money into your mobile wallet, you can only spend it with a merchant who accepts payment through the said app.

iii. **NEFT & RTGS** :National Electronic Fund Transfer and Real Time Gross Settlement are electronic payment systems that allow convenient fund transfer between bank accounts. Both facilities are maintained by the RBI (Reserve Bank of India). The facilities can be used to transfer money only within India. The RTGS transfer window is from 8 am to 4.30pm on weekdays and bank working days. NEFT settlements happen in deferred batches between 8 am to 7 pm on bank working days. There is no facility for 'stop payment' instructions in case of either systems and the payments made are irrevocable.

iv. **Net Banking** :Net banking is an alternative to using your debit or credit card. The user needs to login to their net banking account to approve a payment. Net banking gives you the flexibility of transacting

even if you have misplaced your debit card or lost it. You can use internet banking to make utility payments, purchase goods and services online, or send and receive money.

5.1.2 Digital Classes through different digital Apps

A digital classroom is a classroom that is fully immersed in technology. Each student has access to an Internet-connected device, whether it be a laptop, tablet, Chromebook, or another device, and the majority (or all of) the curriculum is delivered via an online, engaging, interactive platform. Digital learning is any type of learning that is accompanied by technology or by instructional practice that makes effective use of technology. It encompasses the application of a wide spectrum of practices including: blended and virtual learning. Digital Learning is sometimes confused with online learning or e-learning, digital learning encompasses the aforementioned concepts.

A Digital Learning Strategy may include any of or a combination of any of the following:

- Adaptive Learning
- Badging and Gamification
- Blended Learning
- Classroom Technologies
- E-Textbooks
- Learning Analytics
- Learning Objects
- Mobile Learning E.G. Mobile Phones, Laptops, Computers, Ipads.
- Personalized Learning
- Online Learning (Or E-Learning)
- Open Educational Resources (Oers)
- Technology-Enhanced Teaching And Learning
- Virtual Reality
- Augmented Reality

Through the use of mobile technologies, digital learning can be used whilst travelling as mobile technologies gives us this advantage.

Digital Learning Tools and Resource

There are plethora of tools and resources online (Free basic Tools) can be used to create and enhance a digital learning environment. Listed below are resources and tools 21st Century teachers can use for digital learning.

RSS or Social Readers

Google+ Communities

YouTube Channels

I TunesU

Cloud-based Word Processors (i.e. Google Drive)

File-sharing platforms (i.e. Dropbox)

Evernote

Digital Pocket, Zetero, Mendely

5.2. Health Care and Impact of COVID –AI And MI

Everyone has been in lockdown for over a month. Many of us are bored, miss our daily routines, and frustrated about staying indoors all the time. It is completely normal to feel this way as it is in our nature to go out and socialize with other people. But what we don't seem to have realized is that there is a plus side to being in lockdown. The first and obvious reason is that we are helping to flatten the curve by safeguarding ourselves from Coronavirus.

Here is how being Quarantine is having a Positive Impact on our health

i. We Are Getting Sufficient Sleep

When we don't have to commute long distances to get to work or have to get the kids ready for school on time, we can get a little more sleep. Even an extra hour of sleep could mean seven hours instead of six, which makes a big difference to our health. In the evening too, as people don't have to get home late, it is possible to get to bed a little earlier and get more rest.

ii. Eating Healthy Home Made Food

Not only are we stuck at home, but most restaurants and delivery services have stopped. Many of us have also become cautious about eating outside food because we don't want to catch COVID-19. As a result, more of us are eating home-cooked food. Home cooking usually uses less oil, fresh ingredients, and little to no processed foods, making it a healthier option than eating out.

iii. Time To Workout

The extra time on our hands and the worry of gaining weight has prompted many people to start working out at home. From yoga and meditation to energetic Zumba sessions, people all over the world are getting creative with their home workouts. This is also a fun activity because the whole family can join in and stay healthy together.

iv. Home Care

With domestic help also needing to stay home, we find ourselves needing to do our own housework. This is a good thing for several reasons. Housework is one of the most productive ways to keep busy and not get bored. You are personally invested when you are cleaning your own home so you do a much better job. You find things that you haven't used in a long time and can take the call to throw them out. And you end up with a much cleaner living space. Sweeping, mopping, dusting, and cleaning cobwebs are all ways to keep active and burn extra calories.

v. Family Time

With parents working from home and kids not having to go to school, this is the best time to bond as a family. As parents get involved in home-schooling, they start to understand what their kids are learning in school, what their difficulties are, and how they can help them. Families also have more time to do fun stuff together like play board games, cook meals, do arts and crafts, and much more. This time together is a great way to relieve stress and improve mental health.

vi. Digital Health

Telemedicine 2020-Digital health is the convergence of digital technologies with health, healthcare, living, and society to enhance the efficiency of healthcare delivery and make medicine more personalized and precise!

vii. Telemedicon 2020

Telehealth is the distribution of health-related services and information via electronic information and telecommunication technologies. It allows long-distance patient and clinician contact, care, advice, reminders, education, intervention, monitoring, and remote admissions.

6. Conclusion

After gone through various aspects like Digital India, Digital Learning and Digital Health there is a lot of impact due to lockdown. People are habituated to adopt digital technologies. Sometimes it is mandatory to follow the government rules for self as well as for the safety of society. It is a positive change personally as well as institutionally. We can say that lockdown is bringing changes towards digitization. Educational Institutions are conducting various webinars in related to ICT Tools and its usage and also providing Training for their respective teachers and staff. With the help of Artificial Intelligence a machine learning health care organizations have brought changes for the sake of safety.

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IMPACT OF COVID-19 ON HUMAN LIFE AND THE USAGE OF DIGITAL TECHNOLOGY FOR DISASTER MANAGEMENT**Radhika Dubbaka**

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Abstract

The paper presents brief examples of use of information technology in different disaster management stages such as disaster response, recovery, preparedness and risk reduction. We find discussions on the use of information technology in each stage are scattered. A holistic perspective on the use of information technology throughout all disaster management phases is missing. Information systems play essential roles in recording, exchanging, and processing information. The combination of different roles enhances system performance. In so doing, we argue for the importance of having a comprehensive strategy of technology use throughout different disaster management stages, and the necessity of data standards for information sharing among different systems and stakeholders. In combating the adverse effects of COVID-19 and enhancing societal and economic resilience, digital technology and connectivity have emerged as an essential tool and alternative to the physical equivalent.

1.Introduction

The United Nations International Strategy for Disaster Reduction (UNISDR) defines disaster as “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources”.² In other words, when the impact of disruption goes beyond the control of human beings, that particular situation can be defined as disaster. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption, and environmental degradation.

Disaster impacts on human lives and the environment remind us of the intimate linkage between disaster and development. On the one hand, disasters stall development and can erode and destroy livelihoods. Disasters also affect social and economic investments aimed at eradicating poverty and hunger; providing access to education, drinking water, sanitation and safe housing; protecting the environment; and securing

employment and income. On the other hand, unsustainable development practices increase disaster risks. Unsustainable practices include encroachment into high-risk areas due to rapid urbanization, construction of unsafe shelters, pollution, loss of biodiversity, land degradation, and social discrimination.

As Covid-19 steamrolls across international boundaries, public health officials are paying close attention to countries that are flattening the curve, slowing the spread of infection. Can other countries emulate their success? Top of mind has been whether authoritarian regimes have an edge over democracies, because they can mandate top-down measures like lockdowns and digital tracking of infected people's movements and contacts.

But the latest information from Our World in Data, which shows the doubling rate of cases by country, indicates that the type of regime is less important than it might seem. Both the top and bottom performers in Covid-19 containment span the spectrum from autocratic to democratic. It's true that China is effectively flattening the curve, but so is South Korea, a vibrant democracy. Other democracies — the U.S., Spain, Italy, and France, are faring less well.

2.Literature Review

Manjunath B.S “Epidemics and pandemics have been threatening the human race time and again. SARS, H1N1, Ebola, and more have shown their teeth in the past, but with each such outbreak, we are learning new ways of fighting and managing such unexpected diseases that can potentially kill millions of people. Technology cannot prevent the onset of the pandemics; however, it can help prevent the spread, educate, warn, and empower those on the ground to be aware of the situation, and noticeably lessen the impact. Today, with converging technologies like mobile, cloud, analytics, robotics, AI/ML, 4G/5G, and high-speed internet, it has become possible to test several innovative approaches to pandemic response”

Jaques (2007) also identified a number of criteria for each of these three main stages; pre-crisis includes early warning, scanning, issue and risk management, planning processes, systems, manuals, training and simulations; crisis includes crisis recognition, system activation/response, emergency response and crisis management; and post-crisis includes evaluation, modification, the post-crisis issue impacts, recovery and business resumption. A review by Lettieri et al. (2009) reveals that the literature on crisis management

agrees on four time-oriented phases of crisis management: two pre-crisis phases, mitigation and preparedness; and two post-crisis phases, response and recovery (Lettieri et al., 2009). According to Alas (2009), in the pre-crisis step, the potential crisis is recognised and the corresponding organisational activities should be conducted to prevent the crisis happen.

3.Objectives

1. To study the impact of Covid-19 on Human Life
2. To study the reasons behind the occurrence of Disaster
3. To find out how the Digital technology is used for Disaster Management.

4.Application of Technologies

What, then, do the countries that have so far been effectively flattening the curve have in common Part of the answer is that they tend to be in East Asia — China, South Korea, Taiwan, Singapore and to a lesser extent Japan — where a collectivist spirit may encourage civic-minded embrace of and a more willing compliance with governments' infection control. In addition, these countries tend to be actively deploying technology to collect data on the virus's progress and efforts to contain it, including tracking those who are infected and their contacts. These two aspects of East Asian societies do not work independently; they reinforce each other.

Clearly, applying technology in these ways can be an important tool in containing the pandemic. But this use of technology raises sobering policy questions about data sovereignty and privacy, issues that are more contentious in Western democracies than in the more collectivist societies of East Asia. The most effective deployment of technology for tracking individuals' infection status, movements, and contacts hinges on three critical conditions that might each present difficult dilemmas for Western democracies: The adoption of the needed technologies (whether they are just strongly encouraged or made mandatory); a digital infrastructure enabled and activated by the government; and seamless data sharing between government and business that may afford few privacy protections.

There are five main categories of problems they strive to address:

- Contact tracing
- Testing and responder capacity
- Early warning and Surveillance
- Quarantine and Social control and

- Research and Cure.

4.1 Contact Tracing

Contact tracing is the process of tracking an epidemic's spread — and by far the need to track the pathogen is the most common reason given to increase the amount of data shared during a public health emergency. Traditionally and institutionally, the way contact tracing works is that when a patient tests positive for COVID-19, they share as much about their recent whereabouts and contacts during the infectious period as possible. Here, what we know about how a disease travels — its transmission — is critical. If a disease can travel by air, being in the same space may matter — but if it requires you to exchange fluids, as Ebola does, then being in the same space isn't as strong of an indicator. Public health professionals don't always know how a disease travels, exactly, as is the case with COVID-19 — but they locate and test as many contacts as possible and, for the ones who test positive, repeat the process. The two most important things about the traditional approach to contact tracing are that it is based on specific knowledge — a positive test — not on probabilistic models, and that it's directly tied to institutional response, so that it doesn't alarm people to a risk without a clear pathway to treatment. The primary value of contact tracing is that it significantly accelerates individual and system awareness, testing and treatment.

4.2 Testing and Responder Capacity

Another area where technology is applied in disaster response is to improve, adapt or invest in medical devices, tests, and protective gear. The good news in this area of intervention, which is exceptionally broad, is that when it's effective, it's transformative. The bad news, of course, is that a lot of the efforts to change or augment institutional testing capacity do so by reducing the quality control or scientific integrity of the underlying process.

Efforts to improve existing capacity, however, are some of the most positive ways to intervene, because they have comparatively specific problems to solve (say, improving the quality of protective gear), existing pathways to distribution (that is, testing, manufacturing and logistical distribution infrastructure) and users with at least a high-level understanding of the underlying tool. In other words, these efforts, where they are bounded by existing relationships, infrastructure and systems, often do well.

And, as a result, the efforts to ramp up to solve the practical problems surrounding testing for COVID-19 and the creative problems surrounding the need for equipment have been some of the most inspirational parts of the response. For example, South Korea's use of drive-through testing to limit transmission at health facilities and increase throughput is largely hailed as a success.

4.3 Early Warning and Surveillance

Early warning and surveillance to better understand the pathogen and monitor the outbreak are critical components of responding to any epidemic, but there are significant differences between disease surveillance and individual surveillance. Disease surveillance focuses on tracking the incidences of the disease and its path, which often coincides with temporarily tracking the people who catch or interact with a disease but, critically, only insofar as absolutely necessary to limit the spread of the virus. Disease surveillance is a critical component of any pandemic response — and COVID-19 has been no exception. There are significant, positive examples of this type of work. For example, despite deeply political and problematic early reporting, most countries have invested aggressively in testing, openly reporting their caseload and capacities, and are mobilizing rapidly around other critical disease-tracking initiatives. That means that there's increasingly robust public reporting about the comparative size and scale of the outbreak, for example, the WHO's daily global situation reports and resource portal and the Centers for Disease Control and Prevention's updated world map. A number of academic publishers and news outlets have made their content available for free, to help rapidly increase public knowledge and capacity.

4.4 Quarantine and Social Control

Quarantine and social control are important elements of the human side of a pandemic response — they are, essentially, the way that public health institutions try to contain, limit and stop the spread of a pathogen by controlling the movement of people. More concerning, we're also seeing law enforcement and militaries enforcing lockdown requirements with violence – already resulting in the death of a man seeking food in India. They are also an extremely sensitive element of the relationship between a population and its governments, so much so that most governments require exceptional permissions to impose this type of social control. Most of those protections predate the advent of modern technology and were the standard of care in an era before the breadth or the granularity of digitally enabled social control that's possible today was even imagined.

The common assumption in technology conversations is that resistance must emanate from the privacy community, and so these conversations often miss far more common problems, such as weak quality testing, bad problem selection and significant changes in the balance of individual and government powers. The way that we enable, administer and check the exceptional surveillance and social powers that each government exerts to contain COVID-19, especially as implemented through technology systems, will frame an important part of the future of state power in a world with increasing emergencies.

4.5 Vaccine, Mitigation and Treatment Research

Vaccine, mitigation and treatment research are easily some of the most valuable, and the most mature, uses of technology to accelerate pandemic response. For all of the incremental gains available through contact tracing, containment and mitigation, the way that public health systems “end” pandemics is through vaccines, treatments and institutionalizing response. The COVID-19 response has been no exception — even with expedited trials, public health authorities estimate that it will be between 12 and 18 months before a vaccine is ready. That timeline isn’t because it will take that long to develop a plausible prototype — it’s because that’s how long it will take to ensure that whatever vaccine governments deploy doesn’t have dangerous, unintended side effects.

5. Conclusion

In 2020, it’s time to move past binary conversations about the use of technology for the public interest — “public” and “good” are inherently political concepts, not guarantees. We’re far enough along to recognize that there’s tremendous value to be gained from effective use of technology, but that this value is realized by working through *systems*, not by “disrupting” them when we need them most. While our existing institutions have many and major flaws, they were almost all invented to solve even bigger problems, and circumventing public institutions ignores a lot of hard-won protections from lessons learned. And, it’s critical that we don’t limit the scope of conversations about the potential for harm to discussions of privacy — the use of technology can cause an enormous range of harms during disaster, from using ineffective tools to enabling sweeping abuses of power.

There’s an understandable urge to “do something” in any disaster, and an inspiring range of communities admirably rise to the challenge of providing critical support during times of emergency. Communities, too, are not unalloyed “good”s — and the communities pushing to “open” large parts of response informatics sometimes forget that governance largely exists because communities do not inherently realize their best selves. The technology industry is no exception — it often means well and has incredible capacities — and there have been truly transformative uses of data, research sharing and

integrated technology deployments throughout the COVID-19 response. If anything, the COVID-19 response has, both positively and negatively, illustrated the importance of using technologies to mobilize and coordinate response efforts.

This analysis has focused on the uses and abuses of technology interventions aimed directly at pandemic response — and intentionally excludes the systems and technologies involved in second-order effects, such as public communication, economic stimulus or law enforcement. And, perhaps predictably, where we end up is a recognition that access to technology can be valuable — but mostly when situated in need and exercised through institutional mechanisms to ensure contextual value, necessity and proportionality. In other words, when governed.

There is no shortage of inspirational stories emerging from the COVID-19 response — many of which involve the use of technology, but very few of which are driven by it. Emergencies, especially at a global scale, cause fear and, in many instances, truly awesome generosity. No matter your interpretation of the COVID-19 response, one thing should be universal: emergencies are not a blank cheque for state or digital platform power. And amid this historic, global investment in the international connections between our public health systems, it's absolutely essential that we use technology to amplify institutional capacity and state powers — while we also invest in designing oversight and governance that appeal to established, global standards for the exercise of exceptional powers.

In times of emergency, with the best of intentions, people mobilize the best of their capacities to respond, and those capacities are increasingly digital. If we're going to realize the value of those good intentions, we'll need governance to ensure that the direction they pave serves us all.

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IMPACT OF COVID-19 ON 3E's: ECONOMY, EDUCATION& ENVIRONMENT**Ramprasath TS^{1,2,3*}, KottaParan Jyothi¹, Ram Krishna¹, M. Sreenivasan¹, V. Himamaheswara Rao**¹Pace Institute of Technology and Sciences, Ongole, Andhra Pradesh - 523272.²Steed Capitals - Investment Firm³PACE INNOVATIONS*Corresponding author Email ID: dap@pace.ac.in

Abstract

Coronavirus Disease 2019 (COVID-19) is one of the most destructive pandemic that continues to claim lives around the world. As the pandemic crisis continues, we struggle to cope up with the current situation. In this article, we discuss the impact of COVID-19 on Indian economy and education. India government is planning to reopen economy and education has to address new norms in personnel and professional lives endangered by the pandemic. The infrastructure thus needs to be built and better planned to tackle the existing state of affairs to impact less on individuals and communities.

1. Impact of COVID-19 on Indian Economy

The pandemic is likely to impact the Indian economy through the following four vectors:

- Supply disruptions,
- Global and domestic demand,
- Stress on banking and financial sectors, and
- Falling oil prices

Fast-moving consumer goods (FMCG)

In the immediate aftermath of announcing the lockdown, the demand and consumption of FMCG and household products increased massively owing to panic buying by consumers, and companies had to increase production. Products such as food, groceries, and staples, health, and hygiene products including soaps, detergents, hand washes, and sanitizers, etc. witnessed a massive uptick in demand. However, with the implementation of the lockdown and companies facing disruptions across manufacturing and supply chain, there is a considerable slowdown in the growth of these products. The disruptions in supply chain

and logistics is leading to drying up of inventory levels at retailers which may significantly impact the supply of products to consumers.

Consumer durables and electronics

The COVID impact is expected to be felt acutely in the consumer durable sector as it has a high dependency on China for imports. India imports almost half of its completely built units of consumer durables from China. Besides, India also imports a bulk of its consumer durables components from China. Players may have already stocked inventory, so the impact is likely to be felt only towards the end of Q4 FY20. Product prices could see an increase soon. The situation is extremely unpredictable concerning this sector and is expected to take close to a year to show any signs of growth.

Hotels and restaurants

There has been a massive decline in the restaurant and foodservice business. The impact is growing exponentially as the country comes under lockdown for 21 days – food delivery has become the major means of revenues in the foodservice business. Similarly, the hotels and linked businesses (guest house, townhouses, banquet halls, etc.) have been direly impacted amid the lockdown — Business stays, leisure stays, family holidays, get-togethers, social occasions, etc. are being completely curtailed and in such a scenario the hospitality sector is taking a hard-hit layoff to seem inevitable in the restaurant sector as cash flows have dried up almost completely. Small and mid-size restaurants would be the worst affected as they struggle to cover fixed costs.

Travel and tourism

COVID 19 has resulted in one of the severest downturns for the travel and tourism sector in India. Coming on the back of a sluggish economy and subdued growth over the past few years, the COVID 19 blow is widely expected to push the sector to the brink. The aviation and tourism sectors are direly impacted leading to a near-collapse of the sector, majorly owing to the cancellation of inbound Visas and stringent restrictions on domestic or international travel. With revenue streams drying up, companies will be forced to restructure their workforce. Reduced working hours, work without pay, salary cuts and downsizing the workforce are expected to be the norm over the next three months.

Dependency on China, the Auto sector has a moderate dependency on China for imports with overall 18% of automobile component imports and ~30% of tyre imports. Wuhan is a large Auto hub with not only

OEMs but a large number of part manufacturers supplying parts to many tier 1 manufacturer and OEMs in India – many players started to feel the impact of COVID-19 in India in Jan itself with parts not reaching on time. The import dependency is higher in the two-wheeler segment as more than four-fifths of the imported components in two-wheelers are from China. Hence, this segment is likely to be impacted more. Chinese import ranges around 20 to 25 percent of the total imports, in other segments including buses, passenger vehicles and commercial vehicles and demand has been highly sluggish.

Alternatives for India

The sector has inventories sufficient for short-term support, but lack of single, critical components can hurt OEMs. Local Indian auto-component manufacturers are unlikely to immediately capitalize on the void created by China, as it takes time for OEMs to recalibrate their supply chain. In a scenario of disruption in the supply of key components, the industry could look at sourcing them either locally or from other countries such as Germany, South Korea, Japan, and Thailand (currently accounting for around one-third of the total imports). However, the change in procurement channels could be costlier and the supply could be insufficient to meet the demand.

Food and beverage

Development of the frozen and instant food industry chain is likely to be promoted to ensure supplies during the pandemic. The lockdown situation has led to consumers stocking essential products at home leading to greater demand initially. Further, quick recovery for F&B products is expected after this situation concludes. Consumers' close attention to hygiene and their awareness to improve immunity is expected to surge, prompting escalating consumer demand that can only be met with upgraded materials, techniques, and equipment.

Apparel and footwear

Inventory and distribution challenges amid the lockdown would imply that most enterprises' survival is likely to be determined by two quarters of destocking and withdrawal of funds, prompting reshuffles and integration. Use of on-site workplaces, party venues, gyms, and other places of a gathering is expected to remain limited, leaving companies with demand only for indoor products. Some brands might need to temporarily shut down or even close stores, providing an opportunity for business restructuring and store network reorganization.

Beauty

Fewer makeup scenarios are expected to give rise to new areas of demand, including "home makeup," "mask makeup," and "contrast makeup," influencing the pattern of beauty products. Amid the downturn for offline beauty stores, demand for in-home skincare is expected to increase. Supported by increasing use of virtual technologies, online shopping is likely to gradually replace offline shopping, making decentralization imperative for the industry

Retail

Non-contact demand during the pandemic is expected to boost sales at smaller stores that can host smaller crowds at a time. However, supermarket chains have ensured a supply of products at regular prices. Due to the pandemic's impact on consumer behavior and habits, "online-sales" are expected to witness a significant surge, even after the industry recovers. The establishment of online platforms is expected to become indispensable for offline stores, and online-offline service integration is expected to increase

1.1 Steps Needed to Minimize Impact on the Consumer Industry

1.1.1 Ensuring stock availability

While the PM has assured normal distribution of products and services for the consumers, current circumstances of country lock-down, "Janta curfew," closure of public transportation and public places, etc. imply a challenging outlook for the sector. The government must try to ensure that there is none to minimal disruption in the supply chain of consumer products, and their distribution follows the normal course, else the panic may lead to a mass shortage of essential products and commodities

1.1.2 Facilitating e-commerce

One of the major steps for the government to ensure minimum disruption is to encourage and facilitate e-commerce. Various players in the consumer industry have launched contact-less pickup and delivery models to ensure zero contact with consumers, and thus minimize the risk of contagion. Such contact-less methods are apt in the current scenario and could also lead to greater employment in the logistics and distribution departments for e-com players and retailers

1.1.3 Incentivizing and assisting logistics and delivery

While the risks associated with COVID-19 are common for all citizens, the government can offset its impact in the consumer sector by incentivizing logistics and delivery personnel and increasing its delivery fleet. Further, assisting such personnel by way of the distribution of essential precautionary and protective healthcare products, and mandating timely disbursements of salaries could boost their morale.

1.1.4 Boosting non-urban consumption

To ensure that rural and non-urban citizens have adequate disposable income at hand, the government may resort to direct-benefit transfers and direct-account transfer of wages. Already implemented by few state governments, this could allow immediate cash in hands of consumers, and they may not be constrained by non-availability of funds owing to delays or leakages. At the same time, ensuring digital infrastructure in non-urban areas for consumers for ordering products online is also critical during such times.

1.1.5 Offering unified solutions

Large organized consumer companies, retailers, and foodservice providers are likely to be amongst the most severely impacted lot owing to the closure of malls, restaurants, and people avoiding super and hypermarkets, etc. The government can encourage these players to unite with smaller retailers (kiranas) and e-commerce marketplaces and supply their stocks to ensure product availability. This will not only ensure revenue generation and inventory circulation for the larger players but will also lead to better availability of products for consumers.

1.2 Stock Market

Pre COVID-19, market capitalization on each major exchange in India was about \$2.16 trillion. The 2019 stock market rally was limited to 8-10 stocks within the large caps. The Sensex returned around 14% (excluding dividends) for the year 2019 but prominently featured blue-chip companies such as HDFC Bank, HDFC, TCS, Infosys, Reliance, Hindustan Unilever, ICICI Bank, and Kotak Bank, without which Sensex returns would have been negative. However, at the start of 2020, there was overall recovery which led to both NSE and BSE traded at their highest levels ever, hitting peaks of 12,362 and 42,273 respectively. At the beginning of the year, there were close to 30 companies that were expected to file IPO's. The market conditions were generally favorable as they witnessed record highs in mid-January.

Ever since COVID 19 strike, markets loom under fear as uncertainty prevails. It has sent markets around the world crashing to levels not witnessed since the Global Financial Crisis of 2008. Following the strong correlation with the trends and indices of the global market as BSE Sensex and Nifty 50 fell by 38 percent. The total market cap lost a staggering 27.31% from the start of the year. The stock market has reflected the sentiments this pandemic unleashed upon investors, foreign and domestic alike. Companies have scaled back; layoffs have multiplied and employee compensations have been affected resulting in negligible growth in the last couple of months. Certain sectors such as hospitality, tourism, and entertainment have been impacted adversely and stocks of such companies have plummeted by more than 40%. Regulatory measures are taken to offset impacts (to some extent) of COVID-19 in the consumer industry using monetary stimulus, cut in policy/fiscal rates and rationalization of GST rates.

2.Impact of COVID-19 on Education

Most governments around the world have temporarily closed educational institutions in an attempt to contain the spread of the covid-19 pandemic. These nationwide closers are impacting over 72% of the world student population. Several other countries have implemented localized closers impacting millions of additional learners. UNESCO is supporting countries in their effort to mitigate the immediate impact of school closures, particularly for more vulnerable and disadvantaged communities, and to facilitate the continuity of education for all through remote learning. This information is based on UNESCO observation.

Going to schools is the best public policy tool available to raise skills. While school time will be fun and can raise social skills and social awareness, from an economic point of view the primary point of being in school is that it increases a child's ability. Even a relatively short period of missed school does these; even a relatively short period of missed school will have consequences for skill growth. As of 27 April 2020, approximately 1.725 billion learners are currently affected due to school closures in response to the pandemic. According to UNICEF monitoring, 186 countries are currently implementing nationwide closers and 8 reaching economic and social consequences.

The impact was more severe for disadvantaged children and their families, causing interrupted learning, compromised nutrition, child care problems and consequent economic cost to families who could not work. Mathematical modelling has shown that transmission of an outbreak may be delayed by closing schools. However, effectiveness depends on the contacts of children maintain outside of school. School

closures may be effective when enacted promptly if school closures occur latest relative to an outbreak; they are less effective and may not have any impact at all. Additionally, in some cases, the reopening of schools of a period of closures has resulted in increased infection rates. As closures tend to occur concurrently with other interventions such as public gathering bans it can be difficult to measure the specific impact of school closures.

2.1 Consequences of school closures

The School closures in response to the COVID-19 pandemic have shed a light on numerous of issues affecting access to education, as well as broader socio-economic issues. As of march 12th, more than 370 million children and youth are not attending school because of temporary or indefinite country wide school closures mandated by governments in an attempt to slow the spread of covid-19. As of 29th march, nearly 90% of the world's learners were impacted by closures. Even though school closures are temporary it carries high social and economic costs. The disruptions they cause affect people across communities, but their impact is more severe for disadvantaged children and their families including interrupted learning compromised nutrition, child care problems and consequent economic cost of families who cannot work.

Working parents are more likely to miss work when schools close in order to take care of the children incurring wage loss in many instances and negatively impacting productivity. Localised school closures place burdens on school as parents and officials redirect children to schools that are open.

2.2 Student learning outcomes

School closures negatively impact student learning outcomes. Schooling provides essential learning and when schools close children and youth are deprived opportunities for growth and development. The disadvantages are disproportionate for under-privileged learners who tend to have fewer educational opportunities beyond school. When schools close parents are often asked to facilitate the learning of children at home and will struggle to perform this task. This is especially true for parents with limited education and resources.

Student dropout rates tend to increase as an effect of school closures due to the challenge of ensuring all students return to school once school closures ends. This is especially true for protracted closures. Disadvantaged at risk or homeless children are more likely not to return to school after the closures are

ended and the effect will often be a lifelong disadvantage from lost opportunities. Schools are also hubs of social activity and human interaction. When schools are closed, many children and youth miss out of our social contact that is essential to learning and development.

In response to the pandemic many schools and colleges moved to online distance learning via platforms like zoom, google meet etc. This leads to unequal access to technology; reliable internet access can prevent students in rural areas and from disadvantaged families. Lack of access to technology or good internet connectivity is an obstacle to continued learning, especially for students from disadvantaged families.

3.Impact of COVID-19 on Environment

Stay at home orders unacted to slow human movements and consequently the spread of COVID-19, have had obvious benefits for the environment, but they also affect environmental science. The worldwide disruption caused by the COVID-19 pandemic has resulted in numerous impacts on the environment and the climate. The severe decline in planned travel has caused many regions to experience a drop-in air pollution. In China, lockdowns and measures resulted in a 25 percent reduction in carbon emissions and 50 percent reduction in nitrogen emissions.Upto April 2020, increases in the amount of greenhouse gases produced since the beginning of the industrialization epoch caused average global temperatures on the earth to raise causing effects including the melting of glaciers and rising sea levels. In various forms, human activity caused environmental degradation, an anthropogenic impact.Prior to the COVID-19 pandemic, measures that were expected to be recommended to health authorities in the case of a pandemic included quarantines and social distancing reduced economic activity would help decrease global warming as well as air and marine pollution.

3.1 Negligible Air traffic in the time of COVID-19

Current conditions create a unique opportunity to study airport related pollutants especially nitrogen dioxide and formaldehyde. It is a footprint that will likely gradually return to its former shape as travel policies are relaxed. People are looking at COVID-19 impacts and seeing better air quality with less traffic. They might wonder if this is what the future could look like if we relied more heavily on electric vehicles than we do now. Yet, airplanes are not going to be electric anytime soon.

Airports are usually some of the hottest spots for nitrogen dioxide. Nitrogen dioxide is released when we burn fuel, either in airplanes or cars. When first released into the lower atmosphere or the part of the atmosphere that we breathe, nitrogen dioxide reacts with other nearby chemicals and forms ozone. Airplane exhausts also formaldehyde, which is an indicator of ozone formation and another air toxin. Breathing in ozone can cause chest pain, coughing and throat irritation.

Despite a temporary decline in global carbon emissions, the international energy agency warned that the economic turmoil caused by the coronavirus outbreak may prevent or delay companies from investing in green energy. However, extended quarantine periods have boosted adoption of remote work policies. As a consequence of the unprecedented use of disposable face masks, a significant number are entering the natural environment, adding to the worldwide burden of plastic waste.

4. Conclusion

The economic impact of the COVID-19 pandemic in India has been hugely disruptive, world bank and credit rating agencies have downgraded India's growth for fiscal year 2021 with the lowest figure India has seen in three decades since India's economic liberalization in the 1990s. The former chief economic adviser to the government of India has said that India should prepare for a negative growth rate in FY21 and that the country would need 70 lakh crore rupees stimulus to overcome the contraction. However, the international monetary fund projection for India for the financial year 2021-22 of 1.9% GDP growth is the highest among G-20 nations within a month unemployment rose from 6.7% on 15 March to 26% on 19 April. During the lockdown, an estimated 140 million people lost employment. More than 45% of households across the nation have reported an income drop as compared to the previous year. The Indian economy is expected to lose over 32,000 crore rupees every day during the first 21 days of complete lockdown which was declared following the Corona virus outbreak. Under complete lockdown less than a quarter of India's 2.8 trillion economy is functional upto 53% of businesses in the country will be significantly affected. Supply chains have been put under stress with the lockdown restrictions in place.

Initially there was a lack of clarity in stream lining what is an essential and what isn't. Those in the informal vectors and daily wage groups are the most at risk. A large number of farmers around the country who grow perishables are also facing uncertainty. Various businesses such as hotels and airlines are cutting salaries and laying off employees. Major companies in India such as Ultratech cement, Bharat Forge, Aditya Birla Group and Tata Motors are temporarily suspended or significantly reduced

operations. Young start-ups have been impacted as funding has fallen. The government of India has announced a variety of measures to tackle the situation, from food security and extra funds for healthcare to sector related incentives and tax deadline extensions. On 26th march a number of economic relief measures for the poor were announced totalling over 170000 crore rupees. On 27th March the Reserve bank of India also announced a number of measures which would make available 374000 crore rupees to the country's financial system. On 3rd April the central government released more funds to the states for tackling the coronavirus total to 28379 crores rupees. The World Bank and Asian development bank have approved support to India to tackle the coronavirus pandemic. On 17th April the RBI Governor announced more measures to counter the economic impact of the pandemic including 50000 crore rupees special finance to NABARD, SIDBI, and NHB

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EFFECT OF COVID-19 ON EDUCATION, ECONOMY AND ENVIRONMENT IN INDIA

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Abstract

The COVID-19 pandemic is considered as the most crucial global health calamity of the century and the greatest challenge that the mankind faced since the Second World War. This new infectious disease first emerged in Wuhan, Hubei province, China in December 2019 and was named as COVID -19 by the World Health Organization (WHO). According to the report of the World Health Organization (WHO as of April 18 2020), the current outbreak of COVID-19, has affected over 2164111 people and killed more than 146198 people in more than 200 countries across the world. The outbreak is declared as a national emergency by the World Health Organization. As far as History is concerned, instances of outbreak of pandemics is not new to the human civilization. But, compared to other diseases, COVID-19 is likely to cause greater suffering than other contagious diseases. Since there is no clinically approved drug or vaccine for the disease, it is spreading rapidly and posing a massive health threat to the entire world. Almost all the nations across the globe are trying hard to slow down the transmission of this disease by treating patients , quarantining suspected people, restricting large gatherings, social distancing, following complete lockdown and most important, creating awareness among people. The Coronavirus pandemic is certainly disrupting the globe by challenging people and has created a huge impact on human life. It has significantly disrupted various sectors in India. It has not only affected the lives of humans but also has a devastating effect on education, economy, environment and other spheres. This paper throws light on the impact of lockdown on education, economy and environment in India.

1. Effect of Covid-19 on Education

The Coronavirus outbreak has brought life around the world to a virtual standstill. The pandemic is expected to have a huge impact on education. The state governments across the country have shut down educational institutions in the second week of March as a preventive measure to contain the spread of the disease. This is a crucial time for students as they appear for board examinations, entrance tests and other

competitive exams. With the indefinite closure of educational institutions, there is a short-term impact on the continuity of learning for more than 285 million young learners in India.

The pandemic has significantly disrupted the higher education sector as well, which is a critical determinant of a country's economic future. A large number of Indian student enroll in universities abroad, especially in countries worst affected by the pandemic, the US, UK, Australia and China. Many such students have now been barred from leaving these countries. If the situation persists, in the long run, a decline in the demand for international higher education is evident in the future.

The bigger concern, however, on everybody's mind is the effect of the disease on the employment rate. Recent graduates in India are dreading the withdrawal of job offers from Corporate Companies because of the current situation. The Centre for Monitoring Indian Economy's estimates on unemployment shot up from 8.4% in mid-March to 23% in early April and the urban unemployment rate to 30.9%

Nevertheless, the pandemic has transformed the age-old, chalk and talk teaching model to the one driven by technology. This disruption in the delivery of education is pushing policymakers to figure out how to drive engagement at scale while ensuring inclusive e-learning solutions and tackling the digital divide. Only a handful of private schools could adopt online teaching methods. Their low-income private and government school counterparts, on the other hand, have completely shutdown for not having access to e-learning solutions.

A multi-pronged strategy is necessary to manage the crisis and build a resilient Indian education system in the long term. One of the most immediate measures is to ensure continuity of learning in government schools and universities. Open-source digital learning solutions and Learning Management Software should be adopted so teachers can conduct online teaching. The DIKSHA platform, with reach across all states in India, can be further strengthened to ensure accessibility of learning to the students

With a rapid increase of mobile internet users in India, which is expected to reach 85% households by 2024, technology is enabling ubiquitous access and personalization of education even in the remotest parts of the country. This can change the system and increase the effectiveness of learning and teaching, giving students and teachers multiple options to choose from. Many districts have initiated innovative, mobile-based learning models for effective delivery of education, which can be adopted by others.

It is also important to establish quality assurance mechanisms and quality benchmark for online learning developed and offered by India HEIs as well as e-learning platforms. They offer multiple courses on the

same subjects with different levels of certifications, methodology and assessment parameters. Hence, the quality of courses may differ across different e-learning platforms. But many higher education institutes in India are not equipped with such facilities. The major challenge in EDTech reforms at the national level is the seamless integration of technology in the present Indian education system, which is the most diverse and largest in the world with more than 15 lakh schools and 50,000 higher education institutions.

Since most of the Educational institutions in India follow the traditional approach of teaching, a mix of online and offline teaching seems to be a better solution in the coming days. COVID-19 will impact higher education in India but at the same time has taught us to build resilience to face such threats in the future. The outbreak of Coronavirus has reminded us that change is inevitable. We can't ignore the fact that technology plays a crucial role in the educational system.

1.1 Alternatives or solutions to enhance continuous learning during COVID-19

- To explore possibilities of digital learning.
- To provide support for digitalization to teachers and students.
- To adopt the new approach of education system.
- To explore digital learning platforms.
- To take required measures to mitigate the effects of the pandemic on job offers, internship programs, and research projects.
- To include distance learning programs.
- To initiate innovative solutions.
- To bring out reforms in integrating technology in the present Indian education system.

2. Effect of Covid-19 on Economy

With the outbreak of COVID-19, the Indian economy is going through a major slowdown, which was evident over the recent quarters even before the crisis struck. In the third quarter of the current financial year, the economy grew at a six-year low rate of 4.7%. With all these problems hitting the world from

multiple directions, companies are finding it difficult to sustain in this environment. They are forced to take tough decisions such as cutting down the salaries, giving pink slips to employees and opting for other cost-cutting measures. The outbreak has presented new roadblocks for the Indian workforce and especially for the daily wage and contractual workers.

Recently an industry survey that is jointly conducted by industry body FICCI and tax consultancy Dhruva advisors and took responses from about 380 companies across the sectors. It is said that businesses are grappling with "tremendous uncertainty" about their future.

According to the survey, COVID-19 is having a 'deep impact' on Indian businesses, over the coming month's jobs are at high risk because firms are looking for some reduction in manpower. Further, it is added that already COVID-19 crisis has caused an unprecedented collapse in economic activities over the last few weeks. The present situation is having a "high to very high" level impact on their business according to almost 72 per cent respondents. Further, 70 per cent of the surveyed firms are expecting a degrowth sales in the fiscal year 2020-21. FICCI said in a statement, "The survey clearly highlights that unless a substantive economic package is announced by the government immediately, we could see a permanent impairment of a large section of the industry, which may lose the opportunity to come back to life again.

- The survey found: In respect to the approved expansion plans, around 61 per cent of the respondents expect to postpone such expansions for a period of up to 6 or 12 months, while 33 per cent expect it to for more than 12 months.
- Surveyed firms of around 60 per cent have postponed their fund-raising plans for the next 6-12 months. Also, nearly 25 per cent of the firms have decided the same.
- Surveyed firms around 43 per cent have reported that they do not predict an impact on exports. Further, 34 per cent said that exports would take a hit by more than 10 per cent.
- According to Dun & Bradstreet, COVID-19 no doubt disrupted human lives and global supply chain but the pandemic is a severe demand shock which has offset the green shoots of recovery of the Indian economy that was visible towards the end of 2019 and early 2020. The revised **Gross Domestic Product (GDP)** estimates for India downwards by 0.2 percentage points for the fiscal year 2020 to 4.8 per cent

and by 0.5 per cent for the fiscal year 2021 to 6 per cent. Further, it is stated that the extent of the actual impact will depend upon the severity and duration of the outbreak.

- According to the World Bank's assessment, India is expected to grow 1.5 per cent to 2.8 per cent. And IMF projected a GDP growth of 1.9 per cent for India in 2020 because the global economy is affected by the COVID pandemic, the worst recession since the Great Depression in the 1930s. Also, we can't ignore that the lockdown and pandemic hit several sectors including MSME, hospitality, civil aviation, agriculture and allied sector.
- According to **KPMG**, the lockdown in India will have a sizeable impact on the economy mainly on consumption which is the biggest component of GDP.
- Reduction in the urban transaction can lead to a steep fall in the consumption of non-essential goods. It can be severe if disruption causes by the 21-day lockdown and affect the availability of essential commodities.

According to a survey by the Federation of Indian Chambers of Commerce & Industry (FICCI), the immediate impact of COVID-19 reveals that besides the direct impact on demand and supply of goods and services, businesses are also facing reduced cash flows due to slowing economic activity which in turn is having an impact on all payments including to those for employees, interest, loan repayments and taxes.

Major survey results

- A significant 53 per cent of Indian businesses indicate the marked impact of the COVID-19 pandemic on business operations even at early stages.
- The pandemic has significantly impacted the cash flow at organizations with almost 80 percent reporting a decrease in cash flow.
- The pandemic has had a major impact on the supply chains as more than 60 per cent respondents indicate that their supply chains were affected. The companies also highlighted that they are closely monitoring the situation and expect the impact of the pandemic on the supply chain to worsen further.

- Organizations have brought in a renewed focus on hygiene aspects concerning the pandemic. Almost 40 per cent have put in place stringent checks on people entering their offices and disinfection. Nearly 30 per cent organizations have already put in place Work-from-Home policies for their employees.
- Nearly 42 per cent of the respondents feel that it could take upto 3 months for normalcy to return.

The United Nations Conference on Trade and Development (UNCTAD), has suggested that India's trade impact due to the COVID-19 outbreak could be around US\$ 348 million. India is among the top 15 countries that have been affected most as a result of manufacturing slowdown in China that is disrupting world trade.

For India, the overall trade impact is estimated to be the most for the chemicals sector at 129 million dollars, textiles and apparel at 64 million dollars, the automotive sector at 34 million dollars, electrical machinery at 12 million dollars, leather products at 13 million dollars, metals and metal products at 27 million dollars and wood products and furniture at 15 million dollars. As per UNCTAD estimates, exports across global value chains could decrease by US\$ 50 billion during the year in case there is a 2% reduction in China's exports of intermediate inputs.

While on one hand, Indian employees are losing their jobs and receiving a salary cut, there is also an assumption that the majority of expats have gone back from India and they will take time to return. Different sectors such as automobile, banking and manufacturing employ a large number of expats. Indian companies need expats for several industry verticals and job functions such as after-sales services, business development and market audits.

The government is taking necessary steps that will not damage the economy further but the damage that has been done in the previous few months will definitely last for a longer period of time. As the country is locked down for the coming three weeks, India Inc has to stretch themselves to sustain the situation and face the challenge. The Indian government has also urged employers to not cut jobs and salaries. Many CEOs and management teams are taking pay cuts to ensure their workforce does not have to bear the brunt.

3. Effect of Covid-19 on Environment

There is no denial in accepting the fact that from the very beginning humans have manipulated and destroyed nature for their selfish desires. We often forget that we are largely dependent on Mother Nature

and become totally ignorant in protecting it. As a result environmental pollution has become a global challenge.

In order to satisfy the demand of increasing population, industrialization and urbanization became inevitable, and the obvious significance was proved to be detrimental on the global environment. Further, environmental concerns include air pollution, water pollution, climate change, ozone layer depletion, global warming, depletion of ground water level, change of biodiversity & ecosystem, arsenic contamination and many more (Bremer et al., 2019; Coutts et al., 2010).

Global warming is a term used for the observed century-scale rise in the average temperature of the Earth's climate system and its related effects. Scientists are more than 95% certain that nearly all of global warming is caused by increasing concentrations of greenhouse gases (GHGs) and other human-caused emissions (Wikipedia). Global warming is a result of the increasing concentration of greenhouse gases (CO₂, CH₄, N₂O etc). Planes grounded, events canceled, factories shut down, the Coronavirus weighs on the world economy, but certainly has a good impact on environment. The temporary halt in human activity seems to have a positive impact on the environment. Industrial and transport emissions and effluents have reduced, and measurable data supports the clearing of pollutants in the atmosphere, soil and water.

3.1.A few observations from News reports

- The month of May, which usually records peak carbon emissions due to the decomposition of leaves, has recorded what might be the lowest levels of pollutants in the air since the 2008 financial crisis.
- In India the results were similar too; March 22 was the 'Janata Curfew', following which, a significant dip in air pollution levels was measured across the country. Cities like Delhi, Bengaluru, Kolkata and Lucknow saw their average Air Quality Index (AQI) staying within two digits.
- Another example of cleaner air was seen when, on April 3rd, residents of Jalandhar, a city in Punjab state, woke up to a view of the Dhauladhar mountain range, a rare feat in normal times, considering the distance between the two places- lying nearly 213 kilometres apart from each other and have not been visible from the city in recent memory.
- Water bodies have also been clearing and the rivers Yamuna and Ganga have seen significant improvement since the enforcement of a nationwide lockdown. According to the real-time water monitoring data of the Central Pollution Control Board (CPCB), the average water quality of 27 points of the Ganga seen in recent days, is suitable for bathing and propagation of wildlife and fisheries.

- The severe decline in planned travel has caused many regions to experience a drop in air pollution.
- (CNN) In the capital, New Delhi, government data shows the average concentration of PM 2.5 plunged by 71% in the space of a week -- falling from 91 microgram per cubic meter on March 20, to 26 on March 27, after the lockdown began. The World Health Organization considers anything above 25 to be unsafe.
- The data from the Central Pollution Control Board (CPCB), part of India's Environment Ministry, was collated by the Centre for Research on Energy and Clean Air (CREA).
- Nitrogen dioxide went from 52 per cubic meter to 15 in the same period -- also a 71% fall. Mumbai, Chennai, Kolkata and Bangalore have also recorded a fall in these air pollutants.
- 71 percent in the space of a week -- falling from 91 micrograms per cubic meter on March 20, to 26 on March 27, after the lockdown began.
- The Uttarakhand Pollution Control Board Water from Har-ki-Pauri in Haridwar was tested and the results from the tests reveal that the water here has been classified as 'fit for drinking after chlorination', for the first time in decades.
- "I have not seen such blue skies in Delhi for the past 10 years," said Jyoti Pande Lavakare, the co-founder of Indian environmental organization Care for Air, and author of upcoming book "Breathing Here is Injurious To Your Health."

Due to non-functioning of industries, industrial waste emission has decreased to a large extent. Vehicles are hardly found on the roads resulting almost zero emission of green-house gases and toxic tiny suspended particles to the environment. And owing to lesser demand of power in industries, use of fossil fuels or conventional energy sources have been lowered considerably. Ecosystems are being greatly recovered. In many big cities the inhabitants are experiencing a clear sky for the first time in their lives.

The pollution level in tourist spots such as forests, sea beaches, hill areas etc. is also shrinking largely. Ozone layer has been found to have revived to some extent. The pandemic has displayed its contrasting consequence on human civilization, in the sense that, on one hand it has executed worldwide destruction, but created a very positive impact on the world environment on the other hand.

4. Conclusion

The pandemic certainly has a severe effect on people and countries globally. Hope that all of us will win over this challenging time. Let us all be collective, optimistic and vigilant as we navigate through this period of uncertainty. Stay healthy! Stay Safe!

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CORONA VIRUS: A SIGN OF THE COMING APOCALYPSE**A. Sreelekha¹, V. Annapurna², J. Sridevi^{3*}**

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Abstract

The novel SARS Corona virus (SARS-CoV-2) pandemic crept into India from Wuhan, China. Many countries across the globe including India were affected in the month of March. The first lockdown was announced on 24th March, 2020, by Indian and respective state governments, with a precautionary measure of slowing down the transmission of the virus and reduce the rate as compared to other countries. On the positive note, the environment got into temporary healing mode from these 40 days lockdown, on the other side, there seems to be a remarkable impact on the education and economy. The pandemic has its impact on every aspect of life and still having its effect in the country including all the sectors ranging from education system, agriculture, economy, businesses, and many more as a result of the lockdown. The present article is a small step to explore the impact of COVID-19 on various aspects from economy to education to environment.

1. Introduction

On 22 March, India observed a 14-hour voluntary public curfew at the instance of the prime minister Narendra Modi. It was followed by mandatory lockdowns in COVID-19 hotspots and all major cities. Further, on 24 March, the Prime Minister ordered a nationwide lockdown for 21 days, affecting the entire 1.3 billion population of India. On 14 April, the PM extended the nationwide lockdown till 3 May which was followed by two-week extensions starting 3 and 17 May with substantial relaxations. Beginning 1 June the Government has started unlocking the country (barring containment zones) in three unlock phases.

2. Impact of lockdown on Education

The present situation that is pandemic due to Coronavirus has significantly disrupted various sectors in India. The situation demands that almost all the sectors are hit hardly affected by the crisis. The impact may be more or less. Same is with the education sector in India. The impact of coronavirus on education in India with some possible solutions have to be explored. As we know that due to pandemic the state governments across the country temporarily started shutting down or locking down all schools and colleges. As per the present situation, there is an uncertainty about the normal functioning of the educational institutions right from schools to higher education. Even the functioning of Universities with research labs has come to a halt. It is also a point to be thought of that this is the crucial time for education sector because entrance tests of several central and state universities and various other competitive examinations are scheduled during this time every year (Shikha Goyal, 2020).

Evidence suggests that poor market conditions at labour market entry cause workers to accept lower paid jobs, and that this has permanent effects for the careers of some. As the lockdown has been further extended by two more weeks in India, it means no educational activities will take place during this period. The entrance exams which have been either postponed or deferred will have to be reworked considering the current state of affairs in the country.

2A. Union Public Service Commission (UPSC), Staff Selection Commission (SSC) and other state PSCs will also be working on their schedule of conducting competition activities. The University Grants Commission (UGC) on Wednesday said that terminal semester students' exams will be held in the month of July.

2B. The new academic session for freshers may begin in universities from September and for already enrolled students in August in the wake of the COVID-19 outbreak in the country, the UGC told universities. According to the HRD ministry officials, as of now there are plans to conduct competitive exams, including JEE and NEET, in June for admission to engineering and medical colleges.

In the present scenario, the entrance exam conducting body like NTA, will have to rejig their schedule further. UGC, CBSE, NTA and state boards are expected to announce their revise schedule in the coming days. TOI-Online, Sanjay Sharma, May 1, 2020.

3. Impact of lockdown on Indian Economy

Finance and real estate and professional services was estimated to be hardest hit by the coronavirus (COVID-19) epidemic in India between April and June 2020 compared to the same period in 2019. The

overall impact of COVID-19 on the country's economy during this period was estimated GVA loss of over nine percent. According to the survey, COVID-19 is having a 'deep impact' on Indian businesses, over the coming month's jobs are at high risk because firms are looking for some reduction in manpower. It is also noted that already COVID-19 crisis has caused an unprecedented collapse in economic activities over the last few weeks. The current situation is having a "high to very high" level impact on their business according to almost 72 per cent respondents. About 68 per cent of the surveyed firms are expecting a degrowth sales in the fiscal year 2020-21.

3A. The revised Gross Domestic Product (GDP) estimates for India downwards by 0.2 percentage points for the fiscal year 2020 to 4.8 per cent and by 0.5 per cent for the fiscal year 2021 to 6 per cent. Further, it is stated that the extent of the actual impact will depend upon the severity and duration of the outbreak (Sandhya Keelery, 2020).

4. Impact of lockdown on environment in India

The nationwide lockdown that brought 1.3 billion people to a stop has apparently caused positive changes in the environment, at least temporarily. Skies are clearer and river water seems cleaner.

Visuals of a cleaner River Ganga have emerged from Uttar Pradesh's Kanpur as well as Varanasi. The clear water is a result of the shutdown of most industries. In a rare sighting, fishes can be seen near the Varanasi ghaat steps. This seems to have happened because of absence of crowds and clean water. The lockdown has also led to better air quality. According to the World Air Quality, the average concentration of PM 2.5 in New Delhi came down by 71 per cent for a week last month. The chemical, Nitrogen Dioxide, a pollutant, has also witnessed a decline of 71 per cent. While in most parts of Delhi, the water of River Yamuna has also started to appear clearer in southeast Delhi's Kalinda Kunj, the heavy amount of toxic foam that is usually seen around the year still continues. The toxic foam is caused due to a mix of sewage, detergents and chemicals from industrial waste. Aam Aadmi Party MLA and Delhi Jal Board Vice-Chairman Raghav Chadha said absence of people has made the Yamuna cleaner. "Many industries and offices are closed due to the lockdown these days and therefore the Yamuna is looking cleaner. The stoppage of industrial pollutants and industrial waste has definitely had a positive effect on water quality. We will conduct testing of the water to ascertain the percentage of improvement in the quality," he said.

Himanshu Thakkar, co-ordinator at South Asia Network on Dams, Rivers and People (SANDRP) told NDTV, "Along with lockdown there is increased waterflow due to unseasonal rainfall and snowfall in

some parts. Religious activities have decreased, especially in Varanasi, where lesser cremations are happening.

The current scenario should shape our future approach of how authorities should minimise industrial effluents in the water bodies.” While the relatively cleaner Yamuna, at least based on appearance, is good news for people, the true picture of the impact of the lockdown will come out only when the lab results of the water samples are out. Ajay Singh, April 29, 2020.

Due to the lockdown, air pollution suddenly dropped all over the world. This is one of the major positive effects on the environment because of the coronavirus outbreak. Because several industries are temporarily shut down, there is only an emergency vehicle on the road; that’s why the whole world is pollution-free.

For today’s generation, this is the first time for them to see such a dramatic change in the environment. Because of the coronavirus, the number of tourists reduced so that all the water of seas and rivers is cleaner than they have been in living memory. When the massive number of tourists visit the beaches, they pollute the seawater by spreading garbage, swimming, and motorboats.

5. Conclusion

In this time of crisis, a well-rounded and effective educational practice is what is needed for the capacity-building of young minds. It will develop skills that will drive their employability, productivity, health, and well-being in the decades to come, and ensure the overall progress of India. But over the last few weeks, all the journeys are cancelled due to lockdown, and many economic activities stopped that cause water pollution. As the economic activities are halt so this also drives down the emission. While the whole world shut down the schools, factories, and shops, then the emission is expected to fall. This lockdown period lowers oil demand. The international energy agency said that this year global oil demand is expected to decline because the impact of coronavirus spreads all over.

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LIFE IN THE TIME OF COVID

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Abstract

Covid-19 will change the way the world works, the question on everyone's mind is, 'Will things go back to normal? The economic damage has and will continue to affect more people than the disease itself. There is no doubt that COVID-19 will have a large impact on the Indian economy. With respect to India, the discussion can be bifurcated into 2 parts – India's economy, and its stock markets. The recovery of the underlying economy will be slow, and it will take around 2 years for normalcy to come back across sectors. While the overall economy might take a hit because of the government lockdown, some sectors are set to see immense growth in the post-COVID era – FMCG, B2C specialized lenders, gold-dependent companies, food retail and pharmaceutical companies to name a few. Stock markets have a mind of their own, formed by the collective emotions + intelligence of millions. They are often skewed and aren't the best indicators of the underlying economy. Stock markets will have a strong recovery, not due to the fundamentals strength, but due to global liquidity which is available for almost free (as interest rates tend to near zero). Availability of debt capital will be scarce in India, whilst equity capital will be available in plenty over a period of time.

1.Introduction

1.1 Economy

Like its counterparts across the globe, the Indian government has announced a slew of measures to prevent total collapse. However, it isn't enough. This works to alleviate some of the pain, not counter it.

- Loosen its purse and spend money on infrastructure development – 'Rebuild India, Rejuvenate India'
- Public sector financial institutions need to be further capitalized and nudged by the RBI to lend out low-ticket loans below INR 1 Crore in the form of working capital to ensure that liquidity comes back into the system
- Banking sector needs to be nudged to pass on rate cuts induced by RBI to the borrowers
- Personal tax cuts & tax holidays for 6 – 12 months can be adopted to revive consumption, which will help spur economic growth

These are not an exhaustive list of measures but could help alleviate the impact of COVID-19 on the Indian economy while stimulating growth.

More importantly, we must ensure something like this never happens again. History says that humankind has never learnt from history. Let's hope that it's a thing of the past.

1.2 Indian Education System

The COVID-19 scare is giving restless evenings to students who were to show up in selection tests like JEE for B. Tech confirmations as well as to class 12 students showing up for Board exams. It isn't mistaken to accept that we will before long observe numerous different associations take action accordingly and a whole lot of entrance exams in India be additionally postponed due to Corona virus. Looking at the situation involves concern about what the effect of COVID-19 (Coronavirus) will have on the higher education system in India.

The rate at which Corona virus has spread to various districts in India has constrained the central and state government to shut down educational institutions and schools as a precautionary step bringing about the interruption of studies. This issue is pervasive all over the place.

The “substantial” financial effects on schools and universities will swell through local communities, the group stated, given the wide financial job advanced education plays in a great part of the nation.” Similarly, in India, except if possibility measures are attempted, students searching for confirmations in 2020 could face tough times. While academic specialists are pushing for online models of education – be it study hall instructing or tutorials, we are yet to perceive how viably a country that fundamentally depends on an offline mode of teaching can consistently violate an online mechanism of educating and training. Things being what they are, the question is will the Corona virus Pandemic outcome in a new solution for education and development?

Indian Colleges will set aside some effort to deal with the change and be available to the new strategies as the methodology of the education system here is a lecture-based way to deal with teaching. Digital teaching is increasingly apparent in schools and the school students/instructors/guardians are progressively alright with this methodology when contrasted with advanced education set-up in India. In the case of COVID-19, web-based education has become a need, for students in India as well as

worldwide to search for inventive arrangements in a brief time frame and to consistently have a Plan-B set up for infrastructural arrangement?

1.3 Indian Environment

Human beings often forget that we are largely dependent on Mother Nature and become ignorant towards taking care of it. We have been so reluctant to the preservation of natural resources and sustainable development that we had forgotten the beauty of the Earth completely.

The Covid-19 lockdown imposed throughout the world has struck a chord in every one of us and it has made us thinking how nature is so important for our day to day living. The tangible improvements in nature have made us believe that the Earth can be saved.

It has made us see that our actions can very well impact the Earth's sustainability. For breathing pure air to greener trees, spotting various wildlife into the cities here are some important environmental changes that we have seen for corona virus lockdown in India:

1.3.1 Improvement in air quality

New Delhi was ranked as the most polluted city in the world by WHO in May 2014. The usual air quality of India's national capital according to the air quality index used to be 200. When the pollution level hit its peak, the pollution level soared to 900 and sometimes, off the measurable scale.

While 200 itself is 25 percent above unsafe level as deemed by World Health Organization, but as Delhi's 11 million registered cars were taken off the roads and factories and construction were ground to a halt, AQI levels have regularly fallen below 20. The skies are suddenly a rare, piercing blue. Even the birdsong seems louder.

In the capital of New Delhi, government data shows the average concentration of PM 2.5 plunged by 71 percent in the space of a week -- falling from 91 micrograms per cubic meter on March 20, to 26 on March 27, after the lockdown began.

1.3.2 Dolphins spotted near Kolkata ghats

Critically endangered, South Asian River Dolphins also known as Ganges Dolphins have been spotted back in the Ganga river after 30 years. Due to the reduced pollution in water, the South Asian River Dolphins have been spotted at various Ganga Ghats of Kolkata.

1.3.3 The number of flamingos increased in Mumbai

As a result of the lockdown imposed due to Covid-19, tens of thousands of flamingos have gathered in the city of Navi Mumbai. The birds normally migrate to the area every year, but residents have reported that this year they have seen a massive increase in their numbers.

1.3.4 Ganga fit for drinking in Haridwar

The Uttarakhand Pollution Control Board Water from Har-ki-Pauri in Haridwar was tested and the results from the tests reveal that the water here has been classified as 'fit for drinking after chlorination', for the first time in decades. It is assumed that due to the lockdown, the drainage of industrial waste into the river water has stopped and brought a significant change in the water quality. "Change in the former is there but not much change in the later. Water quality improved in the upstream but downstream Varanasi has seen very little change," said a CPCB scholar working on the Clean Ganga project, on conditions of anonymity. The source further added that "more treatment is required at the industrial source point and municipalities need to work in action."

With hope in our hearts to surpass the hard times, we shall move to a future of refined lifestyle choices to preserve Mother Nature and hope to be working cumulatively to restore our planet earth from the destruction that had been caused over the several years

2. Society

Before we end, let's look at some of the behavioural/societal impacts that Covid-19 might have. As the world overcomes this pandemic, discretionary demand will pick up as people become imprudent. Retail leverage in the world will hit new highs. The use of addictive material – tobacco, narcotics, alcoholic beverages will jump multifold.

3. Conclusion

The next 5 years are going to be the golden period for media and entertainment. 3D/4D chatrooms and conference rooms will emerge rapidly. The largest chunk of media spending will shift from television to digital. Print media will cease to exist. Businesses will experience an increase in productivity due to reduced staff. Remote work will see an uptick. The burden on local transportation infra will ease. Fewer roads, less traffic & pollution. This may be the time to reset. We have the opportunity to rethink everything. If we do things right, we may be able to fix challenges that face humankind – environmental damage, inequality etc.

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LOCKDOWN: A PRACTICAL MEANS TO CONTAIN THE CONTAGION**VasudevanRanganathan**Department of Microbiology, Aurora's Degree & PG College, Chikkadpally, Hyderabad-500020,
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Abstract

No one would have expected in their wildest dreams that an invisible creature would have silenced the entire world from the perspective of regular routine. Perhaps, the world would have not come across this term 'lockdown' as much as it did over the last few months. No one would have expected a situation that has stagnated the world for months and the current situation is one of its kinds in the history of human evolution to be witnessed by the human race. The amount of impact as a consequence of the health crisis has been regarded as one of the most crucial conditions that have manifested the life style of humans. As a matter of fact, the ongoing scenario has been an acid test to all the citizens of the nation because of the extent of psychological impact it imposed on people. The world is under health emergency due to the crisis of the ongoing pandemic that forced people to manifest their routine. Lockdown was the only feasible measure to counteract the intensity of the pandemic by reducing social gathering. Since, several studies claims the spread of the disease among people through contact, lockdown has indeed reduced the spread of the disease to a greater extent by ensuring social distancing and self quarantine measures. As of now the nation has been closed for almost 45 days as an attempt to curb down the disease outbreak and it might possibly extend based on disease intensity in days to come. The current write up attempts to comprehend lockdown and emphasizes on the measures implemented by government to impose nationwide lockdown.

1.Introduction

Though humans are considered as alpha from the point of view of their existence, survival and adaptation, several challenges has in turn questioned this claim which indeed has envisaged a different perspective. Since the dawn of time, human beings have adjusted to cope up with situations and circumstances that have confronted them at every point of their lives. Environment has undeniably framed the extent of social behavior among humans which enables them to mend their ways according to the circumstance. It could be a valid point to make that manifestations in the surroundings will trigger the circumstantial behavior among humans. A very similar scenario is being experienced by people all over the globe because of a nanoscopic biological particle that has taken the world by its stride and has provoked nations all over the globe to impose restriction on the residents and lockdown has been the basis for instigating

awareness among people against the pandemic. It started on the 24th of March 2020 when the government of India has decided to lock the country [Gettleman *et al*, 2020]. Till then no one would have come across a term lockdown which has gained prominence due to the outbreak of the pandemic that has been terrorizing the lives on the planet. Lockdown was the only option to counteract the mass clinical manifestation that was brought upon the human race. In simple terms, lockdown was an attempt to cope up with the global health crisis in order to reduce contact transmission among people. India was not an exception to the global pandemic but was in a better position from the context of the number of cases in comparison to its neighboring contenders. When the lockdown was initially implemented in India, the number of positive corona cases was 500 which have exponentially increased over the due course of time [Gettleman *et al*, 2020]. However, reports have claimed that the lockdown has certainly reduced the outbreak of the pandemic in India which was shown to spread at a rate of doubling for every six days by April 6th to eight days by April 18th [Shekar Gupta, 2020]. Lockdown has indeed changed the perspective of people towards life as it has been an acid test to people all over the world and has tested their psychological abilities. In fact, in the history of mankind it was for the first time that everyone on the planet regardless of their financial position was on the same contour. The health crisis that arose as a consequence of global pandemic has had the same impact on every individual. As a matter of fact, every aspect of a nation from the context of public welfare and development was severely hampered. Various facets ranging from public to private domain were stagnated.

1.1 Official and authorized cue

Different government and non government organizations were forced to hold back on their policies due to the nationwide lockdown. Though everyone was equally experiencing the impact of the crisis, the poor people and those who depend on their daily earnings for survival were the ones to receive the severe impact due to lockdown. In spite of the several constraints among people from the context of their usual routine, several organizations have requested for the extension of lockdown in an attempt to curb the intensity of nCoV-19 disease [India Today, 2020]. Lockdown has completely changed the lives of those who bank on daily wages because the daily wage workers have completely lost their income due to the ongoing lockdown. As a matter of fact, the Government of India has further extended the lockdown in an attempt to curb the intensity of the disease which has further deteriorated the conditions for those who are under the poverty line. In Orissa and Punjab the lockdown procedure was extended till May 1st after the end of first phase which was later implemented in states like Maharashtra, Karnataka, West Bengal and Telangana [HT Digital Streams Ltd, 2020 & Bennett, Coleman & Co. Ltd, 2020]. However, the

Government has taken the appropriate measures to ensure the safety and modesty of those who got estranged during the lockdown and has sent those people who have commuted from different parts of the country in search of work to their respective places through special trains. On the 14th of April 2020, the central government has decided to further extend the lockdown till the 3rd of May 2020 with some relaxation in areas that are less affected or have been strictly contained after the 20th of April 2020 [Livemint, 2020]. The lockdown has also had its impact on multinational firms like the IT industries and has led to an upsurge in recession which has risked the job of many employees who are on the verge of losing their jobs. The economy has gone in to doldrums due to the stagnation of every single deals/contracts/businesses/matters etc due to lockdown. Though the intention of imposing restrictions on various activities through lockdown was to reduce the outbreak of the clinical manifestation, it has severely impacted the normal lives of the people and it would probably take around few years to restore the conditions as they were in the past. The lockdown not only affected the industries and government policies but it also had a stern impact on the academics and the education system. Universities and colleges all over the nation have been closed up to 3rd May 2020 which might be further extended depending up on the situation and the scope of having regular classes seems to be impossible for the current academic year.

The schools, Colleges and academic institutions may remain closed even after the end of the third phase of lockdown that is scheduled to end by May 3rd 2020 [www.indiatoday.in, 2020]. The lockdown has indeed given rise to an ocean of questions in the young minds about the fate of exams and degrees. Students in the final year who are about to pass out are extremely in dilemma about the conductance of the examination. However, center has provided clarity on this issue and has proclaimed that the exams will be conducted after the conditions are conducive and several Universities and colleges are conducting online classes to cope up with the syllabus.

2.Impact on our daily activities and behavior

But this cannot be considered as an alternative because technology cannot serve as the only option for coping with the academics because many students who have gone back to their home towns and villages may not have the access to these facilities. In addition, to these ill effects that has arises due to lockdown, another common aspect that we very often come across in news is the upsurge in domestic violence. The increase in domestic violence during the course of lockdown has reached its peak and has been an issue of severe concern [qz.com, 2020]. As a matter of fact, the increase in domestic violence is an indication on

the psychological state of an individual during lockdown. Lockdown is used as a basis for imposing stringent norms for monitoring the situation during the health emergency and has in turn laid the platform for social distancing measures like self quarantine and physical isolation. Lockdown was regarded as the only means to combat the contagion because it was the only way to prevent public gathering in places like malls and other recreational centers like cinema halls and multiplexes [indiatoday.in, 2020]. Another main reason for prioritizing lockdown over the other options is the lack of a suitable vaccine or medicine. Since the contagion is known for its rapid outbreak through contact, lockdown was the option to avoid public gathering in an attempt to lessen the spread of the disease. In a different point of view, lockdown has also influenced the searching patterns of people on the internet. According to certain reports, lockdown has changed the way people search on Google as lockdown has increased the proximity between the people and online platforms. During these unprecedented times, while the nation is under lockdown, digital dependence among the people has exponentially increased as the people are utilizing their time on digital platforms in order to stay productive indoors during the shutdown [thehindubusinessline.com, 2020]. In a sense the COVID-19 pandemic has changed the way of our work.

It has changed our normal means of communication with others in comparison to the recent past. Technology has been the main medium of communication of formal and informal level among people during the lockdown period.

Hence it could be rightly said that the lockdown has in turn increased the dependency of people on technology. As many people are working from homes and they rarely step out of their houses, procurement of grocery also has been through online means in order to avoid public gathering. As a matter of fact, COVID-19 pandemic is creating a paradigm shift in the behavior of the consumer.

3. Lockdown Scenario

The previous section attempted to disclose the impact of lockdown on various sectors ranging from industries to academics and briefly deciphered the extent of changes brought upon the citizens due to lockdown. The current section will further add to the information and will expand the consequences of the lockdown by substantiating related facts. The first case of novel corona disease was reported on the 30th of January 2020 in the state of Kerala when a student travelled to the state from the Wuhan province of China [Ward, 2020]. By the mid of March 2020, the nCoV-19 cases closed up to 500 which provoked Indian government to impose stringent measures as an attempt to slow down the pandemic. On 19th March 2020, honorable PM, Mr. Modi has urged all the citizens of the nation to maintain self isolation on

the 22nd of March 2020 as a mark of attempt to curtail the outbreak of the disease which was referred as Janatha Curfew. This could be considered as the onset of the lockdown. The Janatha Curfew which was imposed for the duration of 14 hours by the central government was extended to 24 hrs in states like Telangana which slowly got prolonged as it was very obvious from the speech of PM Mr. Modi who cited the People's Curfew as a stepping stone of a long battle against COVID-19. Every citizen were asked to strictly follow the norms of the janatha curfew by staying back in their houses with an exception of few essential services like media, medical and police services [BBC news, 2020]. At the end of janatha curfew on the 22nd March 2020 at 5.00PM, every citizen was urged to express their solidarity to all those including medical staff, police and media by clapping hands and ringing bells. The purpose of this act as instructed by the honorable PM was to express our appreciation to all those involved in essential services who have enlightened every citizen of the nation by risking themselves during the health emergency [India Today, 2020].

3.1 Impact of the first lockdown (25th March 2020- 14th April 2020)

It was on the 24th of March 2020 when PM Mr. Modi addressed the nation for the second time after his speech on the 19th March 2020. It was during his second live interaction with the nation when PM decided to shutdown the nation for 21 days. There was also scientific reason for this 21 days lockdown from the context of virus incubation period (the time from the initial contact to the first possible symptoms). It was a belief that if we stop the people from unwanted gathering, the intensity of the disease could be reduced and we have succeeded to some extent in evading the disease which is very obvious from the number of cases in comparison to countries like Spain France, Italy. The United States of America which is regarded as the most developed nation also couldn't stand a chance against the virus. The first lockdown in India was started on the 25th of March 2020 and lasted for 21 days. It was scheduled to end on the 14th of April 2020. Prior to lockdown on the 22nd of March 2020, the Indian government has suspended the Indian railway services easing on the freight operations during lockdown for the transport of essential goods. Official announcement was made by the Indian railways in accordance to the running of special trains apart from the regular freight operating trains for transporting essential goods and edibles [Republic world, 2020 & Nandi, 2020]. The lockdown has also witnessed desperate behavior of people as they were provoked to stock essentials in advance to cope up with dry period during the nationwide shutdown. Stringent action was taken on those who have violated the norms and regulations of the lockdown. The state and central government have done their part from the context of safeguarding the people by announcing special packages as relief fund for the poor and the affected

people. The packages were aimed at providing food security measures for poor households including medical insurance coverage [Nirmala Sitharaman, 2020]. The reserve bank of India on the 27th of March 2020 has announced apposite measures to mitigate the economic impacts of the lockdown [The Hindu, 2020]. On the 5th of April 2020, India has expressed its gratitude at the behest of the honorable PM to all those who were fighting against the contagion. The people have expressed their gratitude in solidarity for corona warriors by lighting candles, lamps and torches as an action of display in return to the selfless services offered by medical professionals, police, media and the municipal employees. This act of gratitude in support of selfless service lasted for nine minutes and was well received among the citizens. Towards the end of the first lockdown that was scheduled to be lifted up by 14th April 2020, the COVID-19 incidence drastically plummeted.

3.2 Second lockdown (15th April 2020 to 3rd May 2020)

On the 14th of April 2020, the central government at the orders of the PM has extended the lockdown for another 21 days up to 3rd May 2020 with a conditional relaxation after the 20th of April 2020. The relaxation was only applicable in the areas of strict containment of the disease. During the formal announcement of the lockdown extension, it was officially declared that every area will be thoroughly evaluated for COVID-19 containment and easing from the lockdown would be allowed based on the extent of emergency and the number of positive cases. The easing would be revoked in cases of the emergence of new cases after relaxation [Dutta, 2020]. The lockdown areas were later on divided into zones based on the extent of prevalence of the diseases and the most affected areas were identified as hotspots. It was on the 16th of April when the lockdown areas were divided in to red, orange and green zones with the red being regarded as the hotspot areas. The orange and green zone signifies the areas with moderate and no infections respectively [BBC, 2020]. The government during the second phase of the lockdown has decided to provide the ease on sectors like agriculture, dairy, aquaculture and plantations and also announced relaxation on these sectors including firms selling farming supplies. On the 29th of April 2020, the government of India according to the guidelines of the ministry of home affairs has allowed the interstate movement of stranded people who had come from different states on a daily wage pay. The ministry of home affairs has instructed all the states to frame a protocol to receive such people and screen them for through health checkups and send them to quarantine if they test positive to COVID-19 [BBC, 2020].

3.3 Additional extension (from 4th May 2020-17th May 2020)

The ministry of home affairs and the government of India on the 1st of May 2020 decided to further extend the lockdown by a couple of weeks till the 17th of May 2020 with some relaxation in some areas [Ministry of Home Affairs guidelines, 2020]. The country was divided in the zones based on the extent of COVID-19 prevalence and this status would be revised once in a week for updates on the pandemic. The areas under the red zone were strictly monitored without any relaxation. The orange zone areas were exempted from the public transport facilities with an exception of private transport and the green zone areas were permitted with 50 percent of public transport for normal movement. However, this extent of permissible activities could be revoked on the basis of COVID-19 incidence [India Today, 2020].

3.4 Further extension till the month end (May 2020)

According to the recent reports, the lockdown has been extended till this month end (May end) as an attempt to curb the outbreak of the disease which is scheduled to end on the 29th of May 2020 [livemint.com, 2020]. The lockdown in Telangana has been extended till the 29th of May 2020 which was made formal after the live media conference of the honorable chief minister. Restrictions were imposed on the people as they were asked to procure the essentials by 6.00pm and no was allowed to loiter out after 7.00pm. The curfew continues across the state from 7pm to 7am.

4. Conclusion

Humans and microorganisms have shared the same environment over the eons and this interaction between these biological entities has disclosed several hidden facts from the context human-microbe coexistence. As a matter of fact microorganisms have been employed by humans for research purposes in order to resolve scientific challenges and setbacks. However, the darker side of these invisible creatures cannot be denied as they are associated with several diseases capable of manifesting human health and well being. In the recent past, the outbreak of a pandemic resulted in worldwide health concern and has raised the necessity of appropriate measures for safeguarding humans. It could be rightly said that circumstances trigger the conditional behavior in humans. This statement could be validated from the current scenario that has indeed forced people to adapt a contrasting life style different from what it used to be in the past. No one would have ever expected that a disease would inactivate the entire globe but life never disappoints anyone because it is full of uncertainties. The nation has witnessed many facts over the last few months which have provoked the legal bodies to implement appropriate measures to cope with the health crisis that had become a global emergency. Though the first case of COVID-19 was confirmed on the 30th of January 2020, the shutdown of the nation as the only measure was imposed in March 2020

due to the concern over the health emergency. Since the implementation of the first phase of lockdown that started on the 25th of March 2020, the nation has witnessed several measures that were taken in accordance to the health crisis and safeguard the people. One of the main issues related to the disease is the lack of a suitable vaccine or medicine to counteract the efficacy of the disease. Hence, the only way to lessen the wide spread of the disease is by limiting public gathering and lockdown is the easiest way to achieve social distancing.

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EFFECT OF 3E'S AMID COVID-19

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Abstract

COVID-19 pandemic has caused havoc worldwide. India is also going through a challenging situation as the number of infected/positive cases is increasing day by day. With strict preventive measures and restrictions by the Indian Government in the form of nationwide lockdown, the citizens are going through a range of psychological and emotional reactions, fear and uncertainty being one of them. The COVID-19 pandemic has affected educational systems worldwide, leading to the near-total closures of schools, universities and colleges. Supply chains have been put under stress with the lockdown restrictions in place. Stock markets in India posted their worst loses in history on 23 March 2020. The lockdown has also led to better air quality. According to the World Air Quality, the average concentration of PM 2.5 in New Delhi came down by 71 per cent for a week last month.

1. Introduction

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, China, and has since spread globally, resulting in an ongoing pandemic. As of 11 May 2020, more than 4.13 million cases have been reported across 187 countries and territories, resulting in more than 283,000 deaths. More than 1.42 million people have recovered. In India up to 53% of businesses have specified a certain amount of impact of shutdowns caused due to COVID-19. The unemployment rate had increased nearly 19% within a month, reaching 26% across India, according to the Centre for Monitoring Indian Economy. Young startups have been impacted as funding has fallen. Fast-moving consumer goods companies in the country have significantly reduced operations and are focussing on essentials. School closures in response to the COVID-19 pandemic have shed a light on numerous issues affecting access to education, as well as broader socio-economic issues. Even when school closures are temporary, it carries high social and economic costs. The disruptions they cause affect people across communities, but their impact is more severe for disadvantaged children and their families including interrupted learning, compromised nutrition, childcare problems and consequent economic cost to families who cannot work.

The standard method of diagnosis is by real-time reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab. Recommended measures to prevent infection include frequent hand washing, maintaining physical distance from others (especially from those with symptoms), quarantine, covering coughs, and keeping unwashed hands away from the face. In addition, the use of a face covering is recommended for those who suspect they have the virus and their caregivers. Several existing medications are being evaluated for the treatment of COVID-19, including chloroquine, hydroxychloroquine. There are mixed results as of 3 April 2020 as to the effectiveness of hydroxychloroquine as a treatment for COVID-19, with some studies showing little or no improvement.

2. Objectives

- 1) To study the process of reducing the number of active cases in India.
- 2) To analyse the impact of lockdown on Education and Economy.
- 3) To bring awareness among society maintaining social distancing which is considered to be one of the most effective tools.
- 4) To understand the measures which government will take appropriate action to address the economic concerns?
- 5) To analyse the financial aspects of aviation, retail and small business in coming days.
- 6) To understand the impact of lockdown on environment

3. Impact on Education

Efforts to stem the spread of COVID-19 through non-pharmaceutical interventions and preventive measures such as social-distancing and self-isolation have prompted the widespread closure of primary, secondary, and tertiary schooling in over 100 countries. The COVID-19 pandemic has affected educational systems worldwide, leading to the near-total closures of schools, universities and colleges. As of 27 April 2020, approximately 1.725 billion learners are currently affected due to school closures in response to the pandemic.

On 23 March 2020, Cambridge International Examinations (CIE) released a statement announcing the cancellation of Cambridge IGCSE, Cambridge O Level, Cambridge International AS & A Level, Cambridge AICE Diploma, and Cambridge Pre-U examinations for the May/June 2020 series across all

countries. International Baccalaureate exams have also been cancelled. In addition, Advanced Placement Exams, SAT administrations, and ACT administrations have been moved online and canceled.

School closures impact not only students, teachers, and families, but have far-reaching economic and societal consequences. School closures in response to COVID-19 have shed light on various social and economic issues, including student debt, digital learning, food insecurity, and homelessness, as well as access to childcare, health care, housing, internet, and disability services.

The impact was more severe for disadvantaged children and their families, causing interrupted learning, compromised nutrition, childcare problems, and consequent economic cost to families who could not work.

In response to school closures, UNESCO recommended the use of distance learning programmes and open educational applications and platforms that schools and teachers can use to reach learners remotely and limit the disruption of education

3.1 Distance Learning

Online learning has become a critical lifeline for education. Technology can enable teachers and students to access specialized materials well beyond textbooks, in multiple formats and in ways that can bridge time and space. In response to the pandemic, many schools moved to online distance learning via platforms like Zoom. The organisation for Economic Co-operation and Development has created framework to guide an education response to the COVID-19 Pandemic for distance learning.

4. Impact on Economy

The economic impact of the 2019–20 coronavirus pandemic in India has been hugely disruptive. In India up to 53% of businesses have specified a certain amount of impact of shutdowns caused due to COVID-19 on operations. World Bank and credit rating agencies have downgraded India's growth for fiscal year 2021 with the lowest figures India has seen in three decades since India's economic liberalization in the 1990s. The Indian economy is expected to lose over ₹32,000 crore (US\$4.5 billion) every day during the first 21-days of complete lockdown which was declared following the coronavirus outbreak. Under complete lockdown less than a quarter of India's \$2.8 trillion economy is functional. Up to 53% of businesses in the country will be significantly affected.

Supply chains have been put under stress with the lockdown restrictions in place; initially there was a lack of clarity in streamlining what is an "essential" and what is not. Those in the informal sectors and daily wage groups are the most at risk. A large number of farmers around the country who grow perishables are also facing uncertainty. Various businesses such as hotels and airlines are cutting salaries and laying off employees. Major companies in India such as Larsen & Toubro, Bharat Forge, UltraTech Cement, Grasim Industries, Aditya Birla Group and Tata Motors have temporarily suspended or significantly reduced operations. Stock markets in India posted their worst losses in history on 23rd March, 2020. However, on 25 March, one day after a complete 21-day lockdown was announced by the Prime Minister, SENSEX and NIFTY posted their biggest gains in 11 years, adding a value of ₹4.7 lakh crore (US\$66 billion) crores to investor wealth.

Industries working will be on a pause. There is huge loss even in banking sector since there will be no funds which in turn affects CRR and REPO rate. Rupee value weakens. There will be no help for small businesses. Unemployment rate increases. E-commerce will be affected. Like most of the companies the affect of pandemic is clearly visible on airlines sectors too and the companies like Expedia are seeing zero sales with no flight and vocational bookings.

However, Government has to take an opportunity to bail out few companies to uplift the economy and keep things moving for the future. Unlike the product company's Microsoft, Amazon or Apple, minimum wage employees are at huge loss. This might not be something new to the west but countries like India with 130cr population can see the rapid economy changes and job loss. Government has to come up with some strategic plans and bills to control the situation. The Asian Infrastructure Investment Bank's (AIIB) approved a \$500 million loan to support India's Covid-19 operations, Co-financed by the World Bank; the funds were aimed at enabling the government to scale up its containment efforts and to strengthen the health system to manage future outbreaks as well.

5. Impact on Environment

The world's largest coronavirus lockdown is having a dramatic impact on pollution in India. The world's largest lockdown means all factories, markets, shops, and places of worship are now closed, most public transport suspended and construction work halted, as India asks its citizens to stay home and practice social distancing.

Data shows that the main cities are recording much lower levels of harmful microscopic particulate matter known as PM 2.5, and of nitrogen dioxide, which is released by vehicles and power plants. The sudden fall in pollutants and the subsequent blue skies signal a dramatic shift for India. NO₂ levels are falling dramatically. Nitrogen dioxide went from 52 per cubic meter to 15 in the same period also a 71% fall. Mumbai, Chennai, Kolkata and Bangalore have also recorded a fall in these air pollutants.

"I have not seen such blue skies in Delhi for the past 10 years," said Jyoti Pande Lavakare, the co-founder of Indian environmental organization Care for Air, and author of upcoming book "Breathing Here is Injurious to Your Health." It is a silver lining in terms of this awful crisis that we can step outside and breathe. The lockdown has also led to better air quality. According to the World Air Quality, the average concentration of PM 2.5 in New Delhi came down by 71 per cent for a week last month. Nitrogen Dioxide, a pollutant, has also witnessed a decline of 71 per cent.

The nationwide curfew in India on March 22nd also resulted in the lowest one-day traffic pollution levels on record, analysis from CREA said. Other dangerous pollutants, PM_{2.5} and the larger PM₁₀, which are less than 10 micrometers in diameter, also dropped steeply, the report added.

Many industries and offices are closed due to the lockdown these days and therefore the Yamuna is looking cleaner. The stoppage of industrial pollutants and industrial waste has definitely had a positive effect on water quality. While in most parts of Delhi, the water of River Yamuna has also started to appear clearer. Visuals of a cleaner River Ganga have emerged from Uttar Pradesh's Kanpur as well as Varanasi. The clear water is a result of the shutdown of most industries. In a rare sighting, fishes can be seen near the Varanasi ghaat steps. This seems to have happened because of absence of crowds and clean water.

6. Conclusion

India is top 5 populous country in the world. It involves major efforts in controlling the spread of Pandemic. The sentiment behind the lockdown is to save the lives. But many warn it may result in a significant number of people dying due to hunger and poverty arising out of the economic impact of lockdown. However, this can be avoided if the government takes adequate steps to absorb some of the shock due to disruption. Govt is already taking measures to the needy by providing free ration and rational amount of money to fulfil their basic essentials. Labour Law changes and the states are competing for investment and that is a good thing for India. The economy will gradually recover, with the scale and

scope of the stimulus package determining the pace of recovery. Moreover, India becomes independent of other countries and the strategies followed by it will be an inspiration in the greater future.

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ANALYSIS AND SUGGESTIONS FOR INDIA'S EDUCATION, ENVIRONMENT AND ECONOMY DENTED DURING LOCKDOWN - COVID 19**Vishnu Vardhan Chary. S^{1*}, Rangaraju Sai Meghana² and Tanmayee. S³**¹ Graduate Student, Hyderabad, India² Post Graduate Student, Osmania University, Hyderabad, India³ Graduation Student, St. Pious X Degree & PG College for Women, Hyderabad, India*Corresponding author Email ID: srigirivishnuchary@gmail.com

Abstract

The outbreak of the Covid-19 pandemic is an unprecedented shock to the Indian economy. The economy was already in a parlous state before Covid-19 struck. With the prolonged country-wide lockdown, global economic downturn and associated disruption of demand and supply chains, the economy is likely to face a protracted period of slowdown. The outbreak of Corona virus disease 2019, caused by severe acute respiratory syndrome (SARS) corona virus 2 (SARS-CoV-2), has thus far killed over 4,28,000 people and infected over 7,600,000 worldwide as of 15th June, 2020. SARS-CoV-2 might also be transmitted from the bats and causes similar symptoms through a similar mechanism. The world is battling COVID-19 and economies across the globe have declared a lockdown. Work from home has become the norm, especially for service organizations. Following government instructions, even the academic institutions had to shut down temporarily, affecting academic delivery. Thus, they had to find new alternatives to academic delivery, and virtual classes were the way forward. This paper describes the impact of COVID-19 on society and global environment, and the possible ways in which the disease can be controlled has also been discussed therein.

1. Introduction

As per an interview conducted by Rangaraju Sai Meghana with Dr. C. Srinivasulu, Director of Centre for Biodiversity and Conservation Studies, the first thing that we have to understand is that whenever novel species of viri is reported, we try to find out the family match or to which known species or train of virus that particular virus belongs to. In case of COVID-19 we know that it belongs to the corona virus family, which is a large family of many strings of virus that bears to the corona virus family characteristics.

One of the important understandings that need to be brought in is that virus chains change very quickly and they also get influenced by host species in which they are multiplying. So that's why we have multiple numbers of strings. So when some new virus is found, we say so-and-so like virus has been found and not just labeling it as corona virus has been found

Second thing to understand is when we are talking about zoonotic diseases that are coming out of virus/bacteria that are living naturally in wild animal populations but jump or cross contaminate into human population due to various reasons, we need to see that such virus/infections are usually novel in their nature.

There are some diseases that are well established however most of the time the emergent viral diseases that we are seeing are new ones like SARS etc which are established and waiting to be triggered and start infecting but this new virus also comes from that virus family where it was found that it was a new string so the name Novel Corona virus. Biggest challenge of understanding zoonotic diseases such as the Corona Virus is the point of crossover. Answer is in markets or places where bush meat trading happens and where humans are directly involved in bush meat trading. In the meat market, one deals with so many organisms which have been earlier exposed to various bacteria. If proper care like wearing gloves or masks is not taken while processing the raw meat, chances are that one cuts oneself and contaminates self putting whole human species under risk in ignorance of them being infected and they go back to their families travel in buses and public gatherings in turn infecting everyone around. That is how these viruses spread. Instead of understanding how the contamination happened, if bats or any species are blindly blamed and killed, we are losing out. The fact is bats have not given us corona; we have been exposing ourselves to it because we are dependent on bush meat so much that we got it.

Our population is growing and so is our dependence on natural resources is also growing. Hence there is an overall compromise on the immune system of people. With time and generations, immunity to fight diseases has been reducing in mankind and these outbreaks are a way to weed out weak people. Climatic change and ice glacier melting has given new life to frozen viruses. No doubt the climate change is a much greater risk than what we are seeing right now.

2. Covid-19 and the great Lockdown

The largest COVID-19 national lockdown in the world has been extended to Phase 4. As of May 12, India has reported 3,32,000 confirmed cases, 1,70,000 recoveries and 9,520 deaths from COVID-19 in 31 states

and union territories since its first case on January 30. India was quick to close its international borders and enforce an immediate lockdown, which WHO praised as “tough and timely”. The lockdown has also given the government time to prepare for a possible surge in cases when the pandemic is forecasted to peak in the coming weeks. Still, India's population of 1.3 billion across diverse states, health inequalities, widening economic and social disparities, and distinct cultural values present unique challenges.

Preparedness and response to COVID-19 have differed at the state level. Kerala has drawn on its experience with the Nipah virus in 2018 to use extensive testing, contact tracing, and community mobilisation to contain the virus and maintain a very low mortality rate. It has also set up thousands of temporary shelters for migrant workers. Maharashtra has used drones to monitor physical distancing during lockdown and applied a cluster containment strategy: if three or more patients are diagnosed, all houses within 3 km are surveyed to detect further cases, trace contacts, and raise awareness. Whether this strategy will be successful is still unclear. The premise relies on there not being community transmission, and there is danger of stigmatization and coercion. But states deserve much of the credit for India's COVID-19 response.

The government's sudden enforcement of the lockdown seemed hastily prepared and immediately disadvantaged already vulnerable populations. There has been a mass exodus of migrant workers and concerns are rising about starvation among people who work in the informal economy. Implementing public health measures is difficult in places with overcrowded living conditions and inadequate hygiene and sanitation. Non-COVID-19 health services have been disrupted. Reports suggest that the government's efforts to provide financial support and a measure of food security to ease these pressures will be insufficient to meet demand. But better planning and communication could have helped avert this crisis.

Rates of testing have been low (0-28 per 1000 people as of April 20). Capacity issues, absence of political will, and operational feasibility have been to blame. However, efforts to reverse the situation are underway as hundreds of thousands of testing kits have become available, and more testing companies and laboratories have been approved. India's response has also been constrained by a shortage of health workers, but this should be remedied by new reforms that would mobilize additional health-care workers from different sources.

One threat to the COVID-19 response in India is the spread of misinformation driven by fear, stigma, and blame. There have been rising levels of violence against health-care workers and stigmatization of people with or suspected of having COVID-19, which could impede reporting of illness. The pandemic has also been used to fan anti-Muslim sentiment and violence, after a gathering connected to the group Tablighi Jamaat was identified as being responsible for many cases. A welcome initiative to combat fake news is being led by a group of more than 400 multidisciplinary Indian scientists, who have voluntarily formed Indian Scientists' Response to COVID-19 to fight myths and misinformation about the disease.

In India's favour are its young population (65% aged <35 years) and, to date, a less severe pandemic than was feared. The lockdown is already having the desired effect of flattening the epidemic curve. From April 20, states began easing restrictions on the basis of district profiling of infection hotspots (a form of cluster containment). The immediate challenge is to keep infections at manageable levels and ensure the ability to test, trace contacts, isolate patients, implement COVID care plans, and disseminate timely information. The central government should loosen its control and give states more autonomy over their funding and decision making. India must also pay much greater attention to the health sector and recognize the importance of having strong public sector capacity, especially in primary care and at the district level. India's public health-care system is chronically underfunded (at just 1.28% of GDP), leaving primary care weak. This pandemic could be the much needed wake-up call to the necessity of long-term changes to India's health system.

3. History of Pandemics

As humans have spread across the world, so have infectious diseases. Even in this modern era, outbreaks are nearly constant, though not every outbreak reaches pandemic level as COVID-19 has. Today's visualization outlines some of history's most deadly pandemics, from the Antonine Plague to the current COVID-19 event.

4. Impact of Lockdown

While almost all the industries have been impacted because of this pandemic, the ones which have been hit hard are the Airlines and Tourism, Hospitality, Automobile, and Power. Aviation and Tourism is probably the worst affected sector as all the passenger traffic- inbound, outbound and domestic has been grounded during the lockdown. As per International Air Transport Association (IATA), airlines globally can lose in passenger revenue of up to \$113 billion due to this crisis. Further, the industry is already low

on cash reserves, and cancellation, rescheduling and lower traffic may lead to job losses and pay cuts. According to IATA report, more than 20 lakh jobs are at risk in India's aviation space and dependent sectors because of the corona virus pandemic.

The hospitality sector which includes hotels, restaurants and foods and beverages has also seen a substantial downfall in its footfalls. Occupancy across hotels in key cities has declined rapidly by a staggering 45 percentage points compared to last year which has never been seen before. Additionally, many restaurants which already run on a very thin margin will be forced to lay off its staffs or close its operations.

Automobile sector's slowdown is also clearly visible. With China accounting for more than 27 percent of imports of India's automotive part and closure of their factories, there has been a delay in the production and delivery of vehicles. Almost all the major manufactures witnessed a drop in its March sales which is the peak period of inventory clearance for the industry. Maruti Suzuki India's domestic passenger vehicle sales fell 47 per cent and Hyundai witnessed a drop of 40 per cent. Further, the requirement to comply with the BSIV emission norms which was to be implemented from April 1 have decreased the sales further as new BSIV vehicles were few and most of the companies are pushing the production of new BSIV compliant vehicles to a later date.

Also, as most of the factories are closed during this lockdown and with fewer vehicles plying on the road, the consumption of electricity and petrol/diesel has come down substantially. While the electricity consumption contracted by 26.6 per cent for April 1-10 2020 over last year, consumption of petrol fell by 16.4 per cent and diesel by 24.2 per cent in March 2020 on a year-on-year basis. The stock market too has reacted to this pandemic and BSE Sensex fell from the level of 41,000 in mid-February 2020 to 29,000 by the end of March 2020. A decrease of over 30 per cent in such a short period of time has resulted not only in the loss of investor's wealth but also in their trust in the capital market.

4.1 Impact of Lockdown on Economy

While almost all the industries have been impacted because of this pandemic, the ones which have been hit harder than the others are the Airlines & Tourism, Hospitality, Automobile, and Power, says Abhishek Kumar, as he studies.

There are certain events which remain etched in one's memory for a lifetime, for its impact is not limited to a particular geography and neither is it restricted to a particular aspect of social living, but encompasses

almost every aspect of human life. Now as the governments across the world have resorted to the only proven public health measure, that is, social distancing to contain the spread of the virus, the second thing which has most severely been impacted are the economy and its growth with public health bearing most of the brunt.

While it seems plausible on the part of the government and the policy maker to take such a stringent action, doing so has severed the flow of goods and people and disrupted the economic activities at almost every level — right from farming to mining to industries to services. And with this, the economic deceleration is spreading as fast as the corona virus itself.

For any economic activity there has to be a supply side and a corresponding demand side and absence of either of the party stops the activity. With people staying at home, there has been a substantial dip in the supply side of the economic chain. First, because of a decrease in the labour participation on account of social distancing and lockdown, the productivity has declined as there are no workers running the factories and mills, no farmers tilling their land and no carriers to take goods from their source (factories and farms) to destination (consumers). This particular problem of lack of carriers has already resulted in wastage of many essential goods though the government is trying its best to keep the production of essential commodities and its supply chain intact.

Secondly, because of this slowdown in the economic activities the financial institutions are facing liquidity issues and a credit crunch is being felt everywhere. The banks are not looking anymore to increase their asset size and their focus has primarily shifted in keeping the balance sheet intact as many of them are still recovering from the bad debt crisis. To help in this regard and to see that there is no additional impact of corona virus on India's lenders due to a potential slowdown, the Reserve Bank of India (RBI) has introduced measures to pump more rupee liquidity into the banking system through its 'Long Term Repo Operations' and reduction of 25 basis point in its reverse repo rate. Additionally, the central bank has relaxed the asset classification norms which will help banks not to classify some of the (non-NPA) stressed borrowers as defaulters and has eased the liquidity coverage ratio for commercial banks from 100 percent to 80 percent (to be restored by April 1, 2021). All these measures will provide the much-needed liquidity and will keep the credit flowing.

While there is a clear visibility of restrictions on the supply side, the demand side too has started to contract, and this is further hampering the economy which might lead to a vicious cycle of further decrease in supply until the government intervenes and take necessary steps to keep the demands flowing.

Usually, demand in any economy is driven primarily by private final consumption, private investments and government expenditure.

According to the Economic Survey 2020, private final consumption contributed to around 60 percent of India's GDP. With people cutting down their consumption to their basic essential needs and forgoing their discretionary expenses, the private consumption has dampened. The private investments too have witnessed a slowdown primarily because of lower credit flow and secondly because of future uncertainty. Government expenditure, however, is expected to provide some relief and add to the GDP growth. The stimulus package of \$24 billion (Rs 1.7 lakh crore) in the form of Pradhan Mantri Garib Kalyan Yojna to provide relief to people is likely to mitigate some impact and help the poor and daily wage earners sustain during these difficult times.

Another issue which is more relevant to the Indian economy is its huge informal sector which accounts for roughly 94 per cent of the total employment in the country and contributes about 45 per cent of the output. Further, this informal sector employs mostly contract workers or daily wage earners and migrant labourers who are from low-income households and they are the people who are the most impacted because of the lockdown.

The International Monetary Fund (IMF) has come up with a report and has projected a gross domestic product (GDP) growth of 1.9 per cent for India in FY 2020-21. With this subdued forecast, India might witness its worst growth rate since its economic liberalization of 1991. Still, India is among the only two major economies expected to register a positive growth rate in FY 2020-21; the other being China, as the global growth rate in FY 2020-21 is expected to fall to negative 3 per cent.

4.2 Impact of Lockdown on Environment

The Covid-19 lockdown is healing the planet in a way never seen before in living history! We have here some of the most vital environmental changes seen in India after the Covid-19 lockdown.

Human beings often forget that we are largely dependent on Mother Nature and become ignorant towards taking care of it. We have been so reluctant to the preservation of natural resources and sustainable development that we had forgotten the beauty of the Earth completely. The Covid-19 lockdown imposed throughout the world has struck a chord in every one of us and it has made us thinking how nature is so important for our day to day living. The tangible improvements in nature have made us believe that the Earth can be saved.

It has made us see that our actions can very well impact the Earth's sustainability. For breathing pure air to greener trees, spotting various wildlife into the cities here are some important environmental changes that we have seen for coronavirus lockdown in India.

(a) Improvement in Air Quality

New Delhi was ranked as the most polluted city in the world by WHO in May 2014. The usual air quality of India's national capital according to the air quality index used to be 200. When the pollution level hit its peak, the pollution level soared to 900 and sometimes, off the measurable scale. While 200 itself is 25 percent above unsafe level as deemed by World Health Organization, but as Delhi's 11 million registered cars were taken off the roads and factories and construction were ground to a halt, AQI levels have regularly fallen below 20. The skies are suddenly a rare, piercing blue. Even the birdsong seems louder. In the capital of New Delhi, government data shows the average concentration of PM 2.5 plunged by 71 percent in the space of a week -- falling from 91 micrograms per cubic meter on March 20, to 26 on March 27, after the lockdown began.

(b) Dolphins spotted near Kolkata Ghats

Critically endangered, South Asian River Dolphins also known as Ganges Dolphins have been spotted back in the Ganga river after 30 years.

Due to the reduced pollution in water, the South Asian River Dolphins have been spotted at various Ganga Ghats of Kolkata.

(c) The number of flamingos increased in Mumbai

As a result of the lockdown imposed due to Covid-19, tens of thousands of flamingos have gathered in the city of Navi Mumbai. The birds normally migrate to the area every year, but residents have reported that this year they have seen a massive increase in their numbers.

(d) Ganga fit for drinking in Haridwar

The Uttarakhand Pollution Control Board Water from Har-ki-Pauri in Haridwar was tested and the results from the tests reveal that the water here has been classified as 'fit for drinking after chlorination', for the first time in decades. It is assumed that due to the lockdown, the drainage of industrial waste into the river water has stopped and brought a significant change in the water quality. As mentioned in an article by

India Today while talking to a CPCB scholar who is involved in the Clean Ganga project when asked about the rapid improvement in the water quality of Ganga water in Haridwar the source said that "the major pollutant of the river water was Industrial and Municipality wastewater

4.3 Impact of Lockdown on Education

Lockdown Is Disrupting a Generation's Education. What Can Be Done?

An interesting idea has been in the works in Uttar Pradesh which is planning to use Doordarshan, All India Radio and community radio to promote audio-based learning among students. The last few days have finally seen a flurry of activities by the Ministry of Human Resource Development (HRD) and various regulators including CBSE, NCERT etc. to find alternatives to ensure the continuation of education. While this may not be a good time to address the seriously low expenditure on education in India, the lack of seriousness towards the sector can be gauged from the fact that HRD was kept in Category C (the lowest category) for expenditure – i.e. the said department will have to restrict expenditure to within 15% of that budgeted for Q1, 2020-21.

Amidst this background, the department and regulators have started moving towards developing an online mode of education – as, hopefully, a stop-gap arrangement. NCERT has released an Alternative Academic Calendar for four weeks of home-based activities for different subjects. For example, activities like categorising objects including eraser, pencils, cloth, pulses etc. to teach the concepts of colours, shapes and sizes have been suggested for the students of Class I-IV.

For Class V students, teachers will be conducting classes through internet-based platforms, in the absence of which SMS and voice recordings can be sent. However, it has not been explained how voice recordings can be sent without the internet. Certain states including Uttar Pradesh are planning to launch high-quality ed-tech applications along with using e-resources suggested by the MHRD including e-pathshala etc.

However, amongst this whole discourse of moving education online, there has hardly been any discussion surrounding the practical issues of implementation, as well as various socio-economic factors which define the Indian education ecosystem.

(a) Limited internet availability

The 75th report of the National Sample Survey Office (NSSO) for 2017-18 highlights some of the major issues that this new model would have to address. All India percentage of households having internet facilities stands at 23.8% with rural availability at 14.9% and urban at 42%.

The problem does not end there, as having a facility does not mean it would be used. The percentage of people who were able to use the internet (all-India) stood at 20.1% with rural at 13% and urban at 37.1%. Additionally, only 10.8% of people in India had used the internet in the last 30 days. It is important to note that these statistics vary vastly among different states across the country. For instance, Bihar stands at the lowest (9.1%) for individuals who have used the internet in 30 days, while Delhi has the highest number (49.1%) of such individuals with bigger states like Maharashtra (26%), Rajasthan (15.3%), Andhra Pradesh (14.8%) etc. being in the middle.

These statistics strike at the core rationale of using the internet as a mode to impart education, and highlight how a majority of the country would be left out of the quest to achieve basic education in the months to come.

(b) Increased responsibility of parents to educate their wards

Another important pillar of the new model is the increased role that parents play in educating their wards. Take, for example, the NCERT guidelines which – surprisingly has progressive methods of teaching to improve the analytical, quantitative, and logical reasoning abilities of the students – all key factors which our regular model of teaching and learning does not have. However, the guidelines presume that the parents will have the academic intellect to impart education to their students. But statistics highlight otherwise.

The same NSSO survey, quoted above, highlights that 26.1% of the population above 15 years of age is ‘not literate’, while a further 18.9% have attended formal education up till primary school, 16.2% each have attended middle (Class V) and secondary (until Class VIII). This constitutes a whopping 77.4% of total India’s population – who may not have the adequate level of education needed to teach children in the house. The situation at the rural level is even direr, with 69.6 % of the population being in the spectrum of ‘not-literate’ to ‘middle school’.

(c) Loss of nutrition due to school closure

While the above factors touched upon the modality of the education, there is an even more basic issue at stake. The closure of schools has serious implications on the daily nutrition of students as the mid-day meal schemes have temporarily been shut. As of March 31, 2019, close to 12 crore students across the country were provided with food under with mid-day meal schemes.

This is close to 60% of the total students enrolled throughout K-12 education (the actual percentage is likely to be more, as mid-day meal only caters to students till Class VIII). Various studies have pointed out that mid-day meals are an important contributing factor for increased enrolment (~30%) in the schools. These factors highlight a very dangerous scenario for the K-12 education sector in our country. Our learning outcomes in K-12 education do not inspire much confidence, in the first place, as has been pointed out repeatedly in various ASER reports by Pratham.

The loss of possibly half a year – if not the full academic year of 2020-21 – is going to further deteriorate the situation, as students would have difficulty in resuming schooling again after a huge gap. Additionally, the loss of income for a considerable population in India is going to further exacerbate the situation – CMIE's data suggests that 11.9 crore people have lost employment in the two weeks of the COVID-19 lockdown. Investment in education is not going to be a priority, amongst disadvantaged households, and we might see a dip in enrolment, when and if, schools are opened.

5. Possible solutions

5.1 Field of Education

While the damage to the sector is similar to the damage every sector across the world is facing, it is possible that with some careful planning, we might be able to limit the long-term consequences of this prolonged shutdown. To begin with, the districts in the green zone should be allowed to open schools – after analyzing them further over the next few days. So far, there are 318 districts such in the country – which will likely cover a majority of the school children. Eventually, 292 yellow zone districts – which may turn to the green zone in the next few days or weeks – should also allow schools to open.

Strict social distancing measures should be implemented, and to limit the number of students, classes may run in two four-hour shifts. While this strategy would not result in finishing the quarterly curriculum, this will at least reduce the gap in learning that students are likely to experience if schools continue to remain shut for long. This may also help in addressing the possible increase in drop-outs due to the long shutdown. This leaves the government with 107 districts which are in red and orange zones. It might not

be possible to open schools in these areas any time soon, thus, there is a need to deploy public funds to fix the internet gap and ensure that students continue to learn. Some state governments have come up with ideas to address this concern.

The Delhi government had mooted an interesting idea to provide data packages to the students of Class X and XII. While this is likely to have certain implementation challenges – particularly the misuse of data for objectives other than learning – smart technology solutions can be found. Use of the internet can be restricted to specific applications prepared by the government. Similarly, another interesting idea has been in works in the state of Uttar Pradesh which is planning to use Doordarshan, All India Radio and community radio to promote audio-based learning among students who do not have access to the internet. Additionally, there is a need to develop a financial stimulus for the education sector primarily targeting low cost private aided and unaided schools – which are likely to witness a reduction in fee collections, due to income losses. Various states, including Rajasthan, Punjab, Haryana, and Uttar Pradesh have already announced that schools should not pressurise parents to pay fees. However, a move like this is going to have a spillover impact on the incomes of teachers at such low-cost private schools. As of 2016-17, close to 28 lakh teachers were employed in private unaided schools, and further 8.3 lakh in government-aided schools. A more rational system could be to allow a reduced percentage of the fee in schools which are partially working (red and orange zone), with full fees for schools which would be fully functional (green and yellow).

Wherever relevant, a grant-in-aid could be issued for specific schools on a case-to-case basis to bridge income and expenditure. The powers for the same can be devolved to the district authorities to ensure a more localised approach. While understandably, India as a developing country does not have unlimited resources, certain core sectors including education cannot simply be left as the last priority. Similar to other sectors, which are witnessing a staggered opening, the education sector – particularly the K-12 education system – needs to be opened in a staggered way.

These 12 years of education are crucial for every student and are the base years that will support the upward social and economic mobility of disadvantaged classes. A long and unplanned hiatus is likely to shatter the dreams of many and further harm the country in the long-term with a less-educated workforce. We need more talented and skilled individuals to get us out of the possible recession that the world is going to face and dropping the ball on education, is not going to help the cause.

5.2 Field of Environment

“People are now adapting to restricted business timings”, says Dr Dasari Prasad, an environmental scientist, who is also the Telangana State Pollution Control Board’s ambient air quality specialist. Making it clear that these are his personal opinions, Dr Prasad said he did discuss some of these ideas with some officials recently.

6. Conclusion

“My recommendation would be to close commercial activities by 5 pm and malls by 6 pm. However, restaurants could be left open as per their normal working hours in order to cater to the eating habits of people”, he told Deccan Chronicle.

On what could be achieved if such recommendations are implemented, he said “For one, these will provide the environment in the city 8-12 hours of recovery time. This means the air, being dynamic, will have enough time to disperse pollutants, whether from automobiles or other sources. Two, this will mean lot of daylight saving, energy savings for commercial establishments. And equally importantly, it will reduce vehicle movements by evenings and result in cuts in emissions. These thoughts need to be conceptualized and studied in detail and clear proposals need to be made. Eventually, it will be for the Air Quality Monitoring Committee that comprises six senior IAS officers and the government to take a call”, he said.

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TRANSFORMATION OF CHALK & TALK TO VIRTUAL CLASSROOM AT THE BACKDROP OF COVID-19

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Abstract

State and Central governments have imposed lockdown throughout the country from the second week of March, and instructed schools and other educational institutions to close down temporarily to avoid spread of COVID-19. After few days passed by, the uncertainty of reopening of these institutions prevailed, and teachers at all levels started exploring the untapped methods to continue the practice of teaching. After some initial hiccups, majority of both teachers and students communities' have adopted new pedagogical methods in digital teaching like Zoom, Telegram, Cisco Webex, Google classroom and many other platforms. Despite facing a fair share of disadvantages in the world of online education, teachers have been continuing with their classes. The lockdown period has undoubtedly affected the economy of the country, but has also profoundly affected the daily functioning of several lives. According to history, the world has faced many such incidents, including lockdowns amidst pandemics, and with due course of time, different kinds of solutions were made available to humanity. The only mitigating factor to it all might be the fact that worldwide emissions have reduced to minimal levels and the air we breathe is cleaner. In conclusion, as the world faces this predicament, the government should support versatile and effective educational practices for the young minds of this generation by providing access to different digital tools and basic internet facilities being made available to all.

1.Impact on Education

During the second week of March, State and Central governments have instructed the schools and other educational institutions to shut down temporarily throughout India in order to control the spread of COVID-19. During this time teachers, students and their respective families have embraced this period of time with their loved ones. Soon enough uncertainty followed regarding reopening of these institutions where they were forced to explore the untapped digital module of learning. During this period, the Education Sector was involuntarily put on halt across the country as various examinations ranging from nursery school admissions to the crucial board examinations to the entrance tests of several universities

and also the competitive examinations among others, which are all usually held during this period of time. As the days pass by with no immediate solution to stop the outbreak of Covid-19, schools, colleges and universities having been shut down immediately raised concern not just about the short term impact on the continuity of learning for more than 285 million young learners in India but also endangering far reaching economic and societal consequences.. If a report of KPMG is to be believed, then it is estimated that the online education industry of India will grow by 6 times by 2021. The value of the industry is also expected to reach approximately 1.6 billion dollars.



1.1 History

Online teaching can be considered as a type of “distance learning” i.e. learning across distance but not in the setting of a traditional classroom. Distance learning has long history and there are various modes available to us, such as

- Correspondence courses offered by various institutions across the world since many decades.
- The courses offered through radio and televisions are not new to the society.
- CD-ROM lessons have been available ever since the invention of computers.

Government has also been funding organisations like MOOCS, SWAYAM among several others.

1.2 Online classes during lockdown

A new challenge posed to the teacher community at all levels across INDIA which required them to learn new pedagogical practices at the back drop of COVID-19. Since this new form of teaching came about instantaneously without a warning, teachers were navigating uncertain waters and scrambled to incorporate technology in enhancing the learning process and to change the dynamics from a classroom to

the four walls of their homes. Prior to COVID-19, E-learning was practised by many renowned educational institutions throughout the world, and even teachers at all levels used video lessons as a part of their curriculum. But it became a regular practice using the conventional chalk-talk method.



After facing a few initial hiccups, teachers have slowly adapted to the new ways of teaching. They also realise the importance of boosting the confidence levels of students and to encourage them to stay connected with their friends, classmates and teachers simultaneously through a virtual class room.

1.3 Digital Tools required

Computer / smartphone: All the teachers and students require a computer or a smartphone, which supports two or three online apps.

A Virtual Conference Platform: Now, majority are easily accessible to all

Digital material: Prepared documents/pdf's, video lessons, animation lessons

Hardware: A proper headset (wired/wireless)

To Execute: Uninterrupted power and a proper network which supports continuously.

In Practice: People explored the digital classroom platforms such as Zoom, Cisco Webex, Google Meet, Skype, Webinar, Google Classroom and many more. The software companies have also started developing better networking platforms in the form of apps on the market. The State and Central governments have given instructions to schools and universities to continue their education using technology. Various state governments have taken further steps to finish the remaining syllabus using TV channels like DOORDARSHAN, T-Sat and other government public entertainment channels.

- Irrespective of their social and financial status, students can learn the same thing because everyone is on the same platform.
- Less investment of time and energy compared to traditional learning. Can go for short modules to get immediate employability.
- Can view recorded classes at their own pace and convenience. Can store the lessons for future reference.
- Can post their comments in the group for discussion.
- Can submit assignments without hard copies (paper is not wasted, thus also benefiting the environment).

1.4.2 Teachers (in ideal situation)

“There is no win without war”

- Prime duty of teachers is imparting knowledge to students whether personally or virtually.
- Should be a continuous learner.
- This is a new challenge to the teachers to impart their content in a new way to the students in “virtual class room”.
- Successful teachers are those who are ready with their digital material. Which include videos, animations, mind maps and presentations.
- Tough job to sense the attention and class dynamics.
- Should be aware of open educational resources like MOOCS, SWAYAMPRAKASH.
- Should be able to use the digital tools like creating websites consisting of teaching material vastly available on the internet.
- Very easy online evaluation and grading.
- Can send in online assignments with a due date and can cater to fast learners with in- depth assignments (as in a classroom this may be a delicate thing for both students and teachers, sometimes even lowering the motivation levels of slow learners).
- The institutions which cannot afford to buy costly equipment have virtual labs as viable alternative online resources such as videos or step-by-step, process-based websites, which can take students through a sequence.

In this time of crisis, a teacher should play a major role in developing a well-rounded and effective educational practice which is required for the broadening intellectual capabilities of young minds, thereby

inculcating the skills that will drive their employability, productivity, health, and well-being in the decades to come, and ensure the overall progress of India.

1.5 Traditional class

Students:

- There is no chance of distraction if you join a traditional class. You have a certain time set where you spend it with your peers and teachers.
- A place full of likeminded people.
- An immediate answer from teachers to their query.
- It is very difficult to adapt to remote learning immediately.
- Overall personality development: students learn from teachers and fellow students by interacting and discussing to mould their overall personality which is lacking in online classes.
- Personal teacher – student relationship will be missing.
- Regular attendance in classes helps them interact with other individuals of their own age, be better disciplined, follow a regular schedule, and improve their physical fitness and mental alertness.

Teachers:

- It is very difficult to draw the continuous attention of students in online class.
- It is very difficult to assess the progress of the students.
- There are different types of students in a single class and traditional teaching methods enable the teachers to identify those who are not following the lessons. The teachers then can alter their teaching style to cater to the weaker students if that is what helps them.
- The teachers through interesting and interactive sessions keep the students constantly engaged resulting in high retention of the things taught.
- By engaging students in live discussions, the teacher's guide the students to use their critical thinking skills to formulate arguments and opinions.

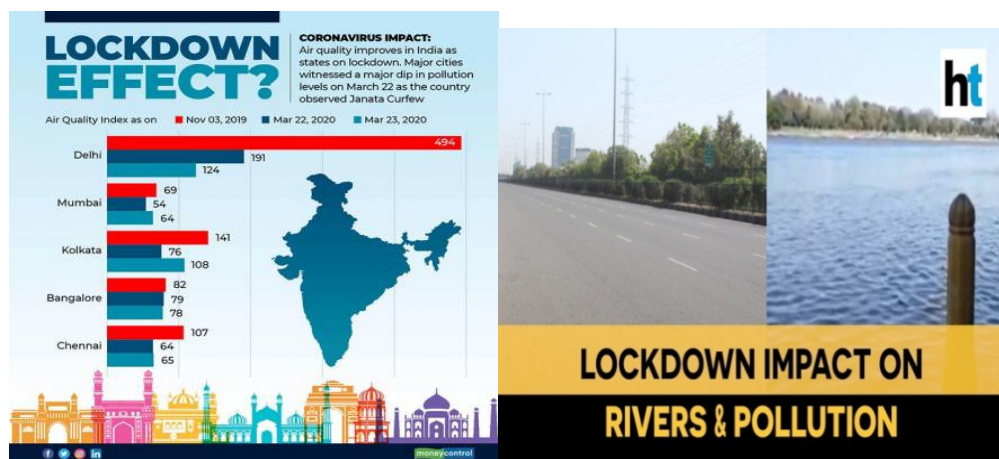
2.Impact on Economy

The lockdown started in India in the second week of March, which is a crucial period for preparing for the upcoming regular exams and entrance examinations. But due to lockdown, both students and teaching faculty were homebound. Many students from rural areas come to urban areas for coaching. The revenue for coaching institutions and the dependent informal sector such as tea shops / food stalls / hostels are

badly affected. Many families have lost their livelihood, and the situation may take time to revert back to normal again.

3. Impact on Environment

The Government of India launched many programmes to clean the rivers by taking enormous loans from other countries and the World Bank. The pictures shown below are showing the improvement of the environment during lockdown. During the Parliament session the corresponding union minister announced that about Rs 28,613 crore will be spent on the cleaning process of rivers and other polluting systems.



The pictures speak about the tremendous impact of lockdown on the environment on a larger scale. According to data by the Central Pollution Board, the pollutants in air have drastically reduced to a nominal level. The people might have experienced the fragrance of fresh air after decades. The distant mountains are visible with naked eye in the absence of air pollution. Nature itself heals its wound by itself by taking breathing time. The survival of marine life in the fresh waters of rivers and all water bodies is really significant sign of improvement in the environment of earth.

4. Measures

After observing the situations, the serious measures to be taken in various sectors are:

4.1. Education

- The government should encourage both traditional and online teaching simultaneously. In emergency situations like these students will be prepared to take up online classes without any difficulty.
- Government should share the 5G frequency bands and spectrum allocations to individual educational institutions governed by district officials/ academicians, so that the poorest of poor students can access quality online teaching and these students will be in a better position to set them up for success.
- Government should provide digital tools to the more economically weak students at all levels.

4.2.Economy

- Government should encourage non-profit social organisations to facilitate the families involved in the education sector.
- To pave the way for alternative forms of employment during such situations

4.3.Environment

- Periodically, the industries / the major pollutant bodies should be advised to have mandatory intervals in order to protect the environment and keep the resources safe for future generations.
- By giving breathing time to the environment the countries need not go spend huge funds on the process of cleaning the water bodies and atmosphere.

5.Conclusion

The measures suggested should be adopted by the concerned governing bodies and thus help in improving the various sectors and overcome the pandemic situation

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COVID-19 AND THE ENVIRONMENT – AN OPPORTUNITY TO REBOOT PLANET EARTH

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Abstract

The COVID-19 outbreak is now a global tragedy. Hundreds of thousands have died, healthcare systems are buckling, and the future is uncertain for millions of people whose livelihoods are collapsing. COVID-19 is a reminder of how vulnerable even our modern, technologically advanced societies are. Covid-19 is an SOS signal for the human enterprise, bringing into sharp focus the need to live within the planet's 'safe operating space', and the disastrous environmental, health and economic consequences of failing to do so. Our economies, livelihoods and wellbeing all rely on nature, from the food we eat, to controlling our climate, regulating disease and providing spiritual fulfillment. Without nature, there would be no life. There have been both positive and negative indirect effects of COVID-19 on the environment. The symbiotic relationship between humans and all other life on Earth, stresses that preserving and sustainably managing biodiversity is necessary for mitigating climate disruption, guaranteeing water and food access, and even preventing pandemics. The credits and subsidies that many governments are handing out so generously in this moment are not just a necessity—they are also a chance to direct economic progress towards sustainable development. This is an important insurance policy to avoid future pandemics. A successful recovery from this global pandemic will be one that brings a new era of social and economic prosperity for all within the planet's natural capacities to perform. A new relationship with nature and an efficient use of our natural resources will be key to this success.

1.Introduction

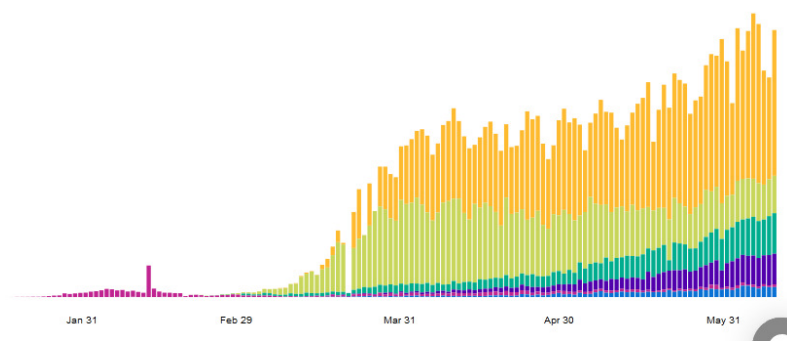
In late 2019, an acute respiratory disease emerged, known as novel coronavirus disease 2019 (COVID-19). The pathogen responsible for COVID-19 is severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2, also referred to as the COVID-19 virus), a member of the coronavirus family.

The COVID-19 outbreak is now a global tragedy. Hundreds of thousands have died, healthcare systems are buckling, and the future is uncertain for millions of people whose livelihoods are collapsing. Emergence of Covid-19 was the result of the over-exploitation of the natural world.

Case Comparison

WHO Regions

Americas	3,560,591
Europe	2,358,953
Eastern Mediterranean	716,151
South-East Asia	422,825
Western Pacific	195,487
Africa	155,762



Source - <https://covid19.who.int>

Globally, as of 2:10pm CEST, 12 June 2020, there have been 7,410,510 confirmed cases of COVID-19, including 418,294 deaths, reported to WHO.

In the context of COVID-19 infection, medical experts have warned that existing health problems, such as chronic obstructive pulmonary disease (COPD) or heart disease are critical determinants of lung damage risk; and results of a recent study indicate that long-term exposure to nitrogen dioxide—largely the result of burning fossil fuels—may be one of the most important contributors to COVID-19 fatality.

2. Nature's Revenge - Environmental Origins of COVID- 19

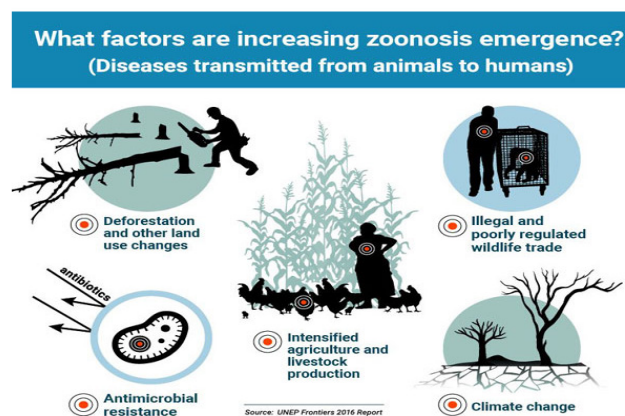
2.1. Healthy planet, healthy people

Nature is our life-support system. Healthy natural systems provide so many essentials like water, clean air, fertile soils and a stable climate. They also give us food, medicines and materials and directly underpin our economies. The interconnected nature of all life on this planet encompasses the links between ecosystem stability, the environment, and human health including zoonotic diseases.

Unfortunately, human activities are placing these natural systems under greater and greater stress, and in turn exposing our society and economies to growing nature-related risks.

2.2. Zoonotic Diseases

It has been widely reported that COVID-19 is a Zoonotic disease. The transmission of zoonotic diseases from animals to humans has long been recognized as a serious threat by global health experts. Studies show that 75% of all emerging diseases come from wildlife. The biggest lesson that we need to learn is that COVID-19 is more than an illness. It is a symptom of the ailing health of our planet. Humanity's dysfunctional relationship with nature has caused this wider disease. Understanding this root cause is critical, if we want to rise stronger after the crisis. COVID-19 evolved into a pandemic due to the now well-established risk cocktail of the 21st century: ecosystem destruction, species loss, global warming, colliding with risky human behavior like illegal wildlife trade.



Source : <https://earthsky.org/human-world>

3. Environmental Perturbation - Key Driver of Pandemics

i. First the loss and degradation of natural habitats must be recognized as a key driver of emerging infectious diseases from wildlife. When an area of land is deforested and converted to agriculture, or used for infrastructure development, it reduces the natural habitat available to species and can bring them into more regular contact with each other as well as humans. This gives microbes a greater ability to move between species and to make the jump to people.

Zoonoses that emerged or re-emerged recently are Ebola, bird flu, Middle East respiratory syndrome (MERS), the Nipah virus, Rift Valley fever, sudden acute respiratory syndrome (SARS), West Nile virus, Zika virus disease, and, now, the coronavirus. They are all linked to human activity.

ii. In addition to being a key factor in land conversion, how we produce our food also has the potential to drive pandemics — raising domestic animals in high density appears to make disease spread and evolution more likely. The lack of genetic diversity in these operations increases the chance of rapid spread of viruses, while the sheer number of animals increases the likelihood of viruses mixing.

iii. The wildlife trade is another activity that is bringing wildlife into close contact with people and providing microbes the opportunity to mix between species- Illegal and unregulated markets must be closed down, for the sake of humanity and for wildlife.

iv. Climate change is a fourth force which in the longer term is likely to be a growing driver of the emergence of zoonotic disease outbreaks - As our planet warms, the distribution and abundance of many species, including the organisms that transmit diseases between animals, are expected to shift, creating further opportunities for viruses to jump.

v. The Biodiversity Crisis

Biodiversity loss and climate change exacerbate each other. The loss of species and habitats contributes to climate disruption, which in turn can accelerate biodiversity loss — both of which can contribute to the rise of pandemics.

4. Impact of Covid-19 On Environment – The Double-Edged Sword

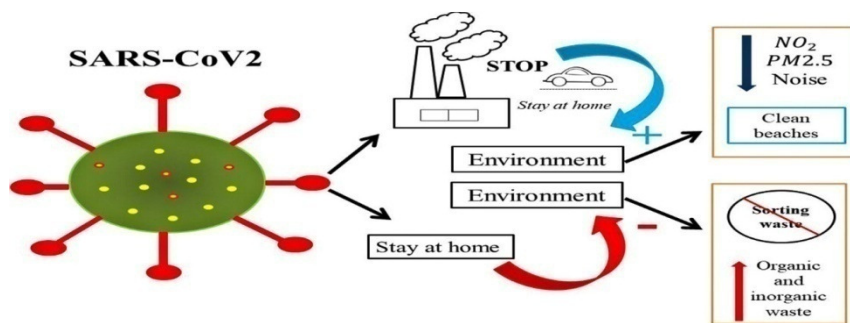
There have been both positive and negative indirect effects of COVID-19 on the environment.

4.1. A Blessing in Disguise

In the wake of COVID19, majority of the countries have implemented pre-emptive and remedial measures. These include a strict lockdown, the most extensive travel restrictions and industries shut down.

An unexpected corollary of these measures is that levels of air pollutants and warming gases over some cities and regions are showing significant drops due to reduced electricity demand, industries, transport networks and businesses being closed down. Reduction of environmental noise level has been observed.

4.1.1. Changes in Air Pollution/Quality

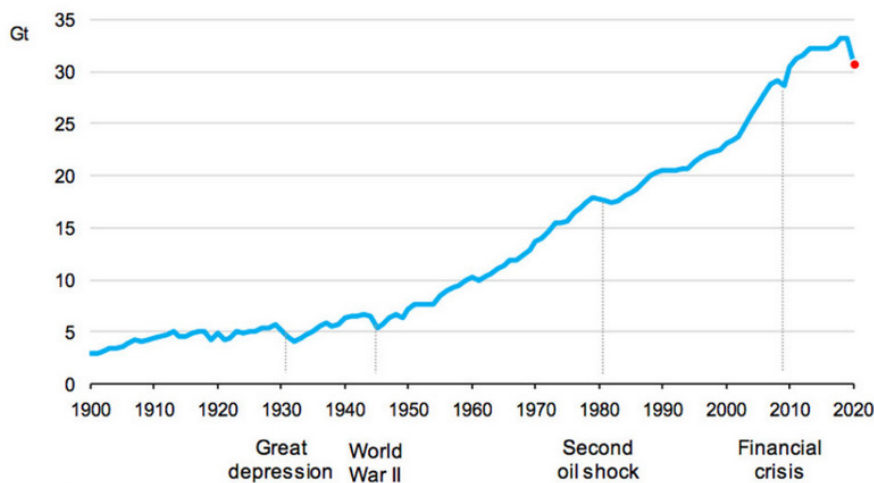


.Source- <https://ars.els-cdn.com/content/image/1>

In China, emissions fell 25% at the start of the year as people were instructed to stay at home, factories shuttered. In Europe, satellite images show nitrogen dioxide (NO₂) emissions fading away over northern Italy. A similar story is playing out in Spain and the UK. Due to quarantine, NO₂ was reduced by 22.8 µg/m³ and 12.9 µg/m³ in Wuhan and China, respectively. PM 2.5 fell by 1.4 µg/m³ in Wuhan but decreased by 18.9 µg/m³ in 367 cities.

Large reduction in airplane emissions would further the recovery of ozone hole.

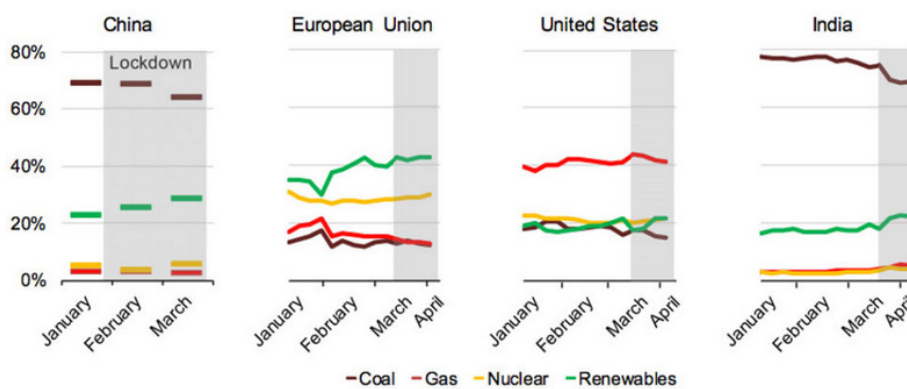
Emissions of the planet-heating gas CO₂ have also fallen sharply. The International Energy Agency has forecast the CO₂ impact of the crisis, suggesting emissions could fall by 8% this year, some 2,600MtCO₂, equivalent to the annual emissions reductions needed to limit warming to less than 1.5C above pre-industrial temperatures.



Source: <https://www.unenvironment.org>

A Nature Climate Change study published last month showed that human-caused CO₂ emissions had fallen by as much as 17% during the height of the worldwide lockdowns in early April. Emissions for the year to date, from 1 January to 11 June, are 8.6% lower than in the same period for 2019, and emissions for the whole of this year are likely to be between 4% and 7% lower than for the whole of last year.

Records reflect a rising renewable share of the electricity mix of countries around the world – where demand has declined during lockdowns – as shown in the chart, below.



Changes in the electricity mixes of key emitters in 2020 so far, with the implementation of lockdown strategies indicated by grey shading. Source: IEA Global Energy Review.

Source: <https://www.iea.org/reports/global-energy-review-2020>

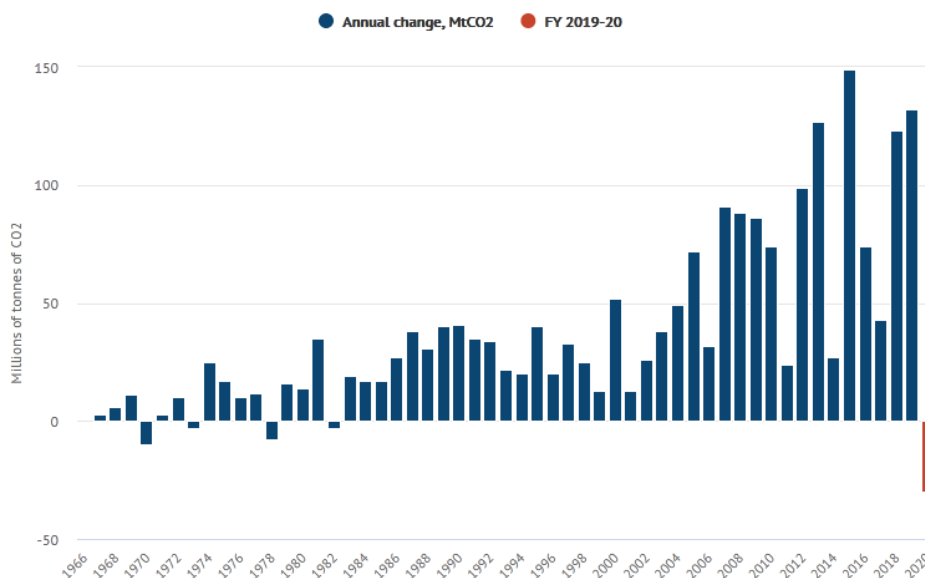
The Indian Story:

Several environmental factors that saw improvements in India as a result of the lockdowns, are namely air quality, noise pollution, water quality, and biodiversity among others.

Analysis of official Indian data across the nation's entire 2019-20 fiscal year shows the fall has steepened in March, due to measures to combat the corona virus pandemic. The country's CO₂ emissions fell by an estimated 15% during the month of March and are likely to have fallen 30% in April. On an average, reduction in particulate matter (PM) concentrations over southern part of India is around 50-60%, and over the Indo-Gangetic basin, including Delhi, UP, Bihar, West Bengal etc it is as much as 75%.

It is estimated that CO₂ emissions fell by 30m tonnes of CO₂ (MtCO₂, 1.4%) in the fiscal year ending March, in what is likely to have been the first annual decline in four decades.

Annual CO₂ emissions fell 30MtCO₂ (1.4%) in the financial year 2019-20



Source: <https://www.iea.org/reports/global-energy-review-2020>

4.1.2. Reduction of Environmental Noise Level

The imposition of quarantine measures by most governments has caused people to stay at home. With this, the use of private and public transportation has decreased significantly. Also, commercial activities have stopped almost entirely. All these changes have caused the noise level to drop considerably in most cities in the world. Several water sources, including river Ganga, have become less polluted and cleaner.

4.2. The Flip Side

Despite certain short-term positive impacts, there are several distressing environmental consequences of COVID 19 pandemic. Huge quantity of unrecyclable waste and organic waste has risen due to lockdown and stay-at-home policy to check virus transmission.

Safe management of domestic waste could be critical during the COVID-19 emergency. Medical waste such as contaminated masks, gloves, used or expired medications, and other items can easily be mixed with domestic waste.

However, once the pandemic ends, countries will most likely revive their economies, and GHG emissions will skyrocket again.

5. Environmental System Upgrade- Insurance Policy to Avoid Future Pandemics

COVID-19 has demonstrated the interdependence of humans and our environment. Representing one of the estimated 8 million species on the planet, we are a key part of an intricate, delicately-balanced web of life. Damage to one part of the web upsets the balance and affects the whole system.

But, the pandemic also represents an opportunity to plan a better recovery and build a better future. We must also look ahead to what we can learn from this crisis to prevent future risks. This means the protection and sustainable management of our global commons—such as our atmosphere and the earth's rich diversity of plant and animal species—must be center-stage of priority-setting in our societies. The spread of this virus has proven once and for all that, in this globalized world, there are no local problems—pollution and pathogens know no borders. Faced with the multifaceted impacts of COVID-19, multilateralism has to evolve. Governments, businesses, the UN, international organizations, scientists and individual citizens need to unite as a single global community to safeguard people from avoidable risks.

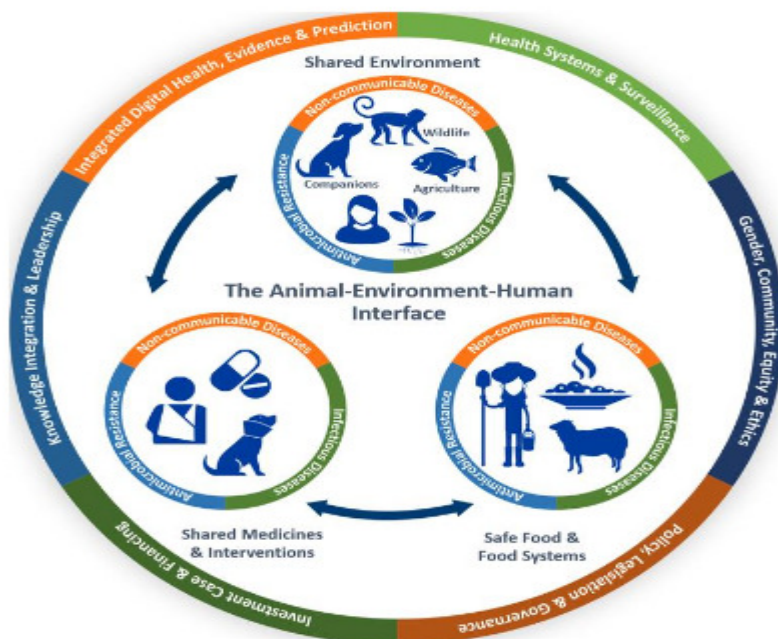
Recovery plans built on the concept of fulfilling human rights, including the right to a healthy environment, entail concrete actions and policies that aim towards achieving a stable climate, waste-free and low-carbon economy; creating millions of jobs in ecosystem restoration; building health, water and sanitation infrastructure and sustainable agriculture, reduced exposure to toxic substances, and healthy

ecosystems and biodiversity. Ending deforestation, tightly regulating wildlife trade, and closely monitoring hotspots where people, wildlife and domestic animals mix will help prevent future pandemics.

Stopping deforestation will not only reduce our exposure to new disasters but also tamp down the spread of a long list of other vicious diseases that have come from rain forest habitats—Zika, Nipah, malaria, cholera and HIV among them. Governments should prohibit the sale of live wild animals in so-called wet markets, where pathogens have repeatedly crossed over into humans. This is an opportunity to embrace renewable energy, green technology and sustainable new sectors that put the planet on a fast-track path to decarbonization.

5.1 UNEP's Response -- The Way Forward

The United Nations Environment Program (UNEP) is stepping up its work on mapping zoonotic threats and protecting the environment to reduce the risk of future pandemics, such as the COVID-19 crisis currently sweeping the globe



Source: <https://wedocs.unep.org/bitstream/handle/20.500.11822/32285/ZD.pdf>

This will take the form of several key interventions:

1. Zoonotic early warning system

A new zoonotic risk and response program will be developed to improve capacity to reduce threats of zoonotic diseases, in coordination with key partners.

2. National zoonotic risk reduction action plans

While many countries already have action plans for dealing with zoonotic diseases, UNEP will explore how it can work with partners to further support Member States in both rebuilding post-pandemic economies better and reducing the threat of zoonotic diseases in the future.

3. Ambitious new biodiversity targets

UNEP will seek to reduce one of the main drivers of zoonotic disease transmission—the degradation of ecosystems—by increasing the ambition and commitment to new global biodiversity targets and their means of implementation.

4. Reviewing the implications of moving environmental governance and multilateralism towards virtual, and thus lower environmental footprint, meeting platforms.

5. Supporting decision makers to deal with the spike in hazardous waste

6. Scale up and accelerate sustainable consumption and production

The sustainable management of natural resources, including the smarter use of materials (such as biomass, fossil fuels, metal ores and non-metallic minerals) has many benefits.



Source: <https://www.genevaenvironmentnetwork.org/resources>

Looking ahead, it is crucial that we rebalance our relationship with nature to secure a sustainable future for people and the planet. World leaders must step up and acknowledge the close connections between people, nature, and climate, and take action to reduce nature-related risks.

6. Conclusion

COVID-19 has made it crystal clear that we must form a blueprint for an economic and societal future that factors nature into everything we plan and build. Transformative action on protecting and restoring nature and the biodiversity of our planet is urgently needed. We have much more to gain from working with nature than against it. We need to use the reboot to incentivize sustainable innovation and green investment. We need to use the reboot to incentivize sustainable innovation and green investment. Nature-based solutions have the capacity to protect, sustainably manage and restore both natural and modified ecosystems. The focal strategies should be to capture opportunities for leap-frogging to green investments, such as renewable energy, smart housing, green public procurement, public transport, — all guided by the principles and standards of sustainable production and consumption.

These actions, - sound management of hazardous medical and chemical waste; strong and global stewardship of nature and biodiversity; and a clear commitment to “building back better”, creating green jobs and facilitating the transition to a carbon neutral future will be key to a resilient and sustainable future and to our reaching the Sustainable Development Goals. And that, of course, remains the future we all want.

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Dr. S. Pardhasaradhi after superannuation presently serving as Professor of Business Management of this Institution. He was former Chairman, Board of Studies in Management, O.U. In Osmania University he was Principal, OUPG College, Vikarabad and was also Director, Directorate of Placement Services, O.U. He served as CEO in L.D. Steels (Hyd) Ltd. He has 15 years of corporate experience and 31 years of teaching experience. 16 Research Scholars were awarded Ph.ds in the area of Finance, Strategic Management and HRM. He published 24 articles in the various national and international journals. He edited MBA Course Material for 4 subjects authored course materials for 8 subjects of PGRRCDE, O.U.

Dr. Mala Das Sharma, HOD, Department of Chemistry completed doctoral research from Indian Association for the Cultivation of Science, Kolkata. She has 30 years of teaching and 20 years of research experience. She has published 21 papers in peer-reviewed journals and recognized as editorial board member and reviewer of International journals. She is the recipient of the Inspiring Citizen Award from Institute of Self Reliance, Woman Researcher Award from VD Good Professional Association and Award for Teaching Excellence from the Indus Foundation. She is the founder of St. Pious Undergraduate Environment Research group and dedicated her life towards teaching and training the students.

Sr. Velangini Kumari Boyapati is a member of the congregation of Catechist Sisters of St. Ann, Hyderabad. She has been involved in field of education for over 20 years. She holds a Post Graduate Degree and M. Phil in English literature. She was awarded gold medal by Kakatiya University, Warangal, Telangana. Presently she is the Principal of St. Pious X Degree and PG College for Women, Nacharam, Hyderabad. She plays a vital role in blending technology in administration process, facilitates character education programs, and professional development. She is a member of many professional bodies such as ELTAI, CEGR, and Secretary for Education Commission of Catechist Sisters of St. Ann Congregation. She has 6 publications to her credit in reputed journals at National and international level. She received "Education Leadership Award" as Principal from 'Dewang Mehta National Education Awards' on 15th November, 2019. She also received "Outstanding Industry and Academic Contributor" award by ASSOCHAM on March 8, 2020.



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