OCCUPATIONAL STRUCTURE AND MULTIDIMENSIONAL POVERTY IN RURAL ODISHA : AN EMPIRICAL ANALYSIS

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Abstract: The study is conducted with the basic objective of assessing the magnitude and status of multidimensional poverty in rural Odisha and the role of farming and business activities to alleviate it. Six socio-economic dimensions comprising of sixteen indicators have been used to construct the MPI, using the Alkire-Foster (2011) Method. The study observed that the non-workers are severely multidimensional poor, whereas farming and business groups are multidimensional non-poor. Analysis across farm and business sub-groups reveals that people engaged in livestock activity are most deprived. Dummy variable regression analysis reveals the negative impact of education on MPI.A agriculture is observed to be an important factor in reducing multidimensional poverty. The study, therefore, suggests both reorientation and strict implementation of government policies in increasing the educational level and skill of the people, making agriculture sustainable. This multidimensional poverty study is of the first kind in the context of the individuals engaged in farming and business activities in the Jagatsinghpur district of rural Odisha, and thus, the novelty of the study is justified.

Keywords: Farming, Business, Multidimensional Poverty, Alkire-Foster Method, MPI, Odisha

1. Introduction

Well-being includes all the altitudes of development (AbdElkhalek, 2018). People aspire for long and healthy life, and also knowledge and resources for maintaining a decent living standard (Abd Elkhalek, 2018). Inability to meet basic needs indicates the presence of poverty which leads to low per capita GDP and unemployment deterring the path of the development process (Sinnathurai,2013).UNDP in its MDGs and SDGs emphasize improving human well-being by alleviating hunger and poverty.

Until the 1970s, income was the only dimension used to measure poverty (Marin *et al., 2018*). Income alone failed to capture the true picture of poverty, as poverty is a condition of deprivation reflected through hunger, unemployment, homelessness, health, education, life satisfaction, social injustice, and exclusion (GC *et al.*, 2015; Tanwar *et al.*, 2019; John & Dankawu, 2018; Olarinde*et al.*, 2020; Peter *et al.*,2014). World Bank defined poverty as deprivation of human well-being arising due to deficiency of food, water, shelter, clothing, basic education, primary healthcare, and security and protection against discrimination (Naminse & Zhuang, 2018). And thus, poverty is considered a multidimensional phenomenon.

The underpinning of the multidimensional poverty index (MPI) was first set out by Foster *et al.* (1984). However, the seminal work by Alkire and Foster (2009) is considered an innovative approach for measuring multidimensional poverty (MDP) (Khan & Akram, 2018). The global MPI was designed in the year 2010 by the OPHI and the UNDP by using three dimensions such as education, health, and living standard (Alkire & Santos,2010; Alkire *et al.*,2019; Alkire *et al.*,2020). Although most of the studies on multidimensional poverty are based on the analysis at the household level, these studies misclassify the poor**,** ignores intra-household inequalities, and fails to provides deprivation faced by different groups (Vijaya *et al.*,2014; Delgado & Klasen 2018, Biswal *et al.*, 2020). On the other hand, an individual-level estimation can be able to assess deprivations at the individual level that provides the greatest support to multidimensional poverty analysis (Vijaya *et al.*, 2014; Biswal *et al.*, 2020). Distinct researchers have identified several dimensions of poverty such as education, health, living standard, economic or employment, environment, empowerment, and social relations (Batana, 2013; Dehury & Mohanty, 2015; Idrees & Baig, 2017; Montoya & Texeira, 2017; Yichao & Di, 2017; Delgado & Klasen, 2018; Gallardo, 2020; Khan *et al.*, 2020; Biswal *et al.*, 2020; Mishra *et al.*, 2020; Nam, 2020).

Education is the fundamental path of development. Lack of education lessens basic knowledge, skill, and productivity that further restricts employment opportunities, greater risk of being poor (Niazi & Khan, 2011; Sial *et al.*, 2015; Israr *et al.*, 2020). Through education, an individual can grow and prosper, extend knowledge and freedom, boosts productivity, enhances capabilities that have positive externalities on the society (Niazi & Khan, 2011; Sial *et al.*, 2015; Goli *et al.*, 2019; Israr *et al.*, 2020). Similarly, sound health is the main determinant of well-being and lack of it reduces physical stamina and brings mental suffering, and makes people prone to several diseases (Dehury& Mohanty, 2015). Quality of life is a symbol of improved socio-economic living status (Israr *et al.*, 2020). Low living standard like improper housing, lack of access to electricity, and unhygienic surroundings makes people unhappy. Clean drinking water is crucial for the household's well-being as water contamination causes many diseases like typhoid, cholera, hepatitis, diarrhea, stomach problem (Artha & Dartanto, 2018; Israr *et al.*, 2020). Poor sanitation such as open defecation practices hurts human health and the environment (Artha & Dartanto, 2018; Israr *et al.*,2020; Biswal *et al.*, 2020). Lack of employment opportunities generates psychological stress, loss of motivation in work, low skill and self-confidence, higher morbidity, and disrupts family relationship, and therefore, make the people deprived in economic front (Dehury & Mohanty, 2015; Mishra *et al.*, 2020). Empowerment is a weapon in life

because people can freely utilize inner capabilities (Kyaw & Routray, 2006). Social connectedness is essential for getting information on employment, health, and education and enables oneself to be physically safe (Wagle, 2005; Samuel *et al.*, 2018; Nowak & Scheicher, 2017; Gallardo, 2020). Social isolation deprives people of achieving socio-economic opportunities and enjoying cultural and political rights (Wagle, 2005; Samuel *et al.*, 2014; Samuel *et al.*,2018; Chan & Wong, 2020).

Agriculture is the mainstay of the rural economy which contributes to the development of an economy by providing food and employment (Bhutto & Bazmi, 2007; Lyatuu *et al.*,2015; Bijla,2018; John &Dankawu,2018). Sustainable agricultural practice has an important role to play in light of growing populations, poverty, malnutrition, food insecurity, and the threat of climate change (Adenle *et al.*, 2018). Agricultural productivity stimulates other non-farm activities in rural areas (Bhutto & Bazmi, 2007). Non-farm income is not only able to absorb surplus labor in rural areas, but also improve the quality of life of common people. Small businesses stemming from rural-based activities like animal husbandry, cow and poultry farming, and farming of vegetables play a predominant role in generating income for the rural poor (Koshy & Prasad, 2007; Sowman*et al.,* 2014; Kowo *et al.*, 2019).

Odisha is observed as a hub of regular natural adversities like cyclones, drought, flood, famine, etc. that put the economy of the State to stress (Mishra, 2001; Panda & Sahu, 2011), that leads to overwhelming rural poverty even after so many years of independence (Mohapatra, 2015). The government of Odisha is endeavoring its rich potential for improving the socio-economic development of the State through industrialization & technological up-gradation (Dolai *et al.*, 2016). The Micro, Small & Medium Enterprises (MSMEs) also plays a crucial role in the state in creating large employment opportunities in rural & backward areas for reducing regional imbalances, achieving equitable distribution of national income and wealth, and capable of eradicating poverty (Munda & Swain, 2014; Dolai *et al.*, 2016; Das, 2017).

Against this backdrop, the study is carried on with the basic objectives of (i) assessing the magnitude and status of multi-dimensional poverty among the individuals engaged in farming and business activities in the Jagatsinghpur district of Odisha and (ii) examining the impact of gender, occupational structure, and education on MPI. Alkire and Foster (2011) method is used to construct MPI in order to assess the extent of multidimensional poverty among the individuals engaged in farming and business activities. Furthermore, OLS-based dummy variable regression is used in the study to determine the factors responsible for the multidimensional poverty among the individuals engaged in farming and business activities in the district.This study contributes to the literature the evidence that about 70 per cent of the individuals engaged in livestock farming and 50 per of the individuals engaged in street vending activities in the Jagatsinghpur district of Odisha are either multi dimensionally poor or severely multi dimensionally poor. The empirical evidence also suggests that gender, the levels of education, and the occupational status of individuals engaged in business and farming activities significantly determine the extent of multidimensional poverty in the Jagatsinghpur district. This study is of the first kind in analyzing the multidimensional poverty among individuals perusing different economic activities (farming and business only) for Jagatsinghpur district of Odisha, and thus, the novelty of the study is justified. The remaining of the article is organized as follows: Section 2 reviews the literature; Section 3 presents data and methodology; Section 4 discusses the empirical results; Section 5 concludes.

2. Literature Review

Poverty is mostly a rural phenomenon. Agriculture along with forestry, fisheries, and related activities acts as the heart of livelihood and path of survival for the majority of rural poor who have low skills and

education by providing employment opportunities to them (Udofia & Essang, 2015; Oyakhilomen & Zibah, 2014).Therefore, agriculture is considered as critical for contributing to GDP, maintaining environmental sustainability, and achieving global poverty reduction (Oyakhilomen&Zibah,2014). Several researchers observed the positive role played by agriculture in reducing poverty (Ravallion & Datt 2002; John &Dankawu,2018)whereas others found no such relationship between agriculture and poverty reduction (Kolawole & Omobitan, 2014; Udofia & Essang, 2015).

The increased number of poor and insufficient capacity of farming to generate sustainable livelihood compels the rural economy not to confine only to the agricultural activities (Darry & Kuunibe, 2012). Non-farm economic activities such as masonry, carpentry, repairing work (mechanical), grinding mill, tractor operation, sanitary work, food vending, hairdressing, tailoring, and weaving of clothes become vital for people living on small farms with single agricultural seasons because they absorb surplus labor in rural areas and provides income at the key moments (Darry & Kuunibe, 2012).Rural farming households also engaged themselves in all kinds of non-farm jobs located near to their villages during the off-season for sustenance (Darry & Kuunibe, 2012; Oladimeji, 2015). Micro and small businesses can diversify the source of income by creating employment opportunities, and spreading business activities which helps the poor households cope up with food security to improve their living standard (Ozoh *et al.*, 2020). Small business activities like selling of vegetables, grains, or raw materials, brick making, coir making, carpentry, repairing motor vehicles, electrical repairs, hairdressing, rice milling, through their specialized skill help in employment generation, income enhancement, and poverty reduction (Shaw, 2004; Darry&Kuunibe,2012). Petty traders in rural areas by selling commodities in temporary roadside stallsare capable of earning something during hard times (Shaw, 2004, Darry & Kuunibe, 2012). Thus, both farm and non-farm activities are crucial in reducing rural poverty.

3. Data and Methodology

The study takes a survey method of collecting primary data adopting the multi-stage random sampling between October - December 2020.

Table 1: Sampling Framework

Sample Village	*Total No of Household in the Village	**Sample Household (in No)
Dhunpada	178	28
Erada	335	52
Gangada	529	83
Ghodansa	351	55
Tentoi	472	74
Ura	213	33
Total	2078	325

NB: *Census – 2011 (Govt. of India) information is used to obtain the total number of Households in each sample village. **15.64 per cent of total households in each sample village is considered for the primary survey.
Source: Authors' Estimation of Sample Size

In the first stage, Jagatsinghpur district has been selected randomly out of the top five multi-dimensionally non-poor districts of Odisha [1], viz., Puri, Jagatsinghapur, Cuttack, Khordha, and Nayagarh. Naugaon block, out of eight blocks under the Jagatsinghpur district, i.e., Balikuda, Biridi, Ersama, Jagatsinghapur, Kujang, Naugaon, Raghunathpur, and Tirtol has been selected randomly in the second stage. In the third stage, six villages, i.e., Dhuanpada, Erada, Gangada, Ghodansa, Tentoi, and Urahave been selected randomly out of ninety villages under Naugaon block. Raosoft online sample size calculator is used to select 325 households randomly out of 2078 households in the fourth stage with 95 per cent confidence level and 5 per cent of margin of error (Table 1). 655 adult members belonging to 325 sample households in the age group of 15-64 years engaged in different economic activities (excluding employment in the public and private sector), and non-economic activities, constitute the unit of the study.

Individuals engaged in farming are divided into two subgroups, viz., (1) Cultivation, and (2) Livestock farming, and individuals engaged in different business activities are divided into five subgroups, viz., (1) Street Vendor, (2) Self-employed (involved in unskilled business activities), (3) Self-employed (involved in skilled business activities), (4) Supplier of construction materials, and (5) Service-related business (Table 2).

Table 2: Occupational Subgroups

Sl. No	Occupational Category	Subgroups	Economic Activities
1	F A R M I N G	Cultivation	Engaged in cultivating agriculture and horticulture products, i.e., Cereals, pulses, oilseeds, fruits, and vegetables, with own/rented land.
2		Livestock Farming	Engaged in selling milk and milk products, meat, eggs through livestock farming, with permanently built/rented structure.
1	B U S I N E S S	Street Vendor	Engaged in selling vegetables, fruits, fish, dry fish, plastic stationery items, grain, paddy, pulses, etc., without having a permanently built/rented structure.
2		Self-employed (involved in unskilled business activities)	Working for self in selling grocery items, snacks, gift, and stationery items, automobile spare parts, hardware, and sanitary items, beetle shop, etc., having a permanently built/rented structure.
3		Self-employed (involved in skilled business activities)	Working for self in skilled activities like tailoring, computer repairing, mobile repairing, wood furniture making, motor vehicle repairing, etc., with permanently

Sl. No	Occupational Category	Subgroups	Economic Activities
			built/rented structure.
4		Supplier of construction materials	Engaged in selling construction materials such as sand, bricks, cement, rod, etc., with permanently built/rented structures.
5		Service-related business activities	Engaged in providing different services such as education (coaching centre), health care (clinic and path lab), travels and transport, laundry, saloon, etc., with a permanently built/rented structure.

Source: Authors' Construction

Alkire-Foster method (Alkire and Foster, 2011) with suitable modification is used to construct the composite index using sixteen indicators under six dimensions for identifying deprived and non-deprived individuals adopting equal nested weight structure (equal weight to each dimension and each indicator under the dimension) (Table 3).

Table 3: Dimensions and Indicators of MDP with weight

Dimension	Weight	Indicator	Symbol	Weight
Education	0.1667	Completed year of schooling	SCHOOL	0.1667
Health	0.1667	Nutritional status (measured by BMI)	BMI	0.0833
		Individual vaccination	VAC	0.0833
Standard of Living	0.1667	Housing Condition	HOU	0.0238
		Access to clean drinking Water	WAT	0.0238
		Practicing Open defecation (Sanitation)	SAN	0.0238
		Access to clean energy as Cooking Fuel	ENR	0.0238
		Access to Electricity	ELCT	0.0238
		Ownership of land	LAND	0.0238
		Ownership of Motor vehicle	MV	0.0238
Economic	0.1667	Engaged in any Economic Activity	EMP	0.1667
Empowerment	0.1667	Autonomy in healthcare decisions	AUTHTH	0.0556
		Autonomy to prevent domestic violence	AUTPVIO	0.0556
		Autonomy in employment choice	AUTEMP	0.0556
Social Relation	0.1667	Participation in community level activities	PARCOM	0.0833
		Organization of community-level activities	ORGCOM	0.0833

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

The individual deprivation score is computed using Eq-1.

$$C_i = w_1h_1 + w_2h_2 + \ldots + w_ih_i \qquad \text{(Eq-1)}$$

where, C_i, h_i, and w_i refers to individual deprivation score, deprivation in the component indicator (Table 4), and the weight assigned to the ith indicator respectively.

Deprivation in the component indicator (h_i) takes a value '1' and '0', when the individual is deprived and non-deprived in an indicator respectively. Therefore, C_i ranges between '0' (completely non-deprived) and '1' (fully deprived). All the individuals under study are categorized under four broad groups in terms of the magnitude of 'C_i', viz., multi dimensionally non-poor - MDNP (MPI<0.2),

vulnerable to multi dimensionally poor - VMDP (0.2≤MPI<0.3333), multi dimensionally poor - MDP (0.3333≤MPI<0.5), and severely multi dimensionally poor - SMDP (MPI≥0.5).

Similarly, the study estimates the incidence as well as the intensity of poverty from a multidimensional perspective in the designed occupational groups and sub-groups. Based on these results, the MPI is constructed for all.

Incidence of multidimensional poverty (H) reflects the percentage of multi-dimensionally poor individuals. Thus H = q/n, where 'q' is the total number of multi-dimensionally poor individuals with a poverty cut-off of 0.3333 and 'n' is the total individuals under consideration.

The intensity of multidimensional poverty (A) is the average percentage of deprived individuals in a particular group.
Thus, **MPI = H x A**
Based on the MPI, the study classified the occupational groups and sub-groups into four categories, i.e., (i) MPI below 0.2 as MDNP, (ii) MPI between 0.2 and 0.3333 as VMDP, (iii) MPI between 0.3333 and 0.5 as MDP, and (iv) MPI 0.5 or higher as SMDP.
The influence of education (EDN), gender (GEND), and occupation (OCCUP) on multidimensional poverty have been studies through OLS (dummy variable) (Gujarati& Porter, 2009).

Table 4: Deprivation cut-off across dimensions and indicators of MDP

Dimension	Indicator	Deprived if he or she...
Education	SCHOOL	has not completed 6 years of schooling
Health	BMI	is underweight / overweight / obesity)
	VAC	not vaccinated
Standard of Living	HOU	is living in an inadequate housing condition
	WAT	has no access to safe drinking water
	SAN	is practicing open defecation
	ENR	is using dirty fuel, such as firewood and cow-dung as primary energy for cooking
	ELCT	has no access to electricity
	LAND	has not in possession of any agricultural/residential land
	MV	has not owned the motor vehicle
Economic	EMP	is not engaged in any economic activity
Empowerment	AUTHTH	not capable of taking healthcare decision
	AUTPVIO	not capable of preventing domestic crime/violence
	AUTEMP	not capable of making employment decisions
Social Connected-ness	PARCOM	has not participated in any community-level activities
	ORGCOM	has not organized any community-level activities

Note: 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).
Information retrieved from https://www.nhp.gov.in/disease/non-communicable-disease/obesity
Source: Authors' Construction

The functional form used in the study to examine the relationship between MPI and the factors influencing it is:

MPI = f(EDN, GEND, OCCUP) (Eq-2)

And the econometric specification of Equation (1) is:

MPI = α_1+ β_1DLP+ β_2DUP+ β_3DSE+ β_4DHSE+ β_5DGRAD+ β_6DMALE + β_7DVEN+ β_8 DUNSKIL + β_9DSKIL + β_{10}DSUPL + β_{11}DSERV + β_{12}DLIV + β_{13}DAG + ε_i (Eq-3)

where, (i) MPI is the dependent variable, (ii) DLP, DUP, DSE, DHSE, and DGRAD represents dummy variables for lower primary, upper primary, secondary, higher secondary, and graduation and above educational standards of the individuals respectively, (iii) DVEN, DUNSKIL, DSKIL, DSUPL, DSERV, DLIV, and DAG represents the dummy variable for street vending, self-employed in unskilled activities, self-employed in skilled activities, supply of construction materials, service-related business activities, livestock farming activities, and agriculture farming activities respectively, (iv) DMALE represents dummy variable for a male person, (v)α_1 as constant, $\beta_1$toβ_{13} represent coefficients of dummy independent variables, and (vi) $\varepsilon_i$is the error term.

4. Results and Discussion

4.1. Sample Profile:

The sample profile of the study is given in Table 5. Female constitutes 65.50 per cent of the total sample of 655 persons. Across social groups, 72.21 per cent of the total sample belongs to SEBC. Only 2.90 per cent are illiterates. The rest 97.10 per cent are distributed more or less equally across five educational groups. Sample profile across occupational group reveals that 63.51 per cent constitutes non-workers, 23.36 per cent belong to the business category and the rest 13.13 percent are engaged in farming activities, i.e., agriculture and livestock development.

Table 5: Sample Profile

Variable	Category	Person	Percentage
Gender	Female	429	65.50
	Male	226	34.50
Social Group	SC	50	7.63
	SEBC	473	72.21
	OBC	102	15.57
	General	30	4.58
Educational Group	Illiterate	19	2.90
	LP	115	17.56
	UP	111	16.95
	SEC	145	22.14
	HSEC	106	16.18
	Graduation & Above (GRAD)	159	24.27
Occupational Group	Non-worker	416	63.51
	Business	153	23.36
	Street Vendor	36	5.50
	Self-employed (Unskilled activities)	57	8.70
	Self-employed (Skilled activities)	10	1.53
	Supplier (Construction Material)	8	1.22

Variable	Category	Person	Percentage
	Service-related business	42	6.41
	Farming	86	13.13
	Agriculture (Farming)	66	10.08
	Livestock (Farming)	20	3.05

NB: SEBC - Socially and economically backward classes, OBC – Other backward classes, SC – Scheduled castes, LP – Lower primary educational level, UP – Upper primary educational level, SEC – Secondary educational level, HSEC – Higher secondary educational level, GRAD – Graduation and above the educational level

Source: Authors' estimation

4.2. Deprivation Status:

The deprivation status of the persons belonging to non-worker, farmer, and business groups across different indicators taken in the study is given in Table 6. The study observes that all the persons in the study have been vaccinated and have access to safe drinking water. This indicates that the vaccination and rural drinking water supply programmes administered by the government reached the intended people living in the study area. Further, more than half of the persons are deprived in the social connectedness dimension irrespective of working groups.

Table 6: Indicator wise Deprivation Status of Non-worker, Farmer and Business Person (in Percentage)

Indicator	Non-worker	Farming	Business	Cultivation	Livestock farming	Street Vendor	Self-employed (Unskilled activities)	Self-employed (Skilled activities)	Supplier (Construction Material)	Service-related business
SCHOOL	34.13	30.23	23.53	22.73	55.00	44.44	14.04	20.00	0.00	23.81
BMI	44.23	40.70	45.75	37.88	50.00	38.89	52.63	60.00	37.50	40.48
VAC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HOU	6.73	5.81	11.11	6.06	5.00	19.44	0.00	0.00	12.50	21.43
WAT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SAN	50.24	87.21	47.06	87.88	85.00	77.78	38.60	30.00	37.50	38.10
ENR	62.26	84.88	52.94	84.85	85.00	91.67	36.84	40.00	12.50	52.38
ELCT	0.24	0.00	0.65	0.00	0.00	2.78	0.00	0.00	0.00	0.00
LAND	84.38	26.74	33.33	7.58	90.00	38.89	28.07	40.00	37.50	33.33
MV	94.71	88.37	47.06	86.36	95.00	75.00	33.33	30.00	25.00	50.00
EMP	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AUTHTH	38.46	8.14	5.23	3.03	25.00	8.33	0.00	0.00	25.00	7.14
AUTPVIO	28.37	8.14	9.80	9.09	5.00	16.67	5.26	0.00	0.00	14.29
AUTEMP	77.64	16.28	13.73	1.52	65.00	27.78	7.02	0.00	12.50	14.29
PARCOM	95.43	74.42	69.28	68.18	95.00	86.11	68.42	50.00	75.00	59.52
ORGCOM	99.28	96.51	97.39	95.45	100.00	100.00	92.98	100.00	100.00	100.00

Source: Authors' estimation

Non-workers are more deprived in eight indicators, viz., completed year of schooling, ownership of land, ownership of the motor vehicle, autonomy in healthcare decisions, autonomy to prevent domestic violence, autonomy in employment choice, and participation and organization of community-level activities in comparison to other two groups, i.e., farming and business. Lack of engagement in any economic activity can be attributed to their deprivation in these indicators. Persons involved in business activities are more deprived in BMI, housing conditions, and access to electricity in comparison to the

other two groups. Similarly, the persons involved in farm activities are more deprived in sanitation and clean energy in comparison to the other two groups.

An interesting observation of the study relating to the educational level of the self-employed (both skilled and unskilled) is that skilled self-employed persons are more educationally deprived in comparison to their unskilled counterparts. Most of the persons involved in skilled activities like tailoring, automobile repairing, and wood furniture making have not completed 6 years of schooling and hence are educationally deprived. But working in these fields over the years enables them to acquire skills without any higher formal education. Further, persons engaged in cultivation, and livestock farming are mostly deprived of sanitation, clean energy, and possession of motor vehicles. Male members of these households are not able to discontinue the usual practice of open defecation. Availability of cheap cooking fuel such as cow dung and agricultural residuals compels them to use these instead of LPG although they possess it.

Multidimensional poverty is also assessed through MPI which is estimated for different groups taking into account the incidence and intensity of multidimensional poverty (Table 7 & Table 8).

Non-workers with an MPI score of 0.57 are observed to be severely multidimensional poor. Persons, as a whole, practicing agriculture and business activities are under the non-poor category (MPI < 0.20). But, livestock farmers are categorized under MDP (MPI score of 0.3504), and street vendors under vulnerable to MDP (MPI score of 0.2364). The MPI for the rest of the groups is below 0.20 which indicates that they are coming under the non-poor category.

Table 7: Multidimensional Poverty Index of Occupational Group

Occupational Group		Total individual (n)	*Individuals Deprived (q)	Incidence of MDP (H = q/n)	Intensity of MDP (A)	MPI (H * A)
All Individual		655	480	0.7328	0.5617	0.4116
Non worker		416	410	0.9856	0.5784	0.5700
Farming (Overall)		86	30	0.3488	0.4675	0.1631
Farming	Agriculture	66	16	0.2424	0.4387	0.1063
	Livestock Farming	20	14	0.7000	0.5005	0.3504
Business (Overall)		153	40	0.2614	0.4614	0.1206
Business	Street Vendor	36	18	0.5000	0.4728	0.2364
	Self-employed (Unskilled activities)	57	7	0.1228	0.4455	0.0547
	Self-employed (Skilled activities)	10	2	0.2000	0.3571	0.0714
	Supplier (Construction Material)	8	1	0.1250	0.3492	0.0437
	Service related business	42	12	0.2857	0.4801	0.1372
SMDP		MDP	VMDP	MDNP		

NB: *Poverty cut-off ≥ 0.3333; SMDP = Severely Multidimensional Poor, MDP = Multidimensional Poor, VMDP = Vulnerable to Multidimensional Poor, MDNP = Multidimensional Non-poor
Source: Authors' estimation

Table 8: Multidimensional Poverty Status of Non-worker, Farmer

& Business Person

Occupational Group		Total Person	MDNP (in %)	VMDP (in %)	MDP (in %)	SMDP (in %)
Non-Worker		416	0.24	1.20	29.09	69.47
Farming	Farming (Overall)	86	18.60	46.51	25.58	9.30
	Agriculture	66	22.73	53.03	22.73	1.52
	Livestock Farming	20	5.00	25.00	35.00	35.00
Business	Business (Overall)	153	30.07	43.79	16.99	9.15
	Street Vendor	36	5.56	44.44	33.33	16.67
	Self-employed (Unskilled activities)	57	38.60	49.12	8.77	3.51
	Self-employed (Skilled activities)	10	20.00	60.00	20.00	0.00
	Supplier (Construction Material)	8	37.50	50.00	12.50	0.00
	Service related business	42	40.48	30.95	14.29	14.29

NB: SMDP = Severely Multidimensional Poor, MDP = Multidimensional Poor, VMDP = Vulnerable to Multidimensional Poor, MDNP = Multidimensional Non-poor (Computed from Individual Composite Index)
Source: Authors' estimation

The severity of multidimensional poverty is assessed by classifying the persons (in percentage) coming under multidimensional non-poor (MDNP), vulnerable to multidimensional poverty (VMDP), multidimensional poor (MDP), and severely multidimensional poor (SMDP) as per the criterion discussed in the methodology section. 69.47 and 29.09 percentage of non-workers are observed to be categorized under SMDP and MDP respectively mostly because of lack of employment opportunities for them. Persons engaged in business activities are less poor in comparison to persons engaged in farm activities. But more than 50 per cent of persons engaged in livestock farming and street vending are observed to be multidimensional poor (both MDP and SMDP category).

4.3. Contribution of Dimensions and Indicators to MPI

An exercise has been done by decomposing the dimensions and indicators to assess the contribution of each of these to overall poverty. This will help in ascertaining the specific dimension/indicator on which the persons under study, as a whole or a specific group, suffer more. This analysis will ultimately help in devising appropriate policies for the reduction of multidimensional poverty. The result is given in Figure 1, Figure 2, Figure 3, and Figure 4.
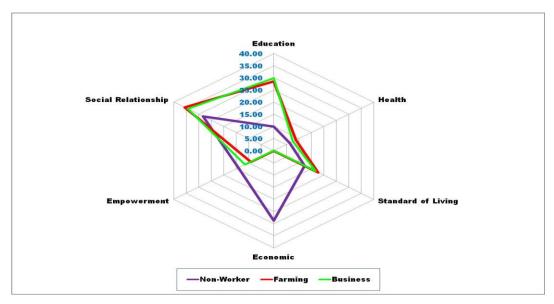
Figure 1: Contribution of Dimension to MPI (in %) across occupational group
Source: Authors construction

The analysis of decomposability of dimensions reveals that the deprivation of individuals in social connectedness accounts for nearly one-third of the overall MPI for all occupational categories except non-worker and supplier. The study observed almost equal contribution of both the indicators i.e., participation in and organization of community-level activities under the social connectedness dimension which has the highest contribution to overall MPI. Health dimension contributes a small (less than 10 per cent) to MPI across all occupational categories except self-employed (skilled) and supplier. The contribution of three parameters, i.e., individual vaccination, access to clean drinking water, and access to electricity is zero or almost negligible to MPI.

For non-workers economic dimension contributes more to MPI followed by social connectedness, empowerment, standard of living, education, and health dimension. The contribution of education to overall poverty is less for this group in comparison to the other two groups.
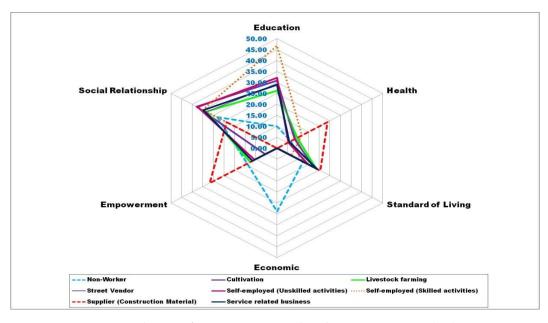

Figure 2: Contribution of Dimension to MPI (in %) across occupational sub-group
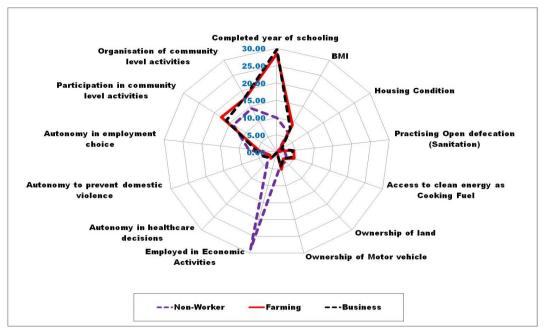Source: Authors construction

Figure 3: Contribution of Indicator to MPI (in %) across occupational group
Source: Authors construction

For farming and small business groups, social connectedness dimension contributes most followed by education, standard of living, empowerment, and health. Street vendors, self-employed (both skilled and unskilled), and persons engaged in service-related business, agriculture, and livestock are more deprived in social connectedness and education dimensions. No deprivation in education and economic dimension is observed for persons engaged in the supply of construction materials. But they are more deprived of empowerment, health, and social relationship dimensions. Self-employed persons engaged in skilled activities are more deprived in education and health dimensions in comparison to their unskilled counterparts.
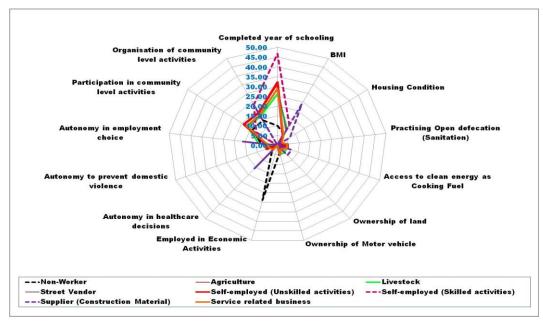
Figure 4: Contribution of Indicator to MPI (in %) across occupational sub-group
Source: Authors construction

4.4. Impact of education, gender, and occupational structure on MPI

The impact of education, gender, and occupational structure on MPI has been studied through a dummy variable regression model (Table 9).

Table 9: Impact of education, gender, and occupational structure on MPI

Variables	Coefficient	Standard Error	t-stat.	p-val.
Constant	0.7453*	0.0193	38.5181	0.0000
Lower Primary Education Dummy	-0.0404**	0.0207	-1.9557	0.0509
Upper Primary Education Dummy	-0.0930*	0.0208	-4.4826	0.0000
Secondary Education Dummy	-0.2002*	0.0204	-9.8119	0.0000
Higher Secondary Education Dummy	-0.2279*	0.0209	-10.9040	0.0000
Graduation & above Education Dummy	-0.2453*	0.0206	-11.8867	0.0000
Gender (Male) Dummy	-0.0696*	0.0097	-7.1522	0.0000
Street Vendor Dummy	-0.2109*	0.0158	-13.3570	0.0000
Self-employed (Unskilled activities) Dummy	-0.2438*	0.0138	-17.6026	0.0000
Self-employed (Skilled activities) Dummy	-0.2544*	0.0275	-9.2615	0.0000
Supplier (Construction Material) Dummy	-0.2296*	0.0308	-7.4630	0.0000
Service-related business Dummy	-0.2381*	0.0151	-15.7245	0.0000
Farming (Livestock) Dummy	-0.1756*	0.0191	-9.1963	0.0000
Farming (Agriculture) Dummy	-0.2658*	0.0127	-20.9668	0.0000
F- stat. (p-val.)	203.739* (0.0000)			
R-Sq.	0.8051			

NB: Dependent variable – MPI;

*, ** significance at 1%, and 5% level of probability respectively

Source: OLS estimation

F ratio is statistically significant at a 1 per cent level of significance indicating the overall model fit. About 81 per cent variation in MPI is explained by these three independent variables taken together as indicated by the coefficient of determination. All the coefficients are statistically significant at a 1 and 5

per cent level of significance. The constant in the model indicates that the average MPI for an illiterate non-worker woman is 0.7453. All the dummy variables under education have a negative sign and their magnitude increases with the increase in educational level. This justifies the significant role played by education in lowering multidimensional poverty. The average value of MPI decreases by 0.0696 for a male person in comparison to a female person. Similarly, the MPI decreases by a magnitude of more than 0.176 if a person is engaged in any of the economic activity either in a farm or business in comparison to a non-worker. The study observes the higher impact of agriculture in reducing multidimensional poverty in comparison to other economic activities.

Table 10: Projection of average MPI across gender, occupational groups, and educational level

Gender	Category	ILL	LP	UP	SEC	HSEC	GRAD
F E M A L E	Non-Worker	0.7453	0.7049	0.6523	0.5451	0.5174	0.5000
	Street Vendor	0.5344	0.4940	0.4414	0.3343	0.3065	0.2892
	Self-employed (Unskilled activities)	0.5015	0.4611	0.4085	0.3014	0.2736	0.2562
	Self-employed (Skilled activities)	0.4909	0.4504	0.3978	0.2907	0.2630	0.2456
	Supplier (Construction Material)	0.5157	0.4752	0.4226	0.3155	0.2878	0.2704
	Service-related business	0.5072	0.4667	0.4141	0.3070	0.2793	0.2619
	Livestock business	0.5697	0.5293	0.4767	0.3696	0.3418	0.3245
	Agriculture	0.4795	0.4391	0.3865	0.2794	0.2516	0.2343
M A L E	Non-Worker	0.6757	0.6352	0.5826	0.4755	0.4478	0.4304
	Street Vendor	0.4648	0.4244	0.3718	0.2647	0.2369	0.2195
	Self-employed (Unskilled activities)	0.4319	0.3915	0.3389	0.2317	0.2040	0.1866
	Self-employed (Skilled activities)	0.4213	0.3808	0.3282	0.2211	0.1934	0.1760
	Supplier (Construction Material)	0.4460	0.4056	0.3530	0.2459	0.2181	0.2008
	Service-related business	0.4375	0.3971	0.3445	0.2374	0.2096	0.1923
	Livestock business	0.5001	0.4597	0.4071	0.3000	0.2722	0.2548
	Agriculture	0.4099	0.3695	0.3169	0.2098	0.1820	0.1647
SMDP	MDP	VMDP	MDNP				

NB: SMDP: Severely Multidimensionally Poor; MP: Multidimensionally Poor; VMP: Vulnerable to Multidimensionally Poor; MDNP: Multidimensionally Not Poor
Source: Authors' projection based on OLS Estimation

Table 10 shows the estimated average multidimensional poverty index across different categories of occupation, gender, and educational level. The table indicates that a female non-worker comes under the SMDP category irrespective of educational level. But for male non-worker, if the person has crossed the upper primary level of education, he is coming under the MDP category. None of the male persons engaged in any type of business activity with a secondary or higher level of education are multidimensional poor or severely multidimensional poor. A male person either engaged in agriculture or self-employed (skilled) will be non-poor if he possesses a minimum educational qualification of higher secondary. Further, none of the persons will be under the category of SMDP if engaged in agriculture irrespective of educational qualification and gender. The result incorporated in Table 10 justifies the importance of education and agricultural activity in reducing MDP.

5. Conclusion

This study is conducted to analyze MDP among workers (farming and business) and non-workers. The study observed the significant role played by agriculture in reducing multidimensional poverty. The

government of Odisha is implementing various schemes like KALIA, Ama Krushi, MAKJS, and Agricultural Entrepreneurship Promotion Scheme 2018, etc. to provide support to farmers in accelerating agricultural prosperity and reducing poverty among farmers. These policies are not able to protect the interest of farmers during the occurrence of natural calamities more precisely during drought and enhancing the skills and productivity of the farmers. Therefore, the study suggests reorientation and strict implementation of various policies to improve the productivity and economic condition of the farmers of the state.

The study observed that self-employed persons engaged in skilled activities are non-poor in half of the indicators taken in the study. Skill development, therefore, is a way to bring persons out of multidimensional poverty. Different schemes of the Government of India and the Governmnet of Odisha such as PLTP, PMKVY, DDU-GKY, PMKK are in operation in the state to enhance the skills of unemployed youths. Successful implantation of these schemes will no doubt enhance the skill of unemployed youths which ultimately make them employable and lessen the incidence of MDP in the state.

The study also observed the positive impact of increasing the level of education on lowering MPI and therefore, reverberate the role of education in reducing multidimensional poverty. The Government of Odisha is implementing various schemes, viz., Right to Education Act, ECCE, Ujjwal, Utthan, and Utkarsh under LEP, which justifies the commitment of the government in providing quality education at primary, secondary, and higher levels, and also affordable vocational training. Add to worries, is the increased dropout rates in both primary and upper primary levels over the years in Odisha (Economic Survey, 2019-20, Govt. of Odisha). Therefore, the study suggests for implementation of new schemes along with the successful execution of existing programmes to reduce the dropouts and increase the level of education in the State. It is expected that the proposed New Education Policy by Govt. of India and policies adopted by the Government of Odisha will help in enhancing the educational level as well as the skill of the persons engaged in different economic activities.

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