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COVID-19 Special Issue-I

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Editorial

I Introduction

It would be no exaggeration to assert that one of the gravest health calamities that the world has had to encounter over the past hundred years is the present COVID-19 pandemic that is still very much upon us. On the day of writing this overview, 11th December 2020, the world has already recorded around 69.6 million cases, with about 1.6 million deaths. Of these, India's share has been 9.8 million and 1.4 lakh, respectively. In absolute terms these numbers are already rather high. Owing to the nature of the corona virus, which has a very high possibility of community spread, virtually all countries of the world have had to undertake and enforce prolonged periods of lockdowns and closures of schools, colleges, government offices, courts, market places, and other places of public gathering. In many countries, including India, industries have had to shut down, and most modes of transport have had to be very severely curtailed. The impact of all this on economic activity has been devastating. In the first quarter, April-June of 2020-21, the Indian economy shrank by an unprecedented 23.9 percentage points. The rest of the world also has had to bear the fury of the pandemic in varying degrees.

The COVID-19 pandemic has not merely posed a threat to life but also livelihoods at large. It has already brought about substantial loss of lives and job losses in the US and other major West European countries. Its fatality quotient in the developing world has fortunately been weak. However, its spread potential is perhaps the most in these parts, given the living conditions and environment of the developing world. Appearing in the scene since eight months, its spread remains unabated while the treatment protocol seems to be, at best, tentative.

The possibility of a vaccine, however, seems to be emerging in the horizon. Given the asymptomatic nature of this infection, it has rather made it impossible to ascertain its real grip over the population and that has led to umpteen sets of safety measures to be in place, which has not only crippled the means of living for many, but has also brought about a changing order of living termed as new normal. While one is not sure as yet as to how long it is going to sustain its threat over humanity, the alternative order of living,

the nature of exchanges as well as societal arrangements at large seem to be responding, though only very slowly or in a gradual manner. One needs to perhaps rewrite the common scheme of things with regulations and protocols which were otherwise hitherto overlooked.

II The pandemic and its bearing on the economy and society

In the absence of a definite course of treatment for this infection as well as its protection through vaccination, emphasis has been laid on its containment. The containment measures are in terms of lockdown, social distancing and adoption of proper hygiene practices to keep the infection at bay. While these measures undoubtedly can arrest the spread of infection to a reasonable extent, one wonders as to its implementation in the prevailing living environment on one hand and its differential consequences on various population segments on the other. Measures like social distancing and lockdown seem to be emerging from a middle class mindset that overlooks the larger reality of life and livelihood of the masses. In fact, such containment measures are not only having a 'privilege' bias, but they have also compromised the state of living of a large share of our population that is least resilient to bear the brunt of the changing order of life.

Imposition of such measures have brought to the fore many aspects that were otherwise overlooked, like basic needs, social protection, and resilience to with stand shocks arising out of the unprecedented situation. A country with a billion plus population was for the first time made aware of its vulnerabilities when it had to put up with the chaos that emerged while fighting this pandemic. The vulnerabilities included compromised state of living in urban spaces, a predominant workforce in the unorganised sector without any protection whatsoever and, above all, the limited duration of survival without paid work. Apart from these vulnerabilities, the health infrastructure with a skewed public-private divide is far from sufficient to handle such eventualities. The disparate distribution of health workforce across regions added to the woes further. Given these vulnerabilities, the reading and understanding of the trajectories that the economy is going to assume gained utmost significance. While the immediate implications were in terms of protection of the masses through provisioning of means of survival, the renewal of economic activities in many sectors poses a grave challenge given the pre-COVID-19 work environment, alongside the predominance of informal nature of work.

The pandemic has given rise to a multiplicity of issues cutting across sectors, and is going to leave a scar that would last for quite long. The threat of its spread enforces a different order of living and functioning that has enforced alternative means of conducting routine affairs in almost all sectors. The most visible departure has been from the real to the virtual, personal to impersonal, and the vehicle for this has been the digital interface. It becomes there fore pertinent to engage in understanding its impact on various facets of the economy and society. The *Orissa Economic Journal*, being an instrument of exposition on the concurrent changes in the economy and society, makes a pitch for engagement with this unprecedented circumstance through its pages wherein thoughts and opinions are presented with contributions relating to specific domains. The twin foci have been on the health sector and the economy.

As regards the economy, there are a varied set of propositions that are made in terms of the consequences and sector specific impacts. While the economy has taken the worst beating in terms of shrinking GDP, rising unemployment along with a threat of recession, scholars in this issue have made scientific attempts at forecasting the GDP in times of such a crisis. Such a reading of the economy considering the emerging circumstances undoubtedly provides an expected trajectory of the regional and the national economy. Besides this assessment, attempts have been made to analyse selected sectors of the economy considering the extent of informality therein that brings to the fore the kind of vulnerability associated with the prevailing informality in the Indian economy. This not only calls for reducing informality to a great extent but also provides a ground for the kind of protection that is essential in many of these sectors.

Another segment of papers which largely focus on the health sector comprises challenges posed by the pandemic to the prevailing health system in general and public health outlook in particular. This also includes a region specific assessment of imposition of preventive measures of containing the pandemic among the masses wherein the impracticality of such measures to be effective on the ground along with the lack of feasibility to adhere to such measures have been discussed. When it comes to the health system response, the obvious inadequacy of the infrastructure and its regional disparities are also highlighted. In fact, these analyses of the situation implicitly or explicitly emphasise the role of inter-sectoral coordination that

becomes handy in such emergencies. The set of contributions undoubtedly highlight the vulnerability of the informal work force, inadequacy of health system infrastructure, and also the need for recognition of the distressed migration for the state for employment. While these are not new, their analytic exposition and consequential features offer added evidence to act towards making things better to confront similar challenges in future.

III Some Specific Cases

The contributions made in the volume are not only informative but also can serve towards understanding the economy from wide ranging perspectives. Some of the unique perspectives may be mentioned here. First, COVID-19 has impacted the education sector at large, and the schools and colleges in particular, to a very significant extent. Most educational institutions have remained closed. There is a study that looks at the E-Vidya Programme in the KBK (Kalahandi-Balangir-Koraput) districts. After COVID-19 most classes moved into the online mode. The author however points out that only about 5 to 8 per cent households in the urban areas and barely 2 per cent in the rural areas possess laptops and have access to the internet. Under the present circumstances, therefore, the online teaching programme in these poor far flung districts are bound to be a failure. Another case study looks at the impact of COVID-19 on the handloom sector in Odisha. There are about 1.18 lakh handloom workers in the state. It is revealing to note that as many as 89% of the handloom workers earn less than Rs 5000 per month, and their families live in rather precarious conditions. The onset of COVID-19 has resulted in nil demand for their products, which has intensified their financial difficulties.

IV Concluding Remarks

The COVID-19 pandemic has provided a unique vantage point to reflect on the nature of social and economic development that the world has witnessed after the onset of Industrial Revolution in the middle of the eighteenth century in England and some of the major European countries. By the time Adam Smith published his *Wealth of Nations* in 1776, he had already witnessed and theorised about the clear advantages of 'division of labour' and specialisation. By the beginning of the nineteenth century, England was dotted with hundreds of factories. Labour was being drawn from agriculture to work in factories. The factory owners, or the capitalists,

were out to maximise their profits, and this was realised at the cost of labourers living in appalling conditions in industrial townships. Man was out to conquer nature and produce goods and services at a fast pace to satisfy human wants. This however led to a massive destruction of the flora and fauna. Such an emerging development trajectory was already evident to some of the later classical masters such as John Stuart Mill.

In his *Principles of Political Economy* published in 1848 Mill argued against the singular focus on economic growth and boldly welcomed a stationary state. He imagined a state where there would be a stable population and thanks to technical innovations, people in general would be assured of a comfortable existence. Mill saw this as the beginning of a benign world where mankind would turn its attention to the serious and meaningful matters of liberty and justice, so that all individuals are able to realise their full potential. After a few weeks' lockdown there have been innumerable instances of rejuvenation and renewal of natural phenomena within India and across the globe. The quality of water in the Ganges distinctly improved, and the snow-capped peaks of the Himalayas could be seen from cities like Jalandhar after more than a hundred years!

What we are trying to emphasise, in other words, is that one of the unexpected fallouts of the COVID-19 pandemic is the vital truth that humans need to respect nature and learn to live in harmony with natural phenomena. This would also call for revisiting the scope of age old subjects of study like economics.

The editors of this volume would like to applaud the initiative of the Orissa Economic Association to publish this special issue on the economic and social implications of the COVID-19 pandemic. The contributors have addressed diverse aspects of the economic fallouts of COVID-19 as it has affected the state of Odisha in particular. It is hoped that these essays will help us understand the nature of this major calamity in a more informed manner.

Pulin B. Nayak and ***Udaya S. Mishra***

Article

Pandemic beyond Lockdown in India

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Abstract

The aim of this study is two-fold. First, it evaluates the scorecard of the COVID-19 pandemic in India and its major states during the last four phases of nationwide lockdowns and unlocks. Second, it examines the changing structure of the health status under this pandemic in terms of increasing COVID-19 cases. To this end, we have employed the prevalence rate, recovery rate, case fatality rate, doubling rate, and sample test multiple as methodologies using the daily data from the Ministry of Health and Family Welfare (India) and WHO. The analysis reveals that there is a huge variation in the prevalence rate, fatality rate, testing rate, and doubling rates across the states in India. From the end of the fourth lockdown (May 31, 2020) to the end of the fourth unlock (unlock 4.0 – September 30, 2020), the prevalence rate has increased from 538 per million to 19185 per million during this period. The average case fatality rate in India was 2.2 per cent at the beginning of the first lockdown and increased to 3 per cent during the fourth lockdown. However, owing to the phase-wise unlocks, case fatality rate has reversed to 1.6 per cent till the end of unlock 4.0. On average, most of the states moved to a slower doubling rate of COVID-19 cases during the unlock periods. This study emphasises the need for rapid identification, to find isolation, quick test, and treat cases of COVID-19, including providing optimal care for its severity in patients, especially the elderly, to ensure these recent declining trends continue.

Keywords: COVID-19, pandemic, lockdown, unlock, India

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1. Introduction

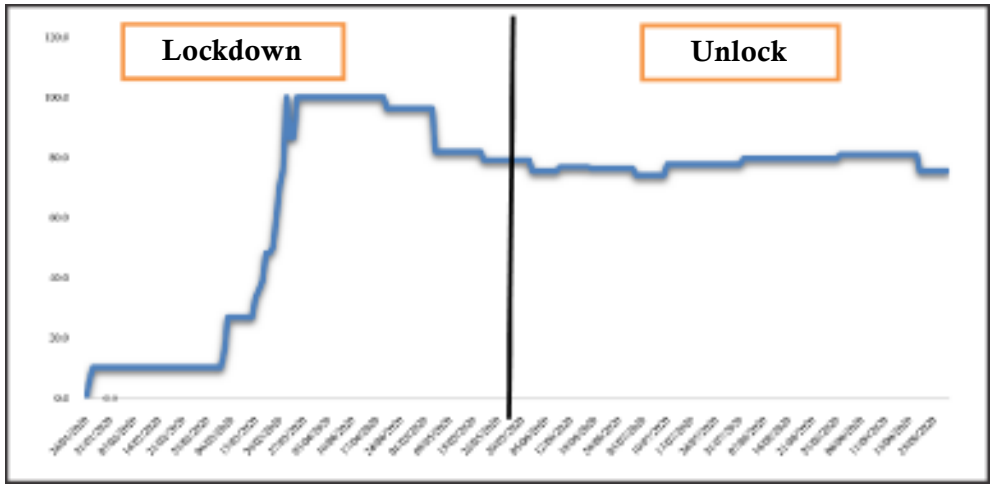
An epidemic outbreak generally brings substantial economic impact, human grief, and major demand and supply disruption. The COVID-19 pandemic has created havoc and unprecedented bearing on global economics and brought uncertainties in the world health system. This pandemic has not only paralysed the world but also brought the engine of growth to a juddering halt. As a result, the global economy is expected to contrast by -3 per cent and 1.9 per cent in India in 2020 and revive in 2021 to 5.8 per cent across the world and 7.4% in India in 2021(IMF, 2020). The consequences of this pandemic would be worse than that of the 1929 Great Depression and the 2008 global financial crisis (Gopinath, 2020; Harilal, 2020). The latest study by the International Labour Organization (ILO), on April 7, 2020, reflects that the COVID-19 is expected to wipe out 195 million workers in the second quarter of 2020 (ILO, 2020). The COVID-19 outbreak has also caused an unprecedented shock to the Indian economy (Dev & Sengupta, 2020; Sengupta, 2020).Ray& Subramanian (2020) have highlighted and given a comprehensive view of the lockdown impact on the Indian economy from different angles.

It is well known that the recent outbreak of the novel corona virus has generated ample measures from various governments across the world. At first glance, the common measures include school closings, workplace closing, cancelling public events, stopping public transport services, banning mobility & travels both domestic and international, ban on public gatherings, other interventions like fiscal and monetary stimuli, and finally lockdown and shutdowns, in favour of greater common good, to create social distancing to contain the outbreak of COVID-19 pandemic. These are the most far-reaching measures undertaken by any government including India as a response to the pandemic. According to the Oxford COVID-19 Government Response Tracker[1] (OxCGRT), India scored 79.2 out of 100 – Strictest, on the Stringency Index developed by the Blavatnik School of Governance (as on May 31, 2020), University of Oxford (Hale et al., 2020). India achieved this score with effect from imposition of the first lockdown

[1]The tracker collects publicly available information on 11 indicators; however, it does not look at the ground level implementation of these indicators.

till the end of the fourth lockdown[2] and some relaxation during the periods of unlock and downgraded the score substantially to 75.5 during the end of September (Figure 1).

Figure 1: Stringency Index (India)



Source: Blavatnik School of Governance, University of Oxford

These unprecedented heterogeneous measures adopted quickly by the governments have been enduring in various debates among the policymakers and public. Some of these debates are about the adverse effect on the economy, medical ethics in a public health emergency, issues related to the exodus of millions of the vulnerable working section from cities to villages, soaring unemployment and also how the abrupt drastic steps of the governments in the form of draconian lockdowns are going to affect the spread of the disease pandemic. These are the core arguments, which this study tries to scrutinize. At the same time, these lockdowns and bans have created many economic uncertainties around the world, mainly through three channels viz., a decline in consumption, corporate investments, and international trade in goods and services on the back of an economic downslide.

The query arises whether the centrality of the social distancing and severe lockdowns is in favour of or against the progression of the scorecard of the

[2]The Centre on May 31, 2020 extended the nationwide lockdown, first imposed on March 25, second imposed on April 15 and third imposed on May 4, for the fourth time on May 18 till May 31, while giving considerable flexibility to the States in deciding red, green and orange zones of COVID-19 intensity.

COVID-19 pandemic. In particular, this note attempts to evaluate the COVID-19 in India during the nationwide lockdown and unlocks[3] using the daily data from the Ministry of Health and Family Welfare, Government of India. This study is unique as it asks whether the stringency of the government's response to COVID-19 broadly tracks the spread of the disease through the lens of confirmed cases (sample positive), prevalence rate - number of positive cases per million population, cured ratio, and case fatality rates - number of deceased cases, sample test multiple (STM) - total sample tested in order to get a single positive case and doubling rate of confirmed cases and the degree of spatial variation across all affected states in India.

Moreover, this centralised policy of lockdowns and unlocks does not necessarily reflect the effectiveness of a government's response directly with the COVID-19 statistics as differential responses can also be seen across nations such as Italy and the U.S.A. against their relationship with the progression of COVID-19 cases. Of course, the variation in responses would be less as there are more containment replies implemented over the course of the outbreak.

The remainder of the study is divided into nine parts, with the first part being the introduction, and followed by data and methodology in the second section. The third section gives a glimpse of COVID-19 confirmed cases, the fourth part focuses on the overall prevalence rate across Indian states, and the fifth part looks into the case fatality rate. The sixth and seventh parts focus on STM and doubling rate, respectively. The eighth part discusses the pandemic impact on the Indian economy in a broader perspective. The last part ends with a conclusion and policy implications.

2. Data and Methodology

In this study, to evaluate the changing COVID-19 health pandemic in India in terms of increasing positive cases and case fatality rates, we have used daily data from the Ministry of Health and Family Welfare, Government of India, and World Health Organisation (WHO) and other sources viz., covid19india.org. Further, to evaluate the increase and its consequent health impact, we have applied various methods. These methods include prevalence rate, case fatality rate, mortality rate, doubling rate, and sample test multiple. These can be defined as follows,

[3]Government's phase-wise post lockdown reopening

$$\text{Prevalence Rate} = \frac{\text{COVID Confirmed cases}}{\text{Total Population in Million}} * 100 \quad (1)$$

$$\text{Case Fatality Rate} = \frac{\text{COVID Deaths}}{\text{COVID Confirmed cases}} * 100 \quad (2)$$

$$\text{Mortality Rate} = \frac{\text{COVID Confirmed Death}}{\text{Total Population}} * 100 \quad (3)$$

$$\text{Doubling Rate} = \frac{(\text{No. of days} * LN(2))}{LN\left(\frac{\text{End confirmed cases}}{\text{Beginning confirmed cases}}\right)} \quad (4)$$

$$\text{Recovery Rate} = \frac{\text{COVID Recovered}}{\text{COVID Confirmed cases}} * 100 \quad (5)$$

$$\text{Sample Test Multiple} = \frac{\text{Sample Tested}}{\text{COVID Confirmed cases}} \quad (6)$$

3. COVID-19 Confirmed Cases

As per the WHO report (during the end of the fourth lockdown, May 31, 2020, 05:30 GMT+5:30), around 216 countries were affected by the deadly virus, with 59,56,883 confirmed cases, and 3,66,409 deaths of, including 1,82,143 confirmed cases and 5,164 deaths in India. Moreover, globally, as on September 30, 2020, there were 33,563,028 confirmed cases of COVID-19 and 10,05,226 deaths, including 63,09,635 confirmed cases and 98,121 deaths in India. To combat this pandemic, the Government of India has declared lockdowns and unlocks across India in a phase-wise manner. These include:

Nationwide lockdowns:

- Phase 1: March 25, 2020 –April 14, 2020 (21 days)
- Phase 2: April 15, 2020 –May 3, 2020 (19 days)
- Phase 3: May 4, 2020 –May 17, 2020 (14 days)
- Phase 4: May 18, 2020 –May 31, 2020 (14 days)

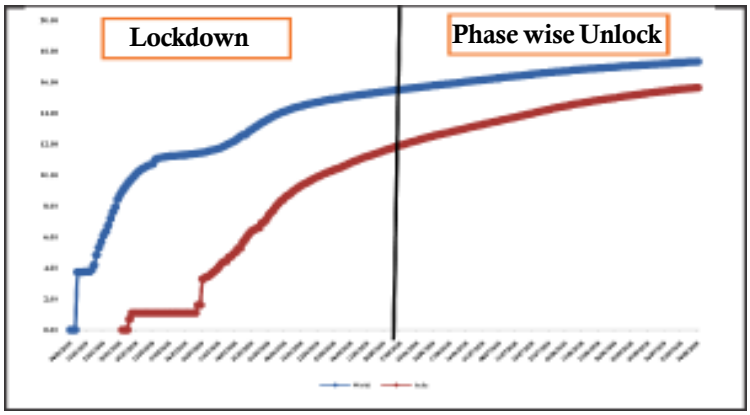
Unlocks:

- Unlock 1.0: June 1, 2020 –June 30, 2020 (30 days)
- Unlock 2.0: July 1, 2020 –July 31, 2020 (31 days)
- Unlock 3.0: August 1, 2020 –August 31, 2020 (31 days)
- Unlock 4.0: September 1, 2020 - September 30, 2020 (30 days)
- Unlock 5.0: October 1, 2020 - October 31, 2020 (31 days)

Although Kerala was the origin state of the COVID-19 in India, presently, the state of Maharashtra has the highest number of 13,84,446 positive cases as on September 30, 2020. Almost, more than 60 per cent of confirmed cases are in the city of Mumbai. Andhra Pradesh, Karnataka, Tamil Nadu, and Uttar Pradesh unfortunately following Maharashtra's pattern, were the top-five corona virus affected states in the number of cases as of September 30, 2020, which accounts for 58 per cent of total COVID-19 cases in India, so far in line with their total recovery rate shared by 70 per cent of the total COVID-19 cases. Maharashtra has the highest recoveries followed by Tamil Nadu. Similar is the trend with respect to active cases in these states. However, perhaps, the important issue in all affected states is that of the competencies and enactment of the existing health systems. Towards this bearing and based on the risk of further spread of the virus, India has extended the national lockdown beginning June 1, 2020, especially in containment zones, with a complete lockdown being the last resort, which has unfortunately been undertaken in several cases.

The logarithmic cumulative corona virus cases (Figure 2) in India shows that since January 29, 2020, the numbers of COVID-19 positive cases are increasing. The curve is flat from February 2 to 29, 2020; afterwards, the number of cases is increasing at the global level, the increase is more due to the increasing number of corona virus cases in USA, India, and European countries. As expected largely, India is relatively low as compared to other countries in the world due to various effective measures taken by the Government of India as a response to the COVID-19 pandemic during the lockdown periods. However, during the unlock period, India remained the second top infected country in the world after the USA.

Figure 2: Confirmed COVID-19 Cases in India and the World



Sources: https://www.mohfw.gov.in/ & WHO Database https://www.who.int/

4. Prevalence Rate

We have taken the prevalence rate as the number of positive cases per million population. Table 1 depicts the situation in COVID-19 cases state-wide at the beginning of the first lockdown (March 25, 2020), at the end of the fourth lockdown (May 31, 2020) and at end of the unlock 4.0 (September 30, 2020), respectively. From the end of the unlock 4.0, the prevalence rate has increased from 538 per millionto19185 per million at the end of unlock 4.0 (Table 1).

States such as Delhi, Maharashtra, Gujarat, Jammu & Kashmir, Telangana, Rajasthan and others show manifold increase in the rate. Due to various policy measures in the form of nation-wide lockdowns by various state governments such as Odisha, Kerala, and Uttar Pradesh, the rate of increase in positive cases is less; but in other states, the rate of increase in COVID-19 cases is high. More than 60 per cent of corona virus cases have recovered throughout the country; this has increased by about 13 percentage points between lockdown 3.0 and 4.0.

Table 1: COVID-19 Prevalence Rate across Indian States (per million)

	March 25, 2020	May 31, 2020	September 30, 2020
Andhra Pradesh	9	3569	693484
Andaman and Nicobar Islands	0	33	3831
Arunachal Pradesh	0	4	9796
Assam	0	1185	180709
Bihar	4	3636	182906
Chandigarh	7	289	11938
Chhattisgarh	1	447	113602
Delhi	31	18549	279715
Goa	0	70	33418
Gujarat	38	16343	137394
Haryana	28	1923	128599
Himachal Pradesh	3	313	14976
Jammu and Kashmir	20	2415	79339
Jharkhand	0	563	83626
Karnataka	41	2922	601767
Kerala	109	1208	196107
Madhya Pradesh	14	7891	128047
Maharashtra	128	65168	1384446
Manipur	1	62	10983
Meghalaya	0	27	5639
Mizoram	1	1	1986
Odisha	2	1948	219119
Puducherry	1	51	27546

Punjab	29	2233	113886
Rajasthan	36	8617	135292
Tamil Nadu	18	21184	597602
Telangana	35	2499	190876
Tripura	0	268	25731
Uttarakhand	4	749	49000
Uttar Pradesh	37	7445	399082
West Bengal	9	5130	257049
Dadar Nagar Haveli	0	2	3040
Nagaland	0	36	6163
Sikkim	0	1	2944
India	46	176781	6309635

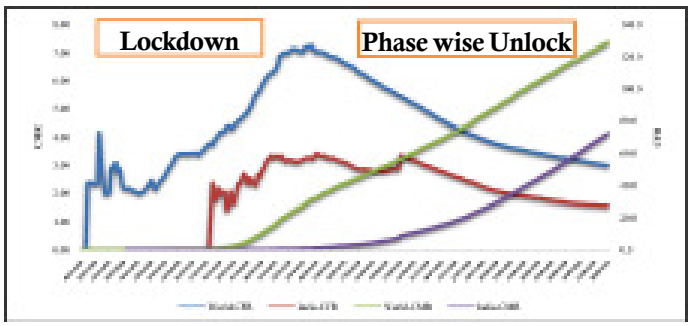
Sources: https://www.mohfw.gov.in/

The highest recovery rate of 100 per cent was reported from Andaman and Nicobar Islands and Mizoram followed by Punjab (88.1 per cent), Rajasthan (66.6 per cent) and Chandigarh (65.4 per cent).Nine states are in the range of 50 per cent to 60 per cent recovery rate and seven states are in the range of 40 per cent to 50 per cent recovery rate. Jammu and Kashmir, West Bengal, Himachal Pradesh and Karnataka have a 30 per cent to 40 per cent recovery rate. Assam, Uttarakhand and Manipur were at the bottom of the recovery rate.

5. Case Fatality Rate

While at the global level, the case fatality rate has increased from 2.4 per cent on January 11, 2020 to 6.2 per cent as on May 31, 2020 and 3 per cent on September 30, 2020. The average case fatality rate in India was 2.2 per cent at the beginning of the lockdown 1.0 and increased to 3 per cent during lockdown 4.0. However, owing to the phase-wise unlocks, it reversed from 3 per cent by the end of unlock 1.0 to 1.6 per cent by the end of unlock 4.0 (Figure 3).

Figure 3: Case Fatality Rate and Crude Mortality Rate

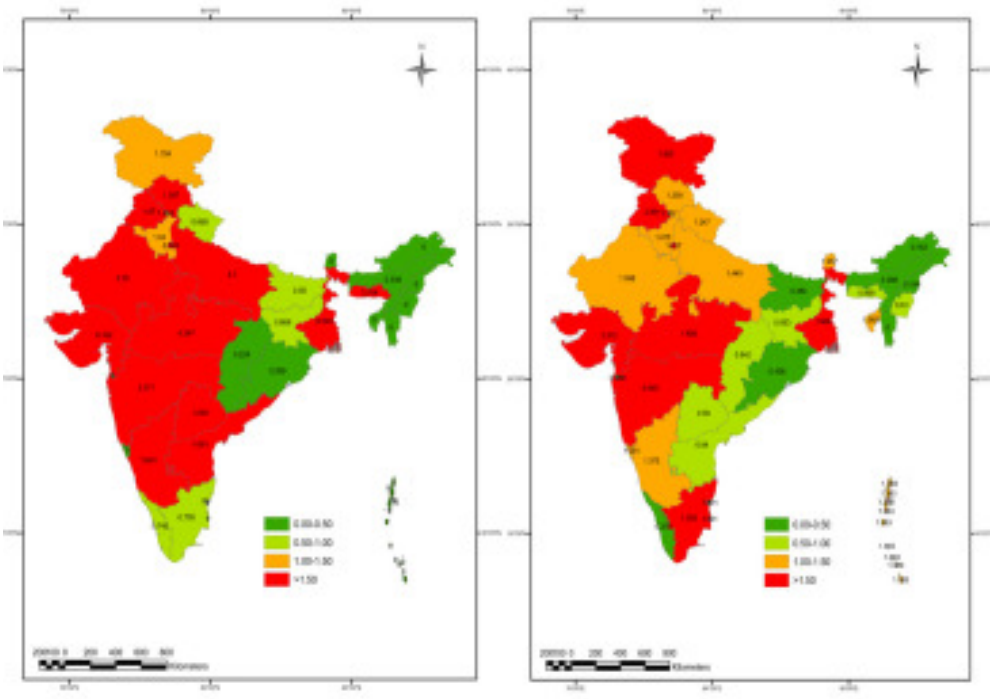


Sources: https://www.mohfw.gov.in/ & WHO Database https://www.who.int/

At the beginning of the lockdown, Himachal Pradesh, Bihar, West Bengal and Madhya Pradesh were the worst affected state in terms of case fatality rate, while later towards the first extension of the lockdown, states like Maharashtra, Meghalaya and Punjab experienced high mortality rate. Kujur and Goswami (2020) in their study on labour majors by the state governments and severity of the pandemic found that states such as Odisha, Uttar Pradesh, Delhi, Kerala, and Bihar adopted inclusive labour policies which led to a lesser case fatality ratio. The area in Maharashtra with higher than average fatality rates was Mumbai followed by Pune. The fatality rates in other severely affected states in India were relatively lower than those in Maharashtra; with mortality rates of 3.7 per cent in Meghalaya, 4.35 per cent in Madhya Pradesh and 6.2 per cent in Gujarat by the end of 4th lockdown (Figures 4a and 4b). By end of the 4th unlock period, mortality rate declined to 1.9 per cent in Madhya Pradesh and 2.6 per cent in Gujarat. As the population is generally susceptible, more than 80 per cent of the deaths are elderly people over 60 years old. Overall, a male person is linked to a higher risk of death.

Figure 4: India Heat Map Case Fatality Rate across Lockdown and Unlock

Figure 4a (May 31, 2020) Figure 4b (September 30, 2020)



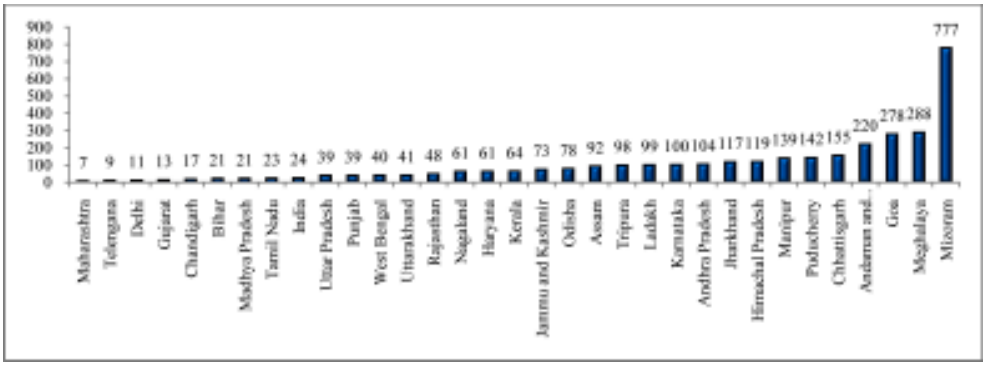
Sources: Author's own mapping using data from https://www.mohfw.gov.in/

6. Sample Tests Multiple

Crucially, quick suppression of infections requires testing more people to identify who is infected; tracking them to make sure they do not spread the disease further; and tracing with whom they have been in contact. Therefore, testing strategies can be used to achieve three main goals: 1) suppressing the resurgence of local outbreaks; 2) identifying people who have developed some form of immunity and can safely return to work; and 3) gaining intelligence on the evolution of the epidemic, including on when a threshold for herd immunity has been reached. Normally, the testing strategies to achieve these goals as practised across countries to manage COVID-19 is of three types, viz., i) Only those who (a) have symptoms and (b) meet specific criteria (e.g. key workers, admitted to hospital, came into contact with a known case, and returned from overseas); ii) testing anyone showing COVID-19 symptoms; and iii) open public testing (e.g. "drive-through" testing available to asymptomatic people).

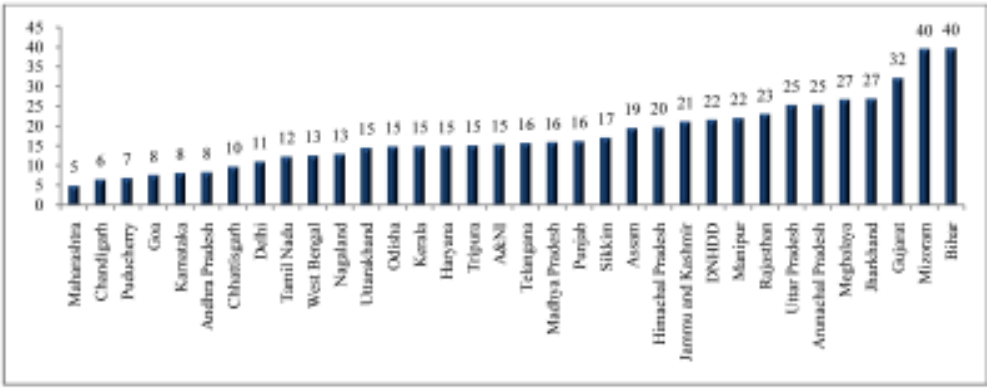
It is difficult to get a proper estimate regarding the total number of people infected with COVID-19. All we know is the infection status of those who have been tested. All those who have a lab-confirmed infection are counted as confirmed cases. The counts of confirmed cases depend on how much a country actually tests. Without testing, there is no data. To interpret any data on confirmed cases, we need to know how much testing for COVID-19 the country actually does. The total number of tests per confirmed case and per million populations is the key statistics to assess the new wave of infections. Total samples tested, by all affected states in India and relative to the size of the population during the end of lockdown 4.0 and unlock 4.0 is shown in Figures 5 and 6, respectively.

Figure 5: State-wise Sample Test Multiple (May 31, 2020)



Sources: Calculated using the data from https://www.mohfw.gov.in/

Figure 6: Statewise Sample Test Multiple (September 30, 2020)



Sources: Calculated using the data from https://www.mohfw.gov.in/

Table 2: State-wise Sample Test Multiple

States/UTs	May 31, 2020	June 30, 2020	July 31, 2020	August 31, 2020	September 31, 2020
Andhra Pradesh	104.44	60.99	13.85	8.56	8.37
A&NI	233.52	161.95	44.19	10.70	15.34
Assam	92.06	49.63	22.84	20.77	19.50
Bihar	20.83	22.12	10.75	23.38	39.73
Chandigarh	16.56	17.48	13.28	6.99	6.49
Chhattisgarh	154.70	56.21	34.39	18.49	9.74
Delhi	11.47	6.09	7.62	9.06	11.01
Goa	278.44	50.56	22.21	11.44	7.62
Gujarat	12.97	11.45	12.45	24.18	32.16
Haryana	61.43	18.16	17.52	17.77	14.93
Himachal Pradesh	118.75	83.42	56.61	35.02	19.76
Jammu & Kashmir	73.87	44.74	30.19	24.70	21.13
Jharkhand	117.03	57.29	26.03	21.94	26.91
Karnataka	100.47	40.73	10.88	8.46	8.14
Kerala	64.16	52.12	32.87	22.35	14.92
Madhya Pradesh	21.27	26.89	24.13	21.53	15.89
Maharashtra	7.11	5.55	5.05	5.23	4.90
Manipur	138.65	40.42	32.60	24.83	22.00
Meghalaya	288.19	364.04	43.22	37.57	26.74
Mizoram	777.00	85.91	51.76	40.35	39.52
Odisha	78.10	37.57	16.14	17.28	14.84
Puducherry	142.25	24.20	11.43	5.28	6.88
Punjab	39.34	54.21	36.14	19.68	16.17
Rajasthan	47.55	45.77	36.28	28.33	23.05

Tamil Nadu	23.22	12.98	10.81	11.24	12.31
Telangana	9.36	5.42	6.98	10.97	15.70
Tripura	102.52	46.29	34.19	23.29	15.11
Uttarakhand	40.64	23.96	23.40	19.87	14.53
Uttar Pradesh	38.94	30.98	27.21	23.83	25.31
West Bengal	39.72	26.30	12.73	11.60	12.56
Nagaland	71.56	36.08	22.38	15.41	12.93
India	21.71	15.07	11.41	11.75	11.98

Source: Calculated using the data from https://www.mohfw.gov.in/
Note: UT – Union Territory

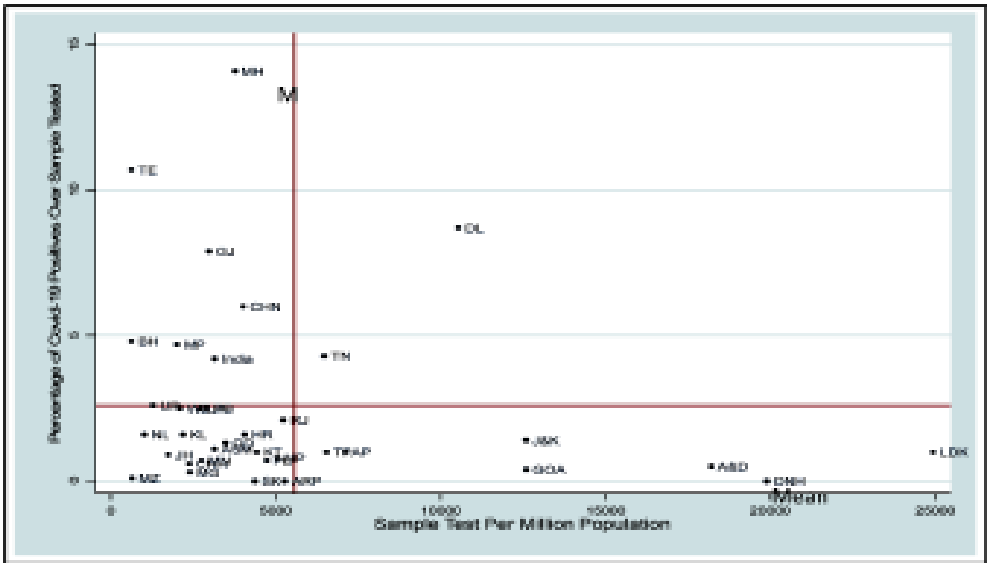
Figures 5 and 6 depict which state of India stand where in the process of COVID-19 testing, individually. Are states/union territories reporting a higher number of positive cases testing more people? The key metrics to be analysed here is the total sample tests conducted to get a single positive case, which we call as an STM. Mizoram reported the best STM during the end of lockdown 4.0. This is owing to its relatively smaller size population, which makes it easier to expand testing coverage. However, Bihar surpassed Mizoram during unlock 4.0. In 35 Indian states, the rank correlation between confirmed cases and samples tested is positive (+0.85). Coincidentally, Mizoram remained at 35th rank in sample tests, among the 35 states in India as on May 31, 2020.

Figure 7 shows the number of tests conducted per million people in a state or UT versus the percentage of positive samples among the tested. The states in the top-right part of the graph have carried out relatively more tests and also have a higher percentage of positive cases among samples tested. The states in the bottom-right part of the graph have carried out relatively more tests but have a lower percentage of positive cases among samples tested. The states in the top-left region of the chart have carried out relatively fewer tests but have a higher percentage of positive cases among samples tested. The states in the bottom-left region of the chart have carried out relatively fewer tests and also have a lower percentage of positive cases among samples tested. Table 2 provides a detailed analysis of state-wise and period-wise STM of COVID-19 testing in India.

States like Goa, Puducherry, Assam, Mizoram, Manipur, Himachal Pradesh, Meghalaya, etc., have carried out relatively higher tests tested but have a lower percentage share of positive cases among samples tested. The extent of COVID-19 cases in these states can be gauged better due to a relatively higher testing rate. The lowest STM states Maharashtra, Gujarat, Telangana, Delhi, Chandigarh, Madhya Pradesh, Tamil Nadu, West Bengal, Uttar

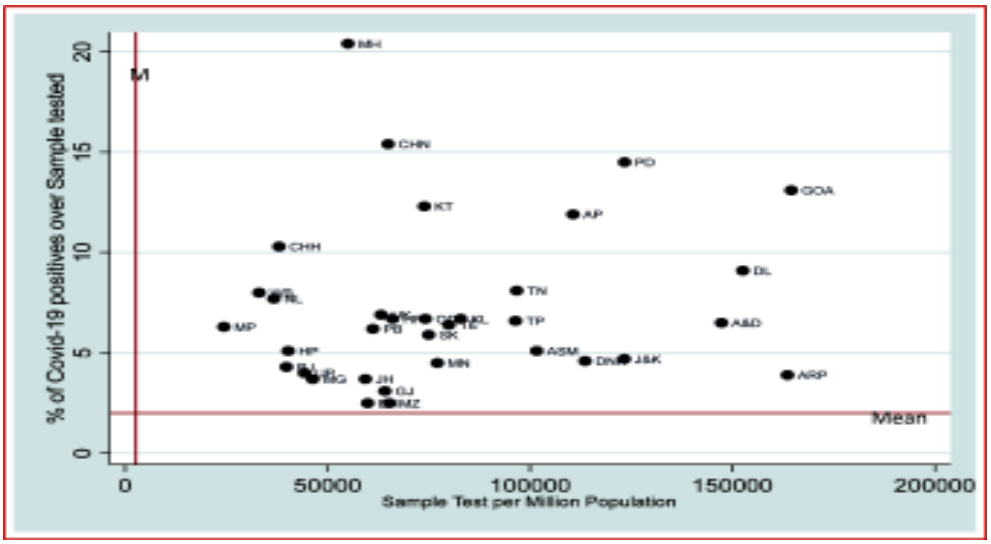
Pradesh, etc., have carried out relatively fewer tests but have a higher percentage share of positive cases among samples tested (Figure 8). However, we can see in Figure 8 that all states are in the top-right part of the graph, because during the period of unlock 4.0, they have carried out large number of tests and also have a higher percentage of positive cases among samples tested.

Figure 7: State-wise COVID-19 Testing Status (May 31, 2020)



Source: Authors' own mapping using data from https://www.mohfw.gov.in/

Figure 8: State-wise COVID-19 Testing Status (September 30, 2020)



Source: Authors' own mapping using data from https://www.mohfw.gov.in/

Notes: A&D: Andaman and Nicobar Islands, AP: Andhra Pradesh, ARP: Arunachal Pradesh, ASM: Assam, BH: Bihar, CHN: Chandigarh, CHH: Chhattisgarh, DL: Delhi, GOA: Goa, GJ: Gujarat, HR: Haryana, HP: Himachal Pradesh, J&K: Jammu and Kashmir, JH: Jharkhand, LDK: Ladakh, KTK: Karnataka, KL: Kerala, MP: Madhya Pradesh, MH: Maharashtra, MN: Manipur, MG: Meghalaya, MZ: Mizoram, NL: Nagaland, OD: Odisha, PD: Puducherry, PB: Punjab, RJ: Rajasthan, TN: Tamil Nadu, TE: Telangana, TP: Tripura, UK: Uttarakhand, UP: Uttar Pradesh and WB: West Bengal.

In a simple regression model[4], STM was taken as an independent variable and the logarithm value of sample positives was taken as a dependent variable. It is observed that 86 per cent variation in sample positives is explained by STM. The STM has a significant impact on the number of positives. This simple analysis suggests conducting more STM so as to read the corona virus situation and its management better.

7. Doubling Rate of COVID-19 Cases

The main priority of many states right now is to move to a slower doubling time of COVID-19 to understand what flattens the curve. Locked down areas, social distancing, school closings, conference and sports event cancellations, washing hands, avoiding gatherings – all of this ensures slow doubling times. We have presented the doubling rate of confirmed coronavirus cases for four spells of lockdowns and unlocks for India and its major states in Table 3.

On average, during the lockdown periods, the curve in India slowly started to flatten, though few states like Gujarat and Punjab have already had a flat curve. Kerala and Uttarakhand were relatively better in controlling the disease. Kerala, Uttarakhand, Himachal Pradesh, Assam, Karnataka, Jammu and Kashmir and Chhattisgarh initially slowed their doubling rate during the first three phases of lockdown, but this deteriorated during the fourth phase of lockdown. Odisha and Tamil Nadu doubled their COVID-19 cases in the range of 11.3 and 14.2 days, respectively. Bihar, Delhi, Madhya Pradesh, Maharashtra, Rajasthan and West Bengal consistently improved their doubling time. Confirmed COVID-19 cases in India first doubled every 4.9 days during lockdown 1.0, and then marginally flattened to a doubling time of 14.7 days, and it improved to 38.9 days recently (Table 3). On an average, most of the states moved to a slower doubling time of COVID-19 during the unlocked periods.

[4] Not reported the results here. It could be available upon request.

Table 3: Doubling Times of Confirmed Cases across Lockdowns and Unlocks

	Lockdowns				Unlocks			
States/UTs	Lockdown	Lockdown	Lockdown	Lockdown	Unlock	Unlock	Unlock	Unlock
Andhra Pradesh	3.6	10.5	25.3	22.9	14.6	9.4	19.6	45.3
Arunachal Pradesh	*	*	*	6.5	9.3	9.9	23.1	23.8
Assam		42.2	11.8	3.7	11.7	13.8	21.6	41.7
Bihar	5.0	6.3	10.9	8.5	21.6	12.9	22.7	71.8
Chandigarh	12.6	8.3	12.7	21.8	51.1	24.3	14.9	20.8
Chhattisgarh	4.0	47.1	55.7	5.5	12.2	18.2	17.2	16.4
Delhi	3.6	12.8	12.5	14.7	14.0	50.5	84.7	44.0
Goa	*	*	10.2	10.2	7.0	14.3	20.1	32.5
Gujarat	5.2	6.1	12.8	24.9	31.4	34.0	48.1	59.0
Haryana	7.3	18.3	12.9	12.0	11.0	24.5	35.0	30.4
Himachal Pradesh	5.9	64.9	13.5	6.6	19.5	21.6	24.7	23.0
J&K; Ladakh	5.2	14.3	20.0	13.3	17.5	22.6	35.4	30.4
Jharkhand		8.6	14.2	9.7	15.2	13.9	16.8	31.1
Karnataka	7.7	14.7	17.0	9.6	13.4	10.3	21.3	37.4
Kerala	11.1	48.7	56.2	12.9	16.6	12.7	18.7	21.4
Madhya Pradesh	3.7	9.2	18.5	19.6	40.6	25.0	30.9	30.0
Maharashtra	4.8	8.2	10.5	13.3	22.0	24.4	34.2	37.4
Manipur	20.0	*	7.2	4.1	7.4	28.4	25.4	37.0
Meghalaya	*	5.0	112.6	12.3	31.5	7.7	20.4	24.0
Mizoram	*	*	*	*	4.0	22.2	23.2	29.8
Odisha	4.2	12.6	5.7	11.3	16.6	14.1	18.4	27.9
Puducherry	7.1	93.4	18.6	6.6	9.1	13.4	15.0	32.2
Punjab	7.9	8.4	15.8	70.2	22.7	19.9	18.1	28.0
Rajasthan	4.3	11.9	16.6	17.9	29.5	25.0	32.7	41.3
Tamil Nadu	3.3	15.1	7.2	14.2	14.9	21.6	39.2	62.8
Telangana	5.0	23.4	27.1	18.9	11.4	16.2	31.9	49.5
Tripura		18.0	3.8	19.1	16.9	16.4	26.1	26.8
Uttarakhand	6.4	26.7	23.5	4.3	18.3	23.3	21.2	22.9
Uttar Pradesh	5.1	9.0	20.5	16.1	19.5	16.4	21.9	38.2
West Bengal	4.5	8.5	9.2	13.9	17.2	16.0	25.8	45.8
Nagaland	*	*	*	*	8.5	17.1	27.0	46.6
Sikkim	*	*	*	*	4.5	10.4	22.6	35.9
India	4.9	9.9	12.0	14.7	18.6	20.2	27.9	38.9

Source: Calculated using data from https://www.mohfw.gov.in/

8. COVID-19 and the Indian Economy

Sudden cessation of economic activity through lockdowns can wreak havoc and cause acute distress among workers who lose incomes without any compensation and do not benefit from any social protection. Further, it is not enough to recommend or even try to enforce the poorly phrased "social distancing" (more properly, physical distancing) as a preventive measure, if people's conditions of work and life simply do not allow it. Containment policies have to provide the infrastructure and facilities that would enable people to follow the required rules: at the minimum, the wherewithal for cleanliness (like adequate clean water and soap) and ensure physical distance. However, in most developing countries, containment strategies have broadly followed the pattern set by China and some developed countries, of strict lockdowns, exhortations to maintain physical distancing, and frequent hand washing, with little regard to the practical feasibility or economic impact of such measures.

Some interim policy actions have already been announced by the central and state governments and the RBI to combat the humanitarian crisis. In March 2020, the central government announced a COVID-19 relief package of worth Rs 1.7 lakh crore for providing safety net programmes. Under this package, around 800 million people would receive free cereals and cooking gas apart from cash through direct transfers for three months. Various COVID-19 schemes introduced in India include both cash and food safety programmes. These include Pradhan Mantri Garib Kalyan Yojana (PMGKY), Self-Reliant India Movement or Atmanirbhar Bharat Abhiyan worth Rs. 20 lakh crore and others. Presently, the major challenges for the state government are to preserve livelihood through employment and other measures. ILO recommended various policy measures in this regard; these include supporting enterprise, employment and income, stimulation of the economy and jobs through social protection measures and employment retention measures, protection of workers in the workplace, and lastly, enabling social dialogue between government, workers, and employers to find a solution. Here, effective policies are crucial to forecast worse outcomes. Absence of any preventive medicine for this pandemic has increased social anxiety, which is both rationally and irrationally a big social menace confronting health research institutions, pharmaceutical industries and global health governing organizations because nothing like this has even been encountered before.

Both in March and April 2020, the centre and various state governments announced relief packages under the COVID-19 schemes. Kerala government announced Rs. 20,000 crore relief packages to save lives and livelihood under this pandemic, Uttar Pradesh announced that, over 4.8 lakh daily wagers would receive Rs. 1000 financial assistance. Maharashtra also announced financial assistance package for 12 lakh construction workers. Odisha announced various health security schemes like Rs. 50 lakh for all health personnel (private and public) and members of all other support services who lost their lives in the fight against COVID-19, the families of all government personnel (medical and others) would continue to receive full salary till the date of retirement; all these are part of the government saga and that would definitely help people tide over their difficulties during the war against COVID-19. In this respect, proper provisioning of social protection schemes and policies is crucial. IMF (2020) and World Bank (2020) also reflect that, "social protection serves as a pillar of counter-cyclical economic policy by delivering rapid financial support to those that need it as crisis hits, providing resources to those that will use them to both directly protect themselves and support the economy."

Moreover, India does not have any immediate external economic threats; there are only concerns about domestic resource mobilisation. It might be possible that domestically it is faced with massive declines in public revenues, as the cessation of economic activity leads to falls in tax (Goods and Services Tax) collection. Even if government spending were not to increase at all, this would imply a significant increase in the fiscal deficit. Since more government spending is required if only to deal with the pandemic, the first option is a direct borrowing from the central bank during the crisis. Yet, most of the developing countries, with a few exceptions, have been remarkably hesitant to do this. Even countries that do not have immediate debt repayment concerns are showing little inclination to increase public spending to anything like the levels necessary just to stop the process of economic decline.

9. Conclusion

At present, despite the quick response of the central government to the pandemic, followed by efforts of the state governments and medical staff, the situation in India has not even been controlled or improved. Considering the enormity of the challenges posed by the pandemic, it is pertinent to

urge governments to conduct rapid identification, isolate positive cases, quickly test and treat cases of COVID-19, and provide optimal care for severe cases, especially the elderly, and trace every contact to ensure these recent declining trends continue. An important take away from this note is that testing and treating cases of COVID-19 alone do not reduce fatality. The severity of patients in different hospitals varies greatly. The grading of treatment of cases in various hospitals can significantly affect the fatality rate as well. To be close enough to the ground reality, further strategies should focus on the principle of centralization of treatment. Prolonged cases of COVID-19 with severe illness should be centralized at the best hospital with the strongest comprehensive capacity for treatment; and finally, the fatality rate would get estimably reduced. These implications point towards innovative thinking on the interplay between grading treatments and mortality dynamics. The centralization of treatment for severe illness is not just necessary but crucial. It is obvious that if the human suffering caused by this pandemic is to be minimised or reduced, both public health measures and safety net policies have to recognise this basic reality.

On the other hand, social protection schemes and programmes, especially for the migrants and informal labourers are also crucial and can play an important role to combat this health crisis, though the financial aspect is another big challenge for both the centre and the states. A recent ILO (2020) study reflects that, "for developing economies, the average financing gap for implementing an adequate social-protection floor is equivalent to 1.6% of national GDP. For low-income countries, that gap is much larger: around 5.6% of GDP. They are unlikely to have enough fiscal space to close that gap on their own". Also, provisioning of a special COVID-19 grant by the Finance Commission as well as relaxing the Fiscal Responsibility and Budget Management Act (FRBM) limits for the states is the need of the hour. There are obvious limitations in the few recent reports on this topic and our opinions need to be further verified by big data sets pertaining to epidemiological characteristics and clinical heterogeneity and quality since the onset of infections.

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Article

COVID-19 and Struggle for Survival of Informal Sector Workers: A Study of Street Vendors in Odisha

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Abstract

COVID-19 is an existential threat to the health and livelihood of millions of people working in the informal sector. This pandemic is an exceptional shock for the poor workers. They are the most vulnerable group as they depend on daily wages to meet their ends. Still, today their affordability of three meals per day seems burdensome. Street vending is a part of the informal economy. It has been one of the important sources of income and employment for informal sector workers. Poverty and lack of employment in Odisha's rural areas force people to migrate to urban areas searching for work and livelihood. The large numbers of urban poor people in Bhubaneswar, Odisha, survive through working as street vendors. This paper aims to assess the impact of COVID-19 on street vendors in Odisha during the state-enforced lockdown and analyse the government's policies to address COVID-19 for this sector. It also recommends some measures to help minimize the pandemic's social and economic impact on these workers.

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Both primary and secondary sources of data have been used for this study. The primary data has been generated through fieldwork employing a survey method with a structured and semi-structured interview schedule with a sample size of 110 street vendors from Bhubaneswar. This paper shows that the employment and income of street vendors are severely affected by the current pandemic.

Keywords: Street venders, COVID-19, Income reduction, Living condition, Bhubaneswar

1. Introduction

Poverty and lack of job opportunities in rural and smaller towns drive many families to cities for employment and livelihood. In general, these migrant workers have low skills and lack the education needed for better-paid employment in the structured or formal sectors. Furthermore, formal sector jobs are shrinking. They need to create their own employment to join the urban economy through entry-level professions that require little capital and few skills. Street vending has been one of the easiest ways to survive for the urban poor and is widespread in the urban informal sector. In a broad sense, a street vendor is defined as a person who offers goods to the public without having a permanent build-up from where he sells (Bhowmik & Saha, 2012). They are mobile in the sense thry move from place to place carrying their products on temporary cart or by cycle or in the baskets on their head. The National Policy of Urban Street Venders (NPUSV) 2004, Government of India defined street venders as "A street vender is broadly defined vendor as a person who offers goods for sale to the public without a permanent built up structure but with a temporary static structure or mobile stall (or head load)". The treading of these informal sector workers is generally stationary and mobile. The informal sector workers are broadly classified into three groups: wage workers in the informal sector, self-employed workers, and unprotected wage workers in the informal sector (Chen etal., 2002, NCEUS 2007). And street vendors are identified as self-employed urban informal sector workers (Saha, 2009). Street vending is an important livelihood securing sector for the urban poor. It offers lower middle and working-class seasonal employment and has been their source of income.

The street vendor concept is there from the time of human civilization. In ancient and medieval civilization, they was recognised as travelling

merchants who travelled from town to town to sold their products and traded in neighbouring countries (Bhowmik & Saha, 2012). They were well regarded at that time, but street vendors are rarely treated with the same dignity and tolerance in the modern period. Despite being the oldest retailing form, India's urban laws still neglect this activity and people involved in this activity (Jha, 2018). Police and municipality officials in urban areas often target them for blocking pavements and creating traffic problems. Even the middle-class residents complain about them for creating disturbances to their general life, though they mostly prefer to buy products from them due to low price (Bhowmik & Saha, 2012). Thus, uncertainties of the business are often present as officials continuously harass them. This group faces different social protection problems, credit accessibility, working conditions, and public space utilization (Bhowmik, 2001; Anjaria, 2006). They are the most vulnerable workers group in the unorganized sector of any developing or underdeveloped economy as their income is low and uncertain and creates anxiety in many aspects (Baliyan & Srivastava, 2016; Kumar & Shing, 2009).

A street vendor is an important component of the urban informal economy (Chakraborty & Koley, 2018; Sharma & Konwar, 2014). Nearly 2.5 per cent of India's population depends upon street vending as a source of livelihood (Kumar & Shing, 2009). Street vendors constitute 11 per cent of the total urban employment in India (Chen et al., 2013). So, street vending is a large employment source in towns and cities of developing countries (Choudhury et al., 2011). Poverty and lack of employment opportunities in rural and small towns drive a group of people to cities searching for better work and livelihood (Pushpalatha & Punnavanam, 2020). However, due to lack of skill and education, they could not get satisfactory employment. Thus, they prefer to work through any means to feed their family as well as themselves. One option left to do so for them is street vending, and they start to sell products outside with a low level of investment. Thus, in the current scenario, street vending is an imperative and integral part of urban employment (Baliyan & Srivastava, 2016). The spreading of this deadly virus is increasing at a higher rate worldwide and has 38 million confirmed cases. India and Odisha in the initial stage had a slower spreading rate, but recently it is drastically increasing. In India, the confirmed cases have reached 69.04 lakh, and in Odisha, it has reached 2.4 lakh as of October 14, 2020. The rate of increase in cases is detrimental for the state and building an alarming condition. So from this point of view, Bhubaneswar having a unique socio-cultural and economic setting is an ideal place for the present paper, which intends to understand the socio-economic impact of the COVID-19 outbreak on marginalized sections of the urban society, namely

street vendors, during the lockdown. It focuses on how do we get them back on track and make our systems resilient to deal with such crises in the future.

The paper is divided into six sections. After the introduction in section I, section II summarises the origin of COVID-19 and Odisha's COVID Profile. Section III gives a brief overview of street vendors in India and Odisha, followed by the impact of COVID-19 on street vendors in section IV. The Odisha government's response to COVID-19 affecting street vendors is discussed in section V, while the possible road ahead after COVID 19 for street vendors is given in section VI.

Informal Sector and India: An Overview

The 15th International Conference of Labour Statisticians (ICLS) in 1993 defined the informal sector as "A group of production units comprised of unincorporated enterprises owned by households, including informal own-account enterprises and enterprises of informal employers (typically small and non-registered enterprises)" (ILO, 1993). However, this definition was limited to enterprises only. Therefore, after ten years, in the 17th ICLS in 2003, the definition of informal employment was redefined and introduced in a broader concept as "Informal employment refers to employment arrangements that leave individuals without legal or social protection and, hence, more exposed to economic risk than others, whether or not the economic units they are working for or which they own are formal enterprises, informal enterprises or households" (ILO, 2003). So, informal workers are those whose social security is not paid by the employer, and they are not entitled to get paid annual or sick leave. The job security and social protection of these workers are not there. These workers are desperate enough to work at a subsistence wage to fulfill their minimum family requirements as they are low skilled for work. They are mainly working in different parts of the country as daily wage earners, salesmen in shops, factory workers, construction workers, and also as more than 100 million landless agricultural workers (Radhakrishnan, 2020).

The term "informal sector" is used explicitly by W Arthur Lewis in his economic development theory to explain employment and livelihood generation in the developing world (Pushpalatha & Punnavanam, 2020). Though the informal sector constitutes a significant portion of the developing economy, its real existence is not clear as it is unreported by employers for their ill-treatment. Informal workers work in miserable conditions. The

occupational and health safety of these workers is not taken into consideration. They are facing inadequate access to water, sanitation, and risk management in the working environment. These workers are also facing financial problems in the form of the lower-wage rate and insecurity in payment receipts.

As per the International Labour Organization (ILO), close to 81per cent of all employed persons in India is engaged in the informal sector, with only 6.5per cent in the formal sector and 0.8per cent in the household sector (ILO, 2018).The employment scenario in different countries is also different. In low-income countries, informal employment represents 90 per cent of total employment, in middle-income countries, 67 per cent and 18 per cent in high-income countries (ILO, 2018).The Economic Survey of India 2018-19 estimates that almost 93 per cent of the total workforce is employed in the informal sector. The layout of informal workers is gloomier as it grows in an unorganized manner. The Periodic Labour Force Survey (PLFS) of 2017-18 released in May 2019 indicates that even 71.1 per cent of regular wage/salaried workers in the non-agricultural sector (of the informal sector) had no written job contract, 54.2per cent were not eligible for paid leave and eligibility for any social security benefit was not there of 49.6 per cent of the workers. They are deprived of the benefit of safety equipment at the workplace, medical facility, or family welfare support, a minimum standard of wage, and specification to certain working hours. So, they are exploited by employers in different forms. They are usually paid at a low rate ranging from Rs.400 to Rs.1000 (US$5 to US$13) and that too on a daily basis. So, the scope for saving is almost zero for them and even access to financial institutions is not proper.

2. Review of literature

Street vending is an integral part of the urban informal economy. Street vending has survived for a long time as there is an increasing demand from the middle class in urban areas as they get inexpensive goods from street vendors compared to malls and organized stores (Kumar, 2015). Still, some people often complain about street vendors and ill-treat them as they block pavements and are less concerned about sanitary measures at the place (Bhowmik & Saha, 2012). Street vendors make the street safer for women (SHRAM, 2015). However, these vendors are facing many difficulties in their lives and livelihood.

Poverty and illiteracy are forcing rural poor to move from rural to urban

cities/towns for better job opportunities and livelihood. The non-availability of alternative jobs necessitates them to choose street vending as the source of livelihood (NIDAN, 2010). Free entry to the market and low level of investment required for trading are other reasons for choosing street vending by these people (Pushpalatha & Punnavanam, 2020; NIDAN, 2010). As a result, the number of street vendors in cities has increased over the years, but the space for vending is limited (Jha, 2018). This is becoming a burden and hindrance to urban planning by authorities (Chen et al., 2013). Consequently, many of these vendors are harassed by local authorities and police (Saha, 2011; NIDAN, 2010; Bhowmik, 2001). The fear of police attacks is always present among vendors (Chen et al., 2013). For this reason, they give bribe to officials and police to be protected from short-term attacks (Bhowmik & Saha, 2012). Corruption in the form of bribery and extortion eats into these people's earning and reduces their income further (Bhowmik, 2001). Often, the wastage of products by officials and police gives them a huge loss in earning (Sekar, 2008; Phil, 2010). These workers work excessive hours for economic activity (Saha, 2011; Sekar, 2008). And the majority of them do not use safety equipment at workplace (Pushpalatha & Punnavanam, 2020). To solve these problems, there is a need to regularize street vending in the country.

An institutional mechanism needs to be developed in such a way which will protect the interest of street vendors. For example, the model implemented by Bhubaneswar Public-Private Community Partners (PPCP) legitimizes street vending and gives rise to a sustainable market to millions of vendors to earn from the street (Kumar & Shing, 2009). However, in the case of policy implementation, the same states take quick decisions while others take longer (Sinha & Roever, 2011). So, there is a lack of uniformity in the functioning of street vendors across states. Regularising street vendors will help those people in different forms. The social, mental, and financial conditions of these vendors will be improved by regularising them. On one hand, they need not give a bribe (hafta), and on the other hand, they can access institutional finance (SHRAM, 2015). By this, they can be kept out from the exploitation of money lenders on whom they are mostly dependent for economic and social activity (Saha, 2011). For operating the business, most finance is derived from their own saving, which is small (Bhowmik & Saha, 2012). So, formalisation of street vendors is required all over the country for which licensing of vendors is important. By this, the fear of attack by police or any kind of pubic disturbances could be avoided. However, municipality authorities are reluctant to issue a license to them

(Bhowmik, 2001), and often, they demand bribes from them. So, it becomes challenging to procure a license the official side, and also from the vendor side to apply for license properly as they are less educated (Sekar, 2008; NIDAN, 2010; Bhowmik, 2001).

In street vending, gender is also an issue. There is dominance of male street vendors in the market (Bhowmik & Saha, 2012). This is because a female vendor faces more problems than a male vendor (Baliyan & Srivastava, 2016). The street is a public and crowded place. The dominance of male vendors restricts female vendors from getting a suitable tradable space in the market. Due to the non-availability of reserved space, a female vendor cannot continue for a long period due to lack of buyers (Sharma & Konwar, 2014). So, the numbers of male vendors are more than female and live in better conditions with respect to income (Chakraborty & Koley, 2018). So, there is a "decent work deficit" in the working life of street vendors (Saha, 2011).

In any kind of uncertain situation, street vendors are affected badly. In the case of natural disasters like floods or cyclones, they are highly affected as their shops are stationary or not well built. Taking into consideration the current undesirable situation of COVID-19, street vendors are severely affected. A study by the Institute of Social Studies Trust (ISST) indicates that 97.14 per cent of vendors are adversely affected by lockdown. The fear of disease or lack of protective equipment is the main reason for slow trade, and consequently, fall in income (ISST, 2020). So, there is a need to look into this vulnerable group of the economy.

3. Materials and Methods

The present study has been conducted on the impact of COVID-19 on street vendors in Bhubaneswar, Odisha. Both primary and secondary sources of data have been used for this study. Primary data has been generated through fieldwork by using survey method with structured and semi-structured interview schedule. Simultaneously, group discussions and informal interview methods have been used. Observation has been done through semi-participant methods. A total of 110 street vendors have been surveyed from Bhubaneswar. The secondary sources of data used in the study are from the Census of India, Economic Survey of Odisha, Government of Odisha, Reports of NSSO, and NCEUS. In addition to the documents, various books, journals, and newspapers are referred to and used. The variables used in this paper are based on the impact of COVID-19 on street vendors on various dimensions and issues. Different data are presented in tabular form, which is shown in percentage.

1. Results and Discussion

Number of Street Vendors in India and Odisha

There are conflicting estimates on the number of street vendors in India's cities. There are about 10 million streets Vendors throughout India with Mumbai accounting for 250,000, Delhi has 200,000, Kolkata, more than 150,000, and Ahmedabad, 100,000 as per the Ministry of Housing and Urban Poverty Alleviation. The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 calculates a maximum of 2.5 per cent of a city's population as street vendors. The National Census 2011 put the national urban population at 377 million. Assuming that the urban population now stands at around 430 million, there will currently be approximately 10 million street vendors. However, this figure seems to be on the higher side, considering the results of successive rounds of the census conducted by the National Sample Survey Organization (NSSO). Notwithstanding the variations in the successive NSSO rounds since 1983, the urban population with street vendors as their primary occupation has grown from 1.03 million in 1983 to 1.61 million in 2011–12. This is not close to even half of the calculations under the Street Vending Act and the number presumed by the National Policy. The data shows 3.33 million persons (urban plus rural) involved in street vending as their primary occupation, which, too, is significantly lesser than the estimated mark. There are 65,000 registered street vendors in Odisha. With more urbanisation likely to happen across India, the number of street vendors is expected to rise substantially.

Table 1: Number of Street Vendors, All India (1983-2012)

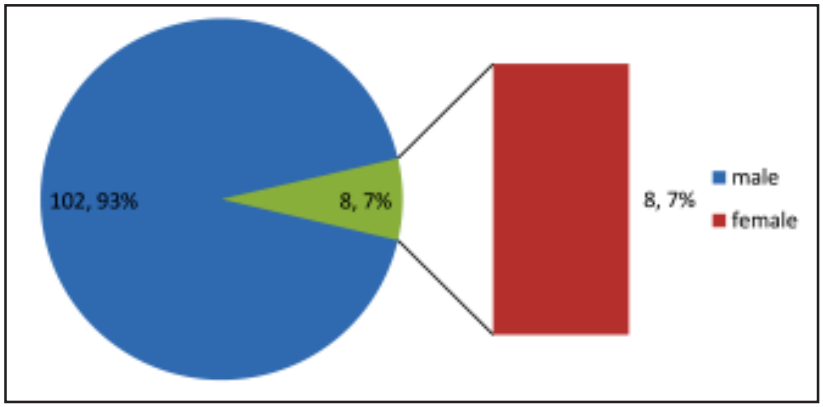
Year	Rural	Urban	Total
1983	1081629	1034744	2116373
1987-88	837684	943801	1781485
1993-94	1292906	1344467	2637373
1999-2000	967853	1088241	2056094
2004-05	2137056	2508987	4646043
2011-12	1721215	1614428	3335643

Source: NSSO, 2011-12

Profile of the Sample Street Vendors in Odisha

In this study, we have shown the socio-economic condition of street vendors. The study found 80 per cent of Hindu street vendors and 20 per cent of muslim vendors, most of whom are engaged in activities like chicken, mutton, and fish. In the context of caste, 36per cent, 30per cent, and 34 per cent of the vendors are from general, OBC, and SC categories, respectively. From marriage point of view, majority (63%) of the vendors are married. Though some of the vendors are unmarried, most of the vendors live with their family with an average family size of 5 members. So, many people in the family depend on the earnings of these vendors. Every vendor has a huge responsibility of sustaining their family.

Figure 1: Gender Composition of Vendors



Source: Field Survey, 2020

The occupation of street vending is mostly dominated by male vendors, as shown by the study. We found only 7 per cent female vendors in our study. Violence and male domination on the street or hardship of work has discouraged female vendors from this occupation. Those who are still working in this field are facing many difficulties in their day–to-day life.

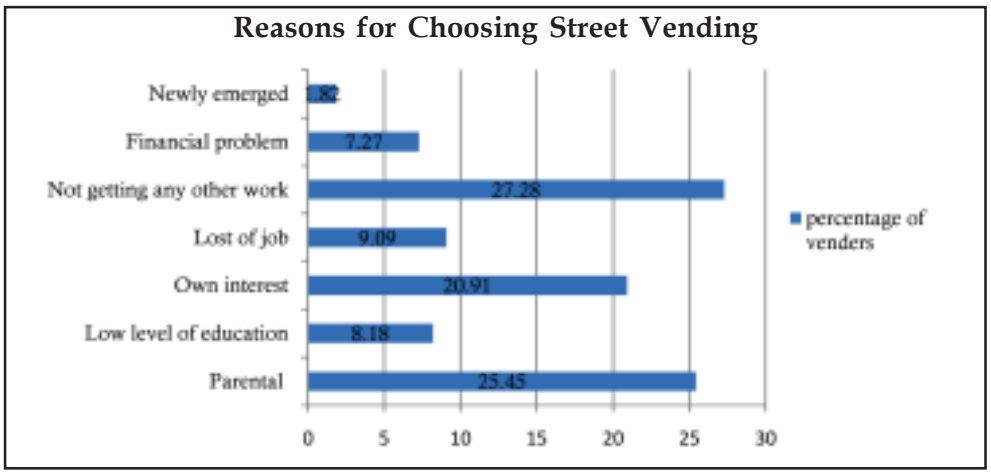
Table: 2 Education Profiles of Vendors

Education	Frequency	Percentage
Illiterate	13	11.83
Primary	51	46.36
Secondary	32	29.09
Higher secondary	14	12.72
Total	110	100

Source: Field Survey, 2020

The education profile of street vendors is very low. The maximum of vendors are primarily literate (46%) or illiterate. None of them have obtained higher education, and very few have obtained higher secondary education (13%). So, these vendors are educationally backward and less technical efficient. This is one of the reasons for choosing street vending as an occupation by this group of people.

Figure 2: Reasons for Choosing Street Vending as Occupation



Source: Field Survey, 2020

Street vending is an occupation which lacks social dignity and prestige. However, still a large group of the population chooses this occupation for different reasons. Parental occupation (25%), not getting any work (27%), and own interest in it (21%), are the main reasons for choosing street vending as occupation. In a situation of lack of technical efficiency and partially stationary vending set-up, parents encourage their children to take up the same job. Likewise, some people do not get any job due to low levels of education and technical inefficiency; with no option left, they choose street vending as their occupation. Loss of job, financial problem, and low level of education are also reasons for choosing street vending as an occupation. Among the respondents, some are working for long days, and some of them have newly started this occupation. Table 3 depicts a picture of how long they are in the street vending occupation.

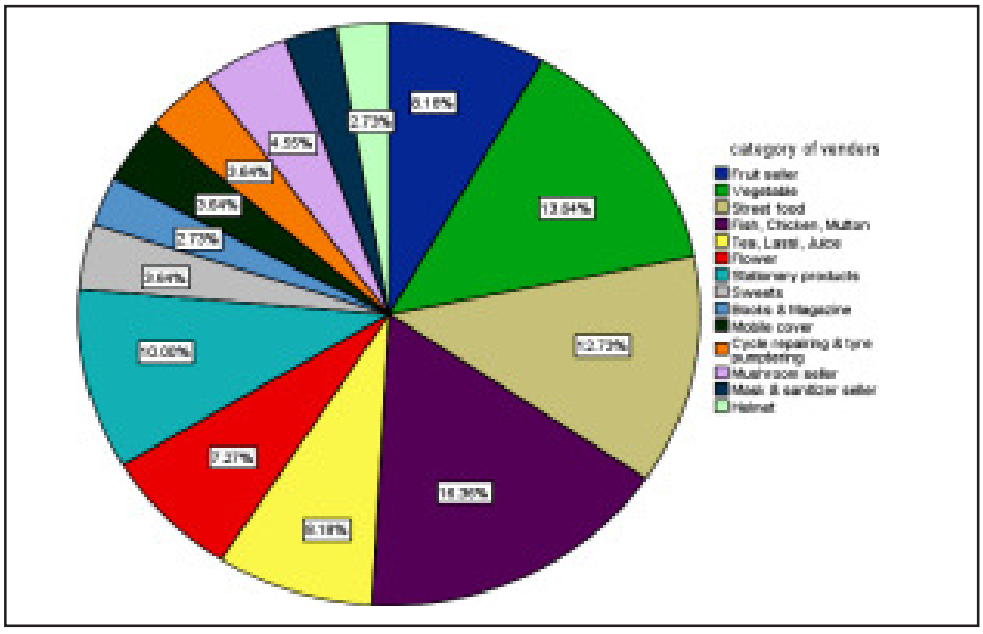
Table 3: Street Vending – Since How Long

Years	Frequency	Percentage
Less than 1	10	9.1
1-5	22	20
5-10	39	35.45
10-15	22	20
15-20	9	8.18
More than 20	8	7.27
Total	110	100

Source: Field Survey, 2020

The study found that many of the vendors are doing this for a long time while some started pursuing this occupation recently. With the changing economic situation and employment profile, some people prefer to do only street vending. Some vendors are into this occupation for a long time, either for better income or they have a semi shop-like structure. There are different categories of vendors. Street vendors are categorised according to the goods they sell in the street. The profile of these vendors is shown in figure 3.

Figure 3: Category of Street Vendors



Source: Field Survey, 2020

The study found 14 categories of street vendors as mentioned in figure 3. The majority of street vendors under the purview of our study are fruit sellers, vegetable sellers, and street food and fish, chicken, and mutton sellers with percentages of 8.18, 13.64, 12.73, and 16.36, respectively. There are also other different sellers like tea, lassi & juice, flowers, books, magazines, etc. Due to the spread of corona virus and the increasing demand for masks and sanitizer, some people have started to sell these products on the street. The new traffic rules have increased demand for helmets in the market. Thus, some people have started to sell helmets on the street. However, the working hours vary in different street vending, which is shown in table 4.

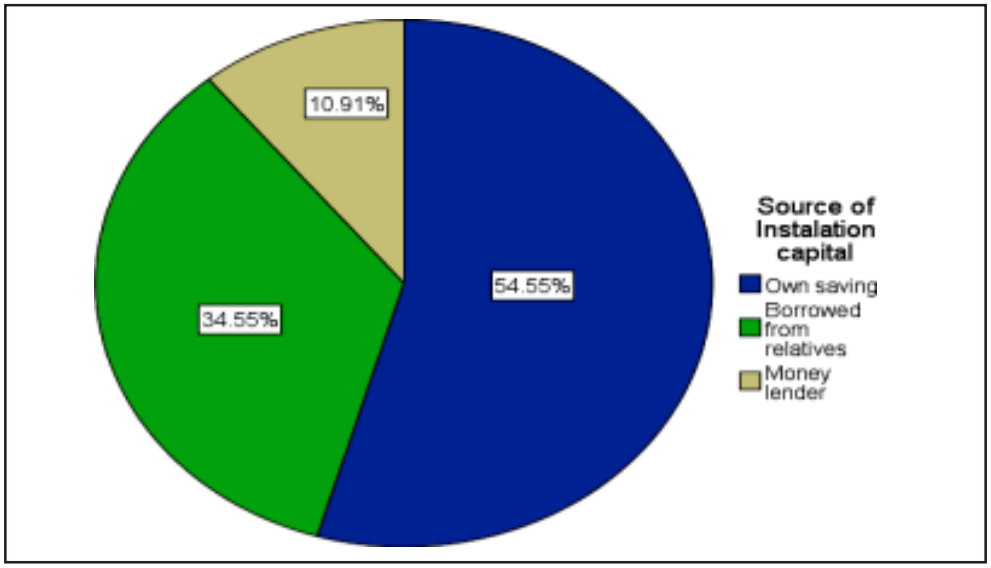
Table 4: Working Hour and Category of Vendors

Category of vendors	Working hours			Total
	< 7 hours	7-10 hour	> 10 hours	
Fruits	0	5	4	9
Vegetable	6	8	1	15
Street food	1	7	6	14
Fish, chicken, mutton	6	10	2	18
Tea, lassi, juice	0	4	5	9
Flower	3	2	3	8
Stationery products	0	3	8	11
Sweets	0	1	3	4
Books and magazines	0	0	3	3
Mobile cover	0	4	0	4
Cycle and tyre repairing	0	0	4	4
Mushroom	2	3	0	5
Mask and sanitizer	0	3	0	3
Helmet	0	1	2	3
Total	18 (16.37)	51 (46.36)	41 (37.27)	110

Source: Field Survey, 2020

The working hours in the informal sector are a big issue for workers. However, it varies according to different kinds of job. In our study, working hour is grouped into three categories, namely less hours (less than 7 hours), medium hours (7-10 hours), and very long hours (more than 10 hours). About 37 per cent of street vendors work for more than 10 hours, which is a long period. More particularly, street food sellers, cycle & tyre repairing shop, stationery products sellers work for a long duration. Working for longer hours deteriorates the health and mental condition of workers.

Figure 3: Source of Initial Capital



Source: Field Survey, 2020

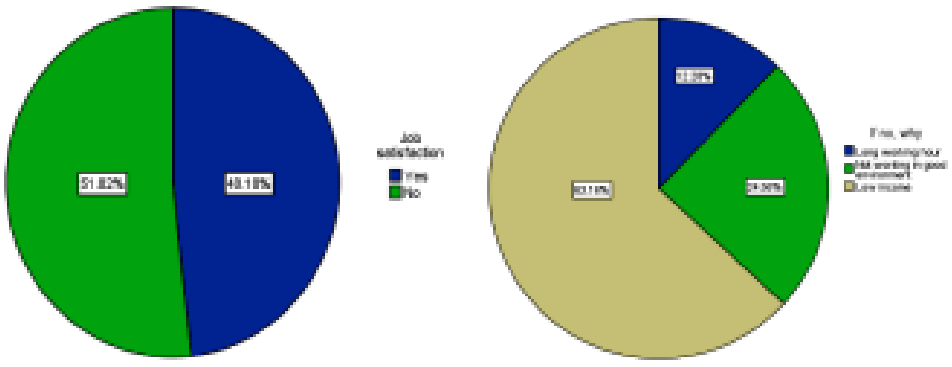
For any kind of business, there is need for capital. And the installation capital is a bit higher. Figure 3 depicts that 55 per cent of vendors had started their trading with the help of their own savings. Some vendors had started their trading by borrowing from relatives (34%) and money lenders (11%).In terms of monthly income, 36 per cent of vendors have an income of less than Rs. 10000 and 24 per cent of vendors earn low income of Rs. 10000-15000, particularly, in vending related to vegetables, books & magazines, tea, lassi & juice, and mobile. However, vendors selling street food, fish, chicken & mutton earn a comparatively better income. So, there is variation in earning as per the category of vending. However, many of them are not satisfied with their occupation. Figure 4 shows us job satisfaction and reasons for lack of satisfaction in vendors.

Table 5: Monthly Income and Category of Vendors

Category of vendors	Monthly income (in Rs.)				
	Less than 10000	10000-15000	15000-20000	20000 above	Total
Fruits	1	2	6	0	9
Vegetable	7	3	5	0	15
Street food	0	5	5	4	14
Fish, chicken, mutton	2	0	10	6	18
Tea, lassi, juice	4	2	1	2	9
Flower	5	3	0	0	8
Stationary products	4	2	5	0	11
Sweets	2	2	0	0	4
Books and magazine	2	1	0	0	3
Mobile cover	4	0	0	0	4
Cycle and tyre repairing	1	3	0	0	4
Mushroom	3	2	0	0	5
Mask and sanitizer seller	3	0	0	0	3
Helmet	2	1	0	0	3
Total	40 (36.36)	26 (23.64)	32 (29.09)	12 (10.91)	110

Source: Field Survey, 2020

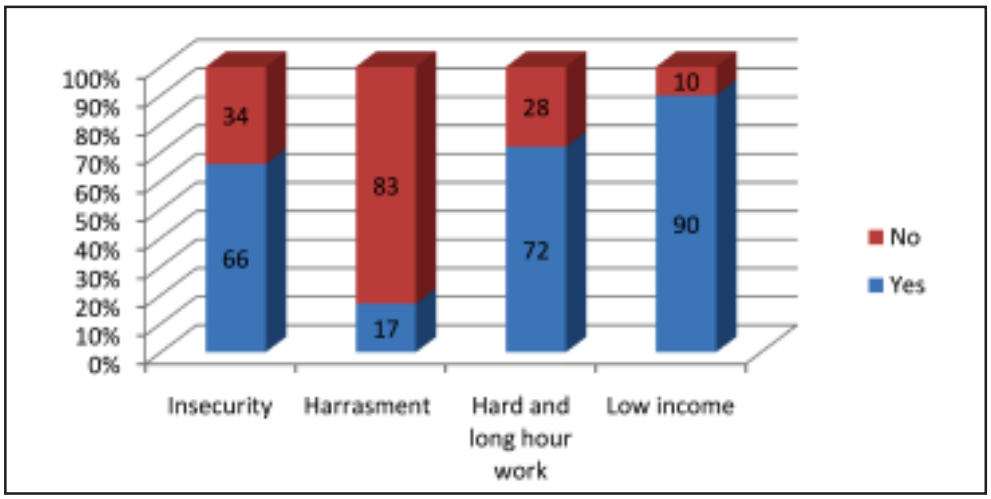
Figure 4: Job Satisfaction and Reasons for Not Being Satisfied



Source: Field Survey, 2020

The majority of street vendors (52 per cent) are not satisfied with their job. As per the study, three main reasons for non-satisfaction are long working hours, not working in a good environment, and low income. About 63 per cent of unsatisfied vendors mentioned that low income is the reason for the non-satisfaction in their job. Along with this, street vendors face other challenges in their day-to-day life, shown in figure 5.

Figure 5: Challenges in Street Vending



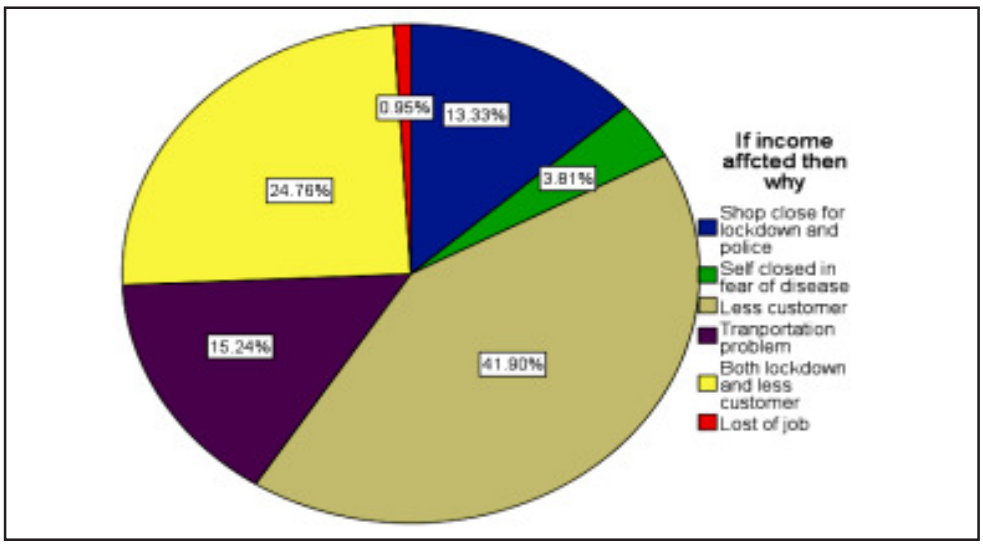
Source: Field Survey, 2020

Street vendors are insecure about their trading places, business volume, and many others. There is always a fear among them about police attack. Uncertain weather also affects their trading as well as wastage of their goods. So, there is an insecurity of trade among street vendors. In response to this, 66 per cent of vendors agreed that they are insecure about their trade. Officials, police and even the public harass the street vendors. However, harassment of vendors is low (17 per cent) in the study area. Another challenge faced by street vendors is the hard and long hours of work. In our study, 72 per cent of vendors said that they worked hard and for long hours.

Due to spread of Corona virus and lockdown, every group of society has been affected, and street vendors are one of them. Street vendors are one of the most vulnerably affected groups. The total trading of these people has been highly affected. The income and employment profile of these people has drastically reduced. Due to the lockdown to prevent the spread of the Corona virus, the trading of street vendors has been affected. Among the

studied street vendors, 95.45 per cent of vendors said that their income has been affected. These are vendors who have returned to their vending, but some other venders have not started vending till now. So, the effect is much greater than this. Among affected vendors, there are different reasons for which their vending has been affected, which are shown in figure 6.

Figure 6: Reasons for Income Being Affected



Source: Field Survey, 2020

The income of street vendors has been affected due to different reasons, as mentioned in the above figure. The most important reason is fewer customers on the street. Due to the fear of the virus, people are not coming outside for any kind of purchase. More particularly, people are avoiding places like the street, where generally crowds gather and sanitary measures are not properly maintained. So, street vendors are facing a lack of demand for their product, due to which their income has reduced. Initially, there was a complete lockdown in our country, during which vendors could not sell their goods. However, after some relaxation, some vendors started their trade, but sales were not as goos as earlier due to weekend shutdown, restriction on time, police attack in small crowded places, and many others. So, 13 per cent of vendors stated that shutdown and police restrictions are the reasons for decline in income. Another important reason is the transportation problem. Generally, products like fruits, vegetables, and fish are brought from distant places to urban areas. Due to the spread of virus, the transportation sector has alone been affected. Thus, vendors are not getting a sufficient amount of products to sell. For this reason, 15 per cent of vendors mentioned that transportation problem is the reason for decline

in income. Some vendors also said that both lockdown/shut down and fewer customers are the reasons for decline in income. The decline in amount of income is shown in Table 6.

Table 6: Income Changes Due to Corona Lockdown

Category of vendors	Average income of February	Average income reduced	Percentage of reduction
Fruits	9889	1445	14.6
Vegetable	9400	1200	12.76
Street food	11357	7000	61.63
Fish, chicken, mutton	11055	4277	38.68
Tea, lassi, juice	10111	2445	24.18
Flowers	4875	2875	58.97
Stationary products	8636	5090	58.93
Sweets	12500	6250	50
Books and magazine	11333	5666	50
Mobile cover	11000	8000	72.72
Cycle and tyre repairing	12250	8250	67.34
Mushroom	10000	4500	45
Mask and sanitiser seller[1]	4666	2666	57.13
Helmet	9000	7333	81.47
Total	9827	4236	43.10

Source: Field Survey, 2020

Table 4 depicts a clear picture of the income profile of street vendors according to their category. February is considered as a normal period and June as lockdown period. We can see that the monthly average income of street vendors at aggregate level was Rs. 9827 before the spread of Corona virus. During the shutdown period, on average, there was income of Rs. 4236, showing a 43 per cent decline. More particularly, sellers of street food, helmet, mobile cover, and cycle & tyre repairing shops have drastically reduced. Demand for street foods declined as the sellers are rarely concerned about sanitary measures. There is uncertainty about the volume of sales at present. So, the sellers do not have a large volume of sales but at the same time, they are incurring increased costs. The income of these vendors has been highly reduced. Due to newly traffic rules, demand for the helmet was high, and these sellers used to earn a good income. However, due to

COVID-19, very few people are stepping outside their homes. As a result, helmet sales has nearly stopped, and so has the income for these vendors. The situation is almost the same for cycle and tyre repair shops.

The income of fruit and vegetable sellers has declined, but not greatly. Even at the start of the lockdown with high restrictions, fruits and vegetable selling was permitted in the market. However, these sellers suffered in two ways, first due to transportation problem, and also due to decreasing demand in the market. Thus, the income of fruit and vegetable vendors has declined by 14.6 per cent and 12.76 per cent, respectively. The income of fish, chicken, and mutton vendors has declined by 39 per cent. People do not find it necessary to consume these items, for which they have to go outside. So, in general, due to fewer customers and fewer sales, the income of these vendors has reduced. Likewise, every vendor has suffered in this situation. The income of every vendor has reduced due to different reasons. Thus, the spread of Corona virus has a negative impact on the income of street vendors.

Field Observation

It is observed from the current situation that more than 50 per cent of street vendors have not returned to their occupation even after the unlock process started in the country. Many peanut, idol, and plastic flower sellers were seen everywhere in the city before COVID-19, but nowadays, they have completely vanished from the market. This is because they belonged to North India, especially Uttar Pradesh and Madhya Pradesh, and they have all moved to their native place. The same happened with door screen seller, clay pot seller, light seller, hakimi medicine seller (jadi buti), and astrologer. Likewise, few street food vendors are seen in the market, and this number was very high before COVID-19 in the city. The situation is the same for all kinds of street vendors and many reasons behind this. Some demand-side and some supply-side factors are responsible for it. A few street vendors are reluctant to vend because of the fear of disease, pressure from their house, and some depend upon educational institutions. Due to COVID-19, all educational institutions are closed up to October 31, 2020 as declared by the state government of Odisha. People also do not feel safe to move

[1]Mask and sanitiser are highly in demand in recent days. So many vendors prefer them; this is a newly emerging activity. The income for February is taken from their previous job.

outside and buy street foods. So, vendors are facing a lack of demand for their products, which prevents them from engaging in vending activity. The role of street vendors is important for the recovery of the economy hit by COVID-19. However, the sector itself is gravely affected to such an extent that the dynamics of restructuring to normal is becoming difficult. The functioning of trade is getting strenuous. Even the nutrition in food intake has reduced and paying monthly rent is becoming tough (Kesar et al., 2020).Thus, it can be stated that street vendors have been severely affected by COVID-19.

Anil Kumar Das, a 22-year-old is working as a street vendor in the Rasulgarh area of Bhubaneswar. He has completed his 12th standard in Science from Ekamra College in Bhubaneswar after completing his technical course. He went to Bangalore and worked in INOX multiplex cinema hall as a screen operator. He was drawing a salary of Rs. 30,000 and his life was running very smoothly. Suddenly everything changed due to COVID-19; all the cinema halls were closed across the country. He was bound to shift to his native place Bhubaneswar. After sitting idle for a month in his house, his savings completely drained out. Then, he borrowed some money from his father and started selling fruits, especially mango and guava, in a trolley near Rasuagarh market area and is now earning just 200 rupees per working day.

Prakash Samal, a pavbhaji seller in Bhubaneswar told us that everything was normal before COVID-19, and then everything changed. Due to fewer customers in the market, he is unable to survive as daily sales are much lesser than his previous average sales. There are six members in his family entirely depending on him. He also has a bank loan availed for his business, which he is unable to pay during the lockdown. Also, he is unable to pay his son's college and tuition fees. The living condition of his family has worsened.

India's National Policy on Urban Street Vendors

Historically, street vending was regulated by the state government and municipal officials with many actions taken against vendors. Street vending was regarded as an illegal activity as they traded in public or private places, block pavements, and sometimes created traffic problems. They were humiliated by government officials and suffered in different aspects. However, as they constituted a large group in the economy and most

vulnerable to uncertainty, laws were needed to help them. For this reason, national policies were formulated to protect the interest of street vendors. The first policy judgement regarding street vending in India was started in 1983 (Bombay hawker's association vs. Bombay municipal corporation case). In this appeal, the Bombay Municipal Corporation Act 1888 was challenged for its arbitrary and unguided power to refuse to grant or renew license for hawking and removal of products from the street. After two years, in 1985, Bombay Hawkers Association vs. Bombay Municipal Corporation case was filed with the aim that hawkers should be allowed to do business with strict regulation on adulteration. After that, in 1989, a classic judgement by the Supreme Court of India in the case of Sodan Singh vs. New Delhi municipal committee was issued that article 19 (1)(g) covers street vending; however, a reasonable restriction could be enforced by article 19(6) by the authority. And municipal authority will permit hawkers for roadside trading, but hawkers cannot make it a permanent asset. Later, in 2001, the Government of India declared a task force to report on street vending. After a short period, national policy on urban street vender was launched in 2004. In 2009, the national policy on urban street vendors was revised to promote livelihood of vendors and prevent overcrowding and unsanitary conditions in the streets. After four years, in 2013, the Supreme Court asked all state chief secretaries to constitute a town vending committee as per the 2009 policy. In 2014, the most important policy on street vendors (street vendors act, 2014) was passed by the parliament. The street vendors (protection of livelihood and regulation of street vending) Act, 2014,directs appropriate schemes and rules to be formulated by the government to benefit street vendors.

The street venders (protection of livelihood and regulation of street vending) Act, 2014 directed to formulate town vending committee, which will be responsible for all venders under its jurisdiction. The committee is to be formulated by 40 per cent of vendor participation and will facilitate dispute resolution by creating grievance redressal channels. All street vendors will be accommodated with a designated vending zone. Keeping in view the issue of child labour, all vendors above 14 years will be provided a certificate of vending. The authority has the power to take action against vendors violating norms and regulations. Despite the enactment of the act, no such impact has been noticed in the condition of street vendors (an interview of Bhowmik, an expert in urban poor and informal sector by SHRAM, 2015).

Government Initiatives for Street Vendors

COVID-19 is unprecedented health and economic crisis in which government intervention with the aim to minimize its adverse effects is important. The government is also adopting many measures to curtail its adverse effects on different groups of society. The Ministry of Labour and Employment (MOLE) has issued an advisory to employers of public and private establishments (including ministries and departments) to extend their coordination by not terminating their employees, particularly casual and contractual workers, from their job or reduce their wages **(ILO, 2020).** The central government has announced a special scheme related to micro credit facility namely PM SVANidhi i.e., Pradhan Mantri Street Vendors Atma Nirbhar Nidhi. This scheme was initiated by the Ministry of Housing and Urban Affairs to provide affordable land for street vendors to restore their livelihoods disrupted by announcement of COVID-19 lockdown on June 1, 2020. This scheme targets 50 lakh street vendors who shall receive a working capital loan of Rs. 10,000, which is repayable in monthly installments during tenure of one year. The benefit of interest subvention is also exists if the loan is paid on time through direct benefit transfer. Till now, 2,77,322 vendors have applied for this scheme, of which 29,566 have been approved. The Government of Odisha has announced a relief package of Rs. 3000 to 65,000 registered street vendors in 114 urban areas of the state amid the nationwide lockdown. Outreach of policy measures to curb the adverse effect of COVID-19 on different social groups is not equidistributed (Kesar et al., 2020).

4. Conclusion

Street vending is a critical occupation with job insecurity and poor working conditions. These vendors are facing many difficulties like low income and lack of sanitary measures at workplace. With these difficulties, the corona virus is spreading and the lockdown has deteriorated their living conditions to a worse level. The working opportunity for street vendors has declined due to several restrictions and lack of demand. More particularly, a significant amount of income has reduced for all street vendors due to the spread of coronavirus. Even globally, some cities like Mexico, Accra, Los Angeles, and New York, where vendors were allowed to vend, reported a 90 per cent drop in their income due to reduced foot traffic (Belbuena, 2020). So overall, the study concludes that life and livelihood of street vendors are badly affected due to the COVID-19 lockdown.

Suggestions for Street Vendors

- The Street Vendors Act 2014 is a groundbreaking effort to secure urban street vendors' livelihood and social security rights. This enables the government to eliminate poverty. The Act aims to create a friendly atmosphere for urban street vendors to do their businesses without harassment. However, the Act has not been enforced in many cities. In the few cities where law regulations have been enforced, the regulatory system has undermined the rule. Therefore, The Street Vendors Act (2014) should be implemented properly and speedily in all the states and union territories

- Street vendors represent one of the largest and most visible segments of the informal economy. The actual number of people employed as street vendors is largely unknown in our country. Government officials need reliable data on street vendors so that correct and efficient policies are formulated. There is an urgent need to create a database for the street vendors by competent institutions and public agencies. After collecting the database for the street vendors, the vendors should be issued identity card. This approach would increase the confidence of vendors in the local government and the mapping results.
- Land management is essential for improving urban planning. The street vendors constitute 2 per cent of the city's population. Thus, 2 per cent of every town's land should be allocated to street vendors. Compulsory arrangements must be made to allocate 2 per cent of the vending spaces in new city planning schemes for new areas. Detailed information of the local environment would help to incorporate updated street vendor designs on-site while solving emerging problems in allocating space to vendors.

- Street vending plays a critical role in ensuring livelihood to a large section of the underprivileged and marginalized society. The city administration or urban planning departments never recognize their contribution. Street vendors work under the persistent threat of municipal and police eviction. This strategy must be avoided to encourage street vendors to carry on business without fear of eviction.
- There is a high incidence of street vendors borrowing from money lenders in the study area. The government can assist them financially in their business activities at a free rate of interest. And the government can extend subsidy to the street vendors, especially for vending

perishable items. Bank initiatives must reduce this by supplying sufficient working capital at the economic expense and with minimal procedural delays. The government should provide interest-free loans, including MUDRA loans, with subsidies to street vendors.

- Vendors should have access to services such as clean drinking water, sanitation, electricity, and storage. These facilities would improve vendor profitability and help preserve hygiene and sanitation in the area.

- A state committee should be formed with members of several vendor associations.

- The analysis revealed that the research area lacks unionization among street vendors. Street vendors should organize and fight together for their cause and problems. NGOs can lead street vendors in this direction.
- Vendors' problems should be solved collectively through the participatory process of stakeholders, and strong legislation with guidelines should be enacted for the same.

- Monetary compensation should be given to street vendors to tide over the negative impact of COVID-19 and stimulate effective demand in the market.

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Article

COVID-19 and the Migrant Workers

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Abstract

After the global financial crisis 2008-09, COVID-19 crisis has been the worst shock to the global economy. And the adverse effect on employment is the second such situation since the Second World War. While there are many who have lost their livelihood, the impact on migrant workers is greater. They got stranded at their place of work, away from their home, and lost their jobs due the lockdowns and shutdowns. Living in unhealthy conditions with meagre savings and not being covered under the safety net of the government, they suffered miseries beyond imagination. The efforts by various levels of the government with schemes likePradhan Mantri Garib Kalyan Yojana(PMGKY) failed to mitigate their woes. A part of the funds made available to developing countries to fight the pandemic must be utilised for the migrants to make them an integral part of thedevelopment process. The present paper, based on secondary data, has made an attempt tolook at some of these issues.

Keywords: COVID-19 pandemic, Migrant workers, Inter-state and Inter-district migration, Remittance

1. Introduction

It is not possible for any government to provide livelihood opportunities for all its working force, which prompts people to move to other places in search of jobs or for livelihood. These movements of people across countries

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and continents, referred to as migration, got a further boost in the globalised era. In India, migration is a commonly adopted livelihood strategy. Rural to urban migrants are mainly concentrated in 53 million plus urban agglomerations (with one thousand and more) that comprise 140 million out of 377 million urban population of the country equivalent to 43 per cent of total urban population as per 2011 Census (Bhagat eta al., 2020). However, the COVID-19 crisis has created a difficult situation for these migrant workers. No doubt, COVID-19 has adversely affected the entire global population, be it rural or urban, from the developed or underdeveloped region, rich or poor country. Travel bans, lockdowns, social distancing and perpetual shutdowns have had an adverse effect on societies as well as the world economy. A projected contraction of the world economy by 3 per cent is estimated this year in stark contrast to the 6 per cent growth observed in 2019 with a high risk of this economic recession continuing well into 2021. This global recession is more prominent in the economies of South Asian countries; whereas the real economic growth is likely to fall by 2.8 per cent; and for the Sub-Sahara African countries, the contraction is expected by -5.1 per cent (World Bank Report, 2020). The nationwide lockdowns and shutdowns in regular intervals have created immediate challenges for timely food distribution, wage payment, pessimism and fear of getting infected.This has resulted in collapsing of livelihoods of migrant workers and forcing them to head towards their native land.Many migrants lost their lives due to starvation, physical exhaustion or co-morbidity conditions; and a few even committed suicide.

Migrant workers have been hit hard by the pandemic leading to joblessness. As per the ILO estimates, job loss has increased by over 400 per cent in Africa and South Asia each since the first quarter of 2020-21. Around 59 per cent of permanent jobs have been wiped out of Asia Pacific region; whereas in South Asia, 110 million out of 235 million have lost their fulltime job. Overall, 254 million fulltime jobs have been lost across the globe in the last few months of the pandemic.

1.1 Statement of the Problem

According to Interim Economic Assessment (March, 2020) by OECD, many of the developed economies are under the threat of stagflation due to high unemploymentand excessive expenditure for the treatment and rehabilitation of COVID-19 victims and their families. In addition, every month, there will be an approximate loss of twenty-two points in annual

GDP growth. The tourism sector alone faces an output reduction of around 50 per cent to 70 per cent.

Refugees and asylum seekers from low income countries are among the worst hit by this outbreak. With the increase in spread of infection on daily basis, it has been found that most of the migrants are super spreaders because of which interstate border closures and restrictions on international movements are cropping up, thus reshaping global mobility patterns for an indefinite period of time. The measures undertaken to mitigate the burden of crisis cannot effectively include migrants unless they themselves along with the civil society assist the states and policy makers in assessing their presence and vulnerability that they are exposed to. The effectiveness of public health efforts is highly undermined as migrants are exempted from the basic screening, testing, and adequate treatment and the follow-up. (Guadagno, 2020)

Baldwin in his analysis has compared the global financial crisis of 2008-09 to the current economic crisis caused by COVID-19. The comparison revealed that while there was only a demand-side shock during the financial crisis, the COVID-19 crisis has both supply and demand side shock, which would push the world economy even further backward. The stricken economies include China, United States, Italy,France, Germany, Britain, and Japan; and these are the countries which account for 60 per cent of the world supply and demand (GDP), 65 per cent of the world manufacturing, and 41 per cent of the world manufacturing exports. The 2020 trade collapse has struck big and wide, which is the consequence of the sudden global lockdown. The negative externalities of lockdowns and indefinite restrictions have scared consumers and investors across the globe.

A reduced workforce across all economic sectors is the result of travel restriction, social distancing and self- isolation caused due to this pandemic. The food sector faced an additional increase in demand due to panic-buying and stockpiling of food products. A broad socioeconomic development plan is required for every sector to encourage entrepreneurship for the development of robust and sustainable business models. (Nicola et al., 2020)

The OECD and WTO both have regarded COVID-19 as the biggest threat to global economy after theglobal financial crisis of 2008–09. So far, a large number of studies have focused on the impact of COVID-19 on economies, and a few have examined the impact of COVID-19 on migrant workers

and the remittance flow. This study is an attempt to highlight the effect of COVID -19 on migrant workers.

The study of the internal migration in India in 2011 census by using Life Table Survival Ratio (LTSR) method reveals that the 1980s and 1990s data followed a standard pattern of migration, which is migration from low-income to high-income states. This pattern has been disrupted with the advent of the 21st century, where technological advancement has led to the emergence of pool centres, in addition, as destinations. The share of interstate migration has declined to a great extent as it is evident from the 2011 census in comparison to the 1981 census. The study also reflected the people's preference for their native places over the states (Mistri & Avijit, 2015).

Indian states having significant number of migrant workers returning to their home land as a result of this crisis are likely to witness increased number of active and confirmed cases. Stringent policies to screen workers before travel, contact tracing, strict quarantine and isolation measures after reaching the destinations are unavoidable requisites for controlling the spread of this disease due to the transportation of the migrant work force (Avijit et al., 2020). Loss of livelihood because of any epidemic/pandemic causes irreparable damage to the society. By analyzing the impact of the virus infection and to limit its further transmission within the community, many affected countries decided to undergo complete lockdown.

Delayed detection, contact tracing and response has resulted in an overburdening of local health systems. Instant response and efficient strategies to contain the infection has been effective in lowering the number of cases in many countries. Restrictive measures like social distancing, lockdown, case detection, isolation, contact tracing, and quarantine of infected people have proved to be the foremost efficient steps to regulate the spread of the disease. Preventive measures, effective contract tracing and well-defined quarantine measures are necessary to keep and contain the infection till a vaccine becomes available worldwide (Khanna et al., 2020).

Many migrant workers lost their livelihood as a result of the nationwide shutdown and were forced to return to their homeland. The transportation of migrants increases the risk of the spread of infections from the major cities to the rural area (BBC, 2020). Migrants suffer from the double burden of being poor and being migrants.

Lockdown induced closure of many micro, small and medium enterprises has resulted in joblessness at a scale, which is difficult to fathom. Besides, there have been vast numbers of daily wagers, hawkers, vegetable and fruit vendors, street food vendors, plumbers, electricians, maidservants, etc. who have no work and hence no money to support themselves and their families (Jha& Kumar, 2020).

On the other hand, the crisis has had a positive impact on the environment. Irreversible and detrimental changes to the environment are one of the biggest and most important challenges of the 21st century. A lot of efforts have been made to restore nature in the past few decades, but with limited results. However the last few months observed a surge in recovery rate of the environment globally as a consequence of the raising pandemic, positively impacting the global climate (Chakravorty and Maiti, 2020).

1.2. Objectives

Against this backdrop, the paper sets forth the following objectives:

- To discuss the impact of COVID-19 on the world economy and migrant workers.
- To discuss the impact of COVID-19 on remittances (with special focus on the South Asian region)
- To throw light on the problems faced by migrant workers due to the COVID-19 pandemic

2. Data and Method

The whole discussion is based on secondary data. Tabular, graphical method is used to analyse the data. The secondary data were collected from the reports of World Bank, Asian Development bank (ADB), United Nations Department of Economics and Social Affairs (UNDESA) and International Labour Organisation (ILO).

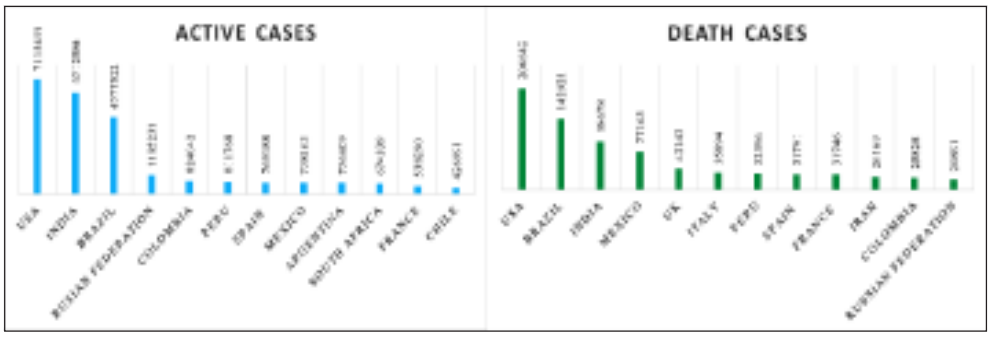
I. Discussion

The virus has spread its tentacles all over the world. Acknowledging the

risk and spread of the virus, WHO has declared it as a 'world pandemic'. Till now, the deadly virus has taken away many lives and has pushed the world economy many years backward. According to the report of Asian Development Bank (May 15, 2020), the global economy could suffer a loss of 5.8 to 8.8 trillion dollars, which is equivalent to 6.4 per cent to 7 per cent of the global GDP because of the pandemic. Prior to discussing the economic impact of the Corona virus, let us take a look at the scenario of COVID-19 worldwide as well as in India.

A. Corona Cases and Deaths in World's Leading Economies

Figure 1: Active and Death Cases of COVID-19 in Top 12 Countries

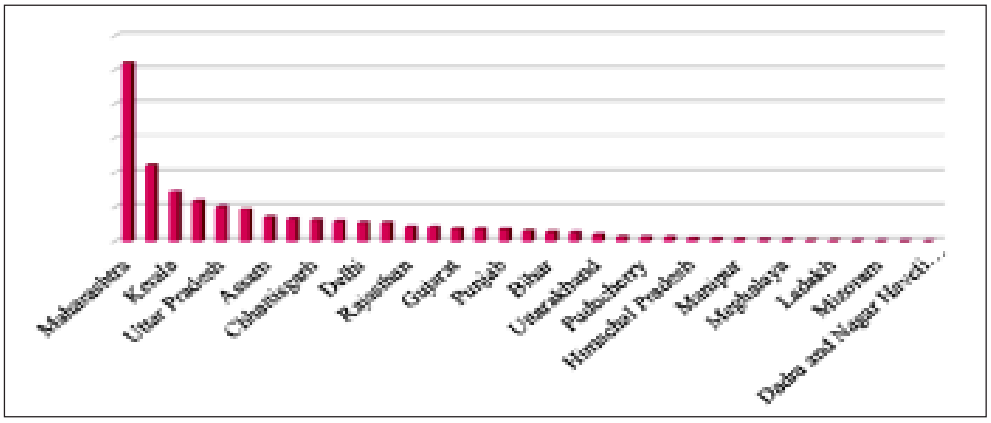


Source: WHO corona virus disease dashboard (accessed on October 2, 2020)

This deadly virus till now has been taken 10,10,634 lives worldwide and 3,38,42,281 people are suffering from this disease. In the countries that have been badly affected by the disease, USA is at the top followed by India, Brazil, and the Russian Federation. USA has 71,15,491 confirmed cases of COVID-19. USA tops the list of number of deaths with 2,04,642 people losing their lives. From this graph (fig 1), one can conclude that the pandemic has hit the developed as well as the developing economies.

B. India's COVID-19 Scenario

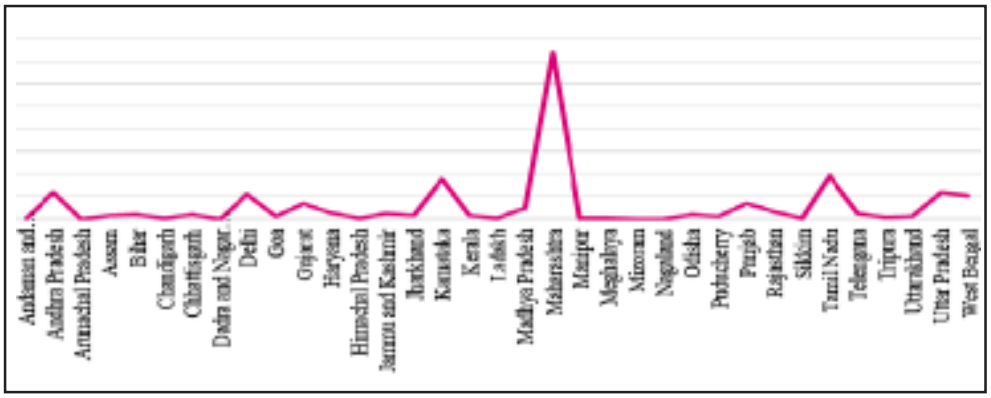
Figure 2: State-wise Active Cases of COVID-19 in India



Source: Ministry of Health and Family Welfare, GoI (Accessed on October 2, 2020)

Figure 2 shows the details of active cases of COVID-19 in India. Maharashtra has the highest number of affected people with a tally of 2,59440 followed by Karnataka, Kerala, Andhra Pradesh, Uttar Pradesh and Tamil Nadu, which are the states badly affected by the pandemic. None of the states in India is free from this disease.

Figure 3: Deaths in India Due to COVID-19



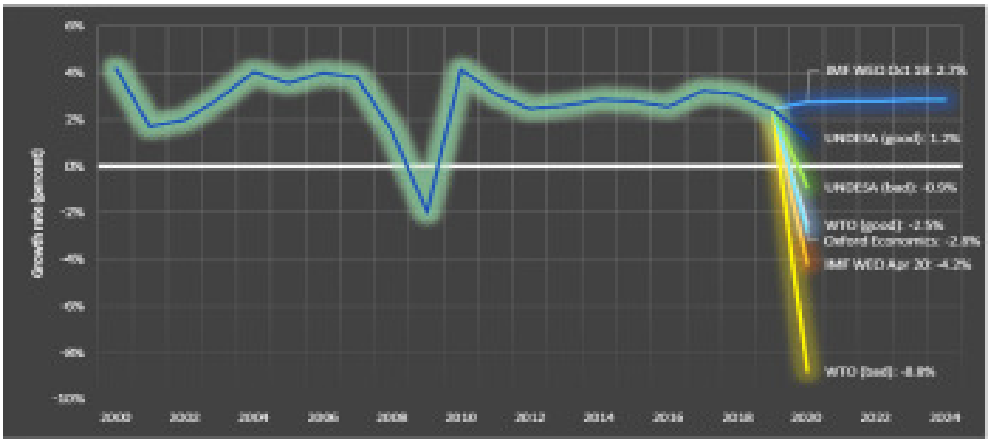
Source: Ministry of Health and Family Welfare, GoI (Accessed on October 2, 2020)

In terms of number of deaths, Maharashtra tops the list (37056), followed by Tamil Nadu (9586), Karnataka (8994), Andhra Pradesh (5869) and Uttar Pradesh (5864). The disease had already claimed 34968 lives all over India by July 30, 2020.

C. Impact of Covid-19 on the World Economy

Though the virus is supposed to have originated from Wuhan, China, it has spread all over the world barring a few countries. This pandemic has a more severe impact in comparison to the other deadly viruses like 1968 flu, H1N1, Ebola, SARS and MARS. The continuous shutdown, lockdown, social distancing and travel ban has affected the economy badly (UNDESA, 2020).

Figure 4: World Growth Outlook Projection by Different Organisations



Source: UNDESA (Accessed on May 26, 2020)

Figure 4 depicts the growth outlook projection made by different organisations about the global GDP. The projection made by IMF pre-COVID-19 pandemic was that the global GDP shall grow at a rate of 2.7 per cent, whereas the projection for the post-COVID-19 period stands at -4.2 per cent. According to WTO, due to the travel ban, restriction on trade, shutdown and lockdown, the production, marketing, export and import of goods and services are badly affected; and therefore the global output is likely to decline by 2.5 per cent. The UNDESA has forecasted the world economy shall shrink by 1 per cent due to COVID-19 in 2020. It has also forecasted the best and worst case scenarios for global growth in 2020. In the best case scenario, with moderate reduction in private consumption, export, investment, and a well-designed government plan to balance the situation through spending by world's major economies, the global growth rate may be around 1.2 per cent in 2020. And in the worst case scenario, the global production would shrink by 0.9 per cent due to demand shock and oil price decline.

D. Impact of COVID-19 on Different Sectors of World Economy

Table 1:Sector-wise Impact of COVID-19

Economic sector	Current impact of crisis on economic output	Baseline employment situation (global estimates for 2020 prior to COVID-19)			
		Level of employment (000s)	Share in global employment (%)	Wage ratio (av. monthly sector earnings/ av. total earning)	Share of Women (%)
Education	Low	176560	5.3	1.23	61.8
Human health and social work activities	Low	136244	4.1	1.14	70.4
Public administration and defence; compulsory social security	Low	144241	4.3	1.35	31.5
Utilities	Low	26589	0.8	1.07	18.8
Agriculture, forestry and fishing	Low-medium	880373	26.5	0.72	37.1
Construction	Medium	257041	7.7	1.03	7.3
Financial and insurance activities	Medium	52237	1.6	1.72	47.1
Mining and quarrying	Medium-High	21714	0.7	1.46	15.1
Arts, entertainment and recreation and other services	Medium-High	179857	5.4	57.2	0.69
Transport; storage and communication	Medium-High	204217	6.1	1.19	14.34
Accommodation and food services	High	143661	4.3	0.71	54.1
Real estate, business and administrative activities	High	156878	4.7	0.97	38.2

Manufacturing	High	436091	13.9	0.95	38.7
Wholesale and retail trade; repair of motor vehicles and motor cycle	High	481951	14.5	0.86	43.6

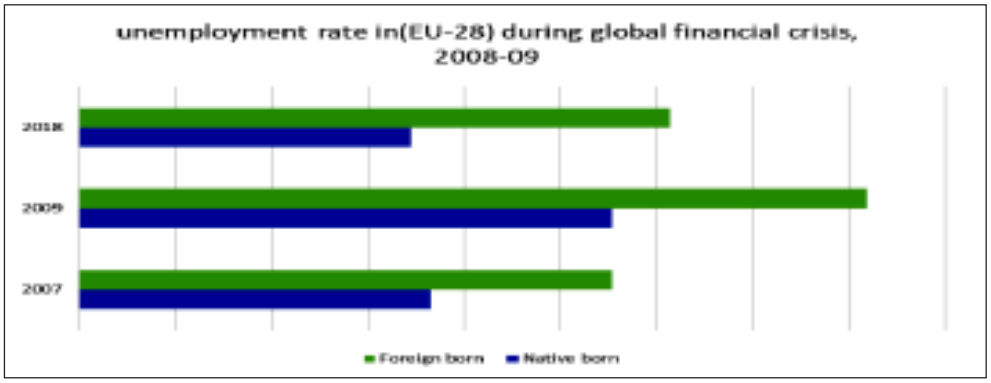
Source: ILO Monitor: COVID-19 and the World of Work, Second edition.

Table 2 shows the economic risk of COVID-19 on different sectors. The pandemic has far reaching impact on output and hence on employment, but the impact is not uniform across the sectors. Many of the economic sectors, which are mostly labour-intensive are the worst hit. The accommodation and food sector, which accounts for 4.3 per cent of global employment and in which the share of women in total employment is the second highest among all sectors (54.1%) is a sector whose output is highly impacted by the health crisis. This is a sector which employs a large number of low skilled and low paid workers. The sectors which are highly impacted are accommodation and food services, real estate, business and administrative activities, manufacturing, and wholesale and retail trade, and the share of these four sectors in total global employment is 37.4 per cent. Naturally, the employment in these sectors is also at high risk. The low risk sectors are education (share in global employment 5.3% and with 61.8 % share of women), human health and social work (share in global employment 4.1% and with 70.4% share of women), public administration, defence and compulsory social security (share in global employment 4.3% and with 31.5% share of women) and utilities (share in global employment 0.8 % and with 18.8 % share of women). As of April 1, 2020, the estimates indicate that working hours will decline in the current quarter (Q2) by around 6.7 per cent, which is equivalent to 195 million full-time workers (assuming a 48-hour working week) (ILO Monitor: COVID 19 and the World of Work, Second edition). This will push a large number of workers to severe poverty due to loss in income.

E. Impact of a Crisis on Migrant Workers

Whenever there is an adverse impact on employment due to any crisis, the workers, who migrated to other states, region and countries in search of higher income or at times for survival, have been the hardest hit. Evidence from the 2008-09 global crisis showed that it had cost more to the foreign-born labourers than the native-born, which indicates that migrants are more affected in such crises.

Figure 5: Unemployment Rate during the Global Financial Crisis



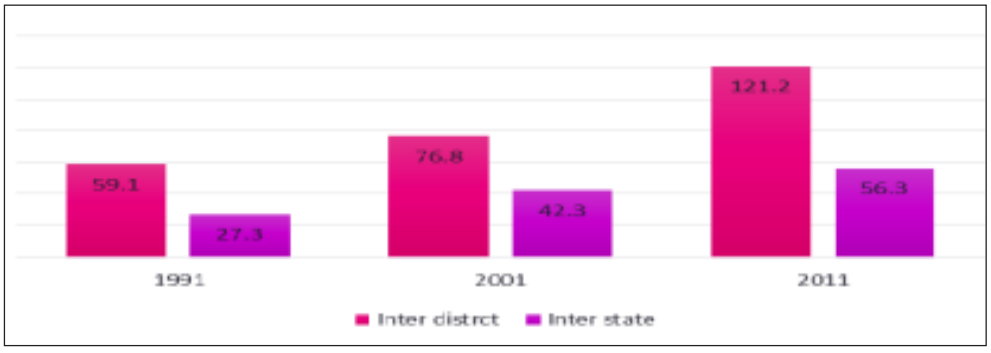
Source: World Bank Report, 2020

Figure 5 shows that during the global financial crisis, the rise in unemployment rate from 2007 to 2009 is much higher for foreign-born labourers than the native born. The unemployment rate for the migrants continued to remain high till 2018.

The situation for the internal migrants is far more difficult than the external migrants worldwide. As per the World Bank report, 40 million internal migrants in India are affected by this pandemic.

F. Indian Scenario of Migration

Figure 6: Interstate and Inter District Migrants in India (In Million)



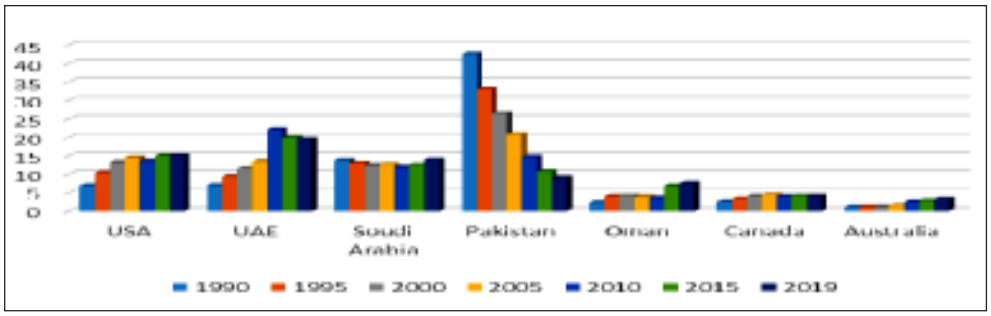
Source: Census 1991, 2001, 2011

Figure 6 shows the interstate and inter-district migration status of India. The data reveals that there is an increase in the growth rate of inter-district migration, whereas the same for interstate migrants has registered a decline.

The growth rate of inter-district migration increased from 23 per cent during 1991-2001 to 37 per cent in 2001-2011. The number of interstate migrants grew at 35% between 1991 and 2001, but the rate of increase came down to 25 per cent between 2001 and 2011.

G. Preferred Destination of Indian Migrants

Figure 7: Preferred Destination of Indian Migrants



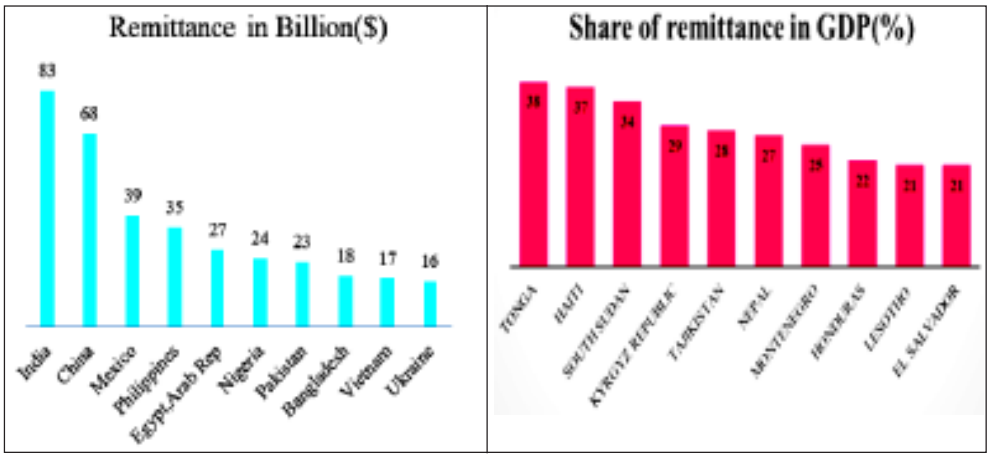
Source: International migration stock 2019, UN

Figure 7 depicts the preferred destinations of Indians migrating beyond national boundaries for economic and other activities. It shows that UAE and USA are the most preferred destinations for Indians. India leads the world in terms of number of immigrants with 17.5 million people, which constitutes 6.4 per cent of the total international immigrants. The figure also reveals that the number of Indians migrating to Pakistan has steadily declined over the years, whereas UAE and USA have shown an increase. In 2019, the highest percentage (19.53%) of workers has migrated to UAE.

H. Migration and Remittances

Remittance is a source of foreign currency as well as the bridge between the migrants and their source of origin. Many of the developing countries like India, China, Indonesia, Philippines etc. have a larger share of total global remittances, which is not surprising as these countries have larger share in total migrants.

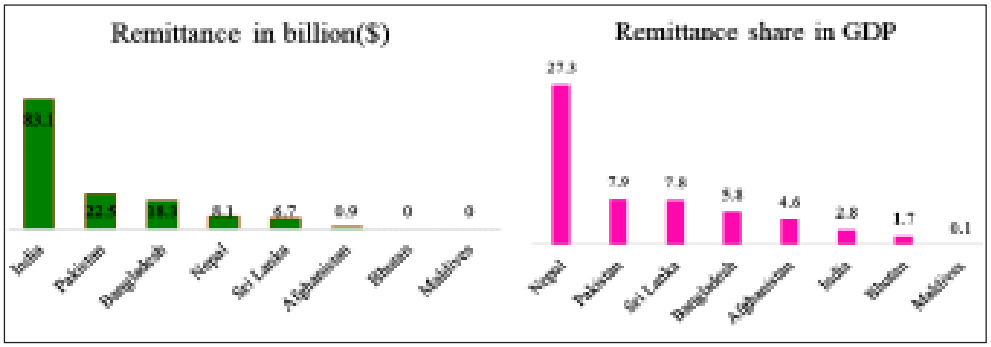
Figure8: Top Remittance in Recipient Countries



Source: World Bank, 2020

Among the top 10 remittance receiving countries, India ranks number one witha receipt of $83 billion followed by China ($63 billion), Mexico ($39 billion), and Philippines ($35 billion). In terms of the share of remittance to GDP, Tonga (38%) tops the list followed by Haiti (37%) and South Sudan (34%). These are countries with greater dependence on remittances.

Figure 9: Top Remittance Recipients in South Asia in 2019

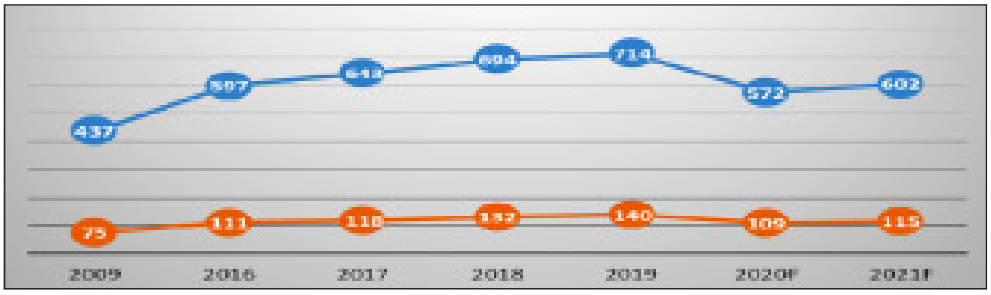


Source: World Bank, 2020

Figure 9, depicts similar position in South Asian region. India ranks the top in terms of quantum of remittance (with $83 billion) whereas in terms of the share of remittances in GDP, Nepal ranks the top (with 27.3%) respectively. Pakistan and Bangladesh are the second and third highest recipient countries of remittances. In the share of remittance to GDP Pakistan has the second highest share followed by Sri Lanka. Remittances can increase the national GDP indirectly through an increase in effective

demand and subsequent multiplier effects. Studies have shown that remittances reduce poverty in low and middle income countries by improving nutritional outcomes, reducing the engagement of child labour in poor households and leads to higher spending on education.

Figure 10: Flow of Remittances to the World and South- Asia



Remittance flow to South- Asia
Remittance flow to the world

Source: World Bank, 2020

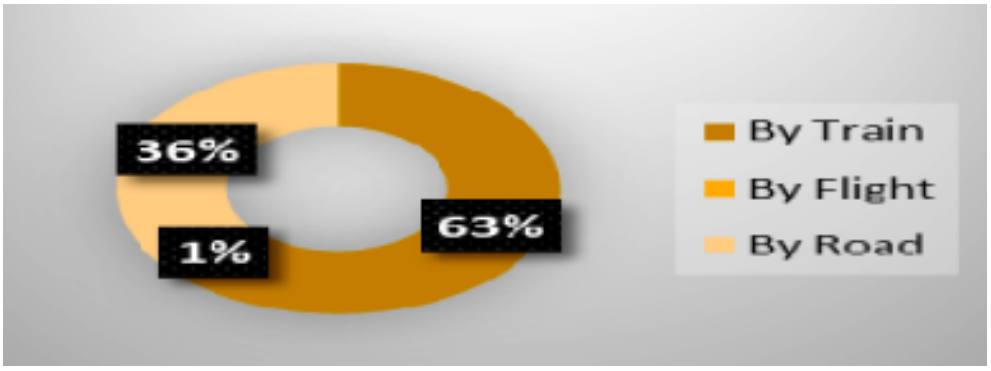
It has been projected by the World Bank that the remittance flow will record a historic decline by 20 per cent in 2020 due to the pandemic and the same in the South Asian region is likely to decline by 22 per cent. Figure 10 shows the flow of remittances to the world and South Asia. This fall is due to the loss in wages and employment of the migrant workers, who tend to be more vulnerable to an economic crisis in the host country; and it will have its adverse impact on the economy and the households of the remittance receiving country. The flow of remittance to low and middle income countries had become larger than the FDI, and hence an important source of external resources for these economies in 2019. For India, remittances are projected to fall by 23 per cent that isto $64 billion in 2020 from $83 billion in 2019. There may be slight improvement in the remittance flow in 2021. The forecast in decline in remittance is not only due to the impact of COVID-19 but also due to the decline in oil price in the world market.

2.1 Overview of Returnee Migrants of Odisha:

Decreasing agriculture and shrinking forests have demolished livelihood for many people in Odisha and forced them to go outside the state to take up hazardous jobs in Tamil Nadu and Andhra Pradesh (Rajsekhar, 2015). After the first phase lockdown was over, 8,53,777 migrants returned to Odisha from states like Gujarat, Tamil Nadu, Kerala, Andhra Pradesh,

Maharashtra, etc. by 277 special trains, buses and some with their own arrangements (as per the report by the state government during the monsoon session of Legislative Assembly from September 29 to October 7, 2020). Figure 11 depicts the different mediums of transport used by these returnees. Majority of them (63%) availed the special trains, which were run between states to bring the migrants back to their homes. Around 36 per cent of the returnees travelled by road and a meagre 1 per cent returned by air from countries like UAE, United States, Kuwait, Oman, Saudi Arabia and other countries by special flights run under the Bande Bharat Mission.

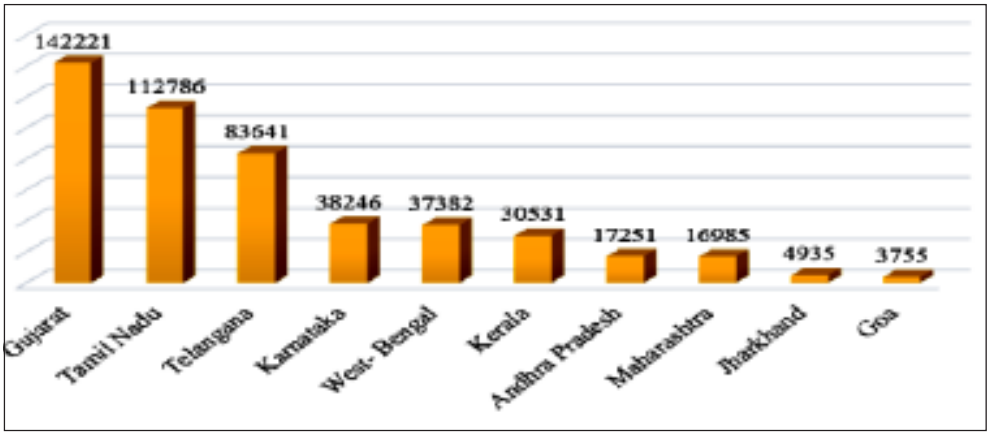
Figure 11: Modes of Transport Used by Returnee Migrants of Odisha



Source: COVID dashboard, Government of Odisha (Accessed on 7th July 2020)

Figure 12depicts the top ten states from which the migrants have returned to Odisha.

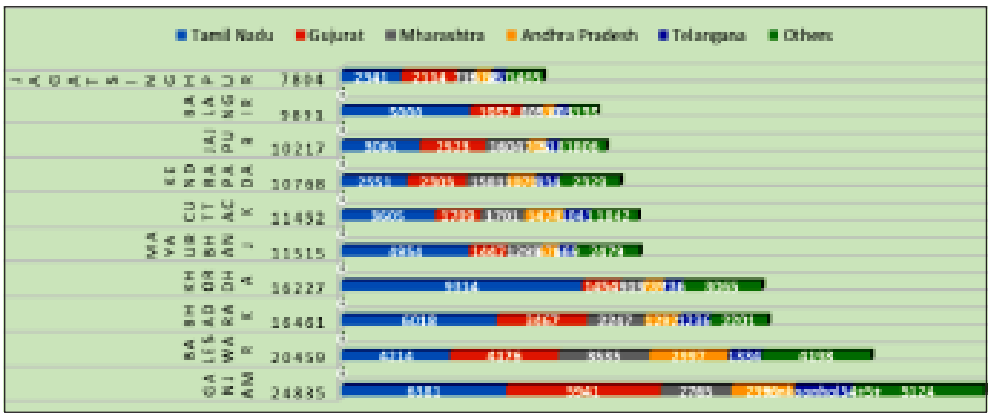
Figure 12: Returnee Migrants by Source States



Source: COVID dashboard, Government of Odisha (Accessed on September 19, 2020)

As the figure reveals, maximum number of migrants have returned from Gujarat, Tamil Nadu and Telangana, in that order, which also indicates that these are the states which constitute the preferred destination for migration from the state. Figure 13 lists the top ten districts of the state, which received the returnee migrants after the first phase of lockdown.

Figure 13: Top Ten Districts Which Received Returnee Migrants



Source: COVID dashboard, Government of Odisha (Accessed on September 19, 2020)

It is evident that Ganjam was the destination for maximum number of returnees and that also explains why the COVID situation in the district reached an alarming situation after the migrants returned home. The governmental facilities for testing and quarantine proved to be grossly inadequate and the district had to seal its borders for quite some time to control the situation. The coastal districts of Baleswar, Bhadrak and Khordha come next in the order in terms of returnees.

2.2 Problems Faced by Migrants

On 24th of March 2020, the Indian government declared full-scale national lockdown. India sealed its international borders, enforced a series of containment measures, which though tough was timely. Consequently, the migrants and the informal sector workers became immediately jobless. With their meagre savings, they were in a position to support themselves for barely a few weeks. Many of them (nearly 10 million) do not have ration cards to access food at subsidised rates. Due to the nationwide shutdown and lockdown and travel ban, nearly 40 million internal migrants in India have faced many problems (BBC News, April 2020). Many of them were found to be trapped in cities under dire conditions. These hardships

prompted many of them to take extreme measures of trying to get back to their villages, sometimes on foot, travelling hundreds of kilometres in extreme heat.

Some common problems that migrants faced during these times are as follows:

- Inadequate access to healthcare services: Migrants in most of the countries, particularly on short-term visas or in an irregular situation, are not enjoying equivalent access to health care as the natives of that country. This caused a difficult and risky situation during the COVID-19 emergency. National as well as local governments have no precise information regarding the migrants in their locality, which makes it almost impossible to include them under the public healthcare services. And it has been difficult to gather actual information, monitor and trace the contacts of affected individuals. The living condition of these migrants at their destination is also such that it is conducive to the spread of contagious diseases like COVID-19.

- Spread of the diseases: With the relaxation of lockdown, these migrants started returning to their homeland by special trains, hired buses, etc. and it has resulted in a sudden hike in the number of cases in their home states. Neither the precautionary measures supposed to be taken during their journey nor the quarantine measures put in place in their home states has proved to be sufficient to control the spread the disease. Many people jumped the quarantine surreptitiously which has further complicated the situation.

- Food insecurity: Many of the migrants, trapped in their destination due to the COVID-19 pandemic, neither had sufficient savings to see them through nor had access to the food grains supplied by the government to help the poor households. Though the government claimed that the stock of food grains in the FCI godown is sufficient to feed the poor for a year and a half, the public distribution system was not effective to make it available, especially to the migrants, as the ration cards were area-specific. The policy of 'One nation one ration card', which was announced as a part of the stimulus package by the central government is yet to be effective in ameliorating the conditions of the migrants.

- Economic impact: The shutdown of the economy had stopped production in many centres. Sealing international border has halted the export and import of goods and services. This has caused millions of job losses, and consequently a loss in the income of the workers. COVID-19 has long-term consequences of the reallocation of jobs and capital. It is estimated that 2 out of 5 jobs lost during COVID-19 pandemic may not come back (World Economic forum, May 25, 2020). The world has lost almost 400 million jobs due to the COVID-19 pandemic in the second quarter of 2020 (ILO, July 2, 2020). Around 100 million or more jobs in India are at risk (Outlook India, July 04, 2020). Due to the pandemic, the unemployment rate has gone up from 8.75 per cent in March to 27.1 per cent in April and May 2020. The latest CMIE report gives a relief to the government, which is grappling with the job loss. It has dramatically reduced to 8.9 per cent (as on July 10, 2020). The unemployment rate of Odisha is 4.2 per cent. (CMIE, July 10, 2020).

- Switching of work is difficult: The current crisis has not only created the difficulty of job loss and rising unemployment, but also the problem of crosssectoral mobility of workers, which is difficult especially for the low-skilled labourers. During the financial crisis of 2008-09, migrant workers moved from construction to agriculture and retail (World Bank, 2020). However, this sectoral movement is difficult in the pandemic situation, because the sectors which require more workers are sectors like health care and information technology, which require skilled labour.

- The migrants who are returning home will be in state of flux in the sense that some of them may prefer to go back to their previous employment as the situation improves and the movements become normal. However, some of them may prefer to stay back home and seek livelihood. The government has declared that extra man days of employment must be made available under MGNREGS to people seeking work; so, some of them may get employment there. However, some of the migrants may take refuge in the agricultural sector.This sector, which already employs more than half the work force in India and is already characterised by disguised unemployment, may get more crowded. A telephonic survey conducted by a Centre of Excellence of Sambalur University in four western districts of Odisha, namely Sambalpur, Deogarh, Bargarh and Bolangir, revealed that 71 per cent

of the returnees would prefer to stay at home if they get can get stable employment.

On the other hand, some migrants from the district of Ganjam, Balangir and some coastal districts of Odisha have returned to the places where they were previously working. There were special trains plying from some districts to take the migrants back to their place of work. For example, nine special trains were plying from Ganjam to Surat in Gujarat, which were running in full capacity. The migrants who decided to go back reported that they were either sitting idle or were offered a few days' work under MGNREGS, which they were not happy to do as they were skilled or semi-skilled workers. The bothersome part is that many of them took an advance from agents, who themselves were not registered, to go back which kind of reduces their bargaining power and once again put them in a vulnerable position. The existing Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act 1979 must be properly implemented to protect these workers from future uncertainties and exploitative practices.

2.3 Schemes Undertaken by the Government of India

- Pradhan Mantri Gareeb Kalyan Yojana (PMGKY): To deal with the impact of COVID-19, a financial package of Rs 1.7 lakh crore was declared by the finance minister for the migrant workers, labourers, the poor and agricultural workers on March 26, 2020. Under this scheme, it was decided to provide Rs 500 per month to the PMJDY accounts of women for 3 months to help them tide over the pandemic.

- The government asked the states and union territories (U.T) administration to utilise the State Disaster Response Fund (SDRF), which has been allocated Rs 29,000 crore rupees for providing food and shelter to migrantsaffected by the pandemic.

- A national fund under the name 'Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund' (PM CARES FUND) has been set up. It aims to strengthen the combative measures undertaken to fight against the novel COVID-19 and provide relief in emergency situations.

- Apart from these, there are steps adopted by state governments to help migrant workers in this crisis.

2.4 Schemes Undertaken by the Government of Odisha

Taking cognisance of the severity of the pandemic and to support the livelihood of rural population, the Government of Odisha has announced a package of Rs.17,000 crorefor special livelihood intervention, to beimplemented between June 2020 and March 2021, on May 29, 2020. This will include the farmers and migrant workers.

- A package of Rs. 6440 crore has been ear marked for MGNREGS, which is estimated to create job opportunities of 46 lakh person days.

- Along with this, a sum of Rs 373 crore shall be invested in agriculture and allied sectors, which will benefit around 24.57 lakh farmers.

- A financial package of Rs.6000-7000 crore each for the two industrial parks at Dhamra, Bhadrak and one medical park at Dhenkanal, respectively, which is estimated to create the job opportunities for 20,000 people in Bhadrak and 16,000 people in Dhenkanal.

II. Policy suggestions

- India is the second highest populous country with high unemployment rates. This pandemic has further exacerbated the situation. Unemployment rate, which were already at a record high level before the pandemic, is rising again. Besides, the migrant workers returning to their place of origin are to be taken care of. Hence, there is a need torevise the strategy of generating employment, especially in the rural areas, on an urgent basis.

- Migrants cannot be neglected as a stakeholder in the development process. Integration of migrants with development is the need of the hour.

- Only MGNREGA is not sufficient to absorb millions of migrants who are returning to their base, so the government has to find alternatives to supplement it. One viable alternative is to revamp the micro, small

and cottage units as producers of goods and services, both in rural and urban areas.

- Emphasis should be given to rural, agro-based and cottage industries. Every region has its own specific resource base, which can be utilised to absorb the returning migrants effectively.

- Apart from this, the agriculture sector can be diversified to produce both food grains as well as commercial crops so as to absorb more labour.

- There is an acute absence of data on migrants, which became starkly evident during this crisis. No government at any level had any idea about the number of the migrant workers so as to frame a plan for their protection at the place of their work or for their transportation to their place of origin during the first phase lockdown. Hence, there is need to strengthen the database on migration and migrant households through various agencies, preferably at the Panchayat level so that the states are more prepared to deal with a crisis in future, if any.

3. Conclusion

The number of people, who have lost their lives due to COVID-19 pandemic and the number of people infected by the virus, is increasing at an increasing rate. USA, India, and Brazil are the top three countries suffering in this pandemic in terms of the number of people infected and number of lives lost. It is said that the corona virus has plunged the world into an "A global crisis like no other; needs a global response like no other" (the IMF), and it has been estimated that the global economy may shrink by over 3 per cent in 2020. According to the ADB report, global economy may experience a loss to the tune of $ 5.8 trillion to $ 8.8 trillion due to this pandemic. The pandemic has not only disrupted the social and economic conditions worldwide, it has also adversely affected the psychological conditions of the people. The impact on the migrant workers has been worse. They have been at the receiving end of the double whammy of losing their livelihood and staying trapped at their place of work, unable to go back to their villages in the initial days and then facing unprecedented hardships in their efforts to get back to their place of origin. Many of them have started going back to their previous place of work after either sitting idle or not being satisfied with the kind of work available at the place they hail from.

It is estimated that due to the economic crisis induced by COVID-19, almost 1.6 billion informal economy workers have lost their jobs (ILO, 29 April 2020). The steps taken by the central as well as the state governments to ameliorate their conditions, like the Atma Nirbhar Bharat Abhiyaan or the Prime Minister's GaribKalyanYojana, have not been able to deliver the requisite support to them on the ground, precipitating a movement back to their previous employment. The World Bank has approved aid to the developing and underdeveloped countries to face this pandemic situation under which India has received approval for $ 100 billion as aid. Similarly, the ADB has declared $ 1.5 billion loan for India for this purpose. And some of this aid should be utilised to give the migrants a decent life. What the crisis has taught us is that we need to build a robust database for the migrants, preferably at the Panchayat level, and devise a comprehensive migration policy to make them an integral part of the developmental framework. A vigorous implementation of the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 can cover a lot of ground in this direction. The policy of 'One nation one ration card' should be put in place on a priority basis across the country to ensure food security to these people. The contribution of these migrants at their destination as well as their origin towards nation building should not be undermined.

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Article

COVID-19 in India: A Critical Assessment of Pandemic Modelling and Forecasting Gross Domestic Product Using ARMA

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Abstract

The present paper throws light on some of the critical issues regarding the novel corona virus pandemic as well as the economic impact on the country. In the first segment of this article, a modified SEIR (suspected, exposed, infected, and recovered) pandemic modelling has been done to identify the chain of the virus. It clearly shows how some people are being trapped in the infected region and others are getting cured. This present study has considered many parameters for the SEIR pandemic modelling with the help of differential equations. In the second segment of the present study, gross domestic product (GDP) at current price forecasting has been carried out using the auto regressive moving average (ARMA) method and expert modelling method in SPSS, IBM. The data for the GDP has been taken from the IMF outlook database from 2001 to 2021. On the basis of secondary data, forecast for the GDP at current price has been carried out from 2022 to 2026 on a quarterly basis. The main motive behind the study is to compare the trends in GDP at current price in pre-COVID and post-COVID scenarios. It has been clearly observed from the present

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research that the trends in GDP before the pandemic show an upward linear path, which is considered to be normal, but after the "Great Economic shock of 2020", the trends in GDP follow a disturbing and fluctuating path. This unpredictable path of GDP in the coming years will be crucial.

Keywords: COVID-19, SEIR Model, ARIMA, ARMA, Box-Jenkins, Expert Modeller

1. Introduction

The on-going pandemic of corona virus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome corona virus 2 (SARS- Cov-2). The outbreak was first identified in Wuhan, Hubei, China, in December 2019, and was recognised as a pandemic by the World Health Organisation (WHO) on March 11, 2020.This pandemic has also alarmed India after the first case was identified and confirmed on January 30, 2020 in the state of Kerala. Till June 3, 2020 2,19,582 confirmed, 1,11,285 recoveries and 6,115 deaths were reported in India (MoHFW, 2020). As a non-pharmaceutical infection, prevention and control intervention, the Government of India has adopted social distancing. This strategy aims to avoid or restrict the large-scale mass movement, which may accelerate the pace of the contagious disease.

A 14-hour voluntary public curfew (Janata curfew) was put in place on March 22, 2020; and subsequently, nationwide lockdown was implemented on March 24, 2020 to contain the spread of COVID-19. The lockdown has since been extended for the fifth time (5.0), up until June 30, 2020, and has affected the 1.3 billion population of India. In Odisha, the first case of the pandemic was first identified and confirmed on March 16, 2020 (MoHFW, Odisha 2020).

1.1 Effects on Migrant Workers

According to the medical and health experts, social distancing is one of the effective prevention and control methods in the absence of vaccines. However, lockdown strategy to impose social distancing has immediately and adversely affected the migrant workers, particularly the marginalised sections of the society that depends on their daily wages for living. Without any source of earning and no means of transportation to return to their respective native places, these workers are now stranded in different parts of the country. Documents submitted to the Supreme Court of India regarding the number of

migrant workers indicates that approximately 10.55 million migrant workers are living in 22,567 shelters set up in various parts of India (Rawal et al., 2020). Staying away from their family, these migrant workers are insecure about their earning and are emotionally disturbed. The mass gathering on April 14, 2020 (the last day of lockdown 1.0) near railway stations in Mumbai (Maharashtra) and Surat (Gujarat) reveals their strong desire to return to their home(Joshi et al., 2020).

1.2 Impacts on Human Behaviour

The direct economic effects of the illness resulting from COVID-19 are increasing healthcare expenditure of patients and funders like insurers and governments, and heavy work burden on healthcare workers like doctors and nurse. Indirect effects are decreasing the supply of labour due to deaths and increased absenteeism from work sectors by sick labourers. Prophylactic absenteeism is one of the best voluntary strategies for modifying the risk in response to a pandemic. School closure may be a categorised as non-voluntary risk-modifying behaviour since the gathering of children and teachers in schools can accelerate the spread of the virus (Beutels et al. 2008).

Fan (2003) opines that a pandemic can drastically reduce business investment because of high uncertainty and risk, which leads to excess capacity. Similarly, confidence level of consumers will also decline due to fear and uncertainty, which leads to a decrease in consumer spending as people opt to reduce the probability of infection. The decline in consumer spending can affect services which involve face to face contact like tourism, transportation, retail serving, etc.

2. Objectives of the Study

This article primarily focuses on the following:

- To construct a modified SEIR (suspected, exposed, infected and recovered) pandemic model with various compartmental standard and differential equations to show the chain of the COVID-19 spread.
- To forecast the Indian GDP on a quarterly basis from 2022 to 2026 in the wake of the pandemic.
- To identify the fluctuating and uncertain trends of India's GDP after "The Great Economic Shock of 2020" caused by the pandemic.

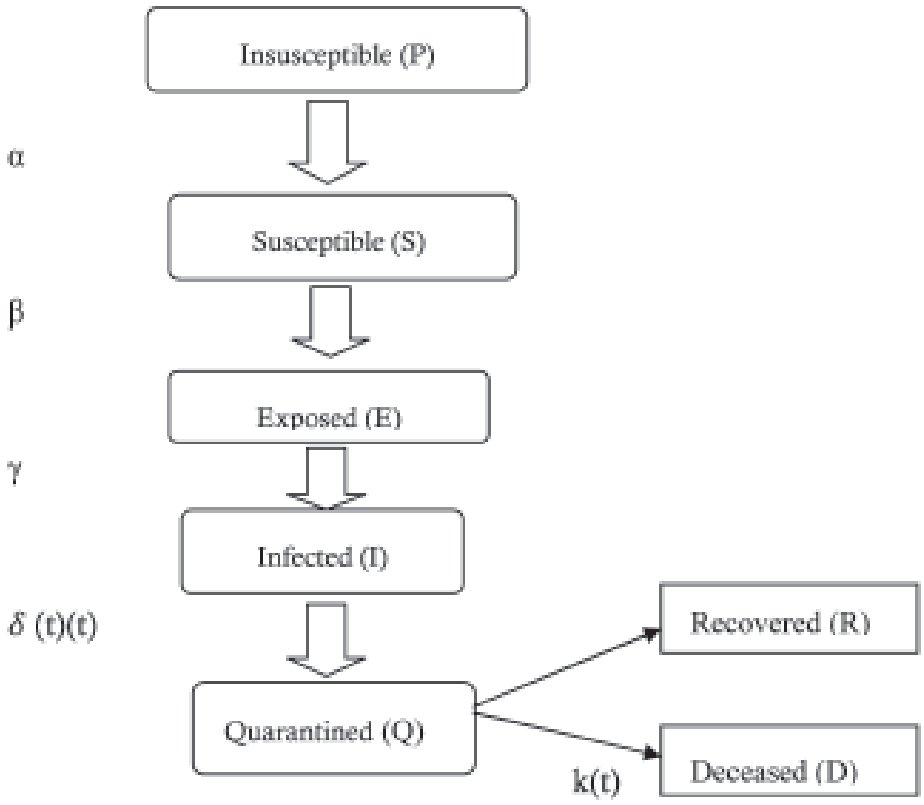
3. SEIR Pandemic Modelling in India

Shen et al. (2020) Tang et al. (2020); Nadim et al. (2019). Biao et al. (2019) and Chen et al.(2020) through generalised SEIR model examine the transmission risk of COVID-19 and predict the number of infected persons. By dividing the whole population into two groups – quarantined and the unquarantined people, they evaluate the incubation and recovery period (Tang et al., 2020). By assuming Poisson-distributed daily time increments, Read et al.(2020) composed an SEIR model. They emphasised the importance of the data-centred mathematical models, which accurately predict the outbreak of COVID-9. It also helps to estimate and plan for future remedial measures to slow the spread of the disease.

The present paper prepares a modified SEIR (susceptible, exposed, infected and recovered) model by considering time-dependent quarantine rate, recovery rate and deceased rate. This time-dependent rate, which is an empirical function can be obtained by analysing the quarantined, recovered and deceased. The time-dependent functions may lead to reduction in COVID-19-related death; improve the recovery rate and aid quicker identification of COVID-19 positive patients. This model does not take into account the births and natural deaths unlike the other SEIR model. As shown in Figure 1, the present SEIR model has divided the population at any time *t* into seven different compartments like Susceptible *S(t)*, Exposed S(t), Infected I(t), Quarantined Q(t), Recovered R(t), Deceased D(t) and Insusceptible or isolated P(t) (Sushma et al., 2020). Using a set of differential equations, channelization of individuals through these seven compartments is shown in Section 1.3. The rate of changes in the data linked to confirmed, recovered and deceased is used to determine the different estimates like á, â, ã, $\delta 0$, $\delta 1$, $\lambda 0$, $\lambda 1$, $\kappa 0$ and $\kappa 1$ values. The present model of SEIR in its initial phase does not consider migrant workers under the unsusceptible compartment. When people defy isolation for different reasons, they come down to compartment (S) i.e., Susceptible from the Unsusceptible compartment (P) at the rate of á (please see figure: 1).People from compartment P are gradually exposed to the disease at the rate of â and eventually move to the Exposed (E) compartment. When they get exposed, they are removed from the E compartment and added to the Infected (I) compartment at the removal rate of ã. This removal rate ã is is equivalent to 1/incubation period also known as latent time. After finding corona positive results of the compartment (I) people, they are either sent for hospital care or to the quarantine centre isolation ward. Whether a patient will be sent for hospital care or isolation

period depends on various factors like morbidity, age, pre-existing health condition, etc. In both cases, the infected persons are assumed to be kept in isolation for reducing the spread of the disease. So, in the present study, these patients are kept in Quarantine (Q) compartment and the rate of moving from I compartment to Q compartment is denoted by δ. The people who get cured or recovered move to R compartment from Q compartment at λ rate and people who die move to D compartment at k mortality rate, since all the people cannot recover from the disease. The crucial leakage in this model occurs because some people are assumed to be spreading the virus asthe entire infected population cannot be tested rapidly.

Figure: 1- Modified and Standard Modelling of Covid-19 Pandemic (without migrants)



3.1 SEIR model explained with differential equations for various compartmental standards

$$\frac{dS(t)}{dt} = -\beta \frac{S(t)\, I(t)}{N + \alpha P(t)} + \alpha P(t) \quad (1)$$

$$\frac{dI(t)}{dt} = \gamma E(t) - \delta(t)\, I(t) \quad (2)$$

$$\frac{dR(t)}{dt} = (t)\, Q(t) \quad (3)$$

$$\frac{dP(t)}{dt} = -\alpha P(t) \quad (4)$$

$$\lambda(t) = \lambda 1 \,(1 - e^{-\lambda_2 \cdot t}) \quad (5)$$

Here S + E+ I+ Q+ R + D = N

N = Total Population β = Rate of Exposure

α = Rate of being Susceptible γ = Rate of being Infected after Exposure

$$\frac{dE(t)}{dt} = \beta \frac{S(t) I(t)}{N} - \gamma E(t) \quad (6)$$

$$\frac{dQ(t)}{dt} = \delta(t)\, I(t) - \lambda(t)\, Q(t) - k(t)\, Q(t) \quad (7)$$

$$\frac{dD(t)}{dt} = k(t)\, Q(t) \quad (8)$$

$$\delta(t) = \delta_1 (1 - e^{-\delta 2 \cdot t}) \quad (9)$$

$$K(t) = k_1 e^{-k2 \cdot t} \quad (10)$$

Here $\delta(t)$ = Detection rate leading to quarantine k (t) = Mortality rate

λ (t) = Recovery rate $\delta_1, \delta_2, \lambda_1, \lambda_2, \kappa_1, \kappa_2$ = Constant Value

4. Forecasting of Gross Domestic Product in India: An Economic Modelling

GDP is the aggregate monetary measure of the market value of all the final goods and services produced within the domestic territory of a country within an accounting year. GDP data is considered as an important index for measuring national economic development and macroeconomic status of the country (Ning et al., 2010). Forecasting in econometrics requires a combination of

statistical and mathematical tools, which allows predicting future events in the economy. It helps economists to gather information about the past economic trends and forecast how the present economic fluctuation will differ from past trends. GDP time series data generally consists of observation created successively over time. As the data in time series are ordered with respect to time, the observations which are successive in nature may be dependent. This observed time series is considered as a time series realisation of an underlying process. The data either may be short term or long term or can be increasing, decreasing or even constant.

4.1 ARIMA Model: A Brief Review of Literature

The present article, in sync with the purpose of this study, has limited the literature review to some empirical ideas and GDP forecasting modelling using ARIMA. The study does not grasp tiny details of the theoretical background regarding GDP and its components.

In the process of forecasting time series variables like GDP, one can opt for different possible types of methods/models like vector error correction models, autoregressive conditional heteroscedasticity (ARCH) model or different combinations. However, among all of these forecasting models, ARIMA models are seen to be proportionately robust in forecasting short-run GDP. It has also outperformed different sophisticated models of econometrics in terms of short-run GDP forecasting (Stockton et al., 1987 and Litterman, 1986).

Box and Jenkins (1976) opined that ARIMA models are a class of linear models capable of determining both stationary and non-stationary time series. They do not require independent variables in their formulation; rather they utilise the available information in the time series to forecast. ARIMA models, thus, depend immensely on the autocorrelation of the data.

Maity and Chatterjee (2012) forecasted the Indian GDP using a simple ARIMA (1,2,3) and their forecasting results show an upward path, while growth rate follows the opposite path for future periods. From a developed country (Sweden) point of view, Zhang (2013) studied 16 years of GDP data of this country and observed that the most significant results can be obtained through the 1st order ARMA. There is presence of seasonality or trends in the data series. For a well-fitted comparison to the Indian context, Zakia (2014) using Pakistan GDP data found ARIMA (1,1,0) to be the most reliable fit using the quarterly numbers, which is the closest approach demonstrated in the present study. However,the GDP data of Pakistan is non-stationary. Using Greece GDP

data from 1980 to 2013, Dristaki (2014) applied ARIMA (1,1,1) to forecast the model for 3 years in future. She observed an upward trend in GDP growth figures. Wabomba et al. (2016) have made a comprehensive GDP forecasting model using the data from Kenya using ARIMA (2,2,2) model and they found the sample is 5% close to the actual numbers. Abonazel and Abd-Elftah (2019) used Box-Jenkins methodology to construct an appropriate ARIMA (1,2,1) model to forecast the Egyptian GDP for the next 10 years using the Egyptian GDP data from 1965 to 2016.A similar approach has been carried out by Miah et al. (2019) to forecast the GDP figures of Bangladesh by considering the data for the period 1960-2017. They found ARIMA (1,2,1) model to be most suitable and concluded that the forecast figures of GDP in Bangladesh are expected to increase at a steady pace over the next 13 years.

4.2 Literature Gap

The present approach has been carried out using ARMA (1,0,1) model as the time series data for this study is found to be stationary. Unlike previous research done on non-stationary time series data through differentiating a number of times and by using ARIMA model, the present study does not require any differentiation as the data structure is stationary by default. Hence, the ARIMA modelling approach has also seemed to be unfit for this particular study. So the major gap in this particular study is that we have taken a time series data, which is purely stationary and applied ARMA (1,0,1), unlike previous work, where the data structures are non-stationary and the GDP modelling structures have relied upon ARIMA methods.

4.3 Auto Regression Process

Yoo J, Maddala (1991) expressed the auto regressive model of order p and present AR (p) as

$$Yt = c + á_1 Y_{t-1} + á_2 Y_{t-2} + \cdots + á_p Y_{t-p} \quad (1)$$

This model reflects the past values, and on the basis of these values, we can predict the coefficients $á_j$, where j = 1, ..., p,which will allow us to forecast the model. Here, every past value posseses cumulative effect on current level Y_t and it will make a long-run memory model. The auto correlation function (ACF) thus does not disappear easily as it takes a larger gap to move ACF close to 0.

The partial autocorrelation function (PACF) helps to express the correlation between a variable/observation *a* periods ago (k) and the current variable/

observation given the controlled observations at intermediate lags (lags < k). Therefore, PACF (k) can be expressed as:-

$$Yt = á_0 + á_1 Y_{t-1} + á_2 Y_{t-2} + \cdots + á_{k-1} Y_{t-k+1} + á_k Y_{t-k} + u_t \quad (2)$$

which means $á_k$ = PACF (K)

4.4 Moving Average Process

It is purely a time series model, which involves the use of errors in the past as explanatory variable (Eugen Slutzky, 1937). Let U_t be a white noise process, where (t= 1,2,3,...)and$E(u_t) = 0$, $Var(u_t) = í^2$, then MA model with q^{th}order can be expressed as:-

$$Yt = \mu + u_t + è_1 u_{t-1} + è_2 u_{t-2} + è_q \quad (3)$$

This MA(q) model presents the past errors and allow us to estimate the coefficients $è_j$, where j= 1, ... , q, which in turn helps us to forecast. Here, errors (q) can influence the current Y_t,but errors with higher order cannot influence Y_t , which indicates that this is a short-term memory model.

4.5 Autoregressive Moving Average Model

Wold H. (1938) presented an ARMA (p, q) model as follows:

$$Y_t = c + á_1 Y_{t-1} + á_2 Y_{t-2} + ... + á_p Y_{t-p} + u_t + è_1 u_{t-1} + è_1 u_{t-1} + è_2 u_{t-2} + ... + è_q u_{t-q} \quad (4)$$

ARMA model combines both AR and MA models. Here ACF and PACF will solely give the information about the maximum orders of p and q. This model when allowed to be extended further to non-stationary time series by differencing the order of the data series, results in the formation of Autoregressive Integrated Moving Average Models (ARIMA).

4.6 Autoregressive Integrated Moving Average Process (ARIMA)

According to G.E.P., Box G. Jenkins (1970), there exist a large variety of ARIMA models. The commonly used model is ARIMA (p, d, q), which is non-seasonal. Here, p represents the total number of autoregressive terms, d represents the total number of differences and q represents the total number of moving average terms. ARIMA (0, 0, 0) is a white noise model since the AR part is absent here as Y_t does not depend on Y_{t-1}. There is the absence of differencing and also the MA part is not present here as Y_t does not depend on e_{t-1}.

For example, if we assume Y_t as non-stationary, we take the first order difference of Y_t tomake " Y_t a stationary variable.

$\Delta Y_t = Y_t - Y_{t-1}$(d = one time differencing)

$\Delta Y_t = c + á_1 "Y_{t-1} + á_2 "Y_{t-2} + ... + á_p "Y_{t-p} + è_1 u_{t-1} + è_2 u_{t-2} + ... + è_q u_{t-q} + u_t$(5)

It is an example of ARIMS (p, 1, q) model.

ARIMA (0, 1, 0) can be called as a random walk model as there is no involvement of AR and MA parts and there is the existence of only one differencing.

4.7 Box Jenkins Framework

George E. P. Box and Gwilym M. Jenkins (1976) have laid emphasis on the uses of four iterative stages of forecasting modelling. These four stages are identification, estimation, diagnostic checking and forecasting *(please see figure 2).*

5. Selection of Accounts Subject for the Model Forecasting

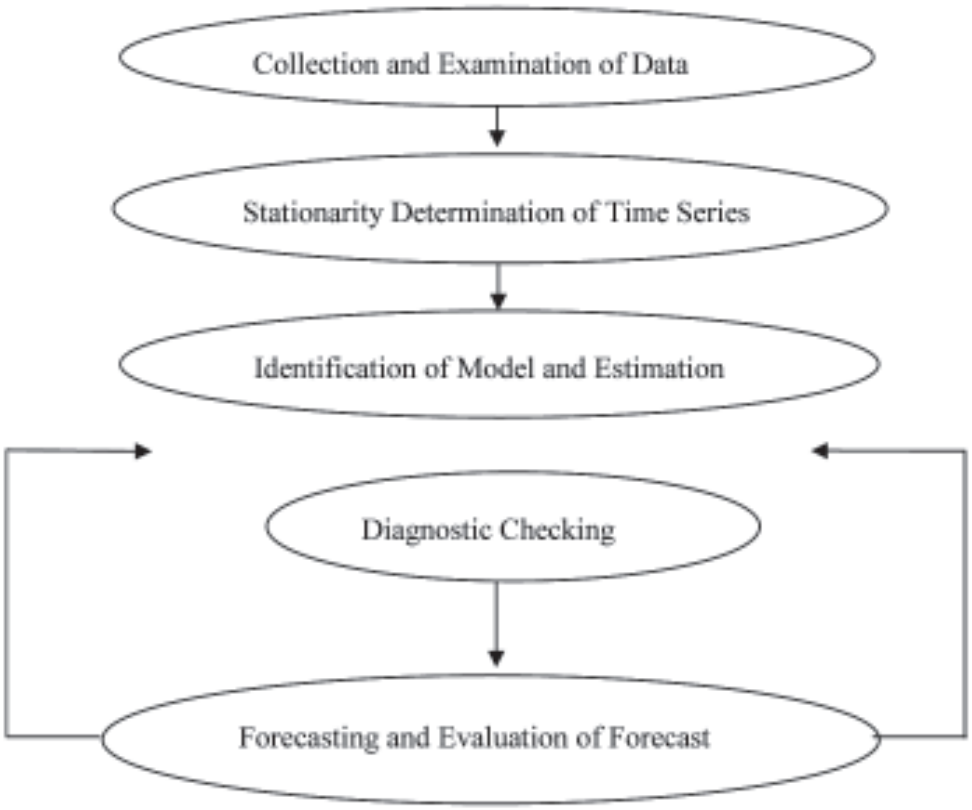
The present paper has made an attempt to show the impact of N-COVID-19 on the gross domestic product of the Indian economy. For this, the study has taken the subjects as follows:-

Table 1: Accounts Statements Selection of India

Subject Descriptor (National Accounts)	Units	Scale
i. Gross Domestic Product, Constant prices	Percentage change	
ii. Gross domestic product, Current prices	purchasing power parity; international dollars	Billion
iii. Gross Domestic Product per capita, Constant prices	Purchasing power parity; percentage change	

Figure 2: ARIMA Forecasting Steps

Figure 2: ARIMA Forecasting Steps



5.1 Dataset

Table 2: Accounts Data from 2001 to 2004

Accounts	2001	2002	2003	2004
i. Gross Domestic Product, Constant prices	4.944	3.907	7.944	7.849
ii. Gross domestic product, Current prices	2,237.256	2,361.454	2,596.382	2,875.556
iii. Gross Domestic Product per capita, Constant prices	3.177	2.203	6.217	6.160

Source: IMF Outlook Database

Table 3: Accounts data from 2005 to 2008

Accounts	2005	2006	2007	2008
i. Gross Domestic Product, Constant prices	9.285	9.264	9.801	3.891
ii. Gross domestic product, Current prices	3,240.424	3,240.424	4,112.907	4,356.042
iii. Gross Domestic Product per capita, Constant prices	7.607	7.618	8.180	2.387

Source: IMF Outlook Database

Table 4: Accounts Data from 2009 to 2012

Accounts	2009	2010	2011	2012
i. Gross Domestic Product, Constant prices	8.480	10.260	6.638	5.456
ii. Gross domestic product, Current prices	4,761.455	5,311.154	5,782.036	6,214.485
iii. Gross Domestic Product per capita, Constant prices	6.942	8.730	5.190	4.055

Source: IMF Outlook Database

Table 5: Accounts data from 2013 to 2016

Accounts	2013	2014	2015	2016
i. Gross Domestic Product, Constant prices	6.386	7.410	7.996	8.256
ii. Gross domestic product, Current prices	6,727.337	7,359.577	8,030.815	8,783.888
iii. Gross Domestic Product per capita, Constant prices	5.005	6.015	6.594	6.851

Source: IMF Outlook Database

Table 6: Accounts Data from 2017 to 2019*

Accounts	2017	2018	2019
i. Gross Domestic Product, Constant prices	7.044	6.120	4.228
ii. Gross domestic product,	9,579.686	10,413.608	11,043.180
iii. Gross Domestic Product per capita, Constant prices	5.654	4.742	2.875

Source: IMF Outlook Database

Table 7: Accounts Data from 2020* to 2021*

Accounts	2020*	2021*
i. Gross Domestic Product, Constant prices	1.871	7.425
ii. Gross domestic product, Current prices	11,321.280	12,399.001
iii. Gross Domestic Product per capita, Constant prices	0.548	6.030

Source: IMF Outlook Database

6. Economic assumptions for GDP forecasting

The present study makes an attempt to forecast the Indian GDP using ARIMA model based on the following important economic assumptions:

- The forecasting of Indian GDP at current price from 2022 to 2026 (quarterly basis) has been done on the basis of the time series data of Indian GDP at current price from 2001 to 2022 (annual basis), which has been reflected in the IMF Outlook database. In other words, the study has purely relied upon the IMF Outlook database.
- GDP at current price (both forecasted and actual) has been measured only in the scale of billion international dollars and purchasing power parity units.
- The time series data taken for the ARMA (1,0,1) GDP forecasting should be stationary in nature, which means that no seasonality or trends should be present in the time series.
- There should be an absence of autocorrelation both in AR and MA process of the time series data.
- Both AR and MA process of the time series data must possess goodness-of-fit as to make the forecast sound and clear.

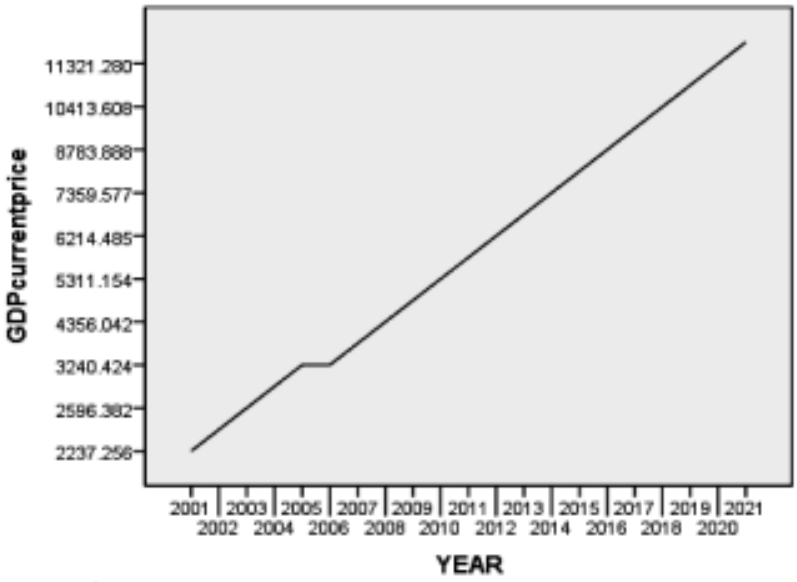
- All the calculations required for forecasting have been done through SPSS,IBM.
- Fluctuation in the predicted/forecasted GDP is due to "The Great Economic Shock of 2020", which has been caused by COVID-19.
- Forecasting results are purely based on ARMA (1,0,1) method and the results other than ARMA (1,0,1) are not taken into consideration.
- Data for GDP forecasting has been collected as on June 3, 2020; and hence does not consider the GDP predictions of any other rating agencies in future.

7. Analysis of the Data

The present study has applied the ARIMA forecasting model to GDP at current prices, purchasing power parity; US dollars (in billion). We have to make sure that the data should be stationary. The stationarity of the data can be estimated by examining into the time series, sequence charts and correlogram (both ACF and PACF) plots.

7.1 Identification of Stationarity of the Data: A Basic Analysis

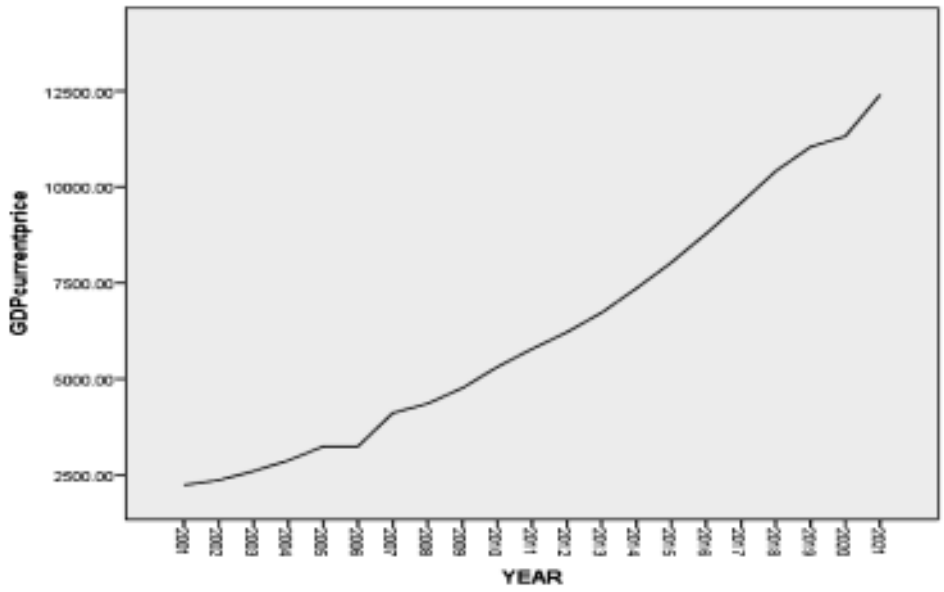
Figure 3: Time Series Plot of GDP at Current Prices, Purchasing Power Parity(US$, in billion)



Note: Done Using SPSS, IBM

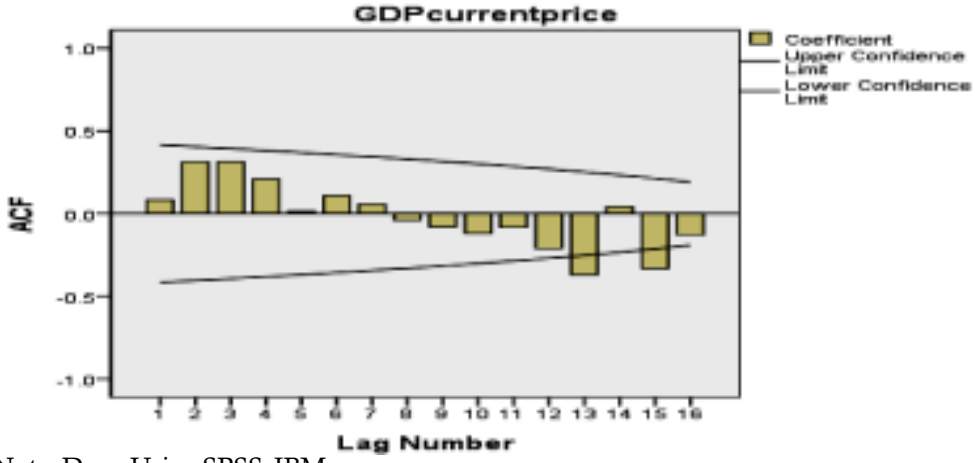
From Figures 3and 4, we can estimate that the time series data is stationary in nature as there is absence of exponential or logarithmic trend and mean and variance seem to be constant. Therefore, the data is stationary; and, hence, we donot need to apply any kind of log differentiation.

Figure 4: Sequence Chart Plot of GDP at Current Prices, Purchasing Power Parity (US$, in billion)



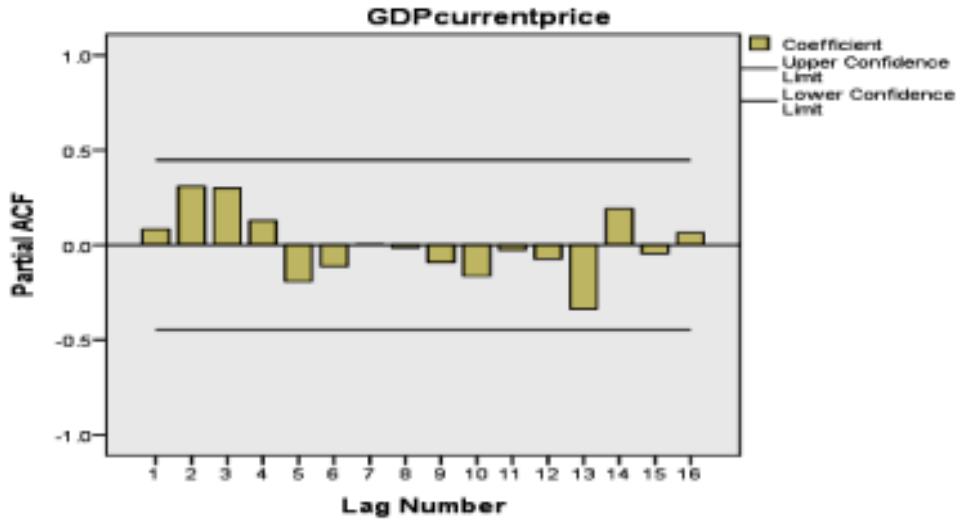
Note: Done Using SPSS, IBM

Figure 5: Correlogram for GDP at Current Price (auto correlation function)



Note: Done Using SPSS, IBM

Figure 6: Correlogram for GDP at Current Price (partial auto correlation function)



Note: Done Using SPSS, IBM

Figures 5 and 6 represent the correlogram with ACF and PACF, respectively. These function charts clearly indicate the stationarity of the data as no seasonality or trends are present. A stationary time series means, whose properties do not rely on the time at which the given series is observed. So, here also, we do not need to transform the model by taking the differences of the natural logarithm.

7.2 Estimation of Results through Melard's Algorithm

As the time series is stationary, we have taken the ARMA (1, 0, 1) process, which has been estimated by Melard's algorithm test and the estimation results areas follows:

Table 8: Parameter Estimation

Non-seasonal lags	Estimates	Std Error	T	Approx Sig
AR (1)	.978	.031	31.982	.000
MA(1)	-.588	.244	-2.412	.026

Note: Done Using SPSS, IBM

Table 8 shows the estimates of AR (1) and MA (1) with their standard error, t-value and significance. The above result is statistically significant as approx significant value is less than 0.5.

Table 9: Covariance Matrix

Non-seasonal lags	AR (1)	MA (1)
AR (1)	.001	.003
MA (1)	.003	.059

Note: Done Using SPSS, IBM

Table 9 represents the correlation between the different lags of AR (1) and MA (1) process. Although the study has not used the Durbin-Watson test, we can predict from the above table that there is absence of any kind of positive and negative correlation as the covariance matrix result is found to be less than 1. So, the correlation is absent here.

Table 10: Residual Diagnostic

Number of Residuals	21
Number of Parameters	2
Residual df	19
Adjusted Residual Sum of Squares	7228102.434
Residual Sum of Squares	5849171.528
Residual Variance	307851.133
Model Std. Error	554.843
Log-Likelihood	-163.730
Akaike's Information Criterion (AIC)	331.459
Schwarz's Bayesian Criterion (BIC)	333.548

Note: Done Using SPSS, IBM

Table 10 reflects the residuals of the ARMA model. Here the minimum value of AIC, BIC and log-likelihood statistics suggest that there is goodness-of-fit in this statistical model as the difference between AIC and BIC is close to 2.

7.3 Syntax Used in SPSS for ARMA (1, 0, 1)

The following syntax has been used in SPSS, IBM to arrive at the ARMA (1, 0, 1) forecast estimates:

```
ARIMA GDPcurrentprice
 /MODEL = (1,0,1) constant.
ARMA GDPcurrentprice
 /MODEL = (1,0,1) ln constant.
ARMA GDPcurrentprice
 /MODEL = (1,0,1) noconstant.
TSMODEL
 /MODELSUMMARY PRINT =[MODEL FIT]
 /MODELSTATISTICS DISPLAY =YES MODELFIT =[SRSQUARE NORMBIC]
 /MODELDETAILS PRINT =[PARAMETERS]
```

7.4 Sample Forecast through Time Series Expert Modeller

A time series expert modeller is something, which is used for forecasting the model data considering all the appropriate measures while predicting. The present model is the correct one as there are minor differences of errors between actual GDP and fitted GDP, which is presented in Table 11.

Table 11: Actual GDP, Fitted GDP and Errors

Year	Actual GDP	Fitted GDP	Errors
2001	2,237.256		
2002	2,361.454	2237.25600	0.5403
2003	2,596.382	2448.49945	0.5864
2004	2,875.556	2766.71789	0.3858
2005	3,240.424	3079.20116	0.5103
2006	3,240.424	3510.43498	-0.8004

2007	4,112.907	3240.42400	0.23843
2008	4,356.042	4825.30077	-0.10231
2009	4,761.455	4526.92954	0.05051
2010	5,311.154	5053.97642	0.04963
2011	5,782.036	5714.51525	0.01175
2012	6,214.485	6120.655637	0.01521
2013	6,727.337	6522.17054	0.03097
2014	7,359.577	7094.41076	0.03670
2015	8,030.815	7816.07911	0.02710
2016	8,783.888	8514.45356	0.03115
2017	9,579.686	9327.55046	0.2667
2018	10,413.608	10152.80643	0.02536
2019	11,043.180	11012.56119	0.00278
2020	11,321.280	11486.14142	-0.01446
2021	12,399.001	11511.51145	0.07427

Note: Calculated Using SPSS, IBM

The present study through this expert model has predicted the GDP of 5 years ahead on quarterly basis from 2022 to 2026 as the data of the study has already included the estimated amount of GDP for 2021 released by the IMF. The predicted values are presented in Table 12.

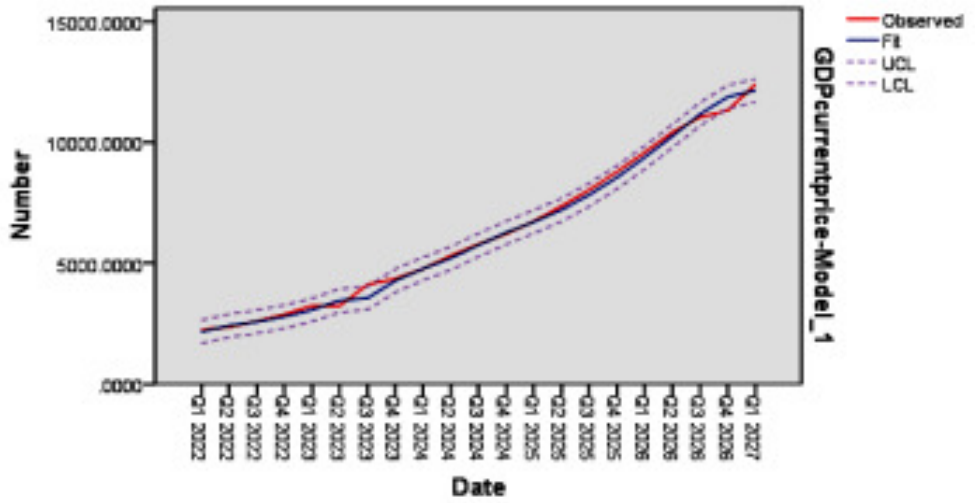
Table 12: Predicted GDP (Current Price) from 2022 to 2026 (in billion dollar)

Year	Quarter	Predicted GDP (current price)
2022	1	2160.5945
2022	2	2413.6117
2022	3	2577.3487
2022	4	2786.9038
2023	1	3066.4587
2023	2	3455.2925
2023	3	3553.9796
2023	4	4277.3112
2024	1	4766.0913
2024	2	5207.5665

2024	3	5745.5471	
2024	4	6259.9216	
2025	1	6713.1042	
2025	2	7204.0709	
2025	3	7828.3106	
2025	4	8551.1204	
2026	1	9374.2249	
2026	2	10256.2868	
2026	3	11168.5851	
2026	4	11168.0031	

Note: Calculated Using SPSS, IBM

Figure 7: Fit and Observed Values of Estimated GDP (Current Price)



Note: Done Using SPSS, IBM

Figure 7 shows the fit and observed values of estimated GDP (current price). We can observe the upswing and downswing trends of both the values from the above figure, which indicates the minute differences between these two values.

A summary of the model statistics is presented in Table 13.

Table 13: Model Summary

Stationary R- squared	0.539
R-squared	0.995
LJung-Box Statistics	17.548
MAPE	2.832

Note: Calculated Using SPSS, IBM

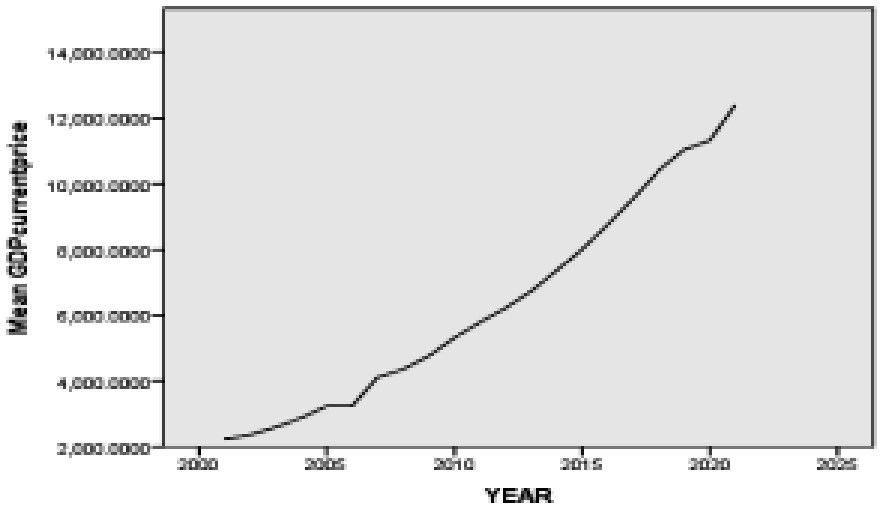
The model is well fitted as the value of R-square is an ideal one and mean absolute percentage error (MAPE) is below 10, which is considered to be the best. The value of stationary R-squared is also close to the average level. LJung-Box Statistics value is also greater than 0.05, which indicates that the residuals are independent of each other and hence the model is correct.

8. The Great Economic Shock of 2020

The novel corona virus pandemic is going to downgrade the economic growth in the next few years at the global level. As a developing nation, India will face an immense shock due to this pandemic. If we compare between the mean trends of actual GDP (current price) and the mean trends of predicted GDP (current price), we can clearly observe a "great economic shock" in 2020.

8.1 Comparisons between the Mean Trends of Actual GDP and Predicted GDP

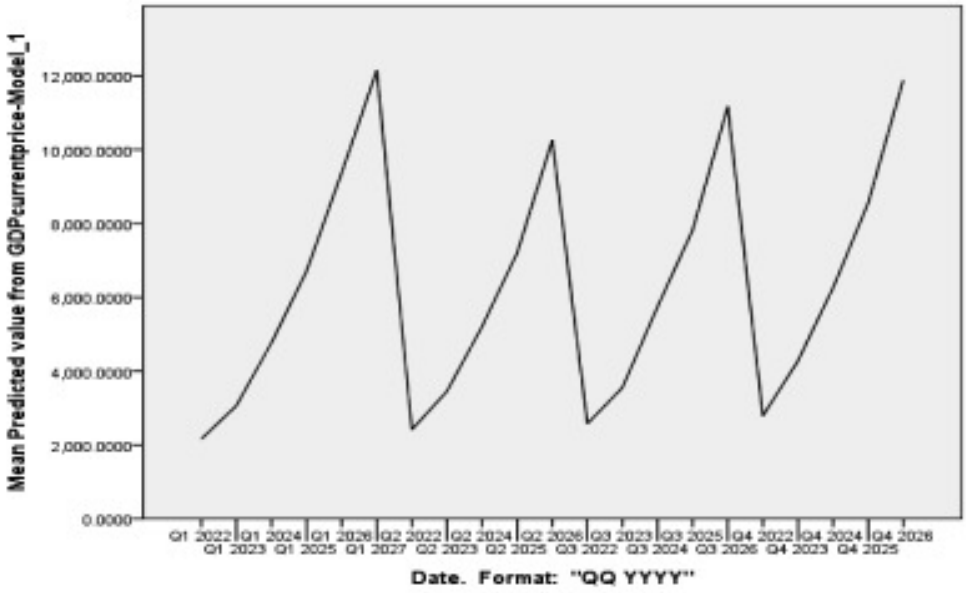
Figure 8: Mean Trends of Actual GDP (current price) from 2000 to 2025



Note: Done Using SPSS, IBM

If we observe the mean trend of the actual GDP (Figure 8), we can find that the trend is an upward linear process without having any major fluctuations. The period from 2000 to 2019 had not experienced any great economic downswings since this period is normal without any major economic disturbances.

Figure 9: Mean Trends of Predicted GDP (Current Price) from 2022 to 2026 (Quarterly Basis)



Note: Done Using SPSS, IBM

From Figure 9, we can predict the mean trend of the predicted GDP, which has been computed through the expert modeller in SPSS, IBM. Due to the "great economic shock" of mid-2020, the predicted GDP from 2022 to 2026 is going to fluctuate a lot in each of the quarters. The unexpected event of the COVID-19 pandemic has dealt a bewildering impact on the predicted GDP as the mean line of predicted GDP in some period has an upward swing and in some period it is rapidly falling. As a result, we are going to observe a great economic uncertainty of GDP trends in the next few years, which will adversely affect the decisions of the government and RBI in formulating a proper economic roadmap for the country.

9. Conclusion

The above literature (regarding GDP forecasting) consists of non-stationary time series data. As a result, all previous research using different ARIMA model by differencing the order appropriately is considered to be the most suitable. In contrast, the present study has a stationary time series data. Hence, there is no need for differencing the order. We have thus applied ARMA(1,0,1) model, which is the best fit for this particular analysis. Considering all the views of previous research, we can conclude that the past studies are appropriate as per the nature of their time series data. At the same time, the present article also presents the most suitable way of GDP forecasting in tune with the nature of the time series data.

Using the time series model of India's GDP from 2001 to 2021, the ARMA (1, 0, 1) model was established. No transformation of the time series is required as the data is stationary and hence it does not require differentiation of any kind. The convincing results of the fitted values make the forecasting reasonably practical, which has been done by the time series expert modeller. The results indicate that the error values lie below 5%, which is an ideal sign for model estimation. The time series expert modeller, based on the previous values has predicted the GDP in the next 5 years from 2022 to 2026 on a quarterly basis. However, the values of forecasting are purely predictive; the Indian economy is a complex and dynamic system. The policies regarding adjustments of a macroeconomic scenario and changes in environmental development will create a relative fluctuation of macroeconomic indicators. Therefore, we have to estimate the risk of adjustment in operating the economy as well as to maintain stability. We should also pay attention to the proper continuation of microeconomic regulation to protect the economy from severe disturbances. The adjustment process should be in correspondence with the target value according to the actual scenario in the country.

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Article

Impact of COVID-19 on the Day-to-Day Life and Living of People: An Empirical Study in Chhattisgarh

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Abstract

In responding to epidemics, the culture of the people, which is the product of ecology, is usually ignored due to which success of efforts to overcome such situations has been limited. In case of COVID-19, the national and state governments in India have been adopting both preventive and curative approaches to overcome its serious effects. With this premise, the study has attempted to determine the awareness, attitude and practice (AAP) of the people towards COVID-19 and changes therein to overcome its effects. The study, undertaken in the district of Chhattisgarh,underscores the salience of socio-cultural factors, which influence our awareness, attitude and practices, so that such pandemic situations may be managed in a more people-friendly and rational manner.

1. Introduction

Historically, the world has encountered several epidemics like influenza, cholera, dengue, small pox, swine flu, HIV-AIDS, SARS, H7N9, Ebola; and presently, the alarming COVID-19. All these natural calamities have spread either from

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animal to human or from human to human. The nature of these epidemics has varied widely and is influenced by geography, disease movement, novelty, severity, population immunity, infectivity and contagiousness. The responses of the people also also varied due to human behavioral patterns, which is the result of their culture, which is built over generations and according to time and space factors. In many such epidemics, the culture of the people, which is the product of ecology, is ignored. As a result of this, the optimum level of success of efforts to overcome such situations has not been satisfactory.

COVID-19: The Pandemic

The COVID-19 pandemic has become a world-wide phenomenon. The World Health Organisation (WHO, 2020) has defined the disease as a pneumonia of unknown cause detected in Wuhan, China and was first reported by China on 31 December 2019. It is caused by a novel corona virusor SARS-COV-2. COVID-19 is considered as a pandemic since it fulfils all the features like its wide geographic and trans-regional spread across the globe (Taubenberger & Morens, 2009), disease movement (Barrelet et al., 2013), novelty (Morens et al., 2009), severity, high attack rates and explosiveness (Donaldson et al., 2009), minimal population immunity (WHO, 2020), infectivity and contagiousness (Su & He, 2015). Tackling the present pandemic has become a major agenda and the only development focus of all nations and world bodies. As a result of this, the Sustainable Development Goals (SDGs) and the unfinished agenda of Millennium Development Goals (MDGs) (UNO, 2015) have become secondary in terms of allocation and attention. As per Johns Hopkins University (2020) the countries with highest deaths include USA, Brazil, India, United Kingdom, Italy, Spain, France, while the infected cases in India is the second highest in the world. The incubation period of COVID-19 is 1-14 days with mean duration of 5-7 days, which underlines the transmission potential of asymptomatic or minimally symptomatic patients (Rodriguez-Morales, 2020). The Government of India (GoI, 2020) has categorized COVID-19 patients into mild, moderate, and severe disease, based on their presenting symptoms and signs. In India, approximately 80.0 per cent of the workforce is employed in the informal sector and about a third are employed as day-labourers, as a result of which any lockdown strategy may exacerbate the existing health and economic inequalities (*The Lancet*, 2020). Therefore, manifestation of personal hygiene and quality public health behaviour like hand washing and maintaining social distancing is necessary to curb the spread of the Corona virus, but it is a big challenge in many cities and rural regions of India (Dahab et al., 2020).

The pandemic has a regional variation in terms of its spread in India. Understanding the severity, the Government of India declared a nation-wide curfew from March 25 which was extended till May 31, 2020 (GoI, 2020). The lockdown and shutdown are being declared in phases by the state governments looking at the pandemic nature of the disease. The continuing intervention by the nation and states has differential impact and effects on different regions, communities, economic sources and growth rate (Bureau, 2020; CMIE, 2020). This has and will have invisible effects on the life and livelihood of the people of India, including the tribal communities (Pani, 2020; Khanna, 2020).

A look into the state of the corona effect in Chhattisgarh (CG) reveals an alarming situation. The first death due to COVID-19 in CG was reported on May 29, 2020, which increased to 100 on August 16, 2020 and 1003 on October 2, 2020. A look into the death rate due to corona in major cities of CG shows that Raipur has the highest deaths of 437, followed by Durg with 116, Bilaspur with 82, Raigarh with 58 and Rajnandgaon having reported 41 deaths (Government of Chhattisgarh, 2020). The death cases in CG increased to 903 during September 17, 2020 to October 2, 2020 with an average of 19 death cases per day; which was 1.25 per cent during February 29, 2020 to August 16, 2020 (Ibid).

2. Review of Literature

The 20th century has witnessed three influenza pandemics namely the Asian flu in 1957-58, Spanish flu in 2018-19 and Hong-Kong flu in 1918-19, which have immensely harmed human life and economy and also the nation. The recent years (21st century) have seen major seven pandemics like H1N1 influenza in 2009, Ebola virus disease, Zika virus (Rewar et al., 2015; Maurice, 2016) and the recent ongoing COVID-19. In the Indian context, cholera has dominated throughout the 19th century during the British era in the years 1817, 1829, 1852, 1863, 1881 and 1899. The plague epidemic occurred in Bombay in 1896,while the influenza pandemic was experienced in India in the early part of 20th century, followed by polio (1970-1990), small pox (1974), and Surat plague (1994) (Ramamurthy et al., 2014). The major pandemics of the 21st century include plague in northern India (2002), dengue in Delhi (2003), severe acute respiratory syndrome (2003), Chikungunya (2006), the H1N1 flu (2009), Indian swine flu (2015) and Nipah (2018), During the last two decades, diseases like severe acute respiratory syndrome (SARS), Middle-East respiratory

syndrome (MERS), avian flu (influenza H5N1) and the recent of COVID-19 pandemic have caused human fatalities. Such outbreaks and devastation have been cause of concern to scientists and governments (Bhatia, et al. 2020). It has affected the quality of life of the families, health delivery system, animal health, agriculture, transport, education, tourism, and the economy of the state (Davies, 2013).WHO (2000) studied the impact of social and environmental factors on infectious disease outbreaks, accelerating rapidly in the developing countries of the tropics and sub-tropics, where infectious diseases continue to have a hold. The recent occurrence of COVID-19 has added to the list of pandemics in history.

Most of the epidemics are universal in character, irrespective of ecological, cultural and social conditions. However, the responses of the communities to these epidemics vary basically because of their cultural variations and built-in social and survival mechanisms to interface by such situations. Therefore, the threats posed by infectious diseases today are amplified by the social, behavioural and environmental factors that accelerate the natural phenomenon that modify the pattern of the infectious disease (David, 2005). In this context, the view of medical anthropologists like Haan (1995) and McElory and Townsend (2004) about the four approaches to understand the relation between disease, illness, and treatment with medical science seem to be pertinent. Disease ecology is defined at three levels of causation like micro-biological, cultural ecological (micro-sociological) and political ecological levels (macro-sociological) (Helman, 1984; Singer & Susser, 2003).

Only a few empirical studies in the Indian context are found (Gupta et al., 2020, 2020b) which provide short-term and long-term trends of vulnerability of COVID-19. Singh et al. (2020) explain the impact of social distancing on age and gender of the patients in India with a focus on the demographic characteristics of India, Italy and China; and suggested the vulnerability of certain age categories (Sahasranaman et al., 2020). Singhal (2020) and Sohrabi et al. (2020) focused on the deficiencies and inadequacies of Indian healthcare infrastructure as per the WHO guidelines to meet the consequences of the community spread of COVID-19.

Impact of COVID-19 on Migrant Labourers

The migrant labourers of CG were the worst sufferers due to the lockdown and shutdown during this pandemic. Lakhs of labourers did not wish obey the

state-imposed rules and regulations. Instead, they chose to defy them and to return to their native places by walk, covering hundreds of kilometres to reach their homes/villages with few of their belongings and family members. In many parts, the migrant workforce of CG travelled across state boundaries. In more developed regions of the country, they were engaged in informal contract work as second-class citizens. These migrant labourers could neither adopt local lingua-franca nor be represented by trade unions; as a result, they have been subjected to harassment by the employers, government institutions and also by local workers. These migrant labourers are more controlled, cheaper and dispensable at their destination. Though CG is known as the rice bowl of the nation, it is largely characterized by traditional agriculture, which is often unable to absorb the increasing population due to small land holdings of the rural households. The mining and industrial pockets of CG are by and large managed and controlled by outsiders, as a result, the poor people of the region, mostly the dalits and andadivasis, are forced to migrate to other states like UP, MP and Andhra Pradesh to work in factories, construction sites, and brick klins. The contribution of migrants in spreading COVID-19 in Bilaspur district is reflected in the following figures: out of 9054 corona positive cases of the district, 6909 (76 per cent) were reported from towns and only 2144 (24.70 per cent) were from rural areas of the district. Only 182 (2.1 per cent) cases occurred in Bilaspur due to migrant labourers and outsiders; of which, 120 cases were reported among migrant labourers (Government of Chhattisgarh, 2020). The data when interpreted shows that in Chhattisgarh, corona-related problem is largely urban and marginally contributed by rural population. Secondly, the spread of COVID-19 became very rampant among the urbanites and is considered as a disease of the urban society.

As per the Labour Ministry Statistics of the Government of India, CG has the highest number of migrant labourers, who are mostly trained in construction activities. Under the government flagship programmes like MGNREGA and Garib Kalyan Rojgar Abhiyan formulated to provide employment opportunities to migrant labourers, the CG government by the end of April 2020 registered 1,985,166 migrant labourers and created 12.3 million man-days of employment for them. The state government has also provisioned free rice, sugar and salt for 2 months to all the BPL card holders under the Public Distribution System (PDS) and Antyodaya programme during the lockdown. For school children under mid-day meal scheme, 4 kg of rice are provisioned for each primary level student and 5 kg of rice for each higher-level student. Rations are provided to both mother and child enrolled at ICDS centre with 750 grams of ready-to-

eat food delivered at home. The state has also waived pending tax and penalties for four-wheelers, at a burden to the tune of Rs. 332 crore. Alcohol-based hand sanitizers are produced by the state government in two distilleries and supplied to the people to meet the requirement of hand sanitizers.

As a part of state-sponsored health measures during COVID-19 period, the Government of Chhattisgarh has implemented few special programmes. They are as follows:

- Restricted the presence of employees at workplace, allowed the method of work at home and ensured sanitizers.
- Provisioned tele-medicines online diagnosis and treatment of patients at government hospitals through digital platform.
- Ensured the plenty availability of medicines at Jan Aushadhi Kendras of the government.
- Manufactured low-cost mask, supplied to the market and popularized the use of masks among the people.
- Reduced the electricity tariff for two months to the extent of half rate both in urban and rural areas.
- Recently, a few private hospitals were enlisted for providing corona treatment under Ayushman Bharat Yojana. It also made the provision of Rs. 2200 per patient in common wards and Rs. 6750 per patient in ICU provided by government to private hospitals.

Knowledge, Attitude and Practice (KAP)-related surveys are useful in appraising appraise, control and mitigation of epidemics. KAP surveys during Ebola yielded critical information to guide response and recovery efforts on health education and social mobilization. KAP surveys have also identified the prevalence of misconceptions about Ebola transmission and prevention and the need to prevent stigmatization of Ebola survivors and to foster safer case management and burial practices (Jalloh et al., 2017). One hardly finds any study on the continuity and change with respect to the awareness, knowledge and practices among the people, which is relevant while examining the long-term continuity of the problem. Therefore, an attempt is made to work on a comprehensive level to analyze the following objectives based on the finding of an empirical study in rural and urban regions of CG, an important geographical location of central India.

Objectives

The present study has the following objectives:

- To determine the current level of awareness of the households on various aspects of COVID-19.
- To assess the knowledge of the households on various preventive measures popularized by the state to curb COVID-19.
- To identify the major socio-cultural barriers in the adoption of key behaviour pattern by the households to counter COVID-19.
- To document the changes with respect to health and hygienic practices adopted by households relating to various aspects of COVID-19.

3. Research Methodology

The study adopted a purposive random sampling to collect primary data from the households. Secondly, the study collected samples from an equal number of households in rural and urban areas of Chhattisgarh on a convenient basis to make an objective assessment of the differences in the AAP of the people in the context of the socio-cultural scenario of the region. To a greater extent, the objective analysis of AAP fully accounted the awareness and changes in the practices of the people, while the attitudinal assessment could not be fully documented except putting them in close ended questions. Available literature on COVID-19 did not provide many research references from social scientists on the AAP of the household members relating to COVID-19.The study covered 80 respondents from eight rural villages (five from Bilaspur district and three from Korba district) and 80 respondents from urban pockets of Bilaspur, Korba and Janjgir-Champa towns of Chhattisgarh. Inclusion criteria for the respondents were selected on the basis of their age - above 25 years and those who lived in their residence. The study tool used to collect data includes interview schedule at the doorstep of the respondents, covering details of respondents' socio-economic background and various aspects of COVID-19 relating to awareness, attitude and changes adopted in the day-to-day practices of the people. The interview schedule consisting of both open ended and close-ended questions was personally obtained from respondents (primary data) by a team of students and both the authors during June 2020. The first part of the interview schedule covered the socio-demographic data of the respondents

and their family, while the second part covered various aspects of COVID-19 relating to awareness, attitude and changes in the practices of people. During the data collection, strict guidelines were followed by the research team like using mask, sanitizer and maintaining social distance. The quantitative data are tabulated in master sheets in Excel formats and presented in the form of percentage and frequencies, diagrams and tabular forms, while the qualitative data are processed in a descriptive and analytical form, putting the responses into groups/categories. The ethical obligation of the study was maintained at the respondent's level appraising him/her about the objective and utilization of the findings of the study.

The Study Area

The field surveys were conducted in the districts of Bilaspur, Janjgir-Champa and Korba of the state of Chhattisgarh, which was formed on November 1, 2000. The share of Scheduled Tribes (STs) is 31.76 per cent while Scheduled Castes (SCs) account for 12.94 per cent of the state's population (Census of India, 2011). The economy of the state is contributed by mining, agriculture, energy production and manufacturing. Tendu leaf is the major non-timber forest product (NTFP) produced by the state.

Being endowed with rich deposits of coal Bilaspur district has both the National Thermal Power Corporation (NTPC) and South Eastern Coalfields Limited (SECL). The Janjgir-Champadistrict has a large rural population (86.10 per cent, as per Census 2011) and it has forest coverage of 79439 hectare contributing tendupatta, sal seed, harra, mahua, and sagon as major NTFPs. Korba is one of the mineral-rich districts of CG and has a forest cover of 50.89 per cent.

Respondents' Profile

The study has covered 80 households from rural and 80 households from urban area of CG With respect to the gender distribution in rural area, there are 58 (72.5 per cent) male respondents while it is only 32 numbers (40 per cent) in urban area. Female respondents are more in urban area because they were accessible to the researchers; while in rural area, the women are more guided by their traditional values of maintaining limited interaction and follow socially determined inclusive norms. During the primary data collection in rural area,

males were more accessible; while in urban area, females were more accessible as respondents since males were absent at home. They had gone out to meet various purposes in their day-to-day life. The age distribution of the respondents shows around 70 per cent of the respondents were young. A look into the marital status of the respondents shows that a sizeable portion of the respondents (73.75 per cent) was married in rural area, while it was around 50.00 per cent in urban area. In total, 36.25 per cent of the respondents were unmarried and were above 25 years.

The literacy status of the respondents shows that around 21.25 per cent respondents in rural area possess primary level education, while graduates are almost similar among the respondents in both the areas (32.50 per cent). However, possession of higher education like post-graduation is more by 15.00 per cent among urban respondents as compared to rural respondents. Occupational distribution of the respondents shows that agriculture is the dominant occupation (41.25 per cent) among rural respondents, while among the urban respondents, employment in government sector (62.50 per cent) and private sector (23.75 per cent) is observed.

In rural area housing, around 22.5 per cent of the respondents have kuccha type, while 32.5 per cent have pucca type, 45.0 per cent have both types. Similarly, around 95.0 per cent respondents in urban area have pucca type of houses. All the households in both the areas have supply of electricity. The economic status of the households was measured looking at their BPL recognition by the state and possession of BPL card. Around 70.0 per cent of the respondents in rural area are belonging to BPL category seems to be quite high, while it is 31.25 per cent in urban area. In total, around 50.62 per cent of the households are categorized as BPL households. With respect to the legal status of the homestead land, around 62.5 per cent of the respondents in rural area have patta or legal ownership over their homestead land, while it is only 27.5 per cent in urban area. The above analysis of the socio-economic profile of the respondents shows that majority of the respondents in both the study areas have certain basic characters like low literacy, adherence to agriculture and income from employment. The details of the status of the households with respect to the socio-economic profile are provided in Table 1.

Table 1: Socio-Economic and Demographic Characteristics of the Respondents

	Characteristics	Responses					
		Rural		Urban		Total	
		N=80	per cent	N=80	per cent	N=160	per cent
1	Gender						
	Male	58	72.50	32	40.00	90	56.25
	Female	22	27.50	48	60.00	70	43.75
2	Age (in years)						
	25-35	22	27.50	47	58.75	69	43.12
	36-45	37	46.25	19	23.75	56	35.00
	46& above	21	26.25	14	17.50	35	21.88
3	Marital Status						
	Unmarried	19	23.75	39	48.75	58	36.25
	Married	59	73.75	40	50.00	99	61.88
	Widow	02	2.50	01	1.25	03	1.87
4	Education						
	Illiterate	02	2.50	0	0	02	1.25
	Primary	17	21.25	09	11.25	26	16.25
	Secondary	31	38.75	28	35.00	59	36.88
	Graduate	26	32.50	27	33.75	53	33.12
	Post-graduate	04	5.00	16	20.00	20	12.50
5	Occupation						
	Agriculture	33	41.25	0	0	33	20.62
	Wage labourers	12	15.0	01	1.25	13	8.12
	Government Employee	11	13.75	50	62.50	61	38.12
	Private Employee	10	12.50	19	23.75	29	18.12
	Business	13	16.25	10	12.50	23	14.37
	Pension Holder	01	1.25	0	0	01	0.625
6	House Type						
	Kuccha house	18	22.5	01	1.25	19	11.87
	Pucca house	26	32.5	76	95.0	102	63.75
	Semi-Pucca	36	45.0	03	3.75	39	24.38

7	BPL/APL Status						
	BPL	56	70.0	25	31.25	81	50.62
	APL	13	16.25	55	68.75	68	42.50
	Others	11	13.75	0	0	11	6.88
8	Supply of Electricity						
	Yes	80	100	80	100	160	100
	No	0	0	0	0	0	0
9	Status of Homstead land						
	On encroached land	10	12.5	02	2.5	12	7.5
	On own patta land	50	62.5	22	27.5	72	45
	On rented land	14	17.5	12	15.0	26	16.25
	On government quarters	06	7.5	44	55.0	50	31.25

Source: Primary Survey, 2020

4. Empirical Study Findings

Awareness About COVID-19

The study attempted to find out the level of awareness of the respondents on various technical aspects of COVID-19. They are as follows: the meaning and symptoms of COVID-19, method of transfer of corona virus, various preventive measures needed to check the spread of corona virus, meaning of hand cleaning, social distance, quarantine, lockdown and shutdown. The purpose here is to assess the level of proper awareness of the people on various aspects of COVID-19 and to assess the variations across rural and urban background.

Regarding the meaning of COVID-19, around 47 (58.75 per cent) respondents in rural area consider it as a virus-borne disease, which is 76.25 per cent in urban area. Overall, 108 (67.50 per cent) respondents are aware that COVID-19 is a virus-based disease. Around 30 (28.50 per cent) respondents in rural area and 13 (16.25 per cent) in urban area do not have any idea about the meaning of COVID-19. In total, 43 (26.87 per cent) respondents do not have any scientific knowledge about COVID-19 pandemic, which reflects the poor awareness of the people both in rural and urban areas. As stated by the respondents, this can be linked to multiple factors like poor school education and the non-implementation of awareness programmes by the state departments. The awareness programmes created by the state machinery are scientific in spirit, but people in rural areas initially considered it as a political move. The state tried to address the morale of the people in a bureaucratic manner and also involved the police department to maintain law and order.

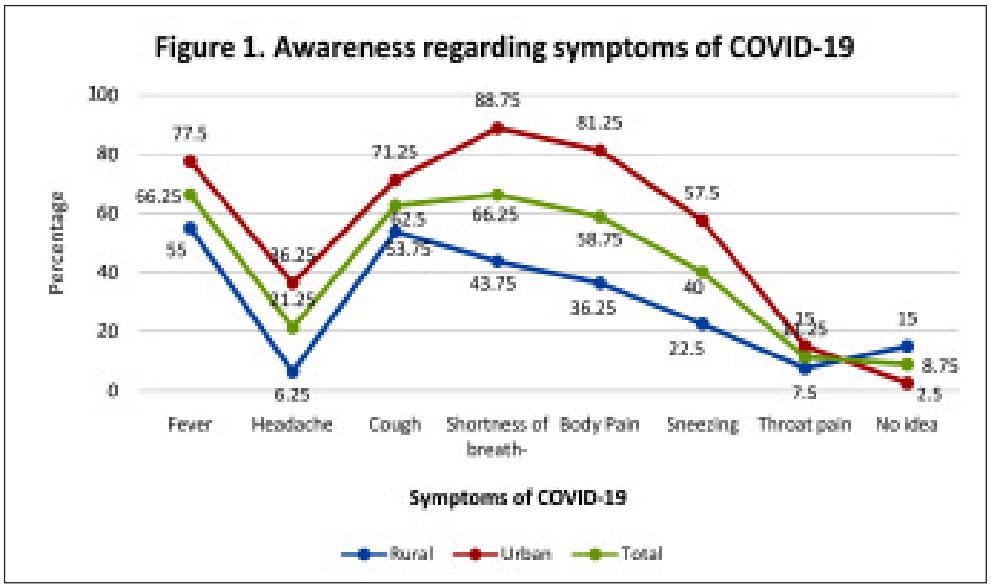
However, all the respondents in rural areas could identify one or two symptoms of COVID-19. When one looks at the responses across rural and urban areas, one finds wide difference in the awareness of the symptoms of COVID-19 (Table-2 and Figure-1). The awareness level of respondents across gender categories reflects that 20 (90.90 per cent) women in rural area and 12 (25.00 per cent) women in urban area do not have any awareness about COVID-19. This is indirectly related to their educational background and the scope of their interacting arena.

In rural area, the women are confined to their traditional roles to perform various activities in their day-to-day life that there is not much possibility of adding new ideas to their awareness context. Many women are members of the women's self-help groups, However, they were not educated by any state agency regarding the pandemic situation. The younger generation (58.75 per cent) belonging to the age group of 25-35 years in the urban area has better awareness on various aspects of COVID-19 compared to the rural area since they are more exposed to various media sources and interact with more outside sources like peer groups. Among the occupational categories, the responses indicate that the employees, both in government and private sectors in urban areas, have much better awareness when compared to the agriculture occupational groups of the rural areas. The interacting networks of the employees in urban areas spread over a wider base including other communities, different occupational groups, and status groups who are equally informed about the various dimensions of COVID-19. In rural area, the agriculture as an occupational group maintains a limited knowledge base, which is the product of similar coherent environmental conditions.

Table 2: Distribution of Responses on Various Symptoms of COVID-19

Sl.	Symptoms of COVID-19	Region/Responses		
		Rural N=80	Urban N=80	Total N=160
1	Fever	44 (55)	62 (77.5)	106 (66.25)
2	Headache	05 (6.25)	29 (36.25)	34(21.25)
3	Cough	43 (53.75)	57 (71.25)	100 (62.5)
4	Shortness of breath	35 (43.75)	71 (88.75)	106 (66.25)
5	Body pain	29 (36.25)	65 (81.25)	94 (58.75)
6	Sneezing	18 (22.5)	46 (57.5)	64 (40)
7	Throat pain	06 (7.5)	12 (15)	18 (11.25)
8	No idea	12 (15)	02 (2.5)	14 (8.75)

Source: Primary Survey, 2020 (Figures in the bracket are per cent to total)



Awareness about Preventive Measures of COVID-19

The study aimed to assess the awareness level of the respondents with respect to the methods of transmission of corona virus. Only 42 (52.5 per cent) respondents in rural area could tell that corona virus was transmitted from human to human, while this response is 81.25 per cent in urban area. Around 33.13 per cent people were not aware of mechanisms of transmission of the virus and said that all these were beyond their understanding. Early to COVID-19, they had never heard or experienced of any virus causing such a disease. The common preventive measures adopted by them included maintaining social distance, staying at home, avoiding public gatherings, use of mask, hand wash, etc. In rural area, around 27.5 per cent were aware of the importance of maintaining social distance and the use of sanitizers (28.75 per cent). Such responses on similar indicators are almost 50.00 per cent less than the responses of urban areas. In urban area, the awareness of the people is quite high related to preventive measures like maintaining social distance (93.75 per cent), staying at home (90 per cent), avoiding public gatherings (90 per cent) and the use of mask (100 per cent). High awareness of people in urban area on preventive measures is due to the impact of mass awareness programmes adopted in media, which are accessible to the people in general. A few such strategies adopted by the state include appeal to the people by the Prime Minister to clap hands and light lamps had a positive effect, which helped in building strong awareness among the people towards COVID-19 in urban areas. The variations in the trend of awareness across rural and urban population are visible in Table 3 and Figure 2. The awareness of the respondents on various preventive measures

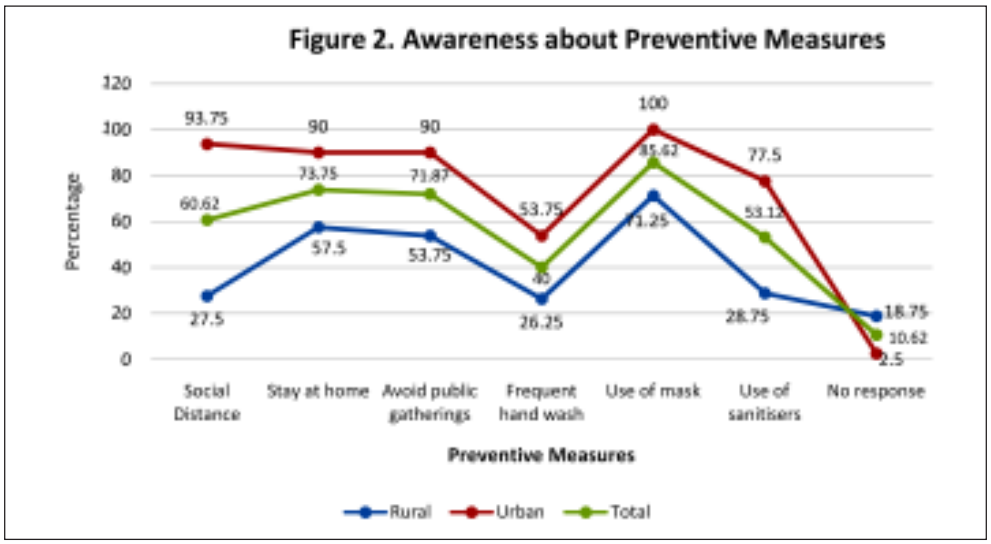
relating to COVID-19 was assessed as per their educational background. All the 55 respondents with education level of graduation and above in urban areas, were aware of the preventive measures like staying at home, avoiding public gatherings, use of mask and use of sanitizers to prevent corona virus. In rural areas, respondents (30 numbers) with similar educational background did not believe in the concept of staying at home, avoiding public gatherings and use of mask as preventive measures for the spread of corona virus. They believed that the life and living of the rural people are of different nature, therefore, such strategies may not be fully appropriate to rural India.

Table 3: Distribution of Responses on the Awareness about Preventive Measures Adopted by the State during COVID-19

Sl.	Preventive Measures	Region/Responses		
		Rural N=80	Urban N=80	Total N=160
1	Maintaining Social Distance	22 (27.5)	75 (93.75)	97(60.62)
2	Staying at home	46 (57.5)	72 (90)	118(73.75)
18	Avoid public gatherings	43 (53.75)	72 (90)	115(71.87)
4	Carrying frequent hand wash	21 (26.25)	43 (53.75)	64(40)
5	Use of Mask	57 (71.25)	80 (100)	137(85.62)
6	Use of Sanitisers	23 (28.75)	62 (77.5)	85 (53.12)
7	No response	15 (18.75)	02 (2.5)	17 (10.62)

Source: Primary Survey, 2020

(Figures in the bracket are per cent to total)



Awareness about the Concept of Quarantine, Social Distancing, Lockdown and Shutdown

The awareness level of the respondents on the concept of hand cleaning, quarantine, social distance, lockdown and shutdown implemented by the state was examined. With respect to the concept of quarantine, in urban areas, the responses are comparatively satisfactory which is much less in rural areas. In urban areas, respondents viewed quarantine as a strategy of isolation of migrants coming from outside the state (91.20 per cent), place to keep COVID-19 patients separately from the community (71.20 per cent) and as a strategy to restrict the movement of people staying under quarantine (71.2 per cent); while in rural areas, awareness level of the respondents with similar awareness was 61.25 per cent, 28.75 per cent and 53.75 per cent, respectively. Similarly, in urban areas, people viewed lockdown and shutdown as a strategy to restrict people's movement and to check the spread of corona virus. The awareness level of the urban respondents is quite satisfactory when one sees the responses on the implementation status of lockdown and shutdown as strategies to keep people inside their homes (92.5 per cent) which restricts the free movement of people (85 per cent), but opening of basic services like medicine shops, grocery, and milk parlour (93.70 per cent) seems to be much higher when compared with the rural area, which is 71.25 per cent, 56.25 per cent and 41.25 per cent, respectively. Around 21.25 per cent of respondents in rural area do not know any of these concepts since they had never experienced such an epidemic earlier or strategies like quarantine, lockdown and shutdown. Therefore, in rural area, the lockdown and shutdown strategy had little effect and the people were fully engaged in their day-to-day social, economic and cultural life and living.

Attitude of Respondents towards COVID-19

The attitude of people is considered as the innate behaviour mostly influenced by their built-in personality, which is considered as the natural product of social ecology and socialization including crisis situations. The degree of acceptance or rejection of new ideas by the people is influenced by their attitude. Keeping this in mind, the study focused on understanding the attitude of the respondents on various aspects of COVID-19 like state interventions and various solutions to such a pandemic situation based on qualitative responses. The quantification of qualitative responses was purposefully kept aside to understand the socio-psychological and cultural dimensions of their attitude from an emic perspective. It was commonly understood that in all the study areas, respondents had not

experienced any pandemic situation like COVID-19 before. COVID-19 was the first of this nature. In initial days, people in rural areas neither understood nor took into account the message on COVID-19 propagated by the state, while in urban areas, more than 60 per cent had developed some understanding, but could not foresee the possible effects of COVID-19 in future. Therefore, during the first lockdown period, people did not develop an attitude to abstain themselves from the COVID-19 related guidelines imposed by the state to check their movement. However, they feel that preparedness on part of the government was not adequate to bring an impact on people to realise the consequences of corona virus in future. In rural areas, the first phase of initial lockdown did not have much impact on people, but the rural people had nothing to do with the government decision of lockdown, which affected only government institutions like school, other offices and market agencies functioning in their localities. In the second phase of lockdown, when the migrant labourers started moving into the state and their region, and brought in the apprehensions being affected by COVID-19, it influenced the attitude of the villagers who supported government strategy of isolating the migrants in quarantine centres, many of which were opened in schools of rural region also. The serious effects of COVID-19 in the subsequent period have been internalized by a large section of respondents in the urban area (95 per cent) and a small section (45 per cent) of the rural area. However, 65.5 per cent of respondents in rural areas and 80.50 per cent of respondents in urban areas did not prefer the continuation of lockdown and shutdown because such strategies negatively affected their livelihood baskets, influenced their day-to-day life and living, and restricted the celebration of festival and festivities, physical movement and celebration of birth, marriage and death rituals. Therefore, they feel that the lockdown and shutdown strategies in the long term may not be helpful to the public to check the spread of corona virus.

With respect to precautionary measures like regular hand cleaning, using sanitizer, maintaining home isolation and social distance, and wearing mask, the respondents in urban area feel that adherence to these practices will have some positive effect in urban areas in reducing the spread of corona virus since people are more exposed to formal processes. In rural area, the respondents considered that their lifestyle by and large was naturally based on the principles of maintaining social distance and isolation at village level and they confined themselves largely to their household work and agriculture-related economic activities in the village. They agreed that growth of urban centres pulled some of the ruralites to nearest urban centres for day-to-day requirements and to

distant lands through seasonal migration for livelihood concerns. As a result, few of the rural respondents and urban slum dwellers expressed their fear of the COVID-19 situation (Case Study 1). Regarding the isolation of COVID-19 patients, the respondents both in rural and urban areas have a similar opinion about isolating the patients from the rest of the people and considered it as the duty of the state to take care of these patients and cure them. Respondents among both rural people (70 per cent) and urbanites (65 per cent) feel that COVID-19 patients have to be socially boycotted. They feel these patients are the source of spreading of the corona virus and also a burden on the society; and need to be properly managed by the state. In this respect, the younger age group respondents are comparatively less consistent when compared with the senior age group respondents. The females in the rural area are almost neutral (75.50 per cent) because of their low level of awareness and being more concerned with their day-to-day life.

Case Study-1

Impact of COVID-19 on a woman working as a maid

Savitri Yadav (not original name), a 38-year-old, house maid lives in Bajpayee Bada, an urban slum area of Bilaspur City. She belongs to a small village "Podi" near Bilaspur located at a distance of 28 km and has settled in Bilaspur city after marriage since 2009. There are 5 members in her family with two sons and one daughter. Both the sons are school-going and studying in classes 5 and 3, while her daughter is only 2 years old. She has been working as a maid for last 9 years in 5 households located in nearby colonies. She is the only bread-earner of her family and does not have any kind of financial support from her husband, as her husband is an alcoholic, has no job and is fully dependent on his wife. They do not have any link with native place and kith and kin. She has no other source of income. Apart from her monthly remuneration; she also receives support in kind either as cooked food, vegetables and many other essential items consumed by the children.

The COVID-19 outbreak has affected her and her family in many respects. Before the lockdown, she was working in five houses but in March, all of

a sudden, she lost her job in three of the houses. Due to the fear of getting infected by COVID-19 through the maid, the employers decided to stop her services for an uncertain period. They considered the slum that housed the maid as the breeding place for the virus. Savitri was left with only two workplaces. The average monthly income of the family reduced from Rs. 5500 to Rs. 2400 per month. This dealt a severe impact on their financial condition. As a beneficiary under PDS and Antyodaya scheme, her family was provided with 35 kg of free rice, 1 kg of sugar and 2 kg of salt in April and May during the lockdown period. Later, the the withdrawal of relief measures by the government led to extreme poverty with increased food insecurity. She was unable to meet the basic expenses on grocery required for the family, education of the children, health, and clothing requirement of the family. During the initial days of lockdown, she was somehow managing financially with the income from the two houses, her own small savings and some advance which she had taken from her employers.

Now with the limited income, she was not able to meet her household expenses along with the care of her children including their education, which ultimately led to increased pressure on her mental and physical health. The education of the children has been stopped since the school is closed, and she can not afford private tuition. She is not able to meet the medical expenses of her children. She has been experiencing physical as well as mental violence from her husband who demands money for liquor consumption daily. This has increased since the day of the lockdown.

COVID-19 crisis made it difficult for her to manage all the responsibilities as there was not enough financial or emotional support this has imposed an enormous economic and psychological burden on her family.

Changes in the Health and Hygiene Practices of the Respondents due to COVID-19

Changes incorporated in human behaviour which are reflected in the day-to-day life improve the quality of life in a sustainable manner. It is believed that changes which are cost-effective, useful to the community and affordable are quickly internalized and adopted. However, many changes in health and hygiene related practices are not much effective due to the influence of and conflict with certain existing socio-psychological and cultural factors, which became

barriers to change. Keeping this in mind, the study highlighted the changes observed and adopted by the respondents in day-to-day life to break the chain and stop the spread of corona virus. A few such indicators include frequency and duration of hand cleaning and the use of personal protective equipment like mask, glove, goggles and clean dress.

Hand Cleaning

The data with respect to the cleaning of hands shows that only 41 (51.25 per cent) respondents in rural area are able to link hand cleaning with eliminating the virus, while 86.25 per cent in urban area are of this opinion. In total, 68.75 per cent of the respondents are able to link cleaning of hand to the elimination of the corona virus. The other purposes of cleaning hands as suggested by respondents in rural area includes the prevention of the spread of corona virus (32.5 per cent) and avoiding infection (41.25 per cent); whereas, it is 71.25 per cent and 60 per cent in urban area, respectively. With respect to the relation of age with that of cleaning hand, the data revealed that the younger generation (76.59 per cent) in urban areas has understood the connecion of hand cleaning with the elimination of corona virus when compared with the older generation (42.10 per cent). In rural areas, age factor does not have much impact on the connection between hand cleaning elimination of the corona virus. This is basically due to the attitudinal factor and non-availability of adequate water in the house, which is normally collected from distantly located public water points. Regarding the frequency of hand washing, around 70 per cent of the respondents in rural area clean their hands as and when required, which is 38.75 per cent in urban areas. In total, around 54.38 per cent of the total respondents clean their hands as and when required, which shows that quite a sizeable population is yet to link hand cleaning with elimination of the virus. Only 14.37 per cent of the respondents expressed that they clean their hands thrice a day, while 31.25 per cent of the respondents practice it thrice a day. With respect to the duration of hand cleaning, around 57.5 per cent of the respondents in rural area do not have any knowledge of cleaning hands properly, while is the same is true of 61.25 per cent of the people in urban area. In total, only 43.12 per cent of the people follow the guidelines about hand cleaning. One can conclude that people are yet to internalize the purpose of hand cleaning in relation to the elimination of corona virus from the hands and the time requirement for hand cleaning. Regarding the use of sanitizers, the data reflect that not a single respondent used sanitizers to clean hands from time to time. For them, neither was it affordable nor available within their reach. A little knowledge about the use of

sanitizer could not overcome the attitudinal dimensions of the rural people. In the urban area, 52 (65 per cent) households showrf the sanitizer bottle at home and said that they only used it when they returned home from outside. The children and women rarely used it since they are largely confined to their home.

Use of Mask

The data with respect to the use of facial mask to prevent the spread of corona virus shows that in rural area 21.25 per cent of the respondents do not use mask, which is reported by 7.5 per cent in urban area. Around 14.38 per cent of the total population admitted that they do not use the mask in day-to-day life. Regarding the type of mask used, the responses indicate that around 79.38 per cent of the respondents (both male and female) in rural area use a scarf; and 51.38 per cent of the respondents in urban area use masks purchased from the market. In total, out of 137 mask users in the study, 55.48 per cent use a scarf and 30.66 per cent use masks purchased from the market. Regarding the benefits of using masks, around 28.75 per cent in rural area do not understand its benefits, which is only 2.5 per cent in urban area. In total, only 15.62 per cent of the respondents are yet to link the use of mask with the prevention of corona virus. The other benefits of mask as stated by the respondents include protection from infections (75.62 per cent), preventing germs from entering human body (66.25 per cent) and avoiding the spread of corona virus (59.37 per cent). Regarding the importance of wearing mask when people go outside, in both rural and urban areas, during summer from March to June, almost all people cover their face with a scarf which protects their face from dust and scorching sun rays. In rural area, women also cover their face when they go outside home and are engaged in work or go to the nearby market. COVID-19 has positively impacted the earlier practices of the people using mask when they go outside. Regarding the washing of used clothes daily, almost all respondents replied that it is a regular habit to wash the clothes that they had worn. In rural area, the respondents justified that since they were not exposed to crowded areas like the people in urban areas, they washed their daily used clothes as a part of their natural, social and cultural practices. Similarly, in urban areas, only 15 per cent of the respondents said that they wash their clothes after returning from the market with an assumption that it will eliminate the corona virus the clothes may carry, but most of the respondents are yet to adopt this concept of eliminating the virus in their day-to-day life.

5. Conclusion

COVID 19 started as an urban problem and a problem of the high class society, which was brought into the Indian society through global processes and imposed on Indian people and particularly on rural people, poor migrants and rural poor. Such a pandemic situation has rather supported the market to meet the imposed requirement of masks, sanitizer, and of pharmaceutical industries to produce medicines and vaccines. In such a situation, medical science and medical scientists look at development as the successful diffusion of scientific knowledge and they expect the adoption of these scientific practices by the people which should be reflected in their behaviour. The social scientists, on the other hand, look at technological development as change in the patterns of culture and society (Foster, 1962). Anthropologists look at communities or societies as the organized groups of people who have historically learned to live and work together in a patterned arrangement of relationships for the achievement of common goals. The above discussion on the "Awareness, Attitude and Practice" in the context of the impact of COVID-19 is based on empirical data, collected from both rural and urban regions of Chhattisgarh, and shows that the culture which contributes in making the patterned behaviours in a society is reflected in the role and behaviour of the people. In principle, the strategies adopted by the state to curb the spread of the virus addresses the medical as well as behavioural aspects of the disease. In practice, to address the behavioural aspects, the strategies adopted by the state to change the awareness, attitude and practices of the people includes implementation of lockdown and shutdown, use of mask, hand cleaning, popularizing limited movement of people outside, motivating people to stay at home, closing down religious and cultural such as public meetings, festivals, festivities, death and birth ceremonies, pressurizing people for home isolation, confinement at quarantine, bringing back the migrants from distant places, etc. To control the spread of the disease, the state adopted all these strategies within a short period starting from end of March 2020 in a repetitive manner and expected that the people will be aware and develop attitude to follow and change their age-old practices, which will help in curbing the spread of the virus. The empirical findings which attempted to study the differential impact of COVID-19 in rural and urban regions of Chhattisgarh largely show less adoption and slow changes in the subsequent period in the behaviour of the people. Whatever little variations were observed have been quantified and do not show the sustainability of these new adoptions to become a part of their day-to-day life. Therefore, to bring a change in the behavioural pattern, transfer of scientific knowledge should be a part of educational syllabus

from the school level targeting childhood learning. Secondly, strategies adopted to address the needs of the masses should integrate the grass root communities including the Panchayati Raj Institutions and urban bodies, civil societies as a part of the long-term vision, where the state can play the role of a support agency better than imposing purely through state administration and police organization. It must be accepted that any change in the human behavioural pattern is a result of cultural needs and demands systematic and long-term interventions.

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Article

Public Health Challenges and Management during the COVID-19 Outbreak in Odisha

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Abstract

This paper focuses on the management of COVID-19 by the Government of Odisha by focusing on problems related to lockdown, isolation, quarantine and hospitals beds in Odisha and its neighbouring states. The state government has initiated various measures to contain the spread of the infection through effective engagement of health workers and information sharing in wider media. This might have resulted in a low case confirmation ratio, low case fatality rate, and a greater recovery and discharge ratio. However, there remains many more challenges before the administration and public health authorities.

Keywords: Hospital beds, Management, Pandemic, Public health, Quarantine, Odisha

Introduction

An incredibly contagious disease COVID-19 has affected over a million and has caused over 606 thousand deaths world wide. In India, it has infected 1.1 million people and around 27000 of them had died by mid-July 2020 (Parmar, 2020). The pandemic has created several constraints including the required changes in provision of care in hospitals as numerous non-COVID patients

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have deferred their treatment. The lockdown has also adversely affected people in different ways (Hebbar et al., 2020).

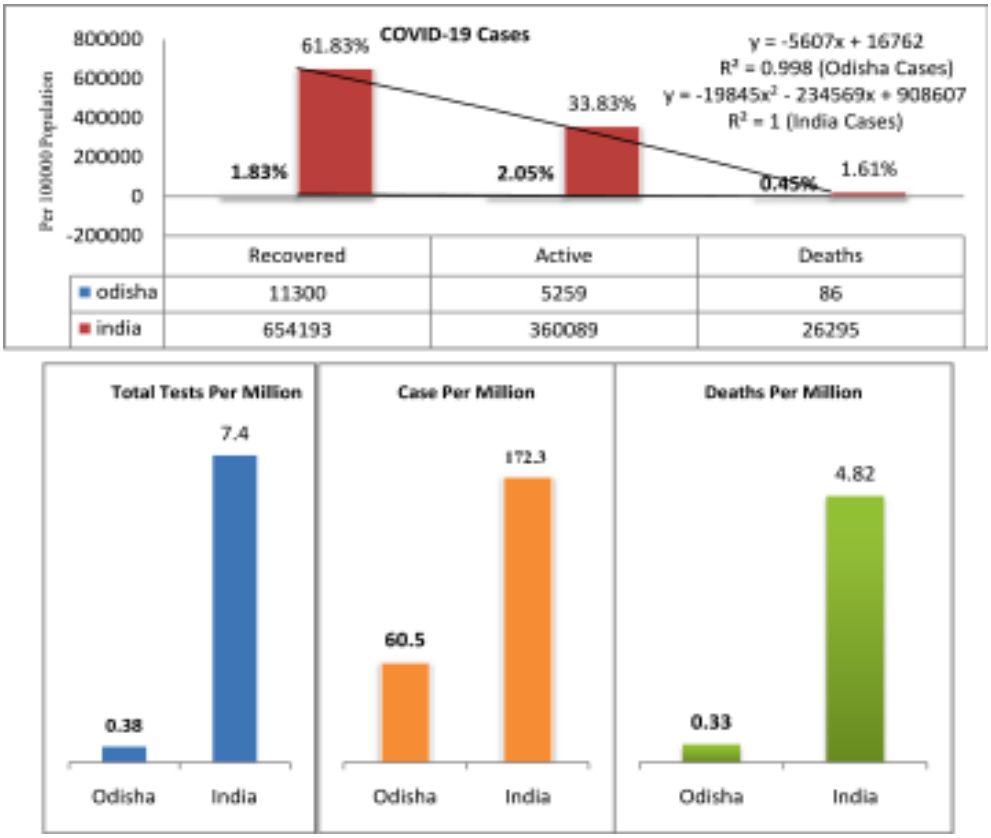
Odisha had taken proactive steps in creating wide spread awareness through campaigns and press meets on social distancing and concerned restrictions at community, district and village levels often involving local level institutions as the Panchayats. Its activities included testing, separating the infected and setting up of COVID emergency hospitals. The state rejigged the working of the healthcare set-ups with web-based training programs and even sent experts to remote areas on COVID duty (Pattnaik et al., 2020). The administration played a major role in controlling the transmission and also in financing of testing and other healthcare provisioning for the infected. Because of the announcement of national lockdown and the advance preventive steps taken by the state government, the situation of Odisha is presently better than that of some other major Indian states (Ganguly et al., 2020; Pattnaik et al., 2020).

The pandemic has posed a challenge not only to the public health system but demands financial allocations of unexpected proportions that threatens availability of funds for other ailments and long term health concerns (V. Sharma, 2020). Estimates of recovery due to the lockdown suggest that Odisha's performance was relatively better, including in managing the return-migrants (A. Das, 2020; S. Das, 2020; Priyambada et al., 2020). This paper focuses on the management of COVID-19 by the state government with reference to issues in lockdown, quarantine and hospitals beds in Odisha.

The COVID-19 Scenario in India and Odisha

As shown in Figure 1, by June 31, 2020 when India's COVID-19 cases stood at 1.04 million with 26,295 deaths in Odisha these figures were 16701 and 86, respectively. This implied the fatality rate of 0.33 per cent for Odisha and 4.82 per cent for India (Kazmi et al., 2020). As of mid July 2020, the recovery rate for Odisha was 61.38 per cent as against the same for India being 1.83 per cent. In Odisha, the death rate was 0.45 per cent whereas for India it was 1.61 per cent. Further, while the total tests per million was 0.38 for Odisha it was 7.4 at the national level. Importantly, deaths per million was much lower at 0.33 for Odisha as against 4.82 in India (HFWO, 2020a & b). Since the start, the state's response to the pandemic has been pragmatic with extensive testing, effective asset allotment, quick private sector associations, setting up healthcare infrastructure, etc.

Figure 1: COVID-19 Related Figures for India and Odishaby Mid-July 2020



Source: Computed by authors

The pandemic has upended thse lives of people as major health facilities are closed, borders are sealed, schools are closed and businesses are shut, resulting in a global public health challenge. Although research and trials were being performed by scientists to find a treatment or vaccine for COVID-19, it is evident that the country's present public health system was not equipped to deal with the issue (S. Sharma, 2020).The first and most challenging aspect is the availability of testing kits, medical supplies, Personal Protective Equipments (PPEs) and its timely distribution. Although there are qualified doctors, paramedics and nurses, they are not well equipped to prepare for and respond to the pandemic. Similarly, the hospitals in India lack Intensive Care Unit (ICU) facilities, isolation wards and medicines to treat COVID-19 (Saikia, 2017). Additionally, due to the limited coordination between the three tiers of government, namely, the federal, provincial and local the problem of poor recording and reporting is possible (Kazmi et al., 2020). While everyone seems to be more focused on how to treat or control COVID-19 cases, other important public health priority programs are at the risk of being ignored. In this regard,

international public health experts have expressed their concern that the focus on COVID-19 cases would only delay the treatment of other medical issues or the provision of vaccinations for diseases such as measles (Pattnaik et al., 2020). As the lockdown continued, a sense of fear and confusion might rise among the general population regarding COVID-19 (Iriart & Merhy, 2012).

COVID-19 Healthcare Facilities in Odisha

The COVID-19 hospitals/care centres are operational in 16 out of 30 districts in Odisha. The special hospitals are situated in different districts such as Gajapati, Ganjam, Jajapur, Keonjhar, Khurda, Puri, Cuttack, Sundargarh, Bhadrak, Rayagada, Malkangiri, Dhenkanal, Boudh, Kendrapara, Balasore and Koraput regions. There are about 7,020 Temporary Medical Centres (TMCs) with the 62,659 bed capacity being functional in all the 6,798 Gram Panchayats across the state (Jena, 2020). There has been a good stock of three-layer veils, N-95 masks, PPEs and hand sanitizers. Further, equipments like ICU ventilators, oxygen concentrators and nebulizers have been available. The proposed expansion in terms ofinfrastructure for COVID care by the state government involves 500-bed isolation wards in each district, including 50-bed ICUs equipped with ventilators in government hospitals to manage the emerging situation (Mohanty, 2020; Muduli & Barve, 2012). The 30 districts of the state have been placed under three revenue divisions to restructure their governance.

Table1 shows the healthcare beds availability in the northern division of the state. In terms of most parameters Sambalpuris much better placed compared to other districts.

Table 1: COVID-19 Healthcare Beds Availability in Northern Division of Odisha

District	Number of beds per TMC	Number of beds per centre	Difference of beds capacity and total beds	ICU beds per centre	Isolation beds per centre	Number of ventilator beds per centre	Oxygen beds per centre
Anugul	35.53	200.00	-50.00	5.00	72.00	2.00	18.00
Balangir	68.59	126.67	73.33	3.33	63.33	3.33	6.67
Bargarh	56.66	76.67	123.33	2.67	30.67	1.67	12.00
Deogarh	30.66	178.00	32.00	0.00	103.00	0.00	46.00
Dhenkanal	49.28	92.00	8.00	1.20	18.80	0.60	18.80
Jharsuguda	33.67	40.00	77.00	2.13	12.50	1.25	12.50
Kendujhar	52.25	80.53	53.47	1.16	2.11	0.11	2.11
Sambalpur	60.59	1000.00	-800.00	20.00	180.00	20.00	180.00
Sundargarh	56.28	200.00	170.00	7.00	35.00	4.60	35.00

Sources: Computed by the author with Database of Odisha State Dashboard

Table 2 shows the healthcare beds availability in the southern division. The total number of beds for per centre is the highest in Ganjam followed by Nuapada, Koraput, Gajapati, Nabarangapur, Malkangiri and the lowest in Rayagada districts. In the remaining five parameters all districts are similarly placed except Koraput and Nuapada where total ICU beds per Centres and total beds per TMC are a little bit high.

Table 2: COVID-19 Healthcare Beds Availiability in Southern Divisionof Odisha

District	Number of beds per TMC	Number of beds per centre	Difference between bed capacity and total beds	ICU beds per centre	Isolation beds per centre	Number of ventilator beds per centre	Oxygen beds per centre
Boudh	39.89	134.00	-18.00	0.00	60.00	0.00	42.50
Gajapati	97.11	200.00	-100.00	0.00	50.00	0.00	20.00
Ganjam	48.00	435.86	-235.86	2.86	25.71	2.86	25.71
Kalahandi	38.19	100.00	100.00	0.60	19.00	0.60	6.60
Kandhamal	63.24	155.70	-5.70	0.00	14.00	0.10	1.00
Koraput	40.74	200.00	-50.00	4.00	147.00	3.00	50.00
Malkangiri	55.46	150.00	-50.00	2.00	48.00	3.00	35.00
Nabarangpur	56.15	166.00	34.00	1.67	66.67	0.33	66.67
Nuapada	40.43	400.00	-400.00	0.00	195.00	5.00	160.00
Rayagada	71.52	100.00	0.00	0.00	16.67	0.00	16.67

Sources: Computed by the author with Database of Odisha State Dashboard

Table 3 shows the healthcare beds availability in the central division. While the total number of beds per centre is the highest in Jajapur, total isolation beds per centre is led by Khordha and followed by Jajapur, Cuttack and Nayagarh.

Table 3: COVID-19 Healthcare Beds Availability in Central Division of Odisha

District	Number of beds per TMC	Number of beds per centre	Difference between bed capacity and total beds	Total ICU beds per centre	Total isolation beds per centre	Number of ventilators beds per centre	Total oxygen beds per centre
Baleswar	33.70	124.00	-4.00	2.40	18.00	1.00	10.00
Bhadrak	100.08	120.00	0.00	0.40	11.60	0.40	2.00
Cuttack	36.43	100.00	50.00	40.00	116.00	8.00	116.00
Jagatsinghapur	33.48	75.00	0.00	1.25	11.25	0.75	5.00

Jajapur	31.23	400.00	-250.00	10.00	140.00	3.00	100.00
Kendrapara	44.30	91.11	18.89	1.00	11.11	0.56	0.00
Khordha	65.16	150.00	875.00	35.00	465.00	32.50	465.00
Mayurbhanj	41.96	57.54	142.46	0.38	7.31	0.15	0.50
Nayagarh	38.57	51.67	148.33	0.00	63.33	1.67	26.67
Puri	37.50	101.33	98.67	0.00	6.67	0.00	1.67
Sonepur	27.50	45.50	154.50	1.67	16.67	0.00	4.17

Sources: Computed by the author with Database of Odisha State Dashboard

Table 4 presents the information on average (of all the 30 districts) of availability of beds at COVID-19 centres. In order to respond to large number of cases, it would be useful to increase the number of ICU beds per centre to 10 and the number of ventilator beds per centreto 10 also.

Table4: COVID-19 Average Hospital Bed Availabilityat the District Level in Odisha

Number of Beds	Minimum	Maximum	Mean	Std. Error	Std. Deviation
Beds per TMC	27.5	100.08	49.47	3.29	18.04
Beds per centre	40	1000	178.39	33.77	184.98
ICU beds per centre	0	40	4.86	1.78	9.75
Isolation beds per centre	2.11	465	67.55	16.83	92.17
Ventilator beds per centre	0	32.5	3.22	1.23	6.74
Oxygen beds per centre	0	465	49.54	16.63	91.09

Sources: Computed by the author with Database of Odisha State Dashboard

Odisha is preparing itself to become the first state in the country to have a dedicated COVID-19 healthcare facility in each of its 30 districts with combined bed strength of 6000. The state govt. is now looking to create 34,000 beds in the COVID-19 care centres form among the TMC and ICUs have been projected 2386 beds and oxygen supported facilities 6141 beds. The bed projection is likely to go up with a gradual rise in the number of affected districts. As of now, Odisha has reported to sensing that creating additional beds will not serve the purpose, the health department has been directed to create an inventory of human resources to be required in these facilities (Kapoor & Mangla, 2020).

Managing the COVID-19 Crisis

The WHO Country Office for India has been working closely with the MoHFW

on preparedness and reaction measures for COVID-19, including surveillance and contact following, laboratory diagnosis, risk communications and community engagement, hospital preparedness, infection prevention and control, and adherence to regulations. Efforts have been stepped up to pursue measuresas to find, isolate, test, treat and follow.

Decentralized Information Campaigns: The first state-wide information, education and communication (IEC) outreach about the Coronavirus in Odisha was conducted on March 8, 2020 the day when the first international passenger was screened in the state. Two days later, the state government declared COVID-19 to be a 'disaster' and public officials were empowered to contain the spread under the Disaster Management Act, 2005. It is perhaps too early to isolate the reason for containment of COVID-19 in Odisha, but timely on-ground preparedness and decentralized information campaigns have mattered. Overall, Odisha's strategy has been considered appropriatein managing the pandemic (HFWO, 2020a).

WhatsApp Helpdesk: The Government of Odisha has started a chatbot on WhatsApp to respond to the queries of people. The chatbot has been named MyGov Corona Helpdesk. It aims to make citizens aware of the pandemic and keep them away from myths and misinformation. A single portal information system was set up with a dedicated spokesperson to provide clear information and discrete instructions to the public at a press meet which took place every day. Clear guidelines on 'what to do' and 'what not to do' were detailed. There was strict regulation on disclosure of identity and information management (Labana, 2020; HFWO, 2020a).

Efficient Work Delivery: The police personnel, healthcare workers and the government had delineated responsibilities. The health officials were not directly involved in public information management, to let them focus on their work. The police took a lead role in enforcing the lockdown and strict distancing norms (Sarita and Datta, 2020). The state government announced several welfare resources to address the difficulties being faced by people during the lockdown. Advance disbursement of these resources was done to the entitled beneficiaries, including pensioners (4 month's pension), ration card holders (3 month's ration) and students (scholarships). Provision of food for the sick, indigent and destitute in rural areas was ensured (Loiwal & Suffian, 2020).

Designated COVID Hospitals and Capacity Building of Healthcare Workers: Odisha had planned for exclusive COVID-19 healthcare facilities early on by setting

up 'Coronavirus hospitals' across the state forging partnership with existing non-government hospitals, including medical colleges and private hospitals. Odisha set an example by creating the first and the largest COVID-19 hospital in India (Labana, 2020; HFWO, 2020b). Online training programmes for healthcare personnel and medical students and advance disbursement of salaries for all healthcare personnel in the state was initiated. To provide informed healthcare in the state, about 500 faculty members and staff of medical institutions, 1600 medical officers of AYUSH, and about 900 residents and faculty members of dental colleges were trained in basic management through video-conferencing apps. Among frontline health workers, about 5542 nursing students, 1.17 lakh ASHAs and auxiliary nurse midwives were trained online.

Collective Efforts by the Government and People

The state government had arranged for sample testing facilities spread across the state and this had helped identifying cases and also to follow ICMR guidelines for isolating people and taking appropriate need-based steps to prevent the spraed of the virus. The temporary medical centres in villages had done an excellent job in checking the scatter of the virus and about 95 per cent of Odisha's positive cases were reported from quarantine centres (Saikia, 2017). This demonstrated the collective efforts put by sarpanches, individual agents and the government apparatus. At the Gram Panchayat level the Sarpanch ensured registration of those who arrived in the village and, if required, sent them for 14 days to stay in the quarantine centre equipped with facilities like accommodation, food, sanitation etc. In addition to observe some health check-up protocols as screening, testing etc.following the stay period financial incentives were also provided by the government.

State Leadership: Odisha played a lead role in extending the lockdown in the initial phase and it was also unique in introducing the complete weekend shutdown in the state after the nationwide lockdown was withdrawn; this acted as a potential preventive measure. Odisha's solution-based approach, with flexible and dynamic state leadership attaching minimal importance to political gains helped strengthen the centre-state collaboration ensuring the best possible outcomes (HFWO, 2020a; Sarita & Datta, 2020). Financial and organizational support was provided to Gram Panchayats ensuring provision for temporary medical camps with extensive information campaigns on COVID-19, its prevention and case reporting by Swachchta Sathis (Sanitation Workers) at Zila Parishad (District Council) level were emphasized (Sarita & Datta, 2020).

Returnee Migrants: Before the lockdown alert Odisha had prepared a database of returnee migrants and recorded the first case in the state. On the day of the national lockdown, the state government knew 78,233 persons had returned to Odisha from other states, with district and Panchayat specific information. The data was shared with Gram Panchayats and the Panchayat Samiti and district administration were intimated about those arrivals. Through IEC, the state had already prepared Panchayat members towards encouraging returnee migrants to self-isolate or quarantine, with cash incentives. A database of all persons arriving in Odisha from other states was activated. Provision of roadside Jalachhatras (sheds to offer drinking water and refreshments), temporary shelters and food, etc. and mobile healthcare units was ensured (Sarita & Datta, 2020; HFWO, 2020a).

Infection Control, COVID Testing and Contact Tracing: It was made compulsory to use face masks while stepping out of the house for any reason. Testing had been broad-based and as on May 5, 2020 Odisha had conducted 723 tests for per million people, much above the national corresponding figure of around 519. Stringent containment and contact tracing measures were followed and sharing of area data of mobile uses identifying confirmed/suspect cases of COVID-19 was undertaken (Sarita & Datta, 2020).

Participation of NGOs: In addition to the measures of the state government, various initiatives were taken at individual and community levels by volunteers and non-governmental organizations (NGOs). In many places volunteers, in turns, closely monitored the entry of any outsiders and ensured mandatory screening and notification. A few NGOs had come forward to provide shelter, food baskets and hygiene kits to the needy; providing masks and refreshments to the police officials and other workers who were on duty. Some individuals and organisations had donated masks, sanitizers, PPEs, etc. to the healthcare institutions (HFWO, 2020a).

Conclusion

Despite being a less developed state, Odisha's efforts in managing the COVID-19 crisis has been widely appreciated because of the low death rates and high recovery rates. Odisha has spent enormously in the health sector particularly in connection with COVID management after lockdown. The economy has shown signs of improvement inspite of many challenges. A negative economic growth would imply less revenue collection and limited fiscal space for the

Odisha government. Nevertheless, the state government is required to implement feasible health policies by allocating a higher share of the budget for the health sector.

The daily recoveries and releases from hospitals and TMCs during the crisis period outnumbered the positive cases. The community cooperation through Panchayat Raj Institutions (PRIs) and self-help groups (SHGs) has been an important element in this achievement. The TMCs and quarantine centrewee being ably overseen at the Panchayat level through the dynamic support of the Sarpanchs, chosen delegates, SHGs and the concerned individuals. It could be argued that COVID-19 never spiked in Odisha, a state not exactly known for an effective health system. From the beginning, the response of the state to the pandemic has seen increased testing, effective resource allocation, swift private sector partnerships, infrastructure build-up, capacity building of human resources in healthcare, and incentives for citizens to opt for tests. All these initiatives would have resulted in a low case confirmation ratio, low case fatality rate, high recovery and discharge ratio. Odisha's COVID-19 management strategy could offer insights into effective pandemic management now and in future.

However, the future is not without a few challenges in terms of containing the spread of the Coronavirus in the state and managing people's restlessness due to limits set on development activities. Reviving the economy and providing appropriate work and food to poor people remain major concerns.

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Article

Out-migration from Odisha: An Analysis in the Wake of COVID-19 Crisis

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Introduction

The COVID-19 that originated in Wuhan Province, China in December 2019 has rapidly spread all over the world and has been declared as a pandemic on March 11, 2020 by the World Health Organization (WHO). Since then, it has created severe health, economic and socio-political crises in different parts of the globe. Given the unavailability of clinically proven vaccines and drugs effective against coronavirus, depending upon the nature of severity of the spread of the diseases, different countries have imposed either partial or complete lockdown to break the transmission chain of coronavirus. This has halted all kinds of socio-economic activities (functioning of industries, tourism, hotels and transports, educational institutes, sports and spiritual institutions, etc.) except for some essential goods and services. As a result of this, economies of many powerful countries are now facing the problem of high inflation and increasing unemployment (OECD interim Economic Assessment, 2020). According to the World Trade Organization (WTO) and the Organization for Economic Cooperation and Development (OECD), COVID-19 is the largest threat to the global economy since 2008-09 financial crisis.

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After the imposition of immediate nationwide lockdown (containment measures) to check the spread of coronavirus[1], India has started facing unprecedented economic crisis in the form of disruption in supply chain and demand, decrease in production, increase in unemployment (as many lost their jobs) and inflation (Dev & Sengupta, 2020).The most important problem that the country has faced is handling the migrants who were stranded in various parts of the country. This has led to a huge humanitarian crisis such as migrants being run over by trains, starvation deaths, walking thousands of kilometres, getting chemicals sprayed on them, etc. This grim situation of the migrants has attracted both national and international attention.

According to the 2011 Census data, there are 450 million internal migrants in the country; out of this, 54 million are inter-state migrants[2]. The trend of this migration reveals that Delhi, Maharashtra, Tamil Nadu, Gujarat and Kerala are the major destination states whereas Utter Pradesh, Bihar, Madhya Pradesh, Odisha, Jharkhand, Rajasthan and West Bengal are the major source states of migrants (Dandekar & Ghai, 2020; Kumar & Kumar, 2020). Low agricultural production with high land lease, chronic poverty, higher dependency on agriculture or lack of industrialisation, etc. are responsible for heavy out-migration from these states (Sharma, 2005;Kumar & Kumar, 2020).

Outmigration from Odisha to other parts of the country for livelihood has been a common phenomenon over the years. However, amidst the COVID-19 crisis, these migrants have faced lot of problems, despite the state government's measures to protect these migrants. In the process of returning, many migrants lost their lives in bus accidents and many others were severely injured. Several

[1] In India, the first case of coronavirus was reported in January in Kerala (Rawat & Mukesh, 2020). Then slowly, the disease spread to the other parts of the country as the 50th case was reported in another 41 days. Further, the number of cases increasedfollowed by a full lockdown of 21 days that was announced on March 24, by the Prime Minister (*The Economic Times*, 2020). Then, on April 14, the lockdown was further extended till May 3, 2020 (Ray & Subramaniam, 2020). So far, as on October 14, 2020, four lockdowns have been imposed with four unlocks. However, the number of positive cases is increasing rapidly. Till today, the number of positive cases is 849553 with 22674 deaths. These numbers are changing rapidly and creating socio-political and economic threats to the country.

[2] However, the actual number of migrants may be much more than this number as many present studies like Economic Survey of India, 2016-17 have calculated a larger number of migrants in the country based on a new cohort-based migration metric (CMM)) and railway passenger traffic flows data.

other migrants were beaten up brutally by the police; even one migrant was allegedly beaten up to death in Surat (*Hindustan Times*, 2020). Similarly, many other painful visuals of these migrants have been reported by print media as well as TV news channels.

Although the relation between COVID-19 and subsequent migration problemsdue to the lockdown is recent, the real problems or issues of migration from Odisha to other states need to be examined. In this context, this paper makes an attempt to understand the nature of the Odia migrants and investigate the factors responsible in relation to Odisha's economy in the pre-COVID period during 2001-16. This may help in formulating better policy measures to address the present migrant crisis.

The paper is divided into five sections. The second section deals with Covid-19 crises and Migrations. The third section explains trend of out-migrants. In the fourth section cause of outmigration has been depicted. Possible policy measures have been analysed in the fourth section. The last section deals with the conclusion.

1. COVID-19 Crisis and Migrants

The lockdown, which was imposed on March 24, 2020, without anticipating the exodus of migrants in the country, created a humanitarian crisis. As the lockdown was imposed, business came to a halt, economic activities were disrupted, and migrant workers lost their jobs. Being unemployed in the city and no guarantee of further employment, it made them economically and psychologically insecure. To get relief from this economical and psychological pressure, they decided to return to their native places. However, sealing of state and district borders by the state governments and unavailability of transportation or lesser transport facilities arranged by the central government in the later phase (in the month of May), made their journey difficult. Even who took extreme steps to walk back home on foot were detained by police. Moreover, they were lathi charged, herded into shelters with minimum facilities and sprayed with dangerous chemicals. Some of them have lost their lives and got injured.

However, those who have managed to come back home are in social and economic distress. Natives of their village are treating them as carrier of the 'coronavirus' even after they completed the quarantine period fixed by their respective states. So, migrants and their family are facing social discrimination

in their own village. On the economic front, they are considered a burden by their family as they would be an additional mouth to feed.

Table 1: Returned Migrants to Odisha

States	By Trains	By Vehicles	Total
Gujarat	130537	11684	142221
Telangana	60053	23588	83641
Tamil Nadu	54968	57818	112786
Karnataka	25339	12907	38246
Kerala	23716	6815	30531
Other States	63788	93913	157701
Total	358401	206725	565126

Sources: COVID-19 dashboard, 2020

In Odisha, there are nearly 13 lakh out-migrants as per 2011 Census. However, this number could have been larger if the Economic Survey of India, 2016-17 calculation is considered. According to an estimate by Mishra (2020),there were 20 lakh migrants wanting to return to Odisha. The Minister for Labour and Employees Susanta Singh told that 8.5 lakh migrants have returned to Odisha (*Times of India*, 2020). However, the COVID-19 Dashboard, Odisha data shows that 5.6 lakh migrants have returned to the state (Table 1).More number of migrants have returned from the states of Gujarat (142221), followed by Tamil Nadu (112786), and Telangana (83641) by trains and vehicles.

2. Trend of Out-Migrants

Migration from Odisha to different parts of the country has been normalised over the years. Cutting across caste, gender and class hierarchy, lakhs of people migrate to other parts of the country to earn their livelihood. There have developed god networks, which follow the community and village lines and end in a specific destination (*Live Mint*, 2014). At the destination, they engage themselves as rickshaw pullers, agricultural labourers, construction workers, security guards, and bricks kilns workers, etc.(Mishra, 2016).

Top-10 destinations of migrants from the state are presented in Table-2 for 2001 and 2011 Census. As per 2001 Census report, Chhattisgarh was the top destination point for migrants, followed by West Bengal and Gujarat. The other

seven most preferable destinations were Andhra Pradesh, Maharashtra, Jharkhand, Bihar, Delhi, Uttar Pradesh and Karnataka chronologically. Since Chhattisgarh and West Bengal share common cultural background with Odisha, a large number of people were migrating to these states for getting married. Additionally, West Bengal, a rich state having large number of industries, was a significant employer of workers from Odisha.

Table 2: Top-10 Destinations of Migration from Odisha, 2001 and 2011

2001			2011		
State	Persons	Share in total migration from Odisha (%)	State	Persons	Share in total migration from Odisha (%)
Chhattisgarh	172371	18.393146	Andhra Pradesh	185872	14.62268
West Bengal	158486	16.911523	Gujarat	176072	13.85171
Gujarat	115316	12.304993	Chhattisgarh	154218	12.13244
Andhra Pradesh	105459	11.253185	West Bengal	142179	11.18532
Maharashtra	91170	9.7284527	Jharkhand	126320	9.937685
Jharkhand	82192	8.7704397	Maharashtra	114411	9.000795
Bihar	42955	4.5835877	Karnataka	64032	5.037443
Delhi	40886	4.3628114	Delhi	41162	3.238244
Uttar Pradesh	20853	2.2251555	Uttar Pradesh	35269	2.774638
Karnataka	16379	1.7477496	Tamil Nadu	22863	1.798649

Sources: Census of India, 2001 & 2011.

However, the scenario has changed as per 2011 Census data. Andhra Pradesh became the top destination of migrants from Odisha, followed by Gujarat and Chhattisgarh. Similarly, the chronology of other seven top destinations has changed and Tamil Nadu is placed in these top destinations. Since work opportunities increased in the above-mentioned states, people started moving towards these states for work.

As per Census data, in 2001, there were 9.3 lakh out-migrants in the state; their number increased to 12.7 lakh in 2011 (35 per cent increase). During the same period, the population of the state has increased by 14 per cent. This number shows that migration has relatively increased in the state. This higher

growth rate of migration than the population shows that work opportunity or work environment in the state is not enough for its population. Possibly, this is why a large number of people are migrating from the state.

The Census provides different reasons for migration. Hence, in Table 3, different reasons for out-migration from Odisha with their top-5 destinations have been presented for 2001 and 2011. During both the periods, it has been seen that employment or work is the main reason for people to migrate. As per 2001, there were 3.8 lakh work/employment related migrants, that is, 35 per cent of the total out-migrants, from the state. However, work/employment-related migrants have decreased to 31 per centas per the 2011 Census. Still the number is higher than the other reason for migration. Further, in both the census periods, Gujarat is the top destination for migrants. In 2001 Census, Gujarat was the destination for 23 per cent of total work/employment related migrants from the state. This number reduced to 20 per cent in 2011 Census. Another point is that West Bengal, which was the second highest destination for work/ employment related migrants in 2001 Census, has been less preferred as a destination point for migrants for the same reason in 2011 Census. For the same reason, Maharashtra and Andhra Pradesh have been preferred as the second and third top destinations subsequently in 2011 Census.

The second most common reason for out-migration from the state is marriage as 30 per cent and 31 per cent of out-migration was reported for the same reason in 2001 and 2011 subsequently. In both the Census periods, Chhattisgarh is the top destination for out-migration for the same reason. The third preferable reason for migration from the state is moved with households. For this reason, Chhattisgarh was the top destination in 2001 Census and in 2011 Census Andhra Pradesh become the top destination. Then, number of out-migrants for other reasons is also high in both the census periods. In 2001 Census, 12 per cent was reported for the same reason and that increased to 14 per cent as per 2011 Census. For business and education purpose, there are 1 to 2 per cent out-migrants.

Table 3: Top-five Destinations of Odisha's Migration for Different Reasons, 2001 and 2011

2001						
Work/ Employment	Business	Education	Marriage	Moved after Birth	Moved with Households	Others
Gujarat (23)	Gujarat (40)	Delhi (16)	Chhattisgarh (29)	Andhra Pradesh (24)	Chhattisgarh (21)	West Bengal (20)
West Bengal (16)	West Bengal (28)	West Bengal (16)	West Bengal (16)	Maharashtra (18)	West Bengal (16)	Andhra Pradesh (16)
Maharashtra (15)	Andhra Pradesh (8)	Maharashtra (15)	Jharkhand (16)	Chhattisgarh (14)	Andhra (13)	Chhattisgarh (14)
Chhattisgarh (11)	Chhattisgarh (6)	Andhra Pradesh(8)	Andhra Pradesh(12)	West Bengal (13)	Maharashtra (9)	Maharashtra (8)
Andhra Pradesh (7)	Jharkhand (3)	Jharkhand (5)	Bihar (12)	Gujarat (13)	Jharkhand (7)	Jharkhand (8)
Total 326141 [35]	Total 13208 [35]	Total 10140 [35]	Total 278611 [35]	Total 22788 [35]	Total 171529 [35]	Total 114731 [35]
2011						
Gujarat (20)	West Bengal 26)	Andhra Pradesh (19)	Chhattisgarh (23)	Andhra Pradesh (31)	Andhra Pradesh (16)	Gujarat (30)
Maharashtra (14)	Andhra Pradesh (18)	Karnataka (14)	Jharkhand (20)	Maharashtra (12)	Gujarat (12)	Andhra Pradesh (15)
Andhra Pradesh (12)	Gujarat (17)	Maharashtra (11)	Andhra Pradesh (15)	West Bengal (10)	West Bengal (11)	West Bengal (12)
Karnataka (10)	Maharashtra (8)	Delhi (10)	West Bengal (14)	Gujarat (9)	Chhattisgarh (10)	Maharashtra (8)
West Bengal (8)	Chhattisgarh (6)	West Bengal (8)	Maharashtra (4)	Chhattisgarh (9)	Maharashtra (9)	Chhattisgarh (5)
Total 387499 [14]	Total 12351 [14]	Total 13002 [14]	Total 397287 [14]	Total 38871 [14]	Total 239879 [14]	Total 182232 [14]

Sources: Census of India 2001 & 2011.

Notes: Figures in parentheses represent the percentage share of total interstate migrants from Odisha to a particular destination for a particular reason. Figures in square brackets represent the percentage share of migrants from Odisha for a particular reason.

3. Causes of Outmigration from Odisha

Over the past one and half decade, growth performance of the state has been significant. Its GSDP (gross state domestic product) growth has been above the national average (*Odisha Economic Survey 2019-20*). Similarly, in sub-sector level as in agricultural and industrial sectors, the growth rate of the state is above the national average while service sector growth is equal to the national level growth. During this period, the state has experienced structural changes in growth rate of income and employment (Sahoo & Adabar, 2018).

Structural change in income in an economy with high growth rate above the national average improves the state's position at an all-India level. Some previous studies like Samantaraya etal. (2014) and Sahu & Panda (2018)also observed that the improvement of GSDP growth along with improvement of various socio-economic indicators (such as life expectancy, infant mortality rate, literacy rate and consumption distribution) has improved the state's position at all-India level. Additionally, political stability with a stable government under the leadership of Naveen Patnaik has helped the state to grow impressively(Sahu & Panda, 2018). Despite this improvement in growth, rate of income and various social indicators, employment generation of the state is inadequate (Padhi & Panda 2020). The structural change in employment has not followed that in income. Agriculture still holds a large share in employment (particularly in rural area), despite decrease its share in income. The mismatch of income and employment generation of sectors is otherwise known as jobless growth. This jobless growth that induces a large number of people to migrate has been a cause for concern among researchers, policymakers and administrators in the state.

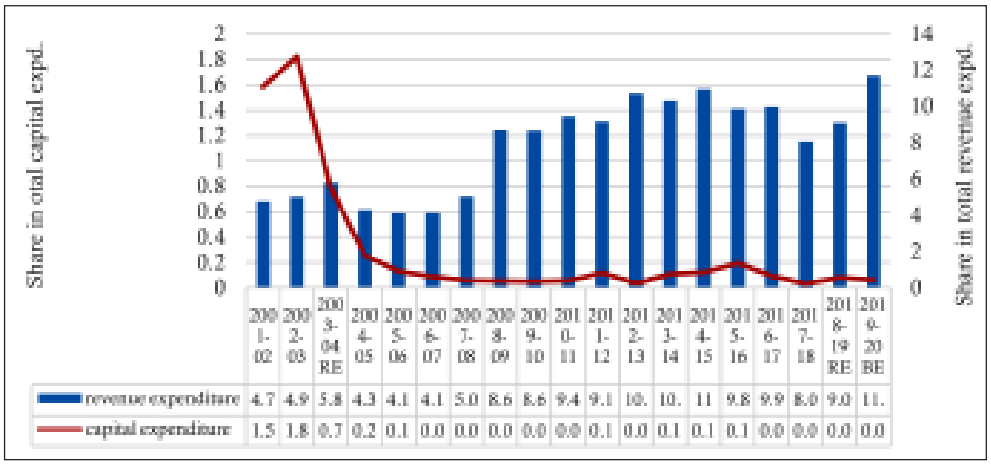
The agriculture sector, which is a source of employment for 49 per cent of the population of the state, has not been considered beneficial over the years. No expansion of the sectors has been observed with continuous decrease of net sown area. In 2001-02, the net sown area was 58.29 lakh ha and declined to 56.52 lakh ha in 2016-17 and 53.32 lakh ha in 2017-18 (*Odisha Economic Survey*, 2011-12 & 2019-20).The area under major crops has declined in the first decade of the 21st century, while it was stagnant in the first half of the second decade[3]. The yield rate of major crops is well below the national average. The yield rate

[3] However, the diversification of cropping pattern has been observed over this period with increasing the share of high value crop.

of paddy, the major crop of production, is 29 quintals per hector, whereas the median value for the country is 40 quintals per hectare. So, this condition of agriculture with the high risk of natural disasters makes the sector a less preferable sector of employment.

At the same time, the sector is not getting much importance in the state's finance. The revenue and capital expenditure data for agriculture for 2001-2016 (Figure1), indicate the same. The share of agriculture in total revenue expenditure for the first 5 years (2001-2006) was continuously low at around 4 per cent. Then, it increased from 5 per cent in 2007-08 to 11 per cent in 2014-15. Further, it decreased to 9 per cent in 2018-19, however, budget estimate for 2019-20 is 11 per cent. On the other hand, the share of agriculture in total capital expenditure is negligible throughout the reference period except the first 3 years (2001-03).

Figure 1: Share of Agriculture in Odisha's State Expenditure



Sources: Handbook of Statistics on State Government Finance, Reserve Bank of India.

Notes: RE - Revised Estimates; BE - Budget Estimates

So, the above explained scenario of agriculture sector has been a cause of increasing rural unemployment in the state. As explained in Table4, in 1999-2000, rural unemployment was 1.9 per cent, which increased to 6.9 per cent in 2017-18. However, between 2004-05 and 2011-12, unemployment rate has decreased from 5 per cent to 2.2 per cent. The urban unemployment rate follows the same trend like rural unemployment. However, the higher urban unemployment rate has raised concern. This can be linked to the industrial sector development of the state.

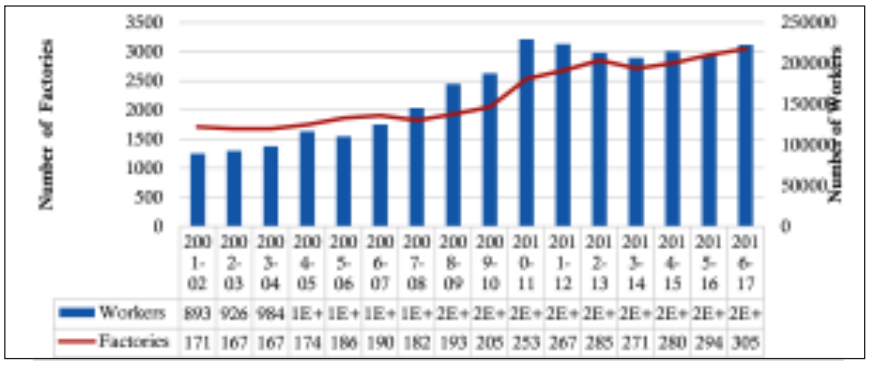
Table 4: Unemployment Rate in Odisha (%)

	1999-00	2004-05	2009-10	2011-12	2017-18
			Urban		
Male	7	9	4	3.9 7.3	
Female	5.3	26.6	5.4	2 12.7	
Overall	6.7	13.4	4.2	3.5 8.3	
			Rural		
Male	2.4	3.1	3.1	2.3 7.4	
Female	1.1	8.3	2.7	2 5.3	
Overall	1.9	5	3	2.2 6.9	

Sources: *Handbook of Statistics on Indian States*, Reserve Bank of India and Periodic Labour Force Survey, 2019.

In Figure 2, the number of factories and workers in the state for the year 2001-02 to 2016-17 is presented. There is no significant growth of industries in the first 5 years (2001-02 to 2006-07). Then, suddenly, the number of factories in the state has increased. Followed by that, the number of workers in the industries has increased. Hence, the urban unemployment has sharply declined in this period from 2004-05 to 2011-12. Further, the number of factories has decreased up to 2015-16, then increased in 2016-17; this trend could be seen in the number of workers in the factories. In 2011-12, number of workers in the factories was 2.23 lakh that declined to 2.09 lakh in 2015-16. In the same period from 2011-12 to 2015-16, number of workers per factories has also declined. In 2011-12, number of workers per factory was 83 that declined to 71 in 2015-16.With the employment elasticity of the industrial sector of the state low (0.06) during 2011-16 (Padhi & Panda, 2020), the industrial sector is unable to absorb surplus labour from the farm sector. This has forced out-migration.

Figure2: Number of Factories and Workers in Odisha, 2001-17



Sources: *Handbook of Statics on Indian States*, Reserve Bank of India

To establish the relationship between migration and factors affecting migration, a regression analysis using the OLS estimation has also been carried from 2001 to 2016. Five models were run and details are given in Table-5. Model-1, Model-2, Model-3, and Model-4 are simple regression to examine the separate individual impacts of the variable, while Model-5 is a multiple regression. In all these models, migration rate is treated as dependent variable. In Model-1, the share of agriculture in NSDP is independent variable and its estimated coefficient is found to be (-0.05) and statistically significant from zero. This means that the decline share of agriculture in NSDP has let to increase in migration rate during the period from 2001 to 2016. Similar kind of situation is also observed in Model-2, where the negative significant estimated coefficient (-0.02) of share of manufacturing sector in NSDP leads to increasing in migration rate. The coefficient of the rural unemployment is positive (0.03) and statistically insignificant, but the positive sign indicates that increasing unemployment is positively affecting migration rate during this period. In Mosel-4, the estimated coefficient of share of state's capital expenditure in agriculture sector is found to be negative and statistically significant. This implies that people are migrating form Odisha to other states because of decreasing capital expenditure in agriculture. The impact of all these variables is seen from the multiple regression framework in Model-5. As expected, the share of agriculture, manufacturing in NSDP, and the state's share in capital expenditure are negatively related to migration rate, while unemployment rate is positively related to it. Model-5 is good as identified by high R^2 value (0.97) and F value (125). These four independent variables explained around 97 per cent variation is migration rate during this period.

Table 5: Factors Affecting Rate of Migration

Dependent Variable: Migration rate from 2001 to 2016
Observations: 16

	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	3.80 (19.12)	3.91 (7.73)	2.63 (21.6)	2.58 (58.60)	4.88(39.38)
Share of agriculture in NSDPs	-0.05 (-5.25)				-0.03(-8.57)
Share of manufacturing in NSDP	-0.02(-2.27)				-0.02(-11.72)
Rural Unemployment			0.03 (1.26)		0.01(1.43)
Share of State's Capital expenditure in agriculture				-0.23 (-3.10)	-0.06(-2.71)
R^2	0.66	0.26	0.10	0.40	0.97
F-statistics	27.62	5.16	1.60	9.61	124.75
Probability of F-statistics	0.000	0.039	0.22	0.007	4.37
d.f	15	15	15	15	15

Source: Authors' Calculation

Notes: Values in parentheses are t-values.

Given the unavailability of time series migration data, compound annual growth rate of migration is computed for the period from 2001 to 2011 and then total migration is extrapolated up to 2016. Migration rate is calculated as a percentage of migrants in a total population divided for each of the years during the period from 2001 to 2016.

Policy Measures

Secure lives and livelihoods of migrants would not be so easy in such a situation of health and economic emergency caused by the COVID-19. However, the state government has taken significant steps on both fronts. The long experience of disaster management with long duration in power has helped the government to understand the seriousness of the disease and take necessary steps to handle it in a better way than other counterparts (Das, 2020).

First the government of Odisha requested to different state governments to provide temporary shelter and food to the Odia migrants until unlock. Then, the government prepared a roadmap to bring back migrants when it was decided to reopen the transport system of the country. To make everything systematic and under control, a registration portal was opened for migrants who wanted to comeback and quarantine centres were arranged in various gram panchayat with all the facilities like food and sanitization for 14 days and mandatory quarantine of migrants (*Downto Earth*, 2020& Times of India, 2020). Further, 20 senior IAS officers were appointed as COVID-19 observers and Sarpanchs of every gram panchayat were empowered along with the district collector to handle the situation better (*Hindustan Times*, 2020). Additionally, Rs.2000 incentive for migrants was declared to complete 14 days of institutional quarantine. Overall, the government interventions to bring back migrants have been appreciable (Rajan & Sami, 2020).

On the economic front, to secure the livelihoods of the migrants, a Rs.17000 crore package, namely special livelihood intervention plan, was announced by the government on May 29, 2020(*The New Indian Express*, 2020). The plan was launched in June and would be implemented till March 2021. The government has planned to generate employment in agriculture, fisheries and animal resources development, MGNREGS, forest and handlooms and handicraft sectors through this package. Besides, the strategy has been to adopt a convergence approach of all departments for enhancing the working days to accommodate the returnee migrants in the state (Meher & Nanda, 2020).So,

these initiatives of the state government with the central government's stimulus packages[4] will be helpful to the migrants.

Apart from the above initiative, the state government is collecting information about migrant workers' skill through 'Mo Sahya' application (*The Hindu*, 2020). The application is developed by professors and students of IIT, Bhubaneswar, which has collaborated with industries bodies like CII and FICCI to capture 308 skill demands across 24 industries (Orissa Economic Association, 2020).Indeed, this is a welcome step by the state government.

However, apart from the aforesaid initiatives, some other important steps must be taken by the government. Preparing a proper data set of migrants has been a debated issue over a period of time. Now, this issue is gaining importance since the government could not anticipate the exodus of migrants. As a result, migrants faced such a humanitarian crisis. The government urgently needs a database of migrants to avoid such a crisis in future. According to Kundu (2020), the government (state or central) needs to take the help of industries, NGOs (non-government organisation) and other state governments to identify migrants. Moreover, the government should replicate scientific sample surveys such as the Kerala Migration Survey to identify migrants and protect their rights (Rajan & Sami, 2020).

Steps should be taken to address the agrarian crisis that can generate employment for the poor migrants. Investment should be made to enhance farm productivity as well as create efficiency in the agricultural marketing system. Further, the government should expend as well as bring transparency in the direct cash transfer programme such as KALIA yojana. Many landless poor agricultural farmers (share croppers) are not included in this programme; also many eligible beneficiaries are not receiving the installments (*Times of India*, 2019).

The MSME (Micro, Small and Medium Enterprises) sectors should be given priority to boost the employment opportunity in rural areas. The sector has the potential to generate employment at low cost. In 2018-19, the sector was

[4] Central government has announced a Rs. 20 lakh crore stimulus package, which is a mix of fiscal support, monetary support, ease of doing business process and some fundamental reforms. This stimulus package is 10 per cent of the GDP of the country. However, there is a great debate regarding the actual value of the package.

able to generate 1.95 lakh employment with Rs.3196.53 crore investment (Odisha Economic Survey 2019-20). So, this sector should be given priority so that the returnee migrants having some skill can engage themselves and earn income from the sector.

4. Conclusion

Given the plight of the migrants, this study has tried to analyse the state of the economy of Odisha which forced large number of people to migrate from the state. Despite having a high growth rate and going through structural changes of the economy, employment generation has been lacking in the state. Moreover, the agricultural sector, which is large employer of the state, is losing its importance in state expenditure. At the same time, the industrial sector is not accommodating the agricultural labourer who leaves the sector. As a result, a large number of people move from the state to other parts of the country. Now, due to the COVID-19 crisis, these migrants are coming back to the state. In order to secure their lives and then their livelihood, the government has taken some welcome steps. However, much more policy action needs to be taken for handling such problems on a long-term basis.

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