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## FOOD INSECURITY DURING COVID-19 PERIOD : AN ANALYSIS FOR ODISHA.

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### Abstract

The present study examines and analyses the problem of food insecurity in Odisha during COVID-19. Odisha is one of the classical cases among Indian states, where the per capita net availability of food grains has remained at a higher level than that of all India for most of the years during 1961 to 2018. But, still there is highest percentage of Poverty, Malnutrition, Infant mortality and higher food deprivation in the state. These problems are most worsted during COVID-19 lockdown. Emerging as a public health crisis, the COVID-19 pandemic has ensured several negative effects, which have directly and indirectly threatened the food and nutrition security of vulnerable populations across the country, including Odisha. Hence, impact of COVID-19 on food insecurity (an already existing problem), it seems to be relevant to look in to the same problem. The present study is based on secondary data. We examine the impact of COVID-19 on the two pillars of Food Security (i.e., availability and accessibility) by taking GSVA data for all sectors of Odisha and India for the year 2012-13 to 2020-21 from DE & S Odisha and data on Per Capita Income and employment placement, inflation and employment generated under MGNREGA for the year 2011-12 to 2020-21 from DE & S Odisha, Directorate of Employment, GoI, Panchayati Raj & Drinking water Department, Govt of Odisha, and Economic Survey 2021 respectively. We also analyses the Public Distribution System (PDS) functioning of at micro level with respects to achieve the objectives food security (i.e., consumption) and economic distribution during COVID-19 by taking data from different published journals. As the PDS is one of the popularist welfare public policy adopted by the government of India since 1950. The impact of floods and cyclones on food insecurity are also discussed by taking data from Directorate of Agriculture and food

Production for the last 10 years. The study found that COVID-19 has had an effect on the ability of vulnerable households to access enough quality food for their families. Lack of income, job losses and inflation are the main obstacle to access enough food during COVID-19 lockdown. Simultaneously, disruptions in supply of food system, irregular of the Public Distribution System and Mid-day meals also affected the food security. The study suggests that, to increase the quantity of providing food and cash assistance to the vulnerable while exploring creative longer-term solutions, including strategies to reach the most vulnerable more efficiently and effectively.

**Key words: Food Insecurity, Public Distribution System and COVID-19.**

Providing nutritious food for all people is an important objective of an ideal food security policy. Nutritious food has its implications on physical activity, mental activity, fighting against diseases and growth and well-being of individuals. It has been empirically found that, working capacity of individuals are positively related with their physical fitness and mental conditions, which is again positively linked with their earning and actively participating in the process of country's economic growth. Therefore, providing food security to all or to maximum number of persons in a country not only contribute to the overall wellbeing of the individuals of the country, in which all the human development indicators are included, but also it may help to stimulate the country's economic growth. Thus, it is important to provide food security to all to achieve wellbeing of the people as it is better off both human development and economic growth as well.

The food production of World relatively increased more than the population growth. Both the developing and developed countries overall growth was increased over a period of time, but still there is abundant evidence that growth alone does not necessarily results to achieve food security of a nation (Jakhar and Marimuthu, 1998). In developing countries to achieve well-being of the individuals many a slip between cup and lip, between a rises in aggregate average incomes and bettering food insecurity.

Since 70s, India has achieved self-sufficiency in food grain production, has surplus stocks of food grains, and has even begun to export food grains (Government of India [GoI], 2004, p. S-21). This indicates that India has achieved food security. On the other hand, in Long-Term Grain Policy this view was challenged by the High-Level Committee appointed by the Govt. of India. It found that the surplus stocks of food grains to the decline in per-capita cereal consumption, rather than to increases in food production in recent decades (GoI, 2002b). As per its findings, more than 70% of the population had a per-capita energy intake less than 2100 kcal/day for some years since 1993-94. The Committee revealed that the bottom 80% of rural households and the bottom 40% of urban households, respectively, spend more than 60% of their total expenditures on food. In other words, the magnitude of food insecurity by this food share criterion is more than the incidence of poverty in India.

Even before the outbreak of COVID-19, the global food systems were already at a critical stage, as also discussed in the 2020 Global Food Policy Report .As of 2018, more than 820 million people worldwide did not have secure access to food (p. 6). The sudden emergence of COVID-19 pandemic has currently worsened the already existing concerns of food insecurity. The closure of restaurants and other food service facilities led to a sharp decline in demand for certain perishable foods, including dairy products, potatoes and fresh fruits, as well as specialty goods such as chocolate and some high value cuts of meat (Lewis, 2020; Terazono and Munshi, 2020). The World Food Programme estimates that an additional 130 million people will face acute hunger as a result of the crisis, nearly doubling the 135 million people already facing acute hunger (Khorsandi, 2020).

In the covid-19 lockdown protection measures were put at various administrative levels, Govt. of India also announced a huge stimulus package of 20 lakhs crores Indian Rupees to alleviate the economic impacts of COVID-19. Nonetheless, the negative consequences of India's imposed lockdown have emerged in the shape of economic crisis, critical migration problem and falling human development. In India (a developing country), still 27% of the population is living without adequate food, and they are living Below Poverty Line even though ample amount of food grains is produced in the country. Estimates of cereal deprivation as measured by different indices were the lowest for the state of Orissa (rural as well as urban).

The COVID-19 pandemic that has spread rapidly and extensively around the world since late 2019 has had deep implications for food security and nutrition. The Global lockdown results not only a major disruption to food supply chain but also a major economic slowdown. The pandemic crises resulted in higher prices of foods, putting food out of reach for many, and undermining the right to food and stalling efforts to meet the second Sustainable Development Goals (SDG) “Zero hunger”. With an aim to bridge this gap, this paper discusses the impact of covid-19 on food security a specific case of Odisha State is examined.

## REVIEWS OF LITERATURE

Sukhwani et al (2020), try to examine the urban-rural supply chain disruption in the covid-19 lock down period. They have taken the case study of Nagpru district of Maharastra one of the most covid-19 affected states. The objective of the study was to explore the role of rural-urban inter-linkages of food supply chain in food security. The study was based on primary data which were collected through face-to-face interviews to the officials of covid-19 supervisor and also conducted online survey to access the people’s perception. The study has taken 12 indicators into 4 dimension to measure food security i.e., 1) Food availability (in-house availability, market availability and current stock), 2) Food accessibility (physical access, market price and institutional support), 3) Food consumption (nutritional adequacy, local preferences and food quality) and 4) Food stability (food supply, food prices and information access). The study found that the traditional supply chain was break down during covid-19, which result shutdown of wholesale shop (implies urban-rural supply

chain disruption). The study concludes that local food system was adversely affected by the pandemic lockdown. The study suggests to conduct more research to know the impact of covid-19 on food system.

Summerton (2020), studies the effects of Covid-19 lockdown on the 4 dimension of Food security and also critically evaluated the Government schemes which are introduced and existing for the food security. The main objective of the study is to explore how the 4 dimension of food security (i.e., physical availability of food, economic and physical access to food, food utilization and stabilization of them) were faces problem due to pandemic lockdown. The study found that along with poor the informal sector (the large portion of total population) was severely affected with respect to mainly quality and variety of food.

Alaimo et al (1998), examined the food insufficiency in the America. The objectives of the study were to estimate prevalence of food insufficiency and to explore food insufficiency socio-demographic characteristic. The study was based on the NHANES III (National Health And Nutrition Examination Survey- III) cross-sectional household survey conducted in two phases between 1988 and 1994 in America. NHANES III consisted of 2 components: (1) a household interview administered in the home, which included a family questionnaire, and (2) an interview and examination conducted in a mobile examination centre. They used logistic regression model to examine the relationship between food insufficiency and other factors such as Poverty, Race, Education, Employment, Health etc. they found that 4.1% food insufficiency prevalence in the America. The logistic regression result shows that food insufficiency was strongly association with Low-income, Employment, Health Insurance and Education. The study suggests to formulating nutrition programmes and policies.

CFS (2020), critically examined the covid-19 effect on food security, global economic recession and loss of livelihood. The committee also critically evaluated the effect arises due to disturbance in food supply chain in pandemic lockdown time. The main objective of the study is to examine impact of covid-19 on food security and nutrition. They use 6 dimension of food security and nutrition i.e., access, availability, stability, utilization, agency and sustainability. They find that all the 6 dimensions were negatively affected by the pandemic lockdown. The study suggests to implements more robust diverse and resilient distribution system, including shorter supply chain and territorial markets.

Mukherjee et al (2020), they try to examine the effect of covid-19 lockdown and social-physical distancing on agriculture and labour forces of the eastern-region of India. The objectives of the study were to explore the implication of the pandemic on disruption in supply chain, problem of labour and cash shortage for agricultural activities. The study found that due to lockdown the agricultural operation were disruption and food supply, labour and cash shortage were adversely affected. Which leads to supply push food inflation and affect the food security. The study suggests to immediate solving input supply and market access problem, promote home delivery of foodstuffs and e-commerce and cash financial support to farmers and agricultural workers as well as unemployed informal sectors.

Suryanarayana and Silva (2007), they try to examine whether the food insecure is larger than poverty. The main aim of the study was to estimate the incidence of poverty and food insecurity at the national and state levels (17 major state separately) and to examine how far their magnitudes tally across states. They have taken deprivation of two dimension of food insecurity i.e., economic access (per capita consumer expenditure) and physical access (food grain consumption and calorie intakes). The study is based on 55<sup>th</sup> round NSS data on household consumer expenditure of per capita consumption, calorie intake and other related parameter for the year 1999-2000. The study found that Orissa stands out as a state with the highest incidence of poverty, but lowest incidence of cereal deprivation. The study also found from the cross-sectional data, under-nutrition can't be removed by single direct or indirect income transfer alone. He studies suggests to nutrition education programmes to influence consumer choice.

Leroy et al (2015), they made a critical review on the measurement of food access, the one among four pillar of food security. The objective of the study is to bring clarity in the assessment of the food access dimension of food security at the household and individual level. They used nine indicators and grouped them in three broad categories: experience-based (the experiences of adults and children in households, as reported by an adult respondent for the household), coping strategies (the coping strategies are organized in four basic categories: dietary change, short-term measures to increase household food availability, short-term measures to decrease the number of people to be fed, approaches to rationing or managing the shortfall) and dietary diversity (A variation of the dietary diversity score is the Food Consumption Score-FCS). They recommend the use of experience-based indicators, Household Dietary Diversity Score (HDDS), or Food Consumption Score (FCS) to assess household access to energy, experience-based indicators to assess household access to diet quality and individual dietary diversity scores for women or children to assess individual access to diet quality, defined as micronutrient adequacy.

#### OBJECTIVES-

1. **To examine the availability & Access pillar of food security during covid-19 period.**
2. **To find out how Public Distribution System and mid-day meals were an effective with respect to covid-19 period.**
3. **To examine the effect of natural disaster on food security in covid-19 period.**

#### FOOD SECURITY: DEFINITION AND CONCEPTUAL FRAMEWORK

The most commonly used definition was agreed upon at the 1996 World Food Summit holds that food security represents “a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. There are three sources to availed Household food security i.e., 1) non-market mechanism, 2) Market



mechanism and 3) Use of natural resources or common property resources. This study is mainly considered with the first aspect. The Non-market mechanism is a system which is regulated by some external agents, rather than the free operations of demand and supply forces like in the free market. The government policy plays an important role in this system to providing food security of the households or concerned individuals. The 4 pillars of food security are availability, access, utilisation and stabilisation.

- Food Security
- 1. Availability
  - 2. Accessability
  - 3. Utilisation
  - 4. Stabilization

The pandemic is affecting all four pillars of food security: 1) availability (is the supply of food adequate?), 2) access (can people obtain the food they need?), 3) utilisation (do people have enough intakes of nutrients?), and 4) stability (can people access food at all times?). COVID-19 is most directly and severely impacting access to food, even though impacts are also felt through disruptions to availability; shifts in consumer demand toward cheaper, less nutritious foods; and food price instability. We outline the 2 pillars of food security i.e., Food availability and Food Accessibility.

## 1. FOOD AVAILABILITY-

This pandemic poses several major threats the food availability pillar. Food security crises are often due to sharp declines in food production. In India, farm production is mostly labour intensive, with many processes such as rice planting and harvesting of staple crops. It was affected as there is shortage of labour, cash problems; lack of supply of inputs, weak health arises due to covid-19 infections. Food was unavailable at covid-19 lockdown because of disruptions in the food supply chain.

Table no-1: Growth performance of Odisha and India at constant price (2011-12)

Year	Agriculture		Sector-wise Growth Rates				GDP/GSDP	
	India	Odisha	India	Odisha	India	Odisha	India	Odisha
2012-13	1.49	15.85	3.27	-0.88	8.33	7.41	5.46	5.36
2013-14	5.57	-4.16	3.79	16.23	7.66	7.79	6.39	9.26
2014-15	-0.22	7.84	7.00	-7.01	9.81	7.75	7.41	1.80
2015-16	0.65	-12.73	9.58	14.42	9.44	9.42	8.00	7.97
2016-17	6.80	19.92	7.72	19.99	8.46	3.99	8.26	15.44
2017-18	5.93	-10.99	6.35	7.94	6.92	9.11	7.04	2.18
2018-19	2.41	7.67	4.88	2.73	7.74	4.48	6.12	4.23
2019-20	4.05	11.92	0.92	3.61	5.55	6.92	4.18	5.21
2020-21 (AE)	3.40	-6.54	-9.57	-8.83	-8.77	-3.18	-7.73	-4.92
AAGR 2012-13 to 2019-20	3.34	4.42	5.44	7.13	7.99	7.11	6.6	7.1
AAGR 2012-13 to 2020-21	3.34	3.20	3.77	5.36	6.13	5.97	5.01	5.72

Source: DE & S, Odisha

The above table no- 1 shows that at constant (2011-12) basic prices, the economy of Odisha has grown at 7.05 per cent per annum during 2012-13 to 2019-20 and -4.92 per cent in 2020-21 (AE) in terms of GSDP and at 6.41 per cent and at -6.20 per cent respectively as per GSV. Food security crises are often due to sharp declines in food production. In the Industry sector all the four-sub sector (Mining and Quarrying, Manufacturing, Utility services and Construction) experienced negative growth in 2020-21 due to the Covid-19 mandated transport restrictions and factory shut downs. Similarly, in the service sector growth to be negative in 2020-21. Again, within the services sector, the hotels and restaurants sub-sector was hit the hardest by Covid-19 with a -54.54 per cent growth in 2020-21 over 2019-20.

## 2. FOOD ACCESSIBILITY-

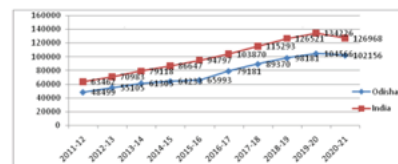
More than any other dimension of food security, food access has arguably been the most affected by the COVID-19 crisis. The global economic recession caused by lockdowns has had a very negative impact on people's ability to access food. As the crisis drags on, short-term coping strategies (e.g., savings, the selling of animals and assets) are reaching their limits or have been exhausted, and in developing countries have limited capacity to provide extensive social safety nets (Gerard *et al.*, 2020). One study, conducted in India (the states of Haryana and Odisha) directly asked farmers about affordability since the start of the lockdown. The study shows large differences between the richer Haryana state, where in the period after the lockdown (April 2020) approximately 5% of farmers reported difficulties to afford sufficient variety of food, and the poorer state of Odisha, where baseline instances of food un-affordability were already high (approximately 90%). Food access was affected negatively since the start of the pandemic and hit poorer household to a larger degree. This means that, in the absence of social safety nets, spending on food declined as incomes declined during the COVID-19 pandemic.

Table no- 2: Per capita income of Odisha and India at current price (Rs)

Year	Odisha	India	Difference (India-Odisha)	PCI-Odisha as per cent of PCI-India	Growth Rate of PCI-Odisha	Growth Rate of PCI-India
1	2	3	4	5	6	7
2011-12	48499	63462	14963	76.42		
2012-13	55105	70983	15878	77.63	13.62	11.85
2013-14	61305	79118	17813	77.49	11.25	11.40
2014-15	64233	86647	22414	74.13	4.78	9.52
2015-16	65993	94797	28804	69.62	2.74	9.40
2016-17	79181	103870	24689	76.23	19.99	9.57
2017-18	89370	115293	25923	77.52	12.87	11.00
2018-19	98181	126521	28340	77.60	9.86	9.74
2019-20	104566	134226	29660	77.90	6.50	6.09
2020-21	102156	126968	24812	80.46	-2.30	-5.41

Source: DESI, Odisha, CSO and Government of India Press Release of First Advance Estimates on 7 January 2021

Per capita income is an acceptable indicator of cardinally measuring the relative standards of living of the people of a state or a nation. The above table no 2 shows that, the growth rate of per capita income both Odisha and India were declined for the year 2020-21 with respect to the year 2019-20. The impact of COVID-19 is distinctly visible in lowering the per capita income during 2020-21 against 2019-20. This is shown by the below figure: 1.



Source: DESI, Odisha, CSO and Government of India Press Release of First Advance Estimates on 7 January 2021

Figure no. 1: Per capita income of Odisha and India at current price (Rs)

Labor is a primary factor of production that supplies the manpower, expertise and skill in need of making goods and provides various services. An overwhelming majority of our population depends on their own labor as the dominant source of livelihood, through its productive use, either in self-employment or in work for wages. Gainful employment of workers is considered as the fundamental basis of sustainable production,

income generation, livelihood, food security, standard of living and economic development. Therefore, it is an essential to study on labor and employment. These losses have affected low wagedworkers, some farmers, and informal traders and hawkers. There is huge job loss due to lockdown. This is shown by the below table no- 3.

Table no- 3: Registration, Notification of vacancies and placement through Employment exchange in Odisha

Year	Registration made during the year	Vacancies Notified	Placement				Vacancies Notified as % of Registration	Placement made as % of Registration
			Total	SC	ST	Female		
2017	222164	182	759	95	226	129	0.081	0.341
2018	175927	209	1674	336	404	279	0.118	0.951
2019	175359	188	1053	327	220	139	0.107	0.600
2020 (up to 31.05.20)	27446	09	52	07	13	06	0.032	0.189

Source: Directorate of Employment, Government of Odisha

The above table no- 3 shows that, the number of placements made stood at 759 in 2017 which rose to 1674 in 2018 but then came down to 1053 in 2019 and again to 52 in 2020. The losses of job indicate reduction in the purchasing power in the hands of people, which ultimately adversely affected the accessibility pillar of food security.

Employment generation in the organized sector is a great indicator of a state's employment situation because this sector provides quality employment with social security. In one hand, losses of job in organized sector and at the same time the demand for and participation rate increases in MGNREGs work from 2015-16 to 2019-20. This indicates that people's standard of living has fallen during COVID-19. It is shown by the below table no- 4. It may also be seen that the women component of person-days generated is showing an increasing trend from 2015-16(38per cent) to 2019-20(43per cent).

Table no- 4: Person days of employment generated under MGNREGS in Odisha

Year	SCs	STs	No. of Person-days generated ( in Lakh)		Percentage Share of	
			Total	Women	Women	SC/ST
2015-16	141.8	372.8	892.7	339.4	38.0	57.7
2016-17	124.3	292.3	773.4	307.9	39.8	54.0
2017-18	152.9	338.7	922.1	386.0	41.9	53.3
2018-19	133.7	294.6	830.3	348.6	42.0	51.6
2019-20	171.3	395.98	1115.72	483.0	43.0	50.84

Source: Panchayati Raj & Drinking Water Department, Government of Odisha

Alike per capita income, per capita consumption expenditure cardinally measures the standard of living of people in a state. But unlike income, both the size and the pattern of expenditure have greater pertinence in determining the standard of life. There is negative relationship between inflation and real income of the people. The inflation has directly affected households' ability to purchase enough food as the food price rises during the COVID-19 lockdown. This has beendemonstrated by the below table no- 5.

Table no- 5: Inflation in Odisha and India

year	Rural		Urban		Combined	
	Odisha	India	Odisha	India	Odisha	India
2014-15	7.2	6.2	5.8	5.7	6.8	6.1
2015-16	7.5	5.6	3.6	4.3	6.4	5.0
2016-17	5.5	5.0	3.4	3.8	4.0	4.1
2017-18	2.0	3.6	3.0	3.6	2.2	3.6
2018-19	2.1	3.0	3.7	3.9	2.6	3.4
2019-20	4.1	4.3	6.1	5.4	4.6	4.8
2020-21 (Apr-Nov)	9.3	7.0	6.9	7.0	8.6	6.9



Source: Economic Survey 2021

The above table no- 5 indicates that, the inflation rate for both rural and urban areas of both Odisha as well as India has record highest in COVID-19 lockdown period during the period 2014-15 to 2020-21. Inflation as per CPI of Odisha rose to 8.6 per cent in 2020-21 (Apr-Nov) from 4.6 per cent in 2019-20 in comparison to the all-India inflation which rose from 4.8 per cent in 2019-20 to 6.9 percent in 2020-21 (Apr-Nov).

#### PUBLIC DISTRIBUTION SYSTEM AND MID-DAY-MEAL DURING COVID-19 LOCKDOWN

PDS is one of the most effective platforms through which people have been benefited During the COVID-19 period. The integrated management of PDS portal which gives real-time data on transactions under ONOC shows that in the entire month of May there were a total of 378 transactions (3077 beneficiaries) under ONOC and 510 transactions (3932 beneficiaries) in June. This has increased to 1859 transactions and 12,971 beneficiaries in July but still a very small number compared to the number of migrants in the country. The Covid-19 survey conducted by the Azim Premji University, for instance, found that during the lockdown about 20% of vulnerable households did not receive any rations, while about 50% of households did not get a single cash transfer (Lahoti, et al. 2020) clearly showing the relative effectiveness of PDS over other relief measures. Similarly, the Government of India announced that an additional 8 crores migrant workers who did not have ration cards would be given 5 kgs of free grains and 1 kg of free dal for two months as part of the Atmanirbhar package (June and July 2020). However, only the 13% of the allotted food grains have been availed to the returning migrant workers under this scheme (Sharma 2020). In Delhi, it was found that children were given a cash transfer only for the few days in March when school was closed after which there was nothing (Iftikhar 2020).

#### IMPACT OF NATURAL DISASTER ON FOOD SECURITY DURING COVID-19

Natural calamities like cyclone, drought, floods and pest attack are common features in Odisha. Almost every year or in alternate year, one part or the other of the State is hit by natural calamities of vary in intensity and agricultural production is badly affected. Table no -6 shows the details of natural calamities affecting Agricultural Production and Economy of Odisha. It is one of the most economically backward states in India, nearly 27% of its population is below the poverty line. Their socioeconomic vulnerability, combined with low coping capacity, turns most hazards into disasters. The erratic geo-climatic conditions could also be adding to disasters, as severe floods in major river basins are common. Frequent disasters force the state to focus on repair, reconstruction, and preparedness or on relief and rehabilitation; it has little scope to engage in developmental activities. In last decade that is from 2010 to 2020 the state has experienced many high floods and cyclones. Disasters affect the economic system in multiple ways, such as destroying assets and factors of production; affecting consumption, employment, saving and investment potential etc.; and imposing both direct and indirect costs, the identification and assessment of which has been the subject of much discussion.

Table no- 6: Natural calamities of last 10 years

Year	Natural Calamities
2010	Flood, Heavy Rain, Drought & Unseasonal Cyclonic Rain
2011	Drought & Flood
2012	Drought & Flood
2013	Very Severe Cyclonic Storm "Phailin" / Flood
2014	Very Severe Cyclonic Storm "Hudhud" / Flood
2015	Drought, Flood & Heavy Rain
2016	Drought, Flood & Heavy Rain
2017	Flood, Heavy Rain, Drought & Pest Attack, Unseasonal Rain
2018	Cyclonic Storm "Tali" and "Pethai" / Drought
2019	Extremely Severe Cyclonic Storm "Fani" and "Bulbul"
2020	Severe Cyclone "AMPHAN" and heavy flood

Source: Directorate of Agriculture and Food Production (5 Decades of Odisha Agriculture Statistics-2020)

The above table no-6 shows about the natural calamities in Odisha in last 10 years. Odisha has faces two extremely severe cyclonic storm "Fani" and "Bulbul" in the year 2019. Similarly, in the year 2020, the severe cyclone and heavy flood "AMPHAN" has hit the Odisha. As due to flood and storm the people lost their lives, homes, livelihood, assets, agricultural and other productivity. Thus, it ultimately adversely affects the food security of the people of Odisha during COVID-19. To recurring disasters put a heavy economic burden on a state and may lead it into a poverty trap if their impact is beyond its reconstructive capacity. These natural calamities also adversely affected the food security.

## CONCLUSIONS-

Emerging as a public health crisis, the COVID-19 pandemic has ensured several negative effects, which have directly and indirectly threatened the food and nutrition security of vulnerable populations across the country, including Odisha. The study found that COVID-19 has had an effect on the ability of vulnerable households to access enough quality food for their families. Lack of income was the main obstacle to access enough food during COVID-19 lockdown. Simultaneously, irregular of the Public Distribution System and Mid-day meals also affected the food security. The present study concludes –

Firstly, as regards availability pillar of food security in Odisha, we find that during the COVID-19 there is sharp decline in all the 3 sectors i.e., Agricultural sector from 11.92% in 2019-20 to -6.54% in 2020-21, Industrial sector from 3.61% in 2019-20 to -8.83% in 2020-21 and Service sector from 6.92% in 2019-20 to -3.18% in 2020-21. Where as in Odisha before COVID-19, there was no dearth of food grain supply and remained at a level higher than that of India considering 1960 to 2018. Simultaneously, the accessibility pillar of food security also most affected during COVID-19. The growth rate of Per Capita Income of Odisha during COVID-19 declined to -2.30 in 2020-21 from 2019-20. The above table no. 3 shows there is huge loses of job in Odisha during COVID-19 i.e., 8.6% in 2020-21 from 4.6% in 2019-20. These are directly affected the household's ability to purchase enough food. This shows that during COVID-19, the accessibility pillar of food security was most affected.

Secondly, as regards the performance of PDS along with Mid-day meals, it is found that there are some difficulties in PDS and Mid-day meals distribution due to the lockdown restriction and social distancing during COVID-19. This, ultimately affects the food security. Even before COVID-19, absolute amount of food grains distributed in Odisha through PDS was always less than many other states during 1961-2018.

Thirdly, the extremely cyclonic storm “Fani”, “Bulbul” and “Amphan” were faced by Odisha during COVID-19. As due to flood and storm the people lost their lives, homes, livelihood, assets, agricultural and other productivity. It gave additional burden to the state as well as to its population. These cyclones have adversely affected the food security among the people of Odisha.

Therefore, to provide adequate and nutritious food to each individual, there are needs to be well-designed food policy, which can be an effective instrument for a country’s economic growth. Which includes-

1- Increase the quantity of food support and expand the coverage Public Distribution System to reach more vulnerable people, as the farm production declined and a reduction in market availability of food grains due to the COVID-19 restriction.

2- Increasing the amount of Cash assistance and coverage of vulnerable households should be explored, as many households reported having cash shortages due to lack of work and loss of income during the lockdown.

3- Continue providing food and cash assistance to the vulnerable while exploring creative longer-term solutions, including strategies to reach the most vulnerable more efficiently and effectively.

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