

Extent and Intensity of Poverty in Maharashtra : Evidence from NSSO Data

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Abstract

This study estimated household poverty among socio-religious groups in Maharashtra by using unit level household consumption expenditure data of 61st (2004 - 05) and 68th (2011-12) rounds surveyed by National Sample Survey Organization (NSSO). Poverty was measured by making use of the Head - Count Ratio (HCR) at six administrative divisions in the state by making use of the Tendulkar Methodology, according to which poverty line in Maharashtra was ₹ 485 and ₹ 632 for 61st round (2004 - 05) and ₹ 967 and ₹ 1126 for 68th round for both rural and urban sectors. The results indicated that the incidence of poverty among the social groups was reduced by 13.7% among Scheduled Tribes followed by 33.15% in Scheduled Castes, 24.62% in OBC, and 16.83% in Others (non ST, SC, & OBC); among the religious groups, poverty reduced by 20.62% in Hindu and 9.45% in Muslim community households during the study period of 61st round (2004 - 05) and 68th round (2011-12).

Keywords: poverty, division wise, socio-religious groups, measurement, NSSO

JEL Classification: I31, I32, I39

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Poverty is a multidimensional phenomenon, and it is the greatest challenge to mankind. In the Indian context, poverty is measured in terms of a specified normative poverty line reflecting the minimum living standard of people. The official approach has laid emphasis on ensuring a subsistence minimum and hence on eradicating absolute poverty (Suryanarayana, 2009). Poverty is defined as deprivation in well-being and comprises of many dimensions. It includes low incomes and the inability to acquire the basic goods and services necessary for survival. Poverty encompasses low levels of health, education, attainment, poor access to clean water and sanitation, inadequate physical security, and insufficient capacity and opportunity to better one's life (The World Bank, 2006). It implies a severe lack of material and immaterial goods, which impedes the normal development of individuals to the point of compromising their personal integrity and as such, in eventually resulting is extreme poverty. In absolute terms, it reflects the inability of an individual to satisfy certain basic minimum needs of a sustained, healthy, and reasonably productive living.

Poverty is one of the most serious issues being faced by any economy. India is still a country having the biggest concentration of poor people in the world and is home to a third of the world's poor. In the Indian context, poverty is measured in terms of a specified normative poverty line reflecting the minimum living standard of people.

The multidimensional approach of identifying poverty highlights several forms of deprivation such as poor

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health, inadequate living standard, lack of education, social exclusion, lack of income, disempowerment, lack of security, and poor equity of work from development and violence. According to the Human Development Report (1997) (United Nations Development Programme, 1997), human poverty includes three indicators such as deprivation in health, in knowledge, and in economic provisions. Thus, human poverty is a broader concept than income poverty. The first millennium development goals (MDGs) proposed by the United Nations of reducing by half the proportion of people living on less than a dollar a day by 2015 grabbed the attention of the world towards poverty measurement at the global level. Higher economic growth would have no meaning for the impoverished if it is unable to bring visible improvements in their lives in the form of cutting short poverty and hunger. Hence, eradication of poverty and hunger are given utmost priorities in the MDGs (Roy, 2017). Therefore, the policy mechanism of poverty alleviation programmes is looked into new perspectives as in the Eleventh Plan.

Poverty estimates at the state level are based on the Household Consumer Expenditure Surveys conducted by National Sample Survey Organization (NSSO). The states wise surveys are conducted on quinquennial term basis. The last survey was conducted in 2009-10 (66th round) and the NSSO conducted another large (thick) sample survey in 2011-12 (68th round). The erstwhile Planning Commission provides poverty estimates at the state level for every quinquennial round. The Planning Commission has adopted the Rangarajan Committee report methodology for estimating state level poverty ratios.

Generally, the measurement of poverty is a complex exercise, and the estimates are broadly based on household per capita consumption expenditure. As per the estimates of the Tendulkar Committee, it was found that 21.9% of the population was poor, that is, 269.9 million of the population was living below the poverty line in 2011-2012 (Planning Commission, Government of India, 2014). The World Bank (2006) estimated that 42% of India's population was below the international poverty line of \$1.25 a day, and it reduced from 60% in 1980. Globally, two-thirds of the world population is living below the international poverty line, which is measured in terms of purchasing power parity (PPP) of \$ 1.90 per day.

Maharashtra is the second largest state in India in terms of population and has a geographical area of 3.08 lakh sq. km. According to the 2011 Census, it was home to 11.24 crore people, that is, 9.3% of India's population with 45.2% people living in urban areas, while its population density is 946 people per sq. mile. The state has 36 districts and six revenue divisions, which are Pune, Nashik, Aurangabad, Konkan, Amravati, and Nagpur. Mumbai is the capital of Maharashtra. Maharashtra is one of the above national average states in the country in majority of the socio-economic indicators. The poverty rate in the state was 18%, which was close to the national average in 2011-2012. It is faced with inter-regional and intra-regional disparities since its reorganization in 1956. The gross state domestic product (GSDP) at current prices for 2013 - 2014 was estimated at ₹ 15,10,132 crore. Industry and services sector, both together contributed 88.7% to the GSDP, while the contribution of agriculture & allied activities sectors was 11.3 % (Maharashtra Economic Survey of 2014 - 2015). Three districts of the state had higher contribution. These are Mumbai (22.1%) followed by Thane (13.3%) and Pune (11.4%). Nashik district contributed a maximum share of GSDP through agriculture and allied activities. Mumbai had the highest share of 27.4% in terms of contribution to the services sector in the state. Mumbai, Pune, and Thane together contributed almost 50% to the industry sector.

This study is an important value addition to the existing literature on poverty in Maharashtra. The study has significant value addition because it examines the extent and intensity of poverty covering two quinquennial rounds for Scheduled Castes, Scheduled Tribes, OBC, and two major religious communities of the state, that is, Hindus and Muslims. The study makes use of specific poverty line for Maharashtra based on Tendulkar Methodology, that is, ₹ 485 and ₹ 632 of 61st round (2004 - 05) and ₹ 967 and ₹ 1126 of 68th round (2011 - 12) for both rural & urban sectors. The study covers 34 districts, and these districts are grouped into six administrative divisions, as classified by Government of Maharashtra and the study compares the level of household poverty for 61st (2004-2005) and 68th (2011-2012) rounds of NSSO.

Poverty Estimation Methodology in India

In India, Dadabhai Naoroji was the first person to discuss about the concept of poverty. After independence, there have been several efforts to develop mechanisms and methodologies to construct the poverty line, and they also identify the number of poor in the country. In 1962, the Planning Commission constituted the working group to define the poverty line based on minimum calorie requirements suggested by the Indian Council for Medical Research (ICMR) as 2,200 kl for rural and 2,100 kl for urban areas. The monetary value of these calories for a family of 5 people was fixed at ₹ 100 per month or ₹ 20 per capita per month at 1960-1961 prices in urban areas. In 1979, the Planning Commission constituted a Task Force Committee to estimate the percentage of population below the poverty line. The committee fixed 2400 kl per capita per day in the rural areas and 2100 kl per capita per day in urban areas, and estimated ₹ 49.09 and ₹ 56.64 monthly per capita for all India rural and urban areas. The Planning Commission (1984) did not re-define the estimation methodology of poverty. It adopted the methodology of the earlier task force committee, and accordingly fixed ₹ 89.50 and ₹ 115.65 as monthly per capita consumption expenditure (MPCE) for rural and urban sectors. According to estimates, 45.65% of rural areas and 40.79% of urban areas, and overall 44.48% of the population was below the poverty line in India.

The Planning Commission constituted the expert group under the chairmanship of Tendulkar. The Tendulkar Committee did not construct a poverty line, but they espoused the earlier expert group of Lakdawala Methodology. Tendulkar fixed ₹ 447 and ₹ 579 per capita per month consumption expenditure for both rural and urban sectors, which is based on minimum calorie requirements, that is, 2100 calories for rural and 1776 calories for urban sectors. In 2012, the Rangarajan Committee computed the poverty level based on average requirements of calories of 2,155 kcal per person per day for rural areas and 2,090 kcal per person per day for urban areas. According to the estimates of Rangarajan, 30.9% (260.5 million poor people) in rural areas and 26.45% (102.5 million poor people) of the population was below the poverty line in urban areas, and overall, 29.5% (363 million people) at the all India level of population was poor.

The World Bank set a new goal to end extreme poverty in a generation, and its target is to have no more than 3% of the world's population living on just \$1.90 a day by 2030 and there has been marked progress in reducing poverty over the past decades. In 2013, the Word Bank estimated that 10.7% of the population lived on or below \$1.90 a day. The hypothetical discussion about the measurement of poverty has been on poverty measures rather than on the poverty line. The primary issue is to determine which measure of poverty is to be used for poverty estimation. The options are Headcount Ratio, Poverty Gap Index, or Squared Poverty Gap Index. The study used household consumption expenditure survey data which is Monthly per capita Consumption Expenditure Survey of Mixed Reference Period¹ (MRP) to measure the incidence of mean poverty, that is, Head Count Ratio (H_p), which is defined as the percentage of population which is below the poverty line.

Concepts in Poverty Estimation

The various measures of poverty estimation are Headcount Ratio, Poverty Gap Index, and Squared Poverty Gap Index.

➤ **Head Count Ratio (H_p)** : The number of poor estimated as the proportion of people below the poverty line is known as head count ratio. It is calculated by dividing the number of people below the poverty line by the total population.

¹ MRP = Consumption data for five non-food items, that is, clothing, footwear, durable goods, education, and institutional medical expenses are collected using 365-day recall period and 30-day recall period for the remaining items.

$$H_p = \frac{n}{N} \quad (1)$$

H_p = Headcount ratio, n = Number of people below poverty line, & N = Total population.

↳ **Poverty Gap Index (PGI)** : Another poverty measure is the Poverty Gap Index. It is the ratio of gap between the per capita income of the poor and poverty line income or it is the difference between the poverty line and average income of all households living below the poverty line expressed as percentage of poverty line.

$$PGI = \frac{Z - M_p}{Z} \quad (2)$$

PGI = Poverty gap index, Z = Poverty line income in ₹, M_p = Income of poor, & $Z - MP$ = Aggregate poverty gap.

↳ **Income Gap Ratio / Poverty Gap Ratio (I_p)** : Sen (1976) called it the income gap ratio and Clark (1981) named it as the Poverty Gap Ratio. It is obtained by dividing the total expenditure of the poor by the number of people below the poverty line. It measures the poor below the poverty line.

$$I_p = \frac{Z - M_p}{Z.N} \quad (3)$$

where, N is the number of poor and rest of the symbols are defined as above.

↳ **Squared Poverty Gap (I_p^2)** : It is the mean of the squared proportionate poverty gaps. It indicates the severity as well sensing to inequality among the poor. It measures inequality among the poor. This measure is a member of Foster - Greer - Thorbecke (FGT) family of the poverty measure (Rani, 2011).

$$I_p^2 = \sum_{i=1}^A = 1 \frac{(Z - M_p) / Z^2}{N} \quad (4)$$

Literature Review

An empirical study on measuring poverty and inequality by using different methodologies to define the official poverty line was conducted by Ojha (1970) who estimated the extent of poverty in India in 1960 - 1961. It estimated the number of persons below the poverty line on the basis of an average calorie intake of 2250 calories per person per day. In monetary terms, this implied undertaking monthly expenses in the range of ₹ 8 to ₹ 11, and ₹ 15 to ₹ 18 of monthly per capita consumption expenditure at 1960 - 1961 prices in rural and urban areas, respectively. This is in terms of physical quantities. This implied consumption of 518 g and 432 g per person per day in rural and urban areas, respectively. Ahluwalia (1978) studied the trends in incidence of rural poverty in 1956 - 1957 to 1973 - 1974 and used the concept of poverty line as expenditure level of ₹ 15 for rural areas and ₹ 20 for urban areas at 1960 - 1961 prices. He found out that people below the poverty line reduced from 50% in mid - 1950s to around 40% in 1960-1961. The extent of poverty later came down and pattern of reduction in poverty in times of good agricultural performance was found.

Poverty line measures and cost of living indices calculation by Himanshu (2010) measured the all India

poverty line based on Planning Commission food² and non-food consumption expenditure. Further, the study estimated household poverty by using state-wise poverty line which was defined as Fisher Index of state prices³ and set up new poverty line for consumption expenditure survey of 2004 - 2005 and was also based on Mixed Recall Period using NSSO data. The study found that estimates of incidence of rural poverty showed a head count ratio of 41.8% for 2004-2005 as against the official estimate of 28.3%. Roy (2017) examined the status of hunger across major states of India by conceptualizing it in terms of calorie under - nourishment. The study also estimated multivariate analysis in the form of logistic regression which was also carried out to explore the determinants of hunger and found that hunger is negatively and significantly influenced by per-capita food grain production, while it is positively and significantly affected by poverty, price level, and economic growth.

Panagariya and Mukim (2013) provided comprehensive analysis of poverty for 17 large states in the country by estimating poverty (headcount ratio) for rural and urban sectors and for socio-religious groups by using two official poverty lines based on Lakdawala and Tendulkar Methodologies. The study found that during 1993-1994 and 2009-2010, poverty declined for various social and religious groups in all the states. Secondly, the reduction of poverty was larger in Scheduled Caste and Scheduled Tribes than the OBC. Gupta and Mishra (2013) identified the linkage between calorie deprivation and poverty in rural India by using household consumption expenditure survey data of 50th (1993 - 1994), 61st (2004 - 2005), and 66th (2009-2010) rounds of National Sample Survey (NSS). The study revealed that the probability of getting low calories was high among the weaker sections of the society. Also, the level of poverty and calorie deprivation across social groups was higher among bigger families and other labour classes. Similarly, levels of poverty as well as calorie deprivation was found to be high among Muslim households.

Arora and Singh (2015) by using unit level NSSO household consumption expenditure data of 61st (2004 - 2005) and 68th (2011 - 2012) rounds estimated regional as well as disaggregated levels of poverty for socio-religious groups for both rural and urban sectors of Uttar Pradesh (UP). The study classified the state into different regions and identified critical poverty affected regions in UP across socio-religious groups. The study found that the level of poverty across the Central region, Southern region, and Eastern region was unfairly distributed. The study found significant region wise variation in the levels of poverty across socio-religious groups. The variation and absolute poverty was highest among the Scheduled Caste (SC) & Scheduled Tribe (ST) households. The study also made use of logistic regression to identify the determining factors of poverty.

Niranjan and Shivakumar (2017) estimated household poverty of five NSS regions⁴ among socio-religious groups in Andhra Pradesh by using unit level household consumption expenditure data of 61st (2004-2005) and 68th (2011-2012) rounds of NSSO regions. The study found higher concentration of poverty in the inland Southern districts in the state, and the state reduced it by 20.60% between 2004-2005 and 2011-2012. The incidence of poverty among social groups were reduced by 36% among Scheduled Tribes, 27.5% among Scheduled Castes, 21.8% among Other Backward Castes, and 10.5% Others category households, and the also estimated poverty in religious groups were reduced by 20.5% in Hindus and 22% in Muslims communities.

Niranjan and Shivakumar (2018) estimated division wise household poverty in Karnataka, especially focussing on the Hyderabad - Karnataka Region. The study also estimated logistic regression to identify key determinants of poverty of the independent variables by using household consumption expenditure data of 61st (2004-2005) and 68th (2011-2012) rounds. The study found that the highest poverty ratio was in Kalaburagi division (also called Hyderabad - Karnataka region), and the second largest poverty was in the Belagavi division

² Food expenditure on Recommended Dietary Allowances (RDA) of 2400 calories in rural and 2100 calories in urban areas on state level.

³ Consumer price index for agriculture labour (CPIAL) in rural areas and consumer price index for industrial workers (CPIIW) in urban areas.

⁴ Coastal Northern, Coastal Southern, Inland North Western, Inland North Eastern, and Inland Southern.

(both rural and urban, while poverty in the state reduced by total 12.74% points between 2004-2005 and 2011-2012. The incidence of poverty in social groups were reduced by 19.67% among Scheduled Tribes, 20.66% among Scheduled Castes, 15.9% among Other Backward Castes, and 4.5% Other category households. The study also estimated that poverty among religious groups were reduced by 13.45% in Hindu and 11.46% in Muslim communities during the study period.

Empirical Analysis and Results

Poverty is a widespread evil in the world, particularly in Asian and African countries. It is a multidimensional phenomena and the most fundamental economic and social problems facing humanity. Poverty encompasses low levels of health, education, attainment, poor access to clean water and sanitation, inadequate physical security, insufficient capacity, and opportunity to better one's life (The World Bank, 2006). Poverty is measured by making use of the head - count ratio (HCR). The HCR measures poverty as a proportion of households living below the poverty line (BPL) at the state level. This figure is based on the Household Consumer Expenditure Surveys of 61st (2004 - 2005) and 68th (2011-2012) rounds collected by the National Sample Survey Organization (NSSO).

The Table 1 reveals that poverty can be a useful policy tool for focusing on resources and development efforts in poor areas. The study attempts to identify where the incidence of poverty in rural and urban areas was improperly distributed in Maharashtra during 61st round (2004-05) and 68th round (2011-12), and found higher household poverty concentration in rural sector and lower household poverty in the urban sector. In the 61st (2004-2005) round, around 38.92% of household poverty in the state declined by 17.31% in the 68th (2011-2012) round. It declined 3.08% points per annum for both rural and urban sectors during the study period.

The Table 2 gives the household poverty estimates across socio-religious groups in Maharashtra. In the 61st round, highest poverty was found in Scheduled Tribes households (68.06%) followed by Scheduled Caste (66.08%), OBC (44.7%), and Others (34%), respectively. In the 68th round, the largest poverty ratio was found in ST (54.36%) households ; except in Scheduled Tribe households, poverty declined in all the other households

Table 1. Incidence of Household Poverty by Sector and Rounds

Round	Rural	Urban	Total
61st (2004-2005)	47.91	25.62	38.92
68th (2011-2012)	24.22	9.12	17.31
Total	35.85	16.30	27.40

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

Table 2. Incidence of Poverty Across Socio - Religious Groups

Round	Sector	ST	SC	OBC	Others	Hindu	Muslim
61st (2004-05)	Rural	73.19	66.08	44.7	34	47.09	40
	Urban	34.81	36.02	26.79	21.41	20.15	47.88
	Total	68.06	52.87	39.15	27.54	37.45	45.62
68th (2011-12)	Rural	61.6	23.81	18.23	16.48	23.82	28.57
	Urban	23.33	15.78	8.73	6.03	6.91	15.61
	Total	54.36	19.72	14.53	10.71	16.83	19.12
	Reduced	13.7	33.15	24.62	16.83	20.62	9.45

Source: Authors' estimate is based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

Table 3. District Level Household Poverty

Divisions	Districts	Rural		Urban		Total	
		61st Round	68th Round	61st Round	68th Round	61st Round	68th Round
Nagpur Division	Wardha	40.41	8.45	50.82	15.37	42.44	10.04
	Nagpur	58.89	17.48	30.33	13.99	40.08	15.26
	Bhandara	66.69	25.67	28.6	9.07	62.26	23.75
	Gondiya	67.23	30.59	27.06	4.54	62.68	28.08
	Gadchiroli	80.74	44.79	52.03	12.88	78.68	42.12
	Chandrapur	43.46	47.77	30.7	13.06	38.51	35.95
Amravati Division	Buldana	50.54	38.64	48.14	42.22	50.09	39.43
	Akola	35.64	28.96	56.39	35.48	42.39	30.72
	Washim	39.73	40.96	35.12	43.9	39.02	41.46
	Amravati	61.16	23.44	52.41	14.84	58.22	20.76
	Yavatmal	71.6	35.83	71.5	27.64	71.58	34.57
Aurangabad Division	Nanded	66.38	24.58	70.24	21.32	67.25	23.52
	Hingoli	35.67	16.37	53.1	54.87	38.11	22.94
	Parbhani	65.85	7.87	40.34	23.9	58.51	12.16
	Jalna	49.46	41.35	54.96	19.79	50.32	37.3
	Aurangabad	73.94	29.05	63.76	26.68	70.27	28.06
	Bid	75.8	19.82	78.86	12.77	76.31	18.02
	Latur	69.03	13.9	45.43	7.32	64.73	11.65
	Osmanabad	27.75	12.72	60.89	31.23	33.04	15.42
	Thane	53.9	52.71	9.99	3.17	22.75	14.42
Mumbai Division	Mumbai	-	-	6.35	1.02	6.35	1.02
	Raigarh	44.77	32.47	12.13	0.11	39.28	23.54
	Ratnagiri	43.34	22.72	14.34	4.54	40.92	19.28
	Sindhudurg	17.57	0.88	50.18	4.23	19.2	1.11
	Nandurbar	61.43	53.19	37.39	34.6	58.91	50.58
Nashik Division	Dhule	50.02	30.52	38.72	31.81	47.69	30.91
	Jalgaon	40.83	24.3	34.83	25.38	38.9	24.7
	Nashik	69.43	34.68	54.29	13.25	63.49	25.55
	Ahmadnagar	30.85	22.9	27.9	13.9	30.38	21.32
Pune Division	Pune	18.35	8.61	19.5	2.73	19.02	4.95
	Solapur	28.89	5.96	44.79	19.29	33.95	9.91
	Satara	22.22	5.08	24.12	10.58	22.52	6.05
	Kolhapur	27.25	4.53	33.76	16.62	28.69	8.03
	Sangli	37.54	10.43	52.74	14.33	40.89	11.35

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

during the period. Household poverty found in SC was 19.72% followed by OBC (14.53%) and Others (10.71%), respectively.

In addition, the study also provides estimates for religious groups like Hindus and Muslims. Muslims were found to be comparatively poorer in Maharashtra in the 61st (2004 - 2005) round. Higher poverty was found in

Muslim households (45.62%) as against 37.45% of Hindu households. In the 68th (2011 - 2012) round, higher poverty was found in Muslim households (19.12%) and Hindus (16.83%) only.

The poverty estimates for all the 34 districts are provided in the Table 3, which reveals significant geographical imbalances in poverty in rural and urban sectors for both rounds. The Table shows higher levels and concentration of poverty in Aurangabad and Amravati divisions compared to the divisions of others. In the 61st (2004-2005) round, five districts had very high level of poverty rates : Gadchiroli District (78.68%) followed by Bid (76.3%), Yavatmal (71.31%), Aurangabad (70.27%), and Nanded (67.25%). Low poverty was found in Thane (22.75%), Satara (22.52%), Sindhudurg (19.2%), Pune (19.02%), and Mumbai Suburban (6.35%), respectively. In the 68th round, higher household poverty was found in Nandurbar (50.58%) followed by Gadchiroli (42.12%), Washim (41.46%), Buldana (39.43%), and Jalna (37.3%). Lowest poverty was found in Kolhapur (8.03%) followed by Satara (6.05%), Pune (4.95%), Sindhudurg (1.11%), and Mumbai (1.02%), respectively.

The Table 4 shows that the headcount ratio by administrative divisions. The extent and depth of poverty in Maharashtra was highest in Aurangabad division in the 61st round and Amravati division in the 68th round of both rural and urban sectors. The poverty estimates reveal significant geographic imbalances with much higher levels and concentration of poverty in the Amravati division districts because there was very low monthly per - capita consumption expenditure (MPCE). The state had the largest poverty ratio in Amravati and Aurangabad divisions.

Table 4. Division Wise Poverty in Maharashtra

Administrative Divisions	Rural		Urban		Total	
	61 st	68 th	61 st	68 th	61 st	68 th
Nagpur Division	58.91	28.45	31.81	13.53	48.52	22.71
Amravati Division	55.27	33.31	53.88	29.14	54.95	32.35
Aurangabad Division	61.65	22.38	60.29	21.08	61.34	22.01
Mumbai Division	44.03	35.39	7.86	1.88	17.73	9.18
Nashik Division	48.13	30.32	42.31	19.63	46.57	26.94
Pune Division	26.19	6.88	28.24	7.63	26.93	7.18

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

Table 5. Divisions Wise Poverty Across Social Groups

Sector	Social Groups	Nagpur Div		Amravati Div		Aurangabad Div		Mumbai Div		Nashik Div		Pune Div	
		61 st	68 th	61 st	68 th	61 st	68 th	61 st	68 th	61 st	68 th	61 st	68 th
Rural	ST	70.62	51.28	79.99	44.03	55.03	33.06	80.75	85.51	78.59	61.76	41.38	61.01
	SC	65.68	30.06	63.65	46.57	83.5	23.59	52.57	18.09	72.65	28.03	42.23	3.48
	OBC	55.07	17.94	46.28	25.4	61.41	20.52	35.72	16.34	39.09	19.43	26.28	8.94
	Others	46.55	61.93	56.87	34.7	53.14	21.98	18.52	9.2	28.02	19.01	21.13	3.73
	Total	58.91	28.45	55.27	33.31	61.65	22.38	44.03	35.39	48.13	30.32	26.19	6.88
Urban	ST	47.98	12.49	61.25	30.94	48.1	45.39	15.55	8.38	53.2	54.4	30.09	1.02
	SC	41.76	27.77	48.43	38.56	68.75	31.75	9.02	3.81	53.99	21.94	45.78	15.47
	OBC	31.38	9.06	42.75	14.25	57.53	19.96	9.08	2.04	33.46	15.29	29.04	10.02
	Others	22.3	5.98	61.89	39.07	57.3	14.76	6.92	0.95	41.84	17.06	22.93	3.99
	Total	31.81	13.53	53.86	29.14	60.29	21.08	7.86	1.88	42.31	19.63	28.24	7.63

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

Note. Div means Division.

Table 6. Divisions Wise Poverty Across Religious Groups

Sector	Religion Groups	Nagpur Div		Amravati Div		Aurangabad Div		Mumbai Div		Nashik Div		Pune Div	
		61 st	68 th	61 st	68 th	61 st	68 th	61 st	68 th	61 st	68 th	61 st	68 th
Rural	Hindu	58.64	27.99	51.56	31.5	60.21	21.33	45.78	38.46	49.25	29.58	26.8	7.24
	Muslim	89.4	10.32	65.07	36.29	58.5	42.02	10.14	0	17.35	40.86	13.02	0.2
	Total	58.76	27.78	52.66	31.78	60.08	23.06	44.21	36.23	47.55	30.28	26.38	7.01
Urban	Hindu	27.91	10.63	35.52	14.05	50.72	18.32	6.11	1.25	34.77	15.73	26.1	7.03
	Muslim	47.32	3.24	86.06	60.63	76.36	22.84	19.75	3.39	65.26	36.82	43.39	14.43
	Total	30.31	9.96	54.98	28.95	58.95	19.28	8.29	1.66	42.56	19.38	28.61	7.86

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

Note. Div means Division.

Table 7. Poverty and Level of Education Across Socio - Religious Groups

Level of Education	Social Group			Religious Group		
	ST	SC	OBC	OTH	Hindu	Muslim
61st Round						
Not Literate	80.83	67.56	61.20	50.77	63.05	60.04
LWFS	93.95	43.17	47.57	37.26	48.15	1.00
Below Primary	74.30	67.30	49.32	38.33	50.98	55.63
Primary to Middle	56.59	52.66	35.93	31.39	34.95	47.85
Secondary to Higher Secondary	23.93	25.52	17.78	10.83	12.95	26.41
Graduate & Above	0.00	4.71	3.40	0.77	1.85	0.00
68th Round						
Not Literate	69.13	23.34	29.28	24.37	33.78	31.18
LWFS	0.00	10.37	83.88	70.26	42.44	1.00
Below Primary	--	0.00	0.00	30.72	0.00	1.00
Primary to Middle	44.59	30.54	18.10	25.78	25.28	21.31
Secondary to Higher Secondary	46.85	17.40	11.29	7.99	12.22	17.03
Graduate & Above	2.62	4.83	0.93	0.11	0.91	0.33

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

Note. LWFS-Literate Without Formal School

In the 61st round, highest household poverty was found in Aurangabad division (61.34%) followed by Amravati division (54.95%), Nagpur division (48.52%), Nashik division (46.57%), Pune division (26.93%), and Mumbai division (17.73%). In the 68th round, the state had the largest household poverty in Amravati division (32.35%) followed by Nashik division (26.94%), Nagpur division (22.71%), and Aurangabad division (22.01%). The lowest poverty was found in Mumbai division (9.18%) and Pune division (7.18%).

The Tables 5 and 6 reveal household poverty across socio-religious groups of six administrative divisions in Maharashtra. Increase in growth rate and reduction of poverty among Scheduled Castes and Scheduled Tribes than the upper cast groups has conical overt the time in all four regions. In the 61st round, higher poverty ratio was observed in Aurangabad across social groups. There was 61.65% poverty in Aurangabad division (rural areas), 60.29% of poverty in urban areas followed by the rest of the divisions. In the 68th round, larger household poverty was found across social groups in Mumbai division (35.39%) in rural areas and 29.14% of urban households in

Table 8. Poverty and Household Occupation Across Socio-Religious Groups

Household Poverty & Occupation	Social Group			Religious Group		
	ST	SC	OBC	OTH	Hindu	Muslim
61st Round						
SENA	53.95	44.93	36.45	22.15	27.02	41.87
Agricultural-labour	75.47	56.72	42.11	30.97	44.41	46.48
Other-labour	66.86	61.99	56.23	45.45	51.46	71
SEA	66.99	49	36.47	28.71	35.76	19.65
Others	24.09	19.29	17.37	10	12.74	29.75
Total	68.06	52.78	39.15	27.54	37.45	45.62
68th Round						
SENA	55.49	16.24	12.8	9.7	14.62	12.98
Agricultural-labour	18.85	7.89	5.05	5.87	4.84	15.48
Other-labour	52.77	28.02	13.49	14.18	16.32	33.58
Casual labour	66.92	35.89	34.95	31.97	40.04	43.92
SEA	77.72	16.75	35.05	9.38	38.3	33.34
Others	36.79	16.13	8.12	2	9.95	1.56
Total	54.36	19.72	14.53	10.71	16.83	19.12

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

Note. SENA-Self Employed in Non Agricultural, SEA-Self Employed in Agricultural Labour.

Amravati division. During 1993-1994 and 2009-2010, poverty declined in various social and religious groups in all the states (Panagariya & Mukim, 2013). In addition, the study also estimated household poverty in religious groups, both rural and urban areas in 2004 - 2005 and 2011 - 2012.

Poverty is not only a problem of low income ; rather, it is a multi-dimensional problem that includes low access to opportunities for developing human capital. The state has embarked on significant reforms in the education sector with increased public investment to ensure access, equity, and quality in education with community involvement, and growth of literacy during the last decade.

The Table 7 shows incidence of poverty and level of education across social groups, major religions, and the state as a whole. It is observed from the Table that from 2004-2005 to 2011-2012, Maharashtra had high incidence of poverty. It is associated with illiterates, irrespective of their caste and religion both in rural as well as in the urban sector. The level of poverty among SCs & STs was higher among literates without formal schooling relative to the other socio-religious groups. Nevertheless, a rise in the literacy level of the head of the household below primary decreased the prevalence of poverty among all the social groups in the 68th round. Similarly, a rise in the literacy level of the head of the household decreased the prevalence of poverty among the two major religions.

It can be seen from the Table 8 that the study estimates the household poverty and occupation in Maharashtra, where a high incidence of poverty is associated among agricultural labour in the 61st round, but it decreased in the 68th round. The level of occupation among SCs & STs was higher among self employed in agricultural labour and other/casual labour relative to the other socio-religious groups.

Logistic Regression

This study uses a binomial logit or probit regression model since it is an appropriate technique to observe the likelihood of a household for being poor or the risk of the household on entering or escaping poverty. The study

uses a module to analyze probability-likelihood of a household being poor in relation to the same independent variables⁵.

To identify key determinants of poverty, we first computed a dichotomous variable indicating whether the household is poor or not. That is,

$$\text{Poor} = \begin{cases} 1, & \text{if household is poor.} \\ 0, & \text{if household is non-poor.} \end{cases}$$

The functional from binary logistic regression model can be given as equation (5) :

$$Z_i = \ln \left[\frac{p_i}{1 - p_i} \right] = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} \dots + \beta_n X_{ni} + \epsilon_i \quad (5)$$

where, Z_i is a log odd of the i^{th} household ; α is constant ; $\beta_1, \beta_2, \beta_3, \beta_n$, and ϵ_i is an error term for the i^{th} household. Independent variable includes wide range of household characteristics that determine poverty of the household. In equation (5), the coefficient produces change in log odds of the dependent variable, not in the dependent variable itself. Therefore, to make the interpretation straightforward, a logistic can be converted to the odds ratio using exponential function (Joshi, Maharaj, & Piya, 2012). The functional form of odds ratio can be given as equation (6) :

$$\text{Odds ratio} = \left[\frac{p_i}{1 - p_i} \right] = e^{\alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} \dots + \beta_n X_{ni} + \epsilon_i} \quad (6)$$

Here, the odds ratio is simply the ratio of the probability that the household will be poor to the probability that the household will be non-poor. In case of binary independent variables, exponential of the respective coefficient gives the proportion of change odds for shift in the given independent variable. However, if the independent variable is a continuous exponential of the coefficient, it is associated with the effect of per unit change in the given independent variable to odds ratio. In both types of variables, sign of coefficient reveals the direction of change.

The particulars of the regression are as follows :

Dependent Variable : A new dummy variable called poor is created, which takes the value '1' if the individual is poor and the value '0' if he or she is non poor.

Independent Variables : Sector, round, social groups, administrative division, education level, household occupation, and land ownership.

The final model that fits the data is given by :

$$\text{Logit}(Z_i) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 \quad (7)$$

where, X_1 is sector, X_2 is social groups, X_3 is religious groups, X_4 is administrative division, X_5 is educational level, and X_6 is household occupation.

The Table 9 exhibits determinants of household poverty for both rural and urban sectors separately. The results

⁵ A binary logistic regression model is considered to be the most appropriate model for the econometric analysis when the dependent variable is a dichotomous (binary) variable such as incidence of poverty in our case. It fits well for both continuous as well as categorical independent variables.

Table 9. Results of Logistic Regression Analysis

Logistic Regression	61st Round (2004 - 2005)				68th Round (2011 - 2012)			
Poor (Dependent Variable)	Odds Ratio	Std. Error	Z	P > Z	Odds Ratio	Std. Error	Z	P > Z
Sector (Reference: Rural)								
Urban	1.048655	0.066087	0.75	0.451	1.77616	0.1679	6.08	0*
Social Group (Reference: Others Category)								
Scheduled Tribes	3.7879	0.3778	13.36	0*	5.3904	0.6919	13.12	0*
Scheduled Caste	1.9860	0.1794	7.60	0*	1.6021	0.2258	3.34	0*
Other Backward Caste	1.4553	0.9807	5.57	0*	0.5445	0.1537	4.37	0*
Religious Group (Reference: Hindu)								
Muslim	2.0849	0.1854	8.26	0*	1.9162	0.2288	5.45	0*
Administrative Divisions (Reference: Nagpur Division)								
Amravati Division	0.9539	0.0990	-0.45	0.649	1.3200	0.1911	1.92	0.06
Aurangabad Division	1.3886	0.1360	3.35	0.001	1.0421	0.1447	0.3	0.77
Mumbai Division	0.1882	0.0189	-16.64	0*	0.4133	0.0591	-6.18	0*
Nashik Division	0.6304	0.0613	-4.75	0*	0.9690	0.1282	-0.24	0.81
Pune Division	0.4207	0.0412	-8.84	0*	0.4649	0.0696	-5.11	0*
Educational Level (Reference: Not Literate)								
LWFS	0.7614	0.2643	-0.79	0.432	1.7319	1.2886	0.74	0.46
Below Primary	0.6813	0.0707	-3.7	0*	1.9943	2.3221	0.59	0.55
Primary to Middle	0.4804	0.0310	-11.35	0*	0.7703	0.0955	-2.11	0.04
Sec to Higher Sec	0.1577	0.0127	-22.85	0*	0.4258	0.0389	-9.34	0*
Graduate & Above	0.0501	0.0176	-8.53	0*	0.0490	0.0139	-10.7	0*
Household Occupation (Reference: Self-Emp-non-agri)								
Agricultural-labour	1.2040	0.0810	2.76	0.006	0.7752	0.0811	-2.43	0.02
Other-labour	1.7493	0.1520	6.44	0*	1.5136	0.173	3.63	0*
Casual labour	--	--	--	-	2.8986	0.4009	7.69	0*
Self-Emp-agri	0.5976	0.0536	-5.74	0*	2.8396	0.4527	6.55	0*
Others	0.4426	0.0472	-7.64	0*	0.8091	0.1642	-1.04	0.3
_cons	4.2887	0.5416	11.53	0*	0.7845	0.1298	-1.47	0.14

Note. *, **, ***, Significant at 1%, 5%, & 10% degrees of precision, respectively.

Source: Authors' estimate based on 61st and 68th rounds of Household Consumption Expenditure Data from NSSO.

reveal that urban household heads were having higher probability of falling under poverty as compared to the reference group of rural households for both sectors. Meanwhile, the urban households were falling in the higher poverty bracket in the 68th round as compared to the 61st round.

The study classifies social group dummies for Scheduled Caste, Scheduled Tribes, and Other Backward Class households with Others as the base category group because the Others category had lower poverty rate in both the rounds; whereas, SC households had three times higher probability of poverty and ST and OBC households had almost double probability of becoming poor households as compared to the reference group in the 61st round. In the 68th round, lower household poverty was found across social groups. Among the administrative divisions, Aurangabad and Amravati division households had almost double probability of falling under poverty for both rounds. The education variables also show a significant relationship with poverty status. This means that it is a

vital factor which influences the chance of being poor and not poor, and that there was a lesser probability for a household to fall into poverty if the household head was educated upto the primary and secondary level. If the educational level of the household head was lower without formal school, below primary, and primary to middle, there was almost half probability of the household falling under poverty as compared to the reference group - not literate, and it is statistically significant at the 1% level in explaining the probability (likelihood) of households being poor. The household size as well as household occupation also had a strong positive relationship with poverty status in both 61st and 68th rounds.

Conclusion

Poverty reduction is a key policy debate in recent literature on social issues. The elaboration of policies for poverty relief requires thorough knowledge of this phenomenon. Therefore, there is a need for research aimed at the identification of determinants of poverty and assessing the impact of policies and welfare programs on the poor. Poverty of India is of great importance today even though so many measures have been taken by various governments and international organizations to alleviate global poverty. The Government of Maharashtra also has initiated various anti poverty alleviation programmes in both rural and urban areas to eradicate extreme poverty in the state. The study examines district wise and division wise status of poverty across socio-religious groups in Maharashtra by making use of 61st and 68th rounds of NSSO Household Consumption Expenditure Data. The results reveal that there is a significant difference between poverty across socio-religious groups in both rounds in rural and urban areas in Maharashtra, and poverty to education ratio at the district level and division levels across socio-religious groups. The results indicate that poverty in the state reduced by 21.61% between 2004-2005 and 2011-2012.

The results indicated that the incidence of poverty among the social groups was reduced by 13.7% among Scheduled Tribes followed by 33.15% in Scheduled Castes, 24.62% in OBC, and 16.83% in Others (non ST, SC, & OBC); among the religious groups, poverty reduced by 20.62% in Hindu and 9.45% in Muslim community households during the study period of 61st round (2004 - 05) and 68th round (2011-12).

Policy Implications, Limitations of the Study, and Scope for Further Research

The present study estimated household poverty in Maharashtra by using Household Consumption Expenditure Survey of 61st and 68th rounds of NSSO. The NSSO collected household consumption expenditure data of 68th round in 2011-12. After 2011-12, the survey was not conducted. Maharashtra is an above national average state in the country in majority of the socioeconomic indicators. There exist several studies on assessments and determinants of poverty both at macro and micro levels. Inter-state and intra-state studies focus on spatial divergence in poverty. In addition, the study makes use of logistic regression model to identify key determinants of households for being poor or not poor. With respect to Maharashtra, there are very few empirical studies focusing on regional disparity within the state and linking the same to poverty. The results reveal that people of the districts of Amravati division were quite poor (both rural and urban sectors) in the 68th (2011-12) round. So, the study can be extended to compare the next survey of household consumption expenditure, and it can help policy makers and Government of Maharashtra in making proper plans and in implementing target budgeting at the district level and effectively monitoring the outcome of the budget. This is necessary to alleviate poverty.

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