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Examining Multidimensional Poverty among Rural Households in Odisha: A Pre- and Post-COVID Analysis

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Abstract

The present study examines the effect of the COVID-19 pandemic on multidimensional poverty at the household level in rural Odisha. Alkire-Foster approach (2011) is used to construct the MPI. The binomial logistic regression analysis has been used to study the impact of various socio-economic and demographic variables on multidimensional poverty. This study contributes to the literature with the evidence that the COVID-19 pandemic exerts a negatively on multidimensional poverty as evidenced by the rise in MPI score both at the household and village level. The study reveals that at the village level the MPI score increases from 0.168 during the pre-COVID period to 0.347 during the post-COVID period, whereas at the household level the percentage of multidimensionally poor households increased from about 45 per cent to 77 per cent with a poverty threshold of 0.3333, for the same period. Household deprivation status across dimensions and indicators of multidimensional poverty reveals that economic and education dimensions; and employment, participation in community-level activities, and school attendance indicators upsurge maximum from pre-COVID to post-COVID period. Therefore, reorienting government policies in uplifting educational levels, providing better healthcare facilities, and better employment opportunities at the reach of the rural people is highly essential to face this type of situation in the future.

Keywords*: Alkire-Foster Approach, COVID-19, Logistic Regression, MPI, Multidimensional Poverty, Odisha.*

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Introduction

The eruption of COVID-19, a highly infectious global pandemic of the 21st century, created unforeseen socio-economic, financial, and public health chaos that drives the entire world into darkness. It is the first and foremost major humanitarian challenge that established fear and economic distress across the globe (Pratheeesh *et al.,* 2020). The pandemic has redesigned the world dynamics within a very short period and left its footprint across the globe, let it be an advanced high-income country, middle-income, or low-income country. As of September 2022, the total number of COVID-confirmed cases reported in the World was more than 60 crores including about 64.8 lakhs of COVID death cases[§]. The adverse impact of the COVID pandemic on the economy was primarily driven by three major shocks, i.e., demand, supply, and financial shocks (Chaudhary et al., 2020; Mishra & Mishra, 2020; Barua, 2021). Lockdown, shutdown, and quarantine measures are mostly responsible for the decrease in demand for goods and services, whereas closure of production units, supply-chain disruptions, restrictions on labour movements both at the internal and international levels and reverse migration of workers to their native places were mainly accountable for decrease in the supply of goods and services (Chaudhary et al., 2020; Mishra & Mishra, 2020; Barua, 2021). These adverse demand and supply shocks, along with the reduction in international trade and capital flows bring financial instability that resulting a fall in major stock market indices globally (Barua, 2021). These three shocks have adversely affected the key drivers of economic growth including domestic and international trade, income and employment, prices, and budgets, and consequently sparking an unparalleled global recession to which many stable advanced economies even failed to immune successfully.

Odisha, an eastern Indian state, reported its first COVID-19-infected case on March 15, 2020, from the capital city of Bhubaneswar with one student who was traveling from Italy[**]. Since then, till July 31, 2022, the state was witnessed a four-wave pattern of the COVID pandemic with a total reported virus-infected cases and death cases of 13,13,145 and 9189 respectively (Table 1 & Figure 1). Jagatsinghpur, the coastal district of Odisha, reported its first virus-infected case on May 5, 2020, about two months after the first infected case reported in the state, with four persons who were returned from Surat, Gujrat.[††] As of July 31, 2022, 2.47 per cent of coronavirus-infected cases, and 3.75 per cent of death cases of the state were reported from Jagatsinghpur. Like the state, the district Jagatsinghpur was also witnessing a four-wave pattern of the pandemic (Table 1 & Figure 1).

The four-wave pattern of the pandemic both at the state and district level reveals that the severity of the second wave of the pandemic was very high in comparison to the other three waves. It is found that the total number of infected cases and death cases in Odisha during the second wave of the pandemic was 2.1 and 3.3 times more than that of the first

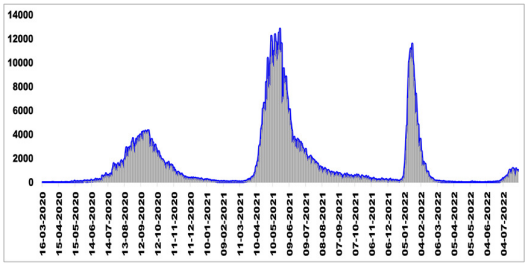
[§]Retrieved from https://covid19.who.int/ on dt. 12/09/2022

[**]Retrived from: https://www.thehindu.com/news/national/other-states/coronavirus-odisha-reports-first-case-as-student-who-returned-from-italy-tests-positive/article61962352.ece on dt.27/07/2022

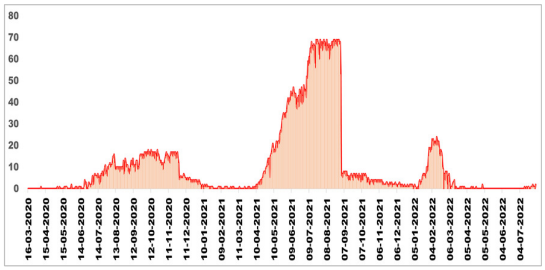
[††]Retrieved from https://sambadenglish.com/jagatsinghpur-registers-four-COVID-19-positive-cases-in-odisha-tally-reaches-185/ on dt. 27/07/2022

wave reported cases respectively. The district-level study also reveals that the total number of infected cases and death cases in Jagatsinghpur during the second wave of the pandemic was 2.04 and 7.39 times more than that of the first wave reported cases respectively. The severity of the first and second waves of the pandemic both at the state and at the Jagatsinghpur district level was mainly due to the reverse migration of the labourers to the state, and a sharp rise in infected cases in the neighboring state of Chhattisgarh respectively[‡‡]. The presence of delta variants of the virus was also accountable for the severity of the second wave as about 93 per cent of the infected cases reported were of delta variants which were more infectious in comparison to other variants of the virus[§§].

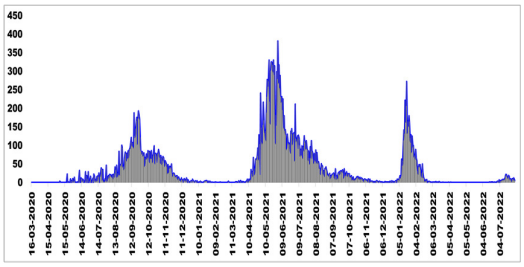
COVID-19 confirmed cases - Odisha



COVID-19 death cases - Odisha



COVID-19 confirmed cases - Jagatsinghpur



COVID-19 death cases - Jagatsinghpur

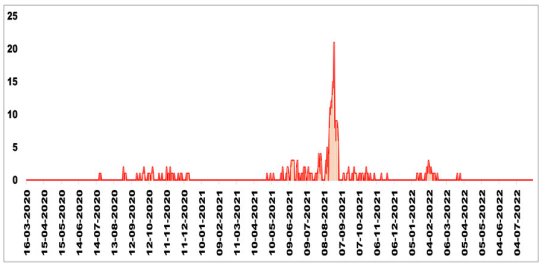


Figure 1: Four-wave pattern of COVID-19 Pandemic (Odisha and Jagatsinghpur)
Source: Authors' construct from the data retrieved from https://github.com/COVID19india/data and https://statedashboard.odisha.gov.in/ as of July 31, 2022.

The multidimensional approach to the 'Quality of Life of individuals includes people's education and health attainment, access to clean water and improved sanitation, better living standard, provision of better employment opportunities, and inclusive development of the society (Odisha Economic Survey 2021-22, pp.247). COVID-19 emerged as a crippling blow to the state in the year 2020 that not only affect people from all sections of society but also in all spheres of their life. The combined stress of the COVID-19 lockdown and the effect of cyclone Amphan in 2020 and Yaas in 2021 also put stress on the

[‡‡]Retrieved from https://frontline.thehindu.com/dispatches/as-the-second-wave-hits-odisha-and-new-COVID-19-cases-increase-dramatically-the-government-resorts-to-night-curfews-and-weekend-lockdowns-to-contain-the-spread/article34365189.ece on dt. 28/07/2022

[§§] Retrieved from https://odishabytes.com/delta-variant-of-COVID-19-more-severe-in-2nd-wave-in-odisha-ils-director/ on dt. 27/07/2022

survival of both people's lives and their livelihoods (Kundu & Santhanam, 2021). The National Multidimensional Poverty Index Baseline Report of India (Niti Aayog, 2021), which was published amid the COVID-19 pandemic period reveals that Odisha occupies the 9th topmost position among Indian states in poverty with 29.35 per cent of the population being multidimensionally poor, while in rural and urban Odisha it was 32.66 and 12.33 per cent respectively. The MPI score for the state was estimated as 0.136, whereas for the rural and urban regions it was 0.152 and 0.057 respectively. Odisha occupied 3rd topmost position among 28 Indian states according to deprivation in using cooking fuel and improved sanitation facility, 5th topmost position in no electricity facility in the household, 8th topmost position according to deprivation in six years of completed schooling, 9th topmost position according to deprivation in using clean drinking water, asset ownership, and possession of bank accounts. Despite of the implementation of various development programmes in the state more than 70 per cent of the total population is deprived of in using clean cooking fuel and improved sanitation, more than half of the population is deprived of in availing better housing facilities, more than one-third of the population deprived of in nutrition, about 20 per cent of the population deprived of in using clean drinking water and in maternal healthcare (Table 2).

Table 1: Life span of COVID-19 Wave (Odisha and Jagatsinghapur)

	Odisha			Jagatsinghpur		
COVID-19 Wave	I	II	III	I	II	III
Date	15.03.2020 - 7.03.2021	18.03.2021 - 05.12.2021	06.12.2022 - 26.06.2022	05.05.2020 - 12.04.2021	13.04.2021 - 03.01.2022	04.01.2022 - 04.07.2022
Life span	368 days	263 days	203 days	343 days	266 days	181 days
Total infected cases	3,38,489	7,11,865	2,38,974	9,254	18,898	3,975
Total death cases	1,971	6,505	699	38	281	26
Days required to reach peak	195	66	44	142	49	14

Source: Authors estimation from the data retrieved from https://statedashboard.odisha.gov.in/

It is also observed that multidimensional poverty is more acute in the rural region in comparison to the urban region of the state, and in all the parameters of multidimensional

poverty, the deprivation percentage in the rural region is higher than that of the urban region. The deprivation gap between the population of the rural region and urban region is very high in indicators such as the use of clean cooking fuel, housing facilities, and in access to improved sanitation facilities.

Table 2: Status of Multidimensional Poverty in Odisha

Parameters		Percentage of population deprived in …		
		Odisha	Rural Odisha	Urban Odisha
Education	Six years of completed schooling	16.67	18.19	8.75
	Child school attendance	4.95	5.20	3.65
Health	Nutrition	37.26	39.60	25.17
	Child mortality	2.23	2.43	1.19
Living Standard	Cooking fuel	80.94	89.30	39.90
	Sanitation	70.43	76.34	39.98
	Drinking water	20.97	22.95	10.80
	Electricity	13.37	14.95	5.23
	Housing	55.81	61.97	24.06
	Assets	19.22	21.49	7.73
	Bank Account	10.94	11.47	8.25
Multidimensional Poverty Index (MPI)		0.136	0.152	0.057

Source: Authors' compilation from the data collected from India: National Multidimensional Poverty Index Baseline Report, 2021, NITI Aayog, Govt. of India.

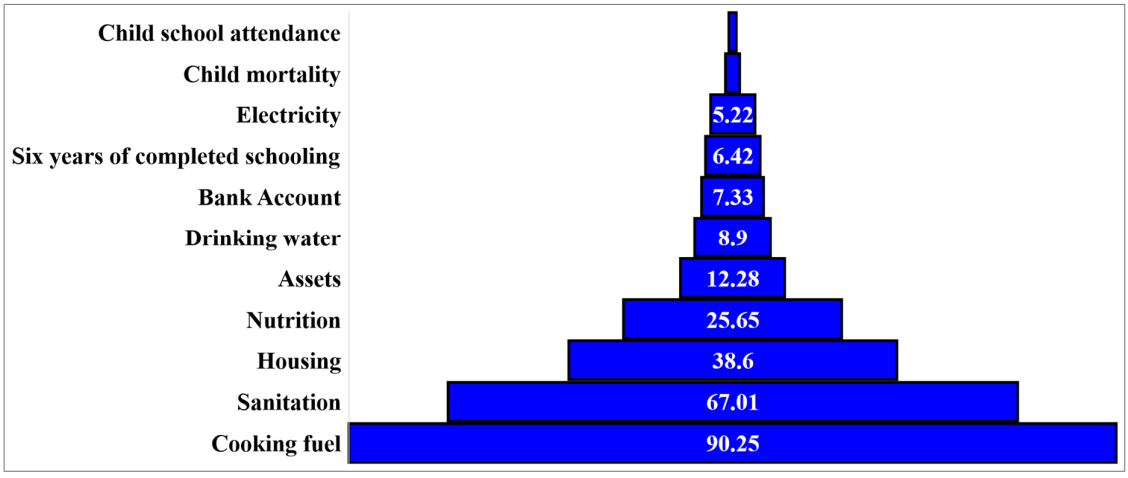


Figure 2: Indicator-wise deprivation status in rural Jagatsinghpur (in percentage)

Source: Authors' construct from the data collected from India: National Multidimensional Poverty Index Baseline Report, 2021, NITI Aayog, Govt. of India.

A similar type of observation was also made in the rural areas of Jagatsinghpur district. Although the district is recognized as the second topmost non-poor district among 30 districts of the state with 11.83 per cent of the population falling under the category of multidimensional poverty, still more than 90 per cent of the rural population was deprived of in using clean cooking fuel, about two-thirds of the population were deprived of in access to improved sanitation facilities, more than one-third of the population deprived of in housing facilities, and more than one-fourth of the population deprived of in nutrition, whereas in child school attendance and in child mortality the deprivation percentage is below two per cent (Fig. 2).

Against this backdrop, the present study examines the status and determinants of multidimensional poverty at the household level in rural Odisha, both at the pre-and post-COVID period. Specifically, the objectives of this study are twofold: (i) to assess the status of multidimensional poverty at the household level during the pre- and post-COVID period, and (ii) to examine the impact of various socio-economic and demographic variables on multidimensional poverty during the pre- and post-COVID period. Alkire and Foster (2011) approach is used to construct the MPI and the binomial logistic regression model is used to examine the impact of various socio-economic and demographic variables on multidimensional poverty. This study contributes to the literature with the evidence that the COVID-19 pandemic exerts a negative impact on multidimensional poverty through an increase in MPI from 0.168 during the pre-COVID period to 0.347 during the post-COVID period for the study village. Further, the severity of the impact of COVID-19 is noticed in two indicators of MPI, i.e., employment and school attendance. This study is of the first of its kind in the context of Odisha, and thus, the novelty of the study is justified. The remaining article is structured as follows: Section 2 reviews the relevant literature, section 3 discusses the data and methodology, section 4 discusses the results, and section 5 makes the concluding remarks.

Literature Review

Poverty has been experienced as a significant shift from the traditional embedded income approach to multidimensional as some people have a low living standard with their income above the poverty threshold level and some people have a highly satisfied living condition with an income level below the poverty threshold (Coromaldi & Zoli, 2012). Poverty is measured by several non-money-metric dimensions such as education, health, living standard, employment, empowerment, environment, social security, and social relationship, and thus globally recognized as a multidimensional concept (Batana, 2013; Dehury & Mohanty, 2015; Montoya & Texeira, 2017; Delgado & Klasen, 2018; Fransman & Yu, 2019; Biswal et al., 2020; Mishra et al., 2021; Mishra et al., 2022). COVID-19 hit is a stark reminder that poverty is not just about income rather it is multifaceted, as many of the poor and marginalized communities across the globe were adversely affected by the virus infection, economic losses, access to vaccines, and other health imperatives[***]. The pandemic has unintended socio-economic consequences where people from the poorest background are

[***] Retrieved from https://feature.undp.org/multidimensional-poverty/ on dt.26/07/2022

the most sufferer in their life (Luo *et al.,* 2020; Martin *et al.,* 2021). To control the spread of the virus, several countries have enforced curfews, quarantine, and lockdowns (Agoramoorthy & Hsu, 2020), and consequently millions of people fail to get basic services such as education, health care, employment, and confront difficulties in their way of survival (Ranjan, 2021). With the fear of catching the virus, people fail to go to healthcare centres to avail the basic healthcare facilities during their need (Bauza *et al.,* 2021). Many patients suffering from chronic diseases and other ailments were also deprived of in availing healthcare facilities and passed away without receiving proper medication (Odisha Economic Association, 2020). Pandemic-led adverse conditions create an obstacle for the poorer to fulfill their basic needs, such as housing, food, clean and safe drinking water, and improved sanitation, and compel them to live in extreme poverty (Buheji, 2020). Worldwide lockdowns led to extensive hardships for people who lost their job and lived in poverty for an indefinite period (Agoramoorthy & Hsu, 2020). The pandemic compels people to leave their work, particularly those who have a low level of education, manual occupations, and informal job (Gumede, 2021). The outbreak destroyed economic activities completely which leads to a decrease in average per capita income and heightened the incidence of poverty (Suryahadi *et al.,* 2020). COVID-19 led shortage of food supply, unattainable healthcare facilities, and lack of water, sanitation, and hygiene compelling a large number of adults, children, and the elderly to remain in poverty (Pereira & Oliveira, 2020).

Lockdowns, business closures, and travel restrictions placed an adverse impact on the household's economic conditions and food security (Bauza et. al., 2021). Financial uncertainty, food shortage, joblessness, and apprehension of future job loss compel people to use their past savings to meet their daily consumption and other basic household expenditures for survival and consequently drive them to fall into severe poverty (Pan & Yue, 2021). The pandemic had increased farm households' vulnerability towards multidimensional poverty through its negative impact on health, employment, industrial development, and income (Liu *et al.,* 2021). Rural farmers are the worst sufferer due to their low level of farm income (Sahoo & Rath, 2020). The lack of marketing facilities due to COVID-19 restrictions creates an obstacle for the farmers to generate income and enforce them to live under the stress of poverty (Timilsina *et al.,* 2020). The deprivation situation was more acute for female farmers due to food insecurity, loss of farm incomes, the decline in employment opportunities, and increased debt traps that brought more hardship both for their spouses and other family members (Kulkarni *et al.,* 2021). Migrant workers are also adversely affected due to the nationwide lockdown, job loss, and return to their native places, which compel them to survive under fear and uncertainty with poor living conditions (Behera *et al.,*2021).

As the COVID-19 pandemic exerts negatively on the socio-economic condition of people globally, thus, research study on multidimensional poverty comparing the pre-and post-COVID period is highly significant for academicians, researchers, and policy planners.

Materials and Methods

The present study was conducted based on the primary survey method to collect required information relating to five dimensions and fifteen indicators of multidimensional

poverty, from each household belonging to Tentoi village of Naugaon block under the Jagatsinghpur district of Odisha, between October-December, 2019. This village is situated 5km east of Naugaon block headquarter. This village is consisting of 472 households with a total population of 1814 and the male and female population constitutes 54.41 and 45.59 per cent respectively[†††]. To assess the impact of the COVID-19 pandemic on multidimensional poverty, each household understudy was surveyed for the second time during October–December 2021. During the second survey, it has been observed that the total number of households exist in the village was 433. Out of these, 67 houses were completely locked and 133 households did not cooperate in providing COVID-19-related information and were thus excluded from the present study. 233 households in total are considered for the present study to assess the impact of COVID-19 on multidimensional poverty.

Table 3: Weight structure and deprivation condition in MPI Calculation

Dimension	Weight	Indicator	Weight	Deprived if …
Education	1/5	Completed years of schooling	1/10	No household member in the age group of 15 years and older have completed five years of schooling
		School attendance	1/10	Any school-age child in the household is not attending school regularly up to the age at which she/he would complete class eight
Health	1/5	Nutrition	1/15	Any household member is underweight or overweight or obese measured by BMI[‡‡‡]
		Vaccination	1/15	Any household member is not vaccinated with any type of age-specific vaccine
		Health insurance	1/15	(i) Any of the household members is not covered under health insurance (private or Govt.), or (ii) household members were insured earlier under health insurance but currently the policy is not in an active position
Economic	1/5	Employment	1/10	None of the household members in the age group of 16 years and older engaged in any type of income-earning activities or lost a job during one year preceding the survey

††† Retrieved from: https://censusindia.gov.in/2011-common/censusdata2011.html

‡‡‡ Overweight (BMI ≥ 23) and obesity (BMI ≥ 25) act as a predisposing factor for non-communicable diseases such as cardiovascular diseases, diabetes, musculoskeletal disorders, and some cancers that kill more people in India in comparison to underweight (BMI < 18.5).
Retrieved from: https://www.nhp.gov.in/disease/non-communicable-disease/obesity

Dimension	Weight	Indicator	Weight	Deprived if …
		Landholding	1/10	The household has not owned any hectare of agricultural land
Living standard	1/5	Housing condition	1/30	The housing condition is inadequate in any of the three components, i.e., floor, roof, and wall
		Electricity	1/30	The household has no electricity
		Drinking water	1/30	The household source of drinking water is not safe
		Sanitation	1/30	Any of the household members practices open defecation, irrespective of toilet facility available or not in the household
		Cooking fuel	1/30	The household uses solid dirty fuel for cooking, irrespective of whether LPG gas is available or not
		Assets	1/30	The household does not own any one of the following assets, i.e., TV, mobile phone, motorbike, refrigerator, car, truck, or tractor
Social connectedness	1/5	Organisation of community-level activities	1/10	None of the household members in the age group of 18 years and older organised any type of community-level activities within one year before the survey
		Participation in community-level activities	1/10	None of the household members in the age group of 18 years and older participated in community-level activities within one year before the survey

Source: Authors' Estimation based on Alkire & Foster (2011) Approach

Alkire-Foster approach (Alkire and Foster, 2011) is used in the study to construct a composite multidimensional poverty index (MPI) with suitable modification to classify whether the households are deprived or not. Five dimensions and fifteen indicators with equal weighting structures were used to construct MPI (Table 3). Each household is assigned a deprivation score (Di), based on deprivation in the component indicator (ci) and the weight assigned to the i^{th} indicator (wi). For deprivation of the household in i^{th} indicator, 'ci' was assigned '1' and for non-deprivation '0'. The composite index for each household is estimated by using the following equation

$$Di = \sum_{i=1}^{15} wici = w_1c_1 + w_2c_2 + ... + w_{15}c_{15} \quad ..... \qquad (1)$$

Household deprivation score lies between '0' and '1', where '0' indicates that the household is non-deprived in all the indicators and '1' indicates that the household is deprived of in all the indicators of multidimensional poverty.

Similarly, the study estimates the incidence as well as the intensity of poverty from a multidimensional poverty perspective at the village level. The incidence of multidimensional poverty (H=q/n) reflects the percentage of multi-dimensionally poor people in the village with a poverty cut-off of 0.3333, and the intensity of multidimensional poverty (A) is the average deprivation score of the deprived persons in the village.

Thus, MPI = H x A …… (2)

Different poverty threshold level, such as (i) 0.20 and less, (ii) between 0.20 and 0.3333, (iii) between 0.3333 and 0.5, and (iv) 0.5 or above is used to identify whether a household and village as a whole are multi-dimensionally non-poor (MDNP), vulnerable to multidimensionally poor (VMDP), multidimensionally poor (MDP), or severely multidimensionally poor (SMDP) category, respectively.

The binomial logistic regression model (Hair et al., 2006, pp.359-387) is adopted in this study to examine the determinants of multidimensional poverty where the log odds of the outcomes (multidimensionally poor and non-poor with a poverty threshold of 0.3333) are modeled as a linear combination of the predictor variables such as social category, gender and education of the head of the household, BPL status of the household, number of household members, and the main occupation of the household. The study takes the following logit model to analyze the impact of different socio-economic and demographic variables on multidimensional poverty.

$$\text{Logit} = \text{In}\left(\frac{P(Yi=1)}{1-P(Yi=1)}\right) = \alpha_0 + \alpha_1\text{General} + \alpha_2\text{OBC} + \alpha_3\text{SEBC} + \alpha_4\text{BPL} + \alpha_5\text{Education of head of household} + \alpha_6\text{Daily wage earner} + \alpha_7\text{Farming} + \alpha_8\text{Business} + \alpha_9\text{Gender} + \alpha_{10}\text{Household size} \quad \ldots\ldots\ldots \quad (3)$$

where:

$P(Y_i = 1)$ is the probability that a person is multidimensionally poor

The coefficients of the logistic regression model have been estimated using SPSS 23 and are presented both in their logit value and odd value. The positive logit coefficient indicates an increase in the predictive probability of the dependent variable with an increase in the independent variable, and vice-versa.

Results and Discussions

Sample Profile

The village 'Tentoi' under study contains 233 households and 784 populations. About 64 percent of households belong to SEBC (Fig 3). Only 3.86 percent of heads of households are illiterate and about 82 percent have qualifications up to a higher secondary level. One-third of total households practice farming as their main occupation followed by service (both

public and private), and business. More than two-thirds of households are identified as BPL categories and 30 percent of households were affected by COVID-19.

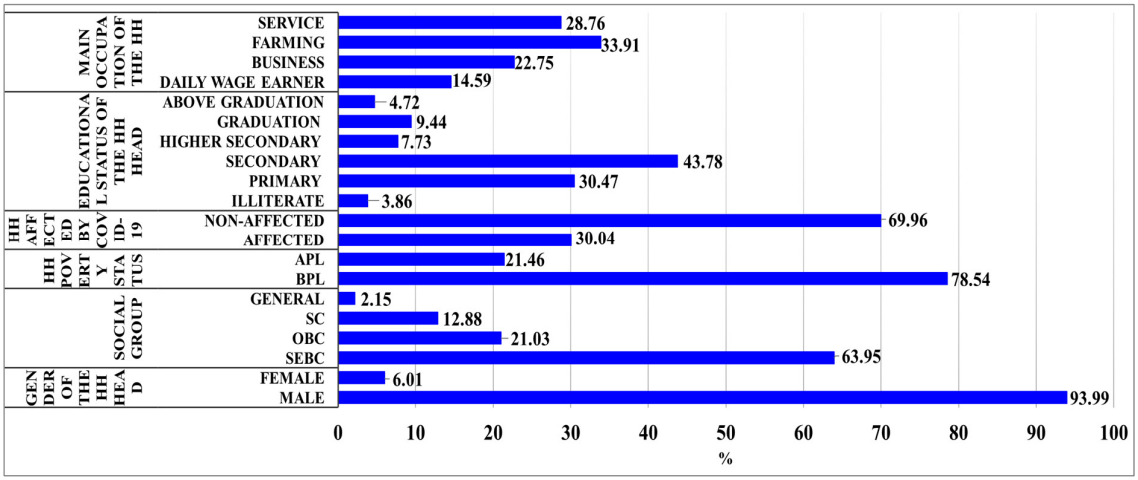


Figure 3: Household Profile
NB: HH – Household Head
Source: Authors' estimation from the field data

Indicator-wise Household Deprivation Status (Pre vs. Post COVID Situation)

A comparative analysis of the deprivation status among the households across 15 indicators reveals the highest level of reduction in employment, participation in community-level activities, and school attendance indicators from the pre-COVID to the post-COVID period, which was primarily due to the adverse impact of government policies to contain the virus such as shutdown, lockdown, social distancing, and closure of educational institutes (Fig 4).

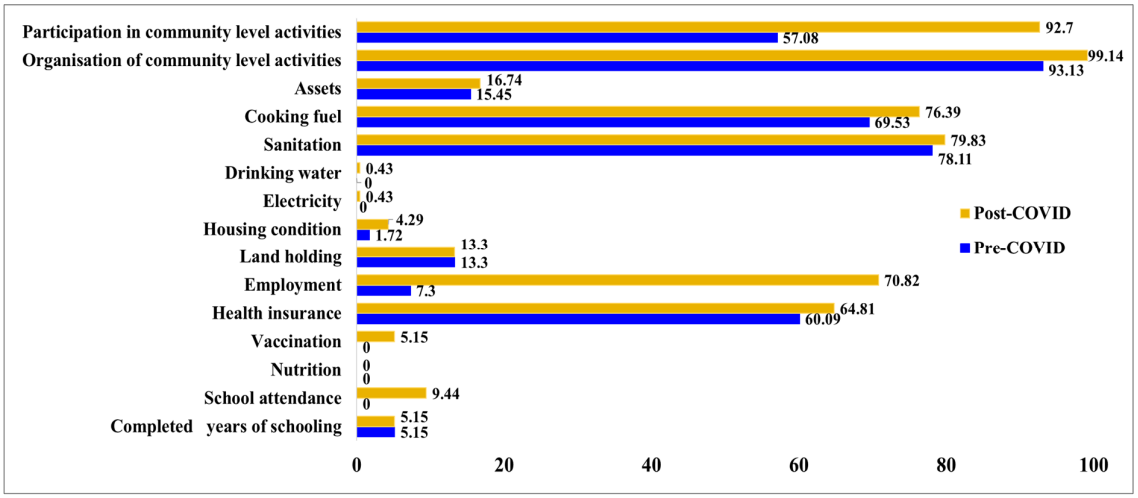


Figure 4: Indicator-wise household deprivation status (in percentage)
Source: Authors' estimation

Dimension-wise Household Deprivation Status (Pre vs. Post COVID Situation)

A comparative analysis of the number of deprived households across five dimensions of multidimensional poverty reveals that in all the dimensions the number of deprived households is higher in the post-COVID period in comparison to the pre-COVID period, and maximum increase in deprivation is observed in the economic dimension (55.79 percent) followed by education (9.01 percent), living standard (6.01 percent), and social connectedness (6.01) (Fig 5).

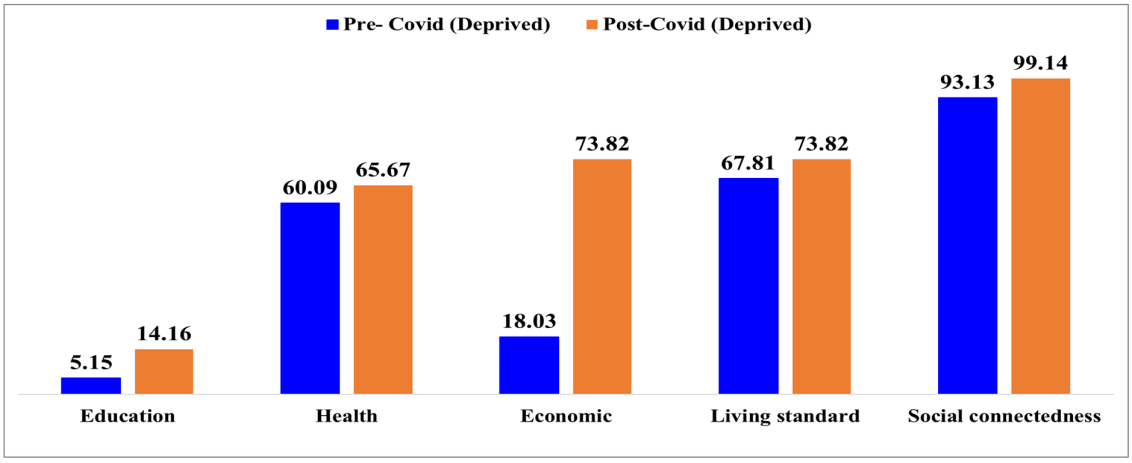


Figure 5: Dimension-wise household deprivation status (in percentage)
Source: Authors' estimation

Status of Multidimensional Poverty

Household deprivation status measured through the composite index MPI reveals that the percentage of households who are multidimensional poor (both MDP and SMDP group together) increased from 45 per cent in the pre-COVID period to 77 per cent in the post-COVID period, whereas the percentage of households under non-poor categories (both MDNP and VMDP group together) decrease from 55 per cent to 23 per cent (Fig 6). The significant Pearson Chi-Square test (71.403) at 1 per cent level of probability reveals that the COVID pandemic influences the level of multidimensional poverty.

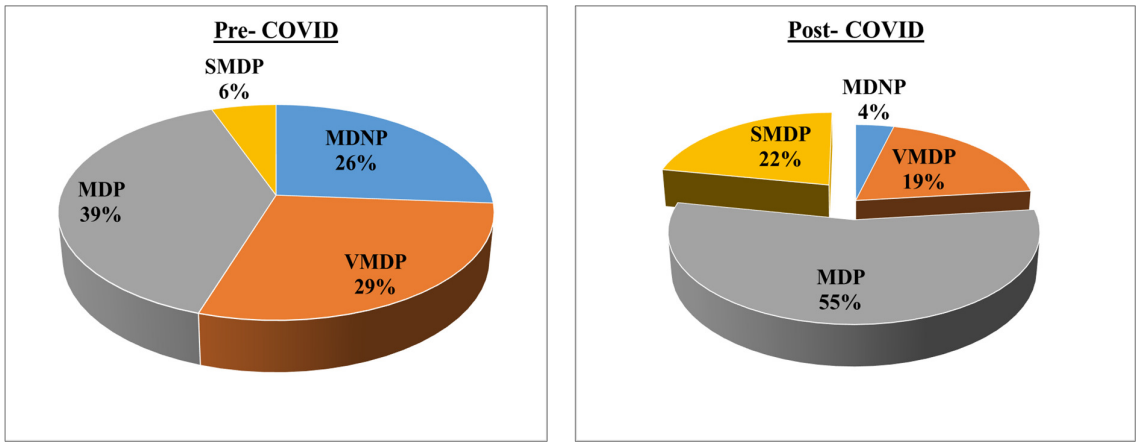


Figure 6: Multidimensional Poverty Status (Pre vs. Post COVID Scenario)
Source: Authors' Estimation based on Alkire & Foster (2011) Approach

Contribution of Dimension and Indicator to MPI

Dimension-wise contribution reveals that the 'social connectedness' dimension contributes maximum to multidimensional poverty, both in the pre-and post-COVID period, whereas the contribution of 'education', and 'economic' dimensions to multidimensional poverty are increasing from the pre-COVID period to the post-COVID period (Fig 7).

Indicator-wise contribution to multidimensional poverty reveals that employment, health insurance, and school attendance are observed to be the most important indicators in accentuating multidimensional poverty during the post-COVID period (Fig 8).

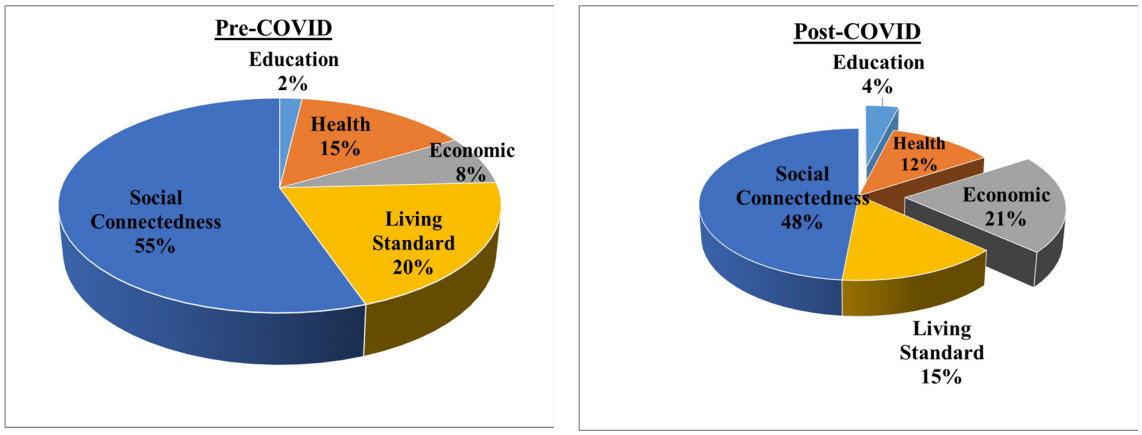
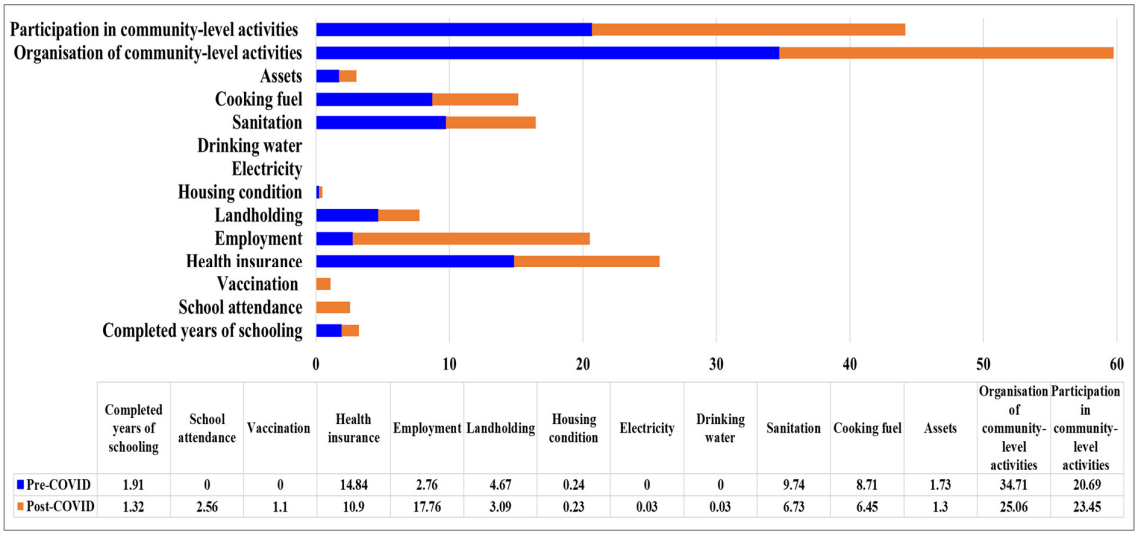


Figure 7: Contribution of dimensions to MPI (Pre vs. Post COVID scenario)
Source: Authors' Estimation based on Alkire & Foster (2011) Approach



	Completed years of schooling	School attendance	Vaccination	Health insurance	Employment	Landholding	Housing condition	Electricity	Drinking water	Sanitation	Cooking fuel	Assets	Organisation of community-level activities	Participation in community-level activities
Pre-COVID	1.91	0	0	14.84	2.76	4.67	0.24	0	0	9.74	8.71	1.73	34.71	20.69
Post-COVID	1.32	2.56	1.1	10.9	17.76	3.09	0.23	0.03	0.03	6.73	6.45	1.3	25.06	23.45

Figure 8: Contribution of indicators to MPI (Pre vs. Post COVID scenario)
Source: Authors' Estimation based on Alkire & Foster (2011) Approach

Status of Multidimensional Poverty across COVID Affected and Non-affected Households

A comparison between COVID-affected households (69 HH) and non-affected households (164 HH) reveals that the gap between the value of MPI from the pre-COVID period to the post-COVID period is increasing both for the COVID affected and the COVID non-affected households (Fig 9).

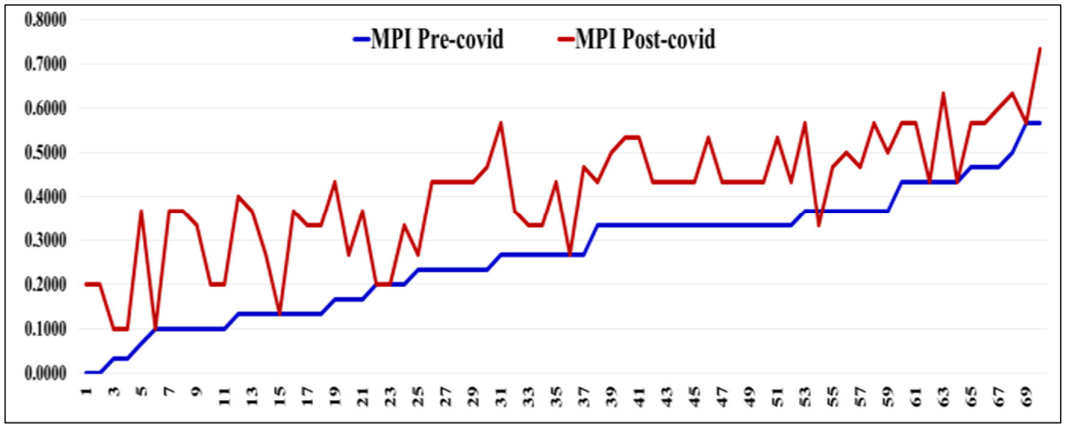
Table 4: Poverty Head-count Ratio, Poverty Intensity, and MPI
(Pre- vs. post-COVID scenario)

Household category	Pre-COVID Period			Post-COVID Period		
	Head-count Ratio (H)	Intensity of Poverty (A)	MPI	Head-count Ratio (H)	Intensity of Poverty (A)	MPI
COVID affected	0.458	0.385	0.176	0.817	0.458	0.374
COVID not-affected	0.418	0.393	0.164	0.743	0.450	0.334
All households	0.431	0.390	0.168	0.767	0.453	0.347

Source: Authors' Estimation based on Alkire & Foster (2011) Approach

The study also found that the MPI score across COVID-affected households, non-affected households, and all the households in the village as a whole, from the pre-COVID period to the post-COVID period is in increasing trend (Table 4). The percentage of multidimensionally poor people at the village level increased by about 34 per cent from the pre-COVID period to the post-COVID period. The statistically insignificant 't' test with a value of 0.7095 (significance at 0.4793 probability level) indicates that the COVID pandemic equally affects the COVID-affected households and COVID non-affected households in terms of multidimensional poverty.

COVID affected household



COVID non-affected household

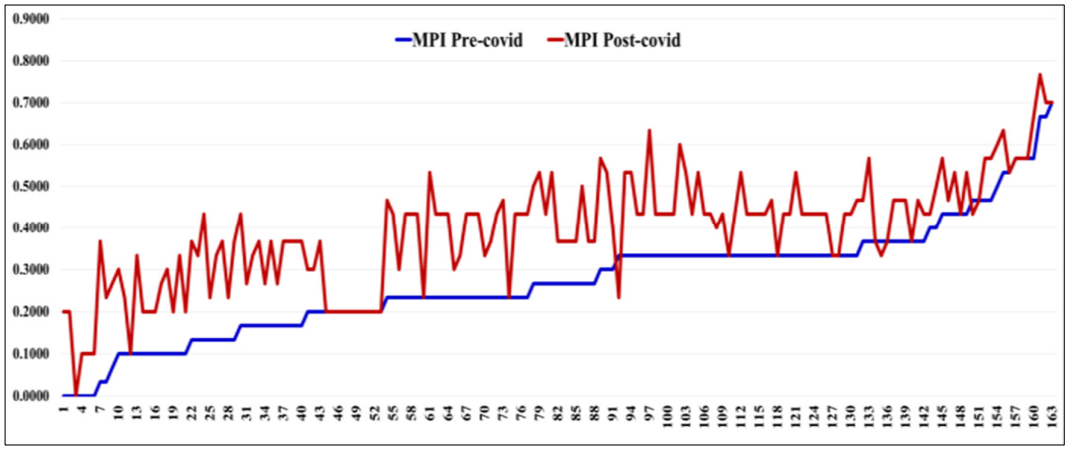


Figure 9: Multidimensional Poverty status among COVID-affected and non-affected households

Source: Authors' Estimation based on Alkire & Foster (2011) Approach

Determinants of Multidimensional Poverty

The binomial logistic regression analysis has been undertaken in the pre-and post-COVID period to study the impact of various socio-economic and demographic variables such as social category, BPL category, education of the head of household, the main activity of the household, gender of head of household, and household size. The baseline categories under categorical independent variables constitute SC under the social category, APL under the income poverty category, service under the main occupation of the household, and female under the gender of the head of the household. The results (Table 5) reveal that an increase in the educational level of the head of household decreases multidimensional poverty both before and after COVID. Similarly, multidimensional poverty increases if the household comes under the BPL category in comparison to the APL category. Poverty level decreases for households coming under SEBC and OBC in comparison to SC households in the pre-COVID scenario, which was not statistically significant during the post-COVID scenario. Multidimensional poverty increases if the main activity of the household is daily wage earner in comparison to service during the pre-COVID period, whereas a significant positive association between the main activity of the household and multidimensional poverty is observed for households pursuing farming and business as their main economic activity during the post-COVID period. No significant influence of gender and household members on multidimensional poverty is observed during both in pre- and post-COVID periods.

Table 5: Determinants of Multidimensional Poverty (Pre- vs. post-COVID)

Variables	**Pre-COVID**				**Post-COVID**			
	B	Wald	Sig.	Exp (B)	B	Wald	Sig.	Exp (B)
General	0.597	0.159	0.690	1.816	-0.346	0.056	0.814	0.707
OBC	-	4.125	0.04	0.263	0.042	0.002	0.96	1.043

Variables	Pre-COVID				Post-COVID			
	B	Wald	Sig.	Exp (B)	B	Wald	Sig.	Exp (B)
	1.335**		2				1	
SEBC	-1.381**	5.695	0.017	0.251	-0.378	0.269	0.604	0.685
BPL	2.526*	10.436	0.001	12.506	1.907*	13.258	0.000	6.734
Education of Head of Household	-0.191*	13.729	0.000	0.826	-0.230*	11.419	0.001	0.794
Daily Wage Earner	1.683*	6.590	0.010	5.380	20.147	0.000	0.998	562138758.161
Farming	0.357	0.615	0.433	1.429	2.289*	13.464	0.000	9.866
Business	-0.129	0.068	0.795	0.879	1.699*	9.098	0.003	5.467
Male	-0.403	0.274	0.601	0.668	1.539	2.544	0.111	4.659
Household size	-0.212	1.880	0.170	0.809	0.050	0.050	0.822	1.051
Constant	0.992	0.623	0.430	2.697	-0.648	0.218	0.640	0.523

Source: Authors' estimation based on the binomial logistic regression model

Conclusion

This study, the first of its kind for rural Odisha, is undertaken with the basic objective of examining the impact of various socioeconomic and demographic variables on multidimensional poverty in the pre-and post-COVID period. The study observed the maximum contribution of the 'Social Connectedness' dimension to multidimensional poverty, both in the pre-and post-COVID period, whereas the contribution of 'Education', and 'Economic' dimensions to multidimensional poverty are increasing from the pre-COVID period to the post-COVID period. Further, employment, health insurance, and school attendance are found to be the most important indicators in accentuating multidimensional poverty during the post-COVID period. The study also observed a significant increase in households coming under multidimensional poverty, i.e., from 45 per cent to 77 per cent during the pre-COVID to post-COVID period. Another significant observation of the study is that the COVID pandemic equally affects COVID-affected households and COVID-non-affected households in terms of multidimensional poverty.

The maximum contribution of the 'social connectedness' dimension to multidimensional poverty is one of the major findings of the study. Social and community participation enables a person to get involved and contribute to the social life to the extent of his/her ability as well as to pursue his/her own goals. Further, social and community participation develops problem-solving skills in the people, making them to take responsibility for their health, and welfare, and also addressing the needs and problems of the community. 'Bhagavata Ghara' or 'Bhagabata-Tungi' in the villages of Medieval Odisha acted as a multipurpose village institution, viz., the village school, the village hall, and the village library, and became instrumental in making the people actively involved and connected with their community. The extinction of 'Bhagavata Ghara', the lack of interest of the rural people in recreational and sporting activities, and the death of village libraries are important reasons for the low social and community-level participation of the people in the study area. Revitalizing these institutions will help in energizing the social connectedness of the rural people.

The study observed an inverse relationship between the educational level of the head of the household and multidimensional poverty in both pre-and post-COVID periods. It is accepted that the increased educational level of a person helps not only in enhancing his/her skill and productivity but also in increasing his/her participation in the capital and labor market. This ultimately improves the living standard of the people and decreases multidimensional poverty. The Governments, both at the Centre and State are committed to providing free primary and secondary education for all girls and boys by enacting and implementing the Right to Education Act, 2009 (RTE), the National Education Policy, and the Odisha Right of Children to Free and Compulsory Education Rules, 2010 in the state. Strict implementation of these policies of the State will be expected to help in increasing the enrolment rate and reducing the drop-out rate in the State.

Another important observation of the study is the falling employment level and the heightening of multidimensional poverty in the post-COVID period. This calls for the generation of employment opportunities to reduce multidimensional poverty in a sustainable manner. 30 Skill Development Centres and 38 Skill Development Extension Centres are in operation in the State to make the unemployed youths employable by enhancing their skill, which is the major strategy adopted by the state government. To make the graduates of ITIs, Polytechnics, and Engineering Colleges ready for global placements, the state government has established the World Skill Centre at Bhubaneswar in the collaboration with ITEES, Singapore, and assistance from Asian Development Bank. To promote rural entrepreneurship and the generation of self-employment activities, 30 Rural Self Employment Institutes (RSETIs) have been set up in the state. Odisha Livelihoods Mission (OLM) has been in operation in the state to enhance the socio-economic condition of the rural poor through the promotion of sustainable community-based institutions and mobilization of Self Help Groups (SHGs). It is expected that these efforts of the state government will be implemented in their true spirit to get the desired outcomes.

The study also observed the significant role of household access to improved sanitation and clean cooking fuel in the determination of household multidimensional poverty. Even if all most all households have latrines of their own, about 80 percent of the households have practised open defecation in both the pre and post-COVID period. Although 1,36,277 LPG connections have been released in Jagatsinghpur district under Pradhan Mantri Ujjwala Yojana (PMUY) as of 1st September 2022[§§§] and almost all households in the study area possess LPG connections, still, about 70 per cent of households are using dirty fuels for cooking. This calls for the implementation of awareness programs regarding the use of household latrines and clean cooking fuel in maintaining a clean environment in rural areas.

It is well recognized that eradication of multidimensional poverty provides a boost to economic growth, develops an educated, healthier, and more engaged workforce, and helps in generating a new source of demand by increasing consumer purchasing power. This can be achieved if we all, as individuals and members of society, and government joins hands together in reducing its menace.

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