

Rural and Urban Multidimensional Poverty in Tinsukia District of Assam, India

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Abstract: This paper aims at measuring the level of multidimensional poverty in Tinsukia district, Assam. The paper also aims at identifying the proportional contribution of each indicator to multidimensional poverty. The present study is mainly a primary survey based study. Using the Alkire and Foster methodology, the study found higher multidimensional poverty in rural area compared to urban counterpart. The contribution of nutrition indicator to MPI is high in rural areas followed by years of schooling while in urban child enrollment indicator contribute more to MPI followed by years of schooling.

Keywords: A.F methodology, Multidimensional poverty, Rural and urban, Assam, India.

I. Introduction:

Background: The existence of poverty in living standard between classes of people is widely believed to be an important development challenge across the world. Realizing the fact, efforts have been made at different levels to quantify the poor on the basis of the poverty line reckoned in money metrics terms for operational phase of interventions. UN, in its Millennium Development Goals targeted to halving the proportion of poor living in income less than \$1.25 by 2015. According to the MDG Report, 2015, although the targets of eradication of extreme poverty and hunger have been met or almost met, the world is still having 825 million people living in extreme poverty and 821 million suffering from hunger in 2017 (New UN Report, 2018). This signifies that measuring poverty in income dimension may yield some pertinent information on its chosen scale, but perhaps overlooks the multifaceted nature of human deprivation. Therefore, there has been a shift of conceptualizing poverty beyond its income dimension. The fundamental reconsideration of the concept of poverty particularly conceived broadly in economics, prompted in the capability approach developed by Amartya Sen. In capability approach Sen. viewed poverty as capability failure and thus rooted poverty as multidimensional. By portraying poverty in multidimensional space in terms of capability failure, Sen., invites direct attention to a range of specific capabilities relating to health, education, shelter and basic amenities. Unlike Sen, many scholars hold the view that for poverty reduction, rise in individual income can of course be very important but simultaneously it needs some social and economic arrangement such as facilities for education and health care as well as political and civil right. The framework of Chamber & Conway's livelihood approach, Basic needs approach of Hicks and Streeten, Atkinson's & Marlier's social inclusion, UNRISD's social protection, the concept of human security etc throw light on the multidimensional aspect of poverty. Over the last decades, both the theory and the practical measurement of multidimensional poverty have made rapid advance. The evolution of the human development paradigm in 1990 led to the strong theoretical foundation to measure multidimensional poverty. Human Development Report, 2010, introduces the global multidimensional poverty index which directly measures the combination of deprivations that each household experience.

The focus on multidimensional aspect of poverty has the potential to draw attention to government failure especially in relation to provision of public goods and how market function. While these conceptual arguments for an independent focus on measuring multidimensional poverty apply to all countries, there is also a significant relevance for India and Assam too. In India about 47.9 percent of Indian households that have more than five children are severely deprived of shelter, water, sanitation, health and education according to Indian Human Development Survey report, 2019. In Assam despite declining trend of poverty in recent years, 77 percent of rural people are without access to sanitation facilities, 14.2 percent are without having safe drinking water and 36.2 percent have no access to

electricity facility (the Human Development Report, 2016). The literature of poverty studies exposed that poverty has regional dimension means where the poor lives is an important dimension. Therefore, the variation in multidimensional poverty as well as material deprivation is found in rural and urban areas across all the countries of the world.

Tinsukia district of Assam: Tinsukia district is one of the 27 administrative districts of Assam. It is situated in between 27.23⁰N to 27.48⁰ N latitudes and 93.38⁰ E longitudes at the north covering an area of 3790 sq.km. Located in the Upper part of Assam, the district is surrounded by Arunachal Pradesh in the East, Dibrugarh district in the west and in the north river Brahmaputra, in the south Arunachal Pradesh. As per 2011 census, total population of the district is 1325263 with population density 350 persons. Tinsukia district has 7 development blocks and 86 goan panchayat. The number of villages in this district is 1168 and 80.60 percent of population live in rural area. Total urban population in this district is 262992 lakes (19.94 percent) out of which 44051 (16.75) are slum dwellers (2011 census). According to the Statistical Hand Book of Government of Assam, 2011, there are 13 towns and 102 slum pockets in Tinsukia district. Despite of being one of the commercial districts with high opportunity and potentiality, people in this district are unemployed, living in poor condition and deprived in having access to basic amenities of life.

II. Objectives:

The objectives of the paper are - (1) to measure the extent of rural and urban poverty in the light of Multidimensional Poverty Index. (2) to identify the proportional contribution of each indicator to multidimensional poverty index

III. Previous literature:

In the literature there are a number studies construct multidimensional poverty index and decomposed it by the area or region to find out the differences in the extent and the nature of multidimensional poverty. **Alkire et. al** (2014), tried direct comparison of the multidimensional poverty of rural and urban areas using Global MPI, 2014. The result covering 105 countries found that 85 percent of multidimensionally poor live in rural area and across all the countries the composition of poverty differs across rural and urban areas. **Santos and Ura**(2008), attempted to estimate multidimensional poverty in rural and urban Bhutan applying the Alkire and Foster methodology using the 2007 Bhutan living Standard Survey data. Considering five dimensions- income, education, room availability, electricity and water for urban areas and two additional dimensions –access to road and land ownership for rural areas, their study found that multidimensional poverty in Bhutan is mainly a rural phenomenon. **Alkire and Kumar** (2012), tried to comparing both income and multidimensional poverty in rural and urban areas. The result they found is that relative deprivations are similar across individual indicator in rural and urban areas, but rural areas faces greater deprivation in sanitation, cooking fuel medium and assets. Rural urban differences in MPI is much higher than income. **Wang et. al** (2016), tried empirically to explore the coincidence and mismatch between the income poverty and multidimensional poverty using AF- methodology in china. The study found that the coincidence of income poverty and multidimensional poverty is 31 percent. This means that 69 percent multidimensionally poor households are not income poor. **Tran et. al** (2015), tried to examine static and dynamic disparities between monetary and multidimensional poverty in Vietnam. Their study revealed that monetary poor are not always multidimensionally poor. The coincidence between the two always less than 50 percent. **Suppa, Nicolai**(2016), assessed the comparisons between income and multidimensionally poverty in Germany. The result found significant differences between the two measures. For income cut-off of 60 percent and k=33 percent, only 39.78 percent income poor are also multidimensionally poor.

IV. Methodology:

Data source: The present study is based on the primary data collected (on 2018-19) by field survey through a structured questionnaire prepared for the purpose. Moreover, some secondary data was also collected from OPHI, Global MPI Report, Statistical Hand Book of Assam, 2016, Assam Human Development Report, 2016

Study design: Tinsukia district was purposively selected as the study area for the present study based on the rationality that Tinsukia district is one of the commercial district of Assam. Despite of being an important industrial district, having the opportunity and potentiality, this district has the lower rank in Human Development Index (22nd, out of 27th). For the study, a multistage sampling method was applied. In rural area, out of 7 development block, one panchayat from one block was selected. From the selected Panchayat, 25 percent villages and from each village 25 percent or 193 households were randomly selected and in Urban area, out of 13 towns, Tinsukia town was purposively selected and out of 12 slum pockets (Census Report, 2011) 1 slum pocket was selected for the study and 25 percent or 159 households of the selected pocket was selected as sample household. Combining total of 352 sample households out of 775 rural households in Gotong Gaon Panchyat and 636 urban households in Mazid Pattety slum pocket of Tinsukia Town were considered in the present study.

V. Analytical strategy:

In order to fulfill the objectives, the present paper identifies the households that are multidimensionally poor using Alkire and Foster methodology (UNDP, Human Development Report, 2010). Considering the household as the unit of analysis, the study follows two steps – (a) Identification and (b) aggregation of the poor on the basis of two poverty cutoffs- deprivation cutoff and poverty cutoff. For identification of the poor, the following dimensions, indicators cutoff and weights were used (Table.No.1)

Table No.1 Dimensions, indicators, deprivation cut-off, and weights of the global MPI

Dimension	Indicator	Deprivation Cutoff	weight
Education	Years of schooling	No household member has completed five years of schooling.	1/6
	Child enrolment	Any school age child in the household is not attending school up to class 8.	1/6
Health	Nutrition	If any adult or child in the household is undernourished.	1/6
	Mortality	Any child has passed away in the household in last five years	1/6
Standard of living	Floor	The household has a dirt, sand, or dung floor/not improved wall of the house.	1/18
	Sanitation	The household's sanitation facility is not improved/ if improved shared with numbers of families	1/18
	Cooking fuel	The household cooks with dung, wood, or charcoal	1/18
	Water	The household doesnot have access to pure drinking water.	1/18
	Electricity	The household has no electricity	1/18
	Assets	The household owns at most one of the following: radio, mobile phone, TV, bike, refrigerator, and doesnot own a car or truck.	1/18

Source: Alkire and Santos (2010, 2014), cf. Alkire, Roche, Santos, and Seth (2011) and Alkire, Conconi, and Roche(2013)

And for aggregation part, after setting the deprivation cutoff, a household is identified as poor if the household's deprivation score is equal to 1/3. After that a censored deprivation score vector is obtain by multiplying each entry by the identification function express as follows.

$$C_i(k) = \sum_{j=1}^d w_j g_{ij}^0(k) \dots\dots\dots(1)$$

The censored deprivation score vector is denoted by C (k). At last, the MPI is constructed dividing the censored deprivation score vector by total population. This can also be easily verified by the product of H (head count ratio) and A (intensity: which is obtain by dividing the total deprivation score by total poor).

VI. Estimation Results

Multidimensional poverty Index of the sample households: Using the methodology of Alkire and Foster (UNDP, 2010, 2014), the multidimensional poverty was constructed on the basis of the FGT class of poverty measures for the households living in rural and urban areas of Tinsukia district. The study found higher uncensored headcount ratio or incidence of poverty in rural area (67 percent) compared to urban area (40 percent) of the district. If we see the intensity (A), less differences is found between the two locations of the district (48 percent in rural and 44 percent in urban) despite of having high differences in headcount ratio. As a product of partial indices of H and A, the higher value of multidimensional poverty index found in rural area compared to urban area of the district. In rural the value (M_0) found is 0.325 and in urban 0.175 that means 33 percent households are multidimensionally deprived in rural area while in urban 18 percent are multidimensionally deprived. In both the rural and urban area, the multidimensional poverty ratio is found high compared to state (16 percent) and national level (12 percent) (Table.2)

Table.2. MPI of the Sample Households

Area	H(Incidence)	A(Intensity)	M_0 (MPI)	M_1	M_2
Rural	0.673	0.483	0.325	-0.253	0.198
Urban	0.400	0.439	0.175	-0.058	0.052
Total population	0.542	0.433	0.235	-0.073	0.066
Assam(State)	0.358	0.446	0.161	--	--
India(national)	0.275	0.439	0.121	--	--

Source: Primary data, own calculation, For Assam and India (Global MPI Report, 2018)

(M_0 = adjusted multidimensional poverty, M_1 = adjusted multidimensional poverty gap, M_2 = adjusted squared multidimensional poverty gap)

The adjusted multidimensional poverty gap (M_1) as well as severity of poverty (M_2) too found high in rural area (0.253) compared to urban area (0.058) in the district (Table No.2).

- **MPI at different poverty cut-offs:**

To know the impact on multidimensional poverty due to change in poverty cut-off, multidimensional poverty index was constructed for the sample households considering two additional poverty cut-off i.e k=40% and k=50%. Table.3 shows that both in rural and urban areas with increase in poverty cut-off to 40 percent and 50 percent, the incidence of poverty (H) and the value of MPI decrease. In rural area, the incidence of multidimensional poverty (H) at k=33%, k=40%, k=50% is 67 percent, 34 percent and 17 percent respectively. The corresponding value of MPI, decrease from the value of 0.325 at k=33 percent to 0.189 and 0.107 at k=40 percent and k=50 percent. In urban area the value of the incidence (H) decrease from 0.400 to 0.155 and 0.155 at the same poverty cut-off and the corresponding value for MPI decrease from 0.175 to 0.083 and 0.082.

Table. 3 MPI of the Sample Households for different poverty cut-off

Multidimensional poverty cutoff(k)	Rural			Urban		
	H	A	MPI	H	A	MPI
K=33%	0.673	0.483	0.325	0.400	0.439	0.175
K=40%	0.344	0.551	0.189	0.155	0.541	0.083
K=50%	0.170	0.628	0.107	0.097	0.841	0.082

Source: Primary data, own calculation

While the value of multidimensional poverty index decrease with increase poverty cut-off, but the intensity shows higher value with every increase of poverty cut-off.

Indicator-wise Uncensored and censored headcount ratio:

Table.4 shows the uncensored and censored headcount ratio in each indicator within the three dimensions. In the study, the higher uncensored headcount ratio is found in drinking water (0.791), nutrition(0.788) , housing floor(0.762) and cooking fuel(0.619) indicators and lower ratio is found in child mortality (0.015) indicator in rural area.

Table.4 Indicator wise Uncensored and Censored Head Count Ratio

Dimensions	Indicator	Rural		Urban	
		Uncensored head count ratio	Censored headcount ratio	Uncensored head count ratio	Censored headcount ratio
Education	Years of schooling	0.227	0.223	0.293	0.265
	Child enrolment	0.077	0.077	0.387	0.283
Health	Nutrition	0.788	0.621	0.195	0.134
	Child Mortality	0.015	0.015	0.040	0.040
Living Standard	Housing Floor	0.762	0.634	0.491	0.199
	Sanitation	0.595	0.553	0.134	0.076
	Cooking fuel	0.619	0.569	0.436	0.193
	Drinking Water	0.791	0.607	0.460	0.011
	Electricity	0.338	0.329	0.121	0.059
	Assets	0.332	0.294	0.557	0.277

Source: Primary data, own calculation

While in urban area, the higher value is found in assets (0.557) followed by housing floor (0.491), drinking water (0.460), cooking fuel (0.436) and lower value is found in child mortality (0.040). If we compare the uncensored headcount ratio found in each indicator, in rural area the higher value for each indicator is found compared to urban counterpart except in child mortality indicator and in indicator of health dimension.

Regarding censored headcount ratio i.e the ratio of households who are multidimensionally poor and simultaneously deprive in each indicator, the higher value in rural area is found in housing flour(0.634), nutrition(0.621) and in drinking water(0.607) in rural and in urban the corresponding value is found high in child enrolment(0.283), assets(0.277), and in years of schooling indicator(0.265) and lower censored headcount ratio is found in drinking water(0.011), child mortality(0.040) and electricity(0.059) indicators.

Percentage contribution of each indicator to MPI:

Though the censored headcount ratio shows the extent of deprivation among the poor, it does not reflect the relative importance of the indicators. Two indicators may have the same censored headcount ratio, but contribution to overall poverty may be different, because the contribution depends both on censored headcount ratio and the weight assigned to each indicator.

Table.5 Indicator-wise percentage contributions to MPI

Dimensions	Indicator	Rural	Urban
Education	Years of schooling	11.61	25.21
	Child enrolment	3.98	26.99
Health	Child Mortality	0.80	3.82
	Nutrition	32.33	12.82
Living Standard	Housing Floor	11	6.33
	Sanitation	9.60	2.43
	Cooking fuel	9.89	6.14
	Drinking Water	10.53	0.37
	Electricity	5.71	1.87
	Assets	5.10	8.81

Source: Primary data, own calculation

Table.5 Shows higher contribution of nutrition indicator (32.3) followed by years of schooling (11.61), housing floor (11) and drinking water (10.53) in rural areas. And in urban, the corresponding value is found high in child enrolment (26.99) followed by years of schooling (25.21), nutrition (12.82) and assets (8.81) indicator in urban area of the district and lower value is found in drinking water.

VII. Conclusion

The findings of the present study shows that 33 percent households in rural area and 17 percent in urban area in the district are multidimensional poor and this ratio is higher compared to state and national level. Compared to rural area, in urban censored headcount ratio, poverty gap and squared poverty ratio is found high. In the analysis of percentage contribution of each indicator to MPI, the difference occurs in nutrition indicator which is high in Rural area compared to urban. And in urban, the indicator shows high contribution to MPI, is years of schooling. One important point that was observed in the study that households both in rural and urban are less asset poor but poor in nutrition, sanitation, water, housing floor. This means that both in rural and urban, expenditure on purchasing asset are high compared to other basic amenities of life.

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Comparing Monetary and Multidimensional Poverty in Tinsukia District of Assam, India

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Abstract:

The aims of the paper are to measure the level of monetary and multidimensional poverty and to compare the outcomes of both the measurement of poverty for rural and urban population in Tinsukia district of Assam. In the study Monetary poverty is measured on the basis of the official state specific rural and urban poverty line and using Foster-Greer-Thorbecke (FGT) class of poverty indices and for multidimensional poverty measurement, Alkire and Foster methodology were used. Then for comparing monetary and multidimensional poverty, the study used the simple cross tables. The findings of the study show that monetary poverty headcount ratio is high in urban compared to rural and in multidimensional poverty, higher headcount ratio is found in rural compared to urban. The results of the comparative analysis of monetary and multidimensional poverty show that for all the three multidimensional poverty cutoffs the similarity between the two measures of poverty is higher than the mismatch in rural but in urban mismatch is higher than the similarity between the two measures. The present study, suggest for simultaneous use of both the income and multidimensional measurement of poverty to identify the poor for effective implementation of poverty reduction policy.

Keywords: Monetary Poverty, Multidimensional Poverty, Tinsukia, Assam etc.

I. Introduction:

The persistence of poverty being the challenge to development has been the central of discussion for researchers, policy makers and international organizations for long time. In the literature huge debate is found on the definition, conceptualization and estimation of poverty. Traditionally poverty is conceptualized as a state or condition of having little or no money, goods or means of support. World Bank refers poverty as “deprivation in well being”. Here, referring well being as command over resources, poverty was measured on the basis of poverty threshold of income or consumption (Haughton & Kandekar, 2010). However, poverty, defined as deprivation in well being sound more about monetary sense and ask for whether people are able to have enough food, shelter, health or education. This approach of well being thus revealed that well being depends on monetary as well as non-monetary variables (Bourguignon & Chakraborty). In the literature, the broadest approach to well being is the one which was articulated by Amartya Sen as “capability deprivation”. According to this approach, well being comes from a capability to function in society and poverty arises when people lack key capabilities and so have inadequate income or education, poor health or insecurity (Sen, 1999). This way of expressing well being defines poverty as multidimensional and therefore, less measurable in the single threshold of income or consumption.

Tinsukia district of Assam: Tinsukia district is one of the 27 administrative districts of Assam. It is situated in between 27.23⁰N to 27.48⁰ N latitudes and 93.38⁰ E longitudes at the north covering an area of 3790 sq.km. Located in the Upper part of Assam, the district is surrounded by Arunachal Pradesh in the East, Dibrugarh district in the west and in the north river Brahmaputra, in the south Arunachal Pradesh. As per 2011 census, total population of the district is 1325263 with population density 350 persons. Tinsukia district has 3 sub-divisions that is Tinsukia, Margherita and Sadiya, 7 revenue circle, 7 development blocks and 86 goan panchayat. The number of villages in this district is 1168 and 80.60 percent of population live in rural area. Total urban population in this district is 262992 lakes (19.94

percent) out of which 44051 (16.75) are slum dwellers (2011 census). According to the Statistical Hand Book of Government of Assam, 2011, there are 13 towns and 102 slum pockets in Tinsukia district. It is a district of mixer communities. As a commercial and trade hub, Tinsukia district is rich in tea, coal, crude oil, petroleum and plywood products. Rural people of this district generally engaged in agriculture, tea plantation, and cultivation of orange, ginger and other citrus fruits. Despite of being one of the commercial districts with high opportunity and potentiality, people in this district are unemployed, living in poor condition and deprived in having access to basic amenities of life. According to the State Human Development Report, 2016 Tinsukia district, still in the position of 22nd rank out of 27th rank of the state. Combining both rural and urban 36 percent people of this district are living below the poverty line (HDR, Assam, 2016). Therefore a careful comparison of monetary and multidimensional poverty in this district is of paramount importance from the view of effective policy measures.

II. Objective:

The objective of the present study is to measure the level of monetary and multidimensional poverty among the rural and urban population in Tinsukia district of Assam. The study also attempts to compare the outcomes of both monetary and multidimensional poverty of the rural and urban population of the district.

III. Review of literature:

In the literature, large numbers of studies are found that compares monetary and multidimensional poverty. **Tran, V.Q et.al** (2015) by analyzing the prevalence and dynamics of both monetary and multidimensional poverty in Vietnam explored that monetary poor are not always multidimensionally poor indeed the overlap between the two measures is much less than 50 percent. The disparity between the two measures of poverty varies across sub-groups of population depending on household's characteristics and their access to their market. **Nicolai, Suppa (2016)** comparing monetary and multidimensional poverty highlighted the significant differences between the two measures and suggested properly designed multidimensional poverty indices for better reflecting human deprivations. **Wang et. al** (2016), tried empirically to explore the coincidence and mismatch between the income poverty and multidimensional poverty using AF- methodology in china. The study found that the coincidence of income poverty and multidimensional poverty is 31 percent. This means that 69 percent multidimensionally poor households are not income poor. **Alkire and Kumar** (2012), tried to comparing both income and multidimensional poverty in rural and urban areas. The result they found is that relative deprivations are similar across individual indicator in rural and urban areas, but rural areas faces greater deprivation in sanitation, cooking fuel medium and assets. Rural urban differences in MPI are much higher than income. **Bader, et al (2016)** made comparison of monetary and multidimensional poverty for Lao people's democratic republic. The outcomes of the result clearly pointed that monetary poverty can't serve as proxy of multidimensional poverty and vice-versa .The correlation between monetary and the various indicators of multidimensional poverty proves to be limited.

IV. Methodology:

Data source: The present study is based on the primary data collected (on 2018-19) by field survey through a structured questionnaire prepared for the purpose. Moreover, some secondary data was also collected from OPHI, Global MPI Report, Statistical Hand Book of Assam, 2016, Assam Human Development Report, 2016

Study design: Tinsukia district was purposively selected as the study area for the present study based on the rationality that despite of being an important industrial district, having the opportunity and potentiality, the district in the lower position in Human Development Index (22nd out of 27th Rank). For the study, a multistage sampling method was applied. In rural area, out of 7 development block, 1 block i.e Guijan development block was selected and from this block, one gaon panchayat was selected. From the selected Panchayat, 25 percent villages and from each village 25 percent or 193 households were randomly selected and in Urban area, out of 13 towns, tinsukia town was purposively selected and out of 12 slum pockets (Census Report, 2011) 1 slum pocket was selected for the study and 25 percent or 159 households of the selected pocket was selected randomly as sample households. Combining total of 352 sample households out of 775 rural households in Gotong Gaon Panchyat and 636 urban households in Mazid Pattety slum pocket of Tinsukia Town were considered in the present study.

V. Analytical strategy:

For identify the monetary poor, monthly per capita consumption expenditure for each household is calculated and then compared with the poverty threshold value of MPCE based on the state specific poverty line for rural (Rs. 1006.66) and urban (Rs.1420.12) recommended by Rangarajan committee of planning commission of India (2014) and for aggregation, Foster-Greer-Thorbecke (FGT) class of poverty measures were used. The individual indices of the family of FGT measures is derived by substituting different values of the parameter 'α' in to the equation given below-

$$FGT_{\alpha} = \frac{1}{N} \sum_{i=1}^H \left(\frac{Z - Y_i}{Z} \right)^{\alpha} \dots\dots i$$

For the purpose of the measurement of multidimensional poverty Alkire and Foster methodology (UNDP, Human Development Report, 2010) was used where multidimensional deprivation were measured on the basis of dimensions, indicators, cutoffs and weights given in Table.1

Table No.1 Dimensions, indicators, deprivation cut-off, and weights of the global MPI

Dimension	Indicator	Deprivation Cutoff	weight
Education	Years of schooling	No household member has completed five years of schooling.	1/6
	Child enrolment	Any school age child in the household is not attending school up to class 8.	1/6
Health	Nutrition	If any adult or child in the household is undernourished.	1/6
	Mortality	Any child has passed away in the household in last five years	1/6
Standard of living	Floor	The household has a dirt, sand, or dung floor/not improved wall of the house.	1/18
	Sanitation	The household's sanitation facility is not improved/ if improved shared with numbers of families	1/18
	Cooking fuel	The household cooks with dung, wood, or charcoal	1/18
	Water	The household doesnot have access to pure drinking water.	1/18
	Electricity	The household has no electricity	1/18
	Assets	The household owns at most one of the following: radio, mobile phone, TV, bike, refrigerator, and doesnot own a car or truck.	1/18

Source: Alkire and Santos (2010, 2014), cf. Alkire, Roche, Santos, and Seth (2011) and Alkire, Conconi, and Roche(2013)

In Alkire and Foster methodology, people are identified as poor on the basis of dual poverty thresholds. One is deprivation cutoffs and another one is poverty cutoff, in which people are considered as poor if their deprivation score vector exceed or equal to the value of one-third. After censoring deprivation of the non-poor and computing the proportion of people who are multidimensionally poor , the head count ratio of multidimensional poverty (H) is counted which represent the incidence of multidimensional poverty. After counting the incidence of poverty, the intensity of poverty (A) is derived by computing the average share of weighted indicators in which poor people are deprived. This is obtaining by adding up the deprivation scores of the poor and dividing them by the total number of poor people. On the basis of the two partial indices, incidence (H) and the intensity (A), multidimensional poverty index is constructed as the product of H x A. This can be express as

$$\text{MPI} = H \times A \dots\dots(ii)$$

VI. Estimation Results:

Estimation of monetary poverty: As per the Table. No2, the analysis of income poverty measured on the basis of state specific poverty line recommended by Rangarajan committee, both for rural and urban shows head count ratio of 16.5 percent in rural area while in urban the ratio found is 50.3 percent. The corresponding poverty gap ratio that is found in rural and urban areas are 2.5 percent in rural and 26.2 percent in urban. The severity of poverty ratio found high in urban (31.1 percent) area compared to rural area (0.6 percent) of the district. The most likely reasons for higher income poverty in urban may be the higher size of family and cost of living.

Table.2 Monetary poverty of the sample households

Area	Head count ratio	Poverty gap ratio	Squared poverty ratio
Rural	0.165	0.025	0.006
Urban	0.503	0.262	0.311

Source: Primary data, author's calculation

Estimation of Multidimensional poverty: The estimation of multidimensional poverty based on Alkire and Foster methodology for both rural and urban areas have been presented in Table No.3. As per Table No.3, the head count ratio of multidimensional poverty is found high in rural (.637) areas compared to urban areas (0.400) of the district. The intensity of poverty too found high in rural compared to urban.

Table.3 Multidimensional Poverty of the Sample Households

Area	H(Incidence)	A(Intensity)	M ₀ (MPI)	M ₁	M ₂
Rural	0.673	0.483	0.325	-0.253	0.198
Urban	0.400	0.439	0.175	-0.058	0.052

Source: Primary data, own calculation

(M₀= adjusted multidimensional poverty, M₁= adjusted multidimensional poverty gap, M₂= adjusted squared multidimensional poverty gap)

The construction of multidimensional poverty Index based on the product of incidence and intensity shows higher adjusted multidimensional poverty value for rural (0.325) compared to urban (0.175). The corresponding multidimensional poverty gap too found high in rural (-0.253) compared to urban (-0.058). The severity of multidimensional poverty also found high in rural compared to urban.

Comparison of Monetary and Multidimensional poverty for different poverty cut-off:

In order to compare the result of two poverty measures the concordance and mismatch between income poverty and multidimensional poverty in the identification of the poor has to be examine. However such exercise depends crucially on the chosen poverty cut-offs. The Table.6 compares the results of monetary poverty and the multidimensional poverty for three different poverty cut-offs.

Table.4 Monetary Poverty and Multidimensional poverty for different poverty cut-offs

	K=33%				K=40%				K=50%			
	Rural		Urban		Rural		Urban		Rural		Urban	
	MD Non-poor	MD poor	MD-Nonpoor	MD-Poor	MD-Nonpoor	MD-Poor	MD-Nonpoor	MD-Poor	MD-Nonpoor	MD-Poor	MD-Nonpoor	MD-Poor
Monetary non-poor	30.0	48.2	22.6	12.6	56	22.3	30.8	4.4	66.3	11.9	33.3	1.9
Monetary poor	0.0	21.8	39	25.8	6.7	15	52.2	12.6	14.5	7.3	56	8.8

Source: Primary data, Own calculation,

From Table.6 on the basis of cross table calculation, in rural area, we can see that with multidimensional poverty cut-off k=33 percent, both monetary and multidimensional poverty measure identifies 21.8 percent household as poor and 30 percent as non-poor. On the other hand with multidimensional poverty cut-off k=33 percent, 48.2 percent of sample households are identified as multidimensionally poor but not monetary poor and 0.0 percent monetary poor are not multidimensionally poor. Thus there is a mismatch between the two measures up to 48.2 (48.2+0.00) percent and the similarity between the two measures is up to 51.8 (21.8+30.0) percent. Now, in order to examine the impact of increase in multidimensional poverty cut-off, two additional poverty cut-offs are taken into consideration. With the increase of multidimensional poverty cut-off from 33 percent to 40 percent and 50 percent respectively, the absolute share of the households who identified both as multidimensional and monetary poor decline from 21.8 percent to 15 percent and 7.3 percent respectively. On the other hand the absolute share of the household who are identifies as non-poor based on both the poverty measures increase from 30 percent to 56 percent and 66.3 percent respectively. However, with the increase in the poverty cut-off from k=33 percent to k=40 percent and k=50 percent, the share of the households who are multidimensional poor but not monetary poor decrease from 48.2 percent to 22.3 percent and 11.9 percent respectively. While the share of the households who are monetary poor but not multidimensionally poor increases from 0.0 percent to 6.7 percent and 14.5 percent respectively.

In urban area, with multidimensional poverty cut-off $k=33$ percent, both monetary and multidimensional poverty identifies 25.8 percent sample households are poor and 22.6 percent are non-poor. On the other hand, share of 12.6 percent sample households are identified as multidimensionally poor but not monetary poor and 39 percent households are identified as monetary poor but not multidimensionally poor. The mismatch between the two measures thus up to 51.6(12.6+39) percent and the similarities in both these two poverty measures up to 48.4(25.8+22.6) percent. Now with increase in the multidimensional poverty cut-off from $k=33$ percent to $k=40$ percent and $k=50$ percent, the absolute share of the households identified as poor in two poverty measure decline from 25.8 percent to 12.6 percent and 8.8 percent respectively. On the other hand, the share of households identified as non-poor both in monetary and multidimensional poverty measures increase from 22.6 percent to 30.8 and 33.3 percent respectively. While the share of the households identified as multidimensionally poor but not monetary poor decline from 12.6 percent to 4.4 percent and 1.9 percent respectively and the share of households identified as income poor but not multidimensionally poor increase from 39 percent to 52.2 percent and 56 percent respectively. The comparative analysis of monetary poverty and multidimensional poverty shows that for all the three multidimensional poverty cut-offs, the mismatch between the two poverty measures is lower (48.2 percent) than the similarities (51.8 percent) in rural area of the district. On the other hand in urban area, the mismatch percentage shows higher (51.6 percent) than the percentage of similarities (48.4 percent) between the two poverty measures. This implies that in rural the monetary poverty still playing some important role in determining their multidimensional poverty status. While in urban found higher percentage of mismatch between the two measures means that monetary poverty here fails to determine multidimensional poverty status of the people.

VII. Conclusion:

The present study though shows higher monetary poverty in urban compared to rural, but in multidimensional poverty, the higher multidimensional poverty index value shows high in rural areas compared to urban. Thus, the results consistent with the fact that monetary measurement of poverty though provides some pertinent information on its chosen scale but overlooks multifaceted nature of human deprivation. The comparative analysis of monetary and multidimensional poverty at different poverty cut-offs shows that in rural area the concordance of the two poverty measure show high compared to mismatch. This implies that income poverty still play important role in determining multidimensional poverty status in rural areas. While in urban, mismatch between the two measures of poverty is found high which implies that monetary poverty of urban population fails to reflect the multiple deprivation. The result found in the present study, therefore, suggest for simultaneous use of both the income and multidimensional measurement of poverty to identify the poor for effective implementation of the programmes framed for poverty eradication.

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Poverty, Poverty Line and Multidimensional Approach to Poverty

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The existence of poverty and large disparities in living standard between classes of people is widely believe to be an important cause of prevailing social tension and unrest. Many hold the view that poverty and inequality are growing and that this trend, if unchecked, would aggravate tension and endanger the countrys stability. Recognized the reality of the fact, several efforts have been made at global and national level to quantify the poor on the basis of the poverty line reckoned in money-metrics terms for operational phase of interventions. UN, in its Millennium Development Goal targets to halving the proportion of poor living in income less than \$1.25 by 2015. According to the MDG Report, 2015, although the targets of eradication of extreme poverty and hunger have been met or almost met, the world is still having the 825 million people living in extreme poverty and 800 million suffer from hunger. This signifies that the income

approach to poverty measure though yields some pertinent information on its chosen scale, but it is essentially one-dimensional and perhaps overlooks the multifaceted nature of human deprivation. This can easily lead to a superficial and misleading understanding of the nature and causes, as well as the cures of human poverty. In this regards, Amartya Sen, articulating poverty as „capability deprivation expounded that for poverty reduction, rise in individual incomes can, of course, very important but simultaneously it needs some social and economic arrangement such as facilities for education and health care as well as political and civil rights (Sen, 1999). Thus, to crystallize the nature of phenomenon, therefore, conceptual understanding is necessary in contemporary poverty studies for precision in the identification and quantification of the poor. In this paper attempt has been made to understand the issues relating to conceptualization of

poverty, line and multidimensional aspect of poverty. In doing so the paper has been divided into three sections. Section 1 comprises the conceptualization of poverty, Section 11 deals with poverty line and Section 111 explores multidimensional approach to poverty.

Conceptualization of poverty

Poverty is general scarcity, dearth or the state of one who lacks a certain amount of material possessions to survive. It has been described as a situation of "pronounced deprivation in well being" and being poor as "to be hungry", to lack of shelter and clothing, to be sick and not cared for; be illiterate and vulnerable to an adverse event. In human term, thus, poverty means little to eat and wear and in economic term it refers to inability to attain a minimum standard of living. The concept of minimum standard of living, of course varies from society to society and thus it implies that what we define as poverty is related to the conditions and possibilities of the society. As a society changes in the quantity and kind of production and in the prevailing standard of living, the definition of poverty too changes. In the literature we find different alternative approaches to the concept of poverty. But behind each measure lies an analytical concept. So attempt has been made to assess each approach with respect to method of identification and aggregation of a group of poor people.

Biological approach: In the long history of poverty literature, poverty has been coined as absolute poverty defined in terms of poverty threshold or poverty line. Rowntree (1901) in his "A Study of Town Life" defined families as being in primary poverty if their "total earnings are insufficient to obtain the minimum necessities for the maintenance of merely physical efficiency". Based on biological approach, bourgeois theorist defines it in relation to human physiology and in terms of subsistence level of nutrition. Marxists treat subsistence minimum more than physiologically determined. They include both natural and necessary wants. Marxists argue that subsistence minimum varies historically, but at any given time and place it can be identified and approximately measured. Following this line of argument, Baran and Sweezy define poverty as "the condition in which those members of society live whose incomes are insufficient to cover what is for that society and at that time the subsistence minimum" (Baran and Sweezy, 1996:281). In the words of Dandekar, "want of adequate income, howsoever defined, is poverty". (Dandekar, 1981:1243) Poverty has to be identified with the deficiency in the total level of living which includes not only energy requirements but also balanced diet needed for health, and other basic needs essential for human existence at a tolerable level" (Rao, 1977:645-54). Abel-Smith and



Townsend viewed poverty in terms of an income limit for social security assistance. (Abel-Smith and Townsend, 1965) The conception of poverty based on this biological approach however subjected to some limitations with its use- (1) the significant variations related to physical features, climatic conditions and the work habits. (2) The translation of minimum nutritional requirements into minimum food requirements depends on consumption behavior of the people. Therefore, the cost of basic necessities varies widely. (3) For non-food item such minimum requirements are not easy to specify. (4) a 'poverty line' definition has failed to distinguish the different minimal needs of families of different size, different stages in the life cycle, and different geographical locations.

The Relative approach: Scholar like Townsend, Galbraith, Miller and Roby, Rainwater, Atkinson argued that poverty is essentially a relative phenomenon. They expounded poverty as a „feeling of deprivation and „condition of deprivation . Peter Townsend articulated poverty as a condition of deprivation and defined it as a point in the scale of the distribution of resources below which families find it increasingly difficult to share in the customs, activities and diet comprising that style of living. Townsend considered that the absolute needs can be relative as well. Suggesting a proper definition of poverty in terms of relative deprivation, he writes:

“individuals and families whose resources over time fall seriously short of the resources commanded by the average individual of family in the community in which they live whether this community is a local, national or international one, are in poverty” (Townsend, 1954: 130-37). Relative deprivation occurs when there is significant disjuncture between the living conditions of many in most of the societies and the population that might be denoted as poor. Galbraith defines poverty as „case poverty commonly or properly related to some characteristic of the individuals so afflicted and „insular poverty which manifests itself as „island poverty and writes: “...People are poverty-stricken when their income, even if adequate for survival, falls markedly behind that of the community. Then they cannot have what the larger community regards as the minimum necessary for decency and they cannot wholly escape, therefore the judgment of the large community that they are indecent. They are degraded for, in the literal sense, they live outside the grades or categories which the community regards as acceptable...”. (Galbraith, 1958: 251) Definition of poverty in relative terms thus, involved more factors than income and brings more people under poverty than the official counts. However, the relative definition of poverty is limited by the fact that it underplays the importance of the level of poverty line for the characteristics of the poor.

The inequality approach:

Arguments in favour of viewing poverty as inequality are presented powerfully by Miller and Roby, who conclude: "casting the issue of poverty in terms of stratification leads to regarding poverty as an issue of inequality. In this approach, we move away from efforts to measure poverty lines with pseudo-scientific accuracy. Instead, we look at the nature and size of the difference between the bottom 20 or 10 percent and rest of the society. Our concern becomes one of narrowing the difference between those at the bottom and the better-off in each stratification dimension. But one can argue that inequality is fundamentally different from poverty. Inequality and poverty are not of course unrelated. But neither concept subsumes the other. Because sensitivity of poverty measures in fact based on poverty line may ignore the perception of poverty. For example, a progressive or regressive transfer of income from a person in the top income group to one in the middle income range and vice-versa must other things being equal reduce or increase inequality, but it may leave the perception of poverty quite unaffected.

The anthropological approach: The anthropological concept of poverty coined by Oscar Lewis (1959) stress on „culture of poverty” in which social relations and kin network and a person's place and well being is frequently conceived. The "culture of poverty" school of thought ascribed

personal characteristics to the cause of poverty in which poor people have a distinct set of behaviors that deviate from the social norm. In other words cultural poverty is seen as a sub-cultural response, where the poor develop a unique set of norms and values (Oscar, L., 1966). In contrast "Class poverty" school of thought argued that the behaviors exhibited by the poor are adaptations to their impoverished environments that emerge from failures in the social, political, and economic structures of society. These scholars proposed that environmental factors cause adaptive behaviors which can be viewed as a subculture of poverty and that the poor hold values similar to those held by other segments of society.

The Socialist approach: In socialist approach, poverty is the outcome of prevailing customs, norms, rules and regulations of social system. It creates social inequality, resulting in a state of inferiority, dependence or exploitation. In other words it implies the existences of social stratum defined by lack of wealth and non availability of social opportunity, so that it is denied from enjoying the pleasure of life. The socialist view of poverty thus explains the nature of poverty fully since it is a multidimensional phenomenon that extends the meaning of poverty beyond the economic arena to encompass factors such as the inability to participate in social and political life (Sen 1979; 1985; 1987). Social definitions of poverty are found to be



suitable by most people and organizations. UN (2009) defines poverty as "a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go to; not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation" (UN 2009:9).

The capability approach, pioneered by Sen (1979; 1985; 1987), conceptualizes poverty as the lack of choice or freedom of individuals to a life that allows them to fulfill their perspective. According to Sen, "poverty must be seen as the deprivation of basic capabilities rather than merely as lowness of incomes, which is the standard criterion of identification of poverty". This implies that the relation between income and capability is strongly affected by the age of a person, by gender and social roles, by location, by epidemiological atmosphere and by other variations over which a person may have no or limited control. It is further implicit in it that income is not the only instrument in generating capabilities, people's ability to convert income into functioning is essential to build one's

capability.

Poverty line: as a criterion of identifying the poor

The conceptualization of poverty in the literature articulates the requirement of a criterion to identify who should be the focus of our concern. The most common route to identification is through specifying a set of basic or minimum needs. In identifying the poor for a given set of „basic needs various elements of basic needs basket are specified which determine the levels of intake or consumption necessary for the basic survival of the human being or by the income which can satisfy the specified basic needs. Setting an explicit poverty line has both descriptive and normative roles. The former is about making poverty comparison over time and space and the latter is in formulating antipoverty policies. The various poverty lines that emerged in England, the United States, and elsewhere around the turn of twentieth century (in the work of Booth, Rowntree, Hunters and Orhansky) helped many well-off people comprehend just how little some people had to live on, and this helped mobilize action to reduce poverty. Similarly to comprehend just how frugal the material level of living, World Bank, in 1990s sets poverty line as \$1 per day (updated to \$1.25 in 2005 and \$ 1.90 at the prices of 2011) as global poverty line and recognized the poor as someone less than this line at their disposal and accordingly sets the

target of reducing poverty on the basis of pertinent information provided by this money matrices poverty line. For example, UN, in its 8th Millennium Development Goals sets the target of halving the proportion of people living on the income less than \$1.25 by 2015 in its first goal. The definition on poverty line in the Indian context was attempted for the first time in 1962 by a working group of eminent Economist and social thinkers. The group on the basis of the recommendations of the Nutrition Advisory Committee of the Indian Council of Medical Research (1958) regarding the requirements of food for a balance diet for a minimum standard of living recommended that the national minimum for each household of 5 persons should not be less than Rs.100/- per month in terms of 1960-61 prices of Rs.20/- per capita and Rs125/- per month for household for Rs25/- per capita for urban areas, excluding expenditure on health and education. Dandekar and Rath (1971) using the norms of 2250 calories per capita estimated poverty line as Rs14.20/- and 22.60/- per capita for rural and urban areas respectively at the 1960-61 prices. In the early 1970s for the first time, the basic minimum needs approach gained prominence. The Planning Commission appointed a Task Force on Projections of Minimum Needs and Effective Consumption Demand that defined the rural poverty line as the per capita consumption expenditure level, based

on a minimum calorie intake in rural and urban areas. Thus although poverty measurement remained in income space, the basis of poverty measurement evolved from the income-based approach to the basic-needs-based approach (Foster and Sen 1997). According to the recommendation of the task force, the minimum basic food intake requirement for the rural and the urban habitants was 2,400 calories and 2,100 calories, respectively. Based on these minimum calorie requirements, the minimum required subsistence income levels were determined for different regions. These minimum required income levels were used as regional poverty thresholds.

To improve the effectiveness and time lines of the policy, since 1992 govt developed a measure to categorize the people living „Below Poverty Line and three successive BPL census (1992, 1997, 2002) were held to identify rural families that are living below poverty line and thus eligible for govt support. However, this approach based on income data may be less accurate than expenditure data (Atkinson and Micklewright 1983, Grosh and Glewwe 2000) and in expenditure method (the BPL survey based on 1997). First, the exclusion criteria were too stringent (the possession of a single ceiling fan was grounds for exclusion). Second, poverty lines for all states/union territories were lacking. Third, the BPL criteria were not uniform across states; hence, the interstate comparison was



difficult. Finally, there were no procedures available to add new families to the BPL lists for five years. Furthermore, the non-poor households were identified according to their resources rather than what household members were capable of being and doing. This is the fundamental distinction between the needs-based approach and the capability approach of Amartya Sen.

Measuring the incidence of poverty using income or food poverty line thus has been criticized in two different lines. The first line stems from many detailed methodological assumptions, or choices that have to be made in the estimation procedure, e.g. about the composition of the food basket, adult equivalence scales, inter-sectoral and inter-regional variation in diet and prices, income distribution data to be used in the estimation process, etc. The robustness of any poverty estimation using the poverty line approach therefore needs to be checked for its sensitivity to variation in these choices and assumptions. For example, the assumption of standard pegs calorie requirements used in construction of poverty line vary, firstly by the age, sex and work habits of the individuals. Secondly, by the choices of commodities, as the actual income at which specified nutritional requirements are met will depend greatly on the consumption habits of the people and thirdly by the physical features, climatic conditions which greatly bring the interregional variation in diet and prices.

The second line of criticism raises doubts whether the notion of poverty as conceptualized in the poverty line discourse is intrinsically meaningful when assessing the extent, nature and forms of deprivation experienced in society. Is it overly reductionist in what Amartya Sen has called commodity space, and thereby exclusionary of a wide range of deficit which are held to be significant by those that experience them on a regular basis? This concern is intensified by the recent drive to narrow the focus of poverty discourse and policy on the category of the „chronically poor, a sub category of the poor that are held to experience poverty, in the sense of the poverty line approach, over several years continuously.

Poverty : a multidimensional approach

A large number of scholars argue that Poverty must be defined as a vector of satisfactions and deprivations which result from the level of living of the poor. The „level of living refers to the aspiration or expectations of life, the „norms of living to desirable conditions of life and the „level of living to the actual living condition of the people. While the standard of living „is essentially subjective kind of yardsticks, the „norm of living refers to the objective criteria laid down from outside. From this point of view, the „norms of living may be interpreted as an index of the measuring the „level of living and the „standard of living



may be treated as the means of measuring the flow of welfare. There is however no unanimity on the meaning of the „level of living. This term has been variously defined. According to Drewnowski, “the level of living of a population is the level of satisfaction of its needs attained in a unit of time as a result of the flow of goods and services the population enjoys in the unit of time”. But this definition lacks clarity. The level of satisfaction cannot be equated with the flow of goods and services consumed by the population. The availability of goods and services does not guarantee satisfaction. Despite the fact that a large number of studies have been made to find out the level of living and measure the poverty, there is little consensus in the literature as to what to be included in the level of living and how poverty should be measured.

In the ‘capability approach’ Sen (1999) says that we have reason to value many things other than income and wealth which ensures real choices and opportunities to lead the kind of life we would value living. He argues that well being or welfare should be defined and assessed in terms of the functioning and capabilities people enjoy. Functioning are beings and doings that people value and reasons to value, and capabilities represents the various combinations of functioning that the person can achieve. Capabilities are defined to have intrinsic value as well as instrumental value- to be ends rather than

merely means. Hence, the capability approach proposes a serious departure from concentrating on the means of living to the actual opportunities of living.

Poverty consists of many interlocked dimension. First, although poverty is rarely about the lack of one thing, the bottom line is lack of food. Secondly, poverty has important psychological dimensions such as powerlessness, voicelessness, dependency, shame, and humiliation. Thirdly, poor people lack access to basic infrastructure- roads, transportation, and clean water. Fourth, poor people realize that education offers an escape from poverty. Fifth, poor health and illness are dreaded almost everywhere as a source of destitution and finally, the poor people rarely speak of income, but focus instead on managing assets - physical, human, social and environmental - as a way to cope with their vulnerability. In many areas this vulnerability has a gender dimension. (Narayan et al 2004: 4-5) Thus poverty is a condition in which people are exposed to multiple disadvantages - actual and potential. The disadvantages encompass homelessness, landlessness, joblessness, and health catastrophes as well as low income. In other cases, violence, humiliation, and poor education contribute.

Framework of multidimensional poverty has been advanced in the context of human security (not merely military security) which implies that there is enough



food to eat, fuel to cook and keep oneself warm, that it is safe to walk on the street, that there is the chance of getting shelter from eviction or earthquake, protection against flood, drought and unemployment, that children can be sent to school and one can avoid illness and count on minimal health care. If these minute personal securities can be ensured, only then can one expect to enjoy a sustainable livelihood. The socio-economic insecurities imply serious deprivation and loss of well-being without necessarily and immediately pushing person or household into income poverty. Amartya Sen, in his "Entitlement Approach", explored „people die because they did not have the income to buy food, but how come they didn't have the income? What they can earn depends on what they can sell and at what price, and starting off with incomes leaves out that part of the entitlement picture. Understanding poverty therefore needs to adopt a broader notion of human deprivation in place of the narrow focus on income poverty.

Conceptually, many frameworks for multidimensional poverty have been advanced such as livelihood, human rights, social inclusion, basic needs, social protection and capabilities. The concept of basic needs approach, which emerged in the mid 1970s as a reaction to the prevailing economic growth-centered approach to the development of the time inspired and motivated to look the aspect of poverty from

multidimensional space rather than income space. The basic needs approach had a policy focus, but in practice it influenced poverty measurement.

While the basic need was one concept of informing measures of deprivation in Europe, this was supplemented by the multidimensional concept of "Social Exclusion to measurement for public policy. Social exclusion became seen as going" beyond the elimination of poverty to focus on the mechanism whereby individual and groups are excluded from taking part in the social exchange, from the component practices and rights of social integration (European Commission 1992, cited in Atkinson and Marlier 2010:18)

Although the social inclusion approach was widely described as „relative", this depends upon the evaluative space. Amartya Sen wrote, "The characteristics features of "absoluteness" is neither constancy over time, nor invariance between different societies, nor concentration merely on food and nutrition. It is an approach of judging of a person's deprivation in absolute terms, rather than in purely relative terms.

The framework of Sen's „Capability approach" has been the key in prompting a „fundamental reconsideration of the concept of poverty. It gains increasing recognition as providing an appropriate space for evaluating poverty: the space of capabilities and functioning rather than the

space of resources upon which basic needs programmes had come to concentrate. Sen argues that defining poverty in the space of capabilities has multiple implications for measurement. The first is multidimensionality: „the capability approach is concerned with plurality of different features of our lives and concerns. This plurality applies also to a poverty measurement: the need for a multidimensional view of poverty and deprivation guides the search for adequate indicator of human poverty.

The second implications of multidimensional poverty as deprivation in valuable capabilities is that value judgment are required - for example, in order to select which dimensions and indicators of poverty to use, how much weight to place on each one, and what constitutes a deprivation. By facing ethical value judgments squarely, rather than confining attention to technical matters, the capability approach has at

times created consternation among quantitative social scientists.

The evolution of the human development paradigm in 1990 led to a strong theoretical foundation to measure multidimensional poverty. The United Nations Development Programme (UNDP) in its annual publications devised a set of composite indices, the Capability Poverty Measure (CPM), the Human Poverty Index 1 (HPI 1) and the Human Poverty Index 2 (HPI 2) to measure multidimensional poverty (UNDP 1996, 1997) using aggregate data. Human Development Report 2010 introduced the Multidimensional Poverty Index, which directly measures the combination of deprivations that each household experience. The new MPI supplants the Human Poverty Index or HPI used in previous Human Development Reports (HDR, 2010) which combines the simultaneous disadvantages experienced by the poor.

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Each time a man stands up for an idea, or acts to improve the lot of others, or strikes out against injustice, he sends forth a tiny ripple of hope, and crossing each other from a million different centre of energy and daring, those ripples build a current that can sweep down the mightiest walls of oppression and resistance.

— **Robert Kennedy**



प्रज्ञान

ISSN 0976-4283

पঞ্চदश वर्ष, १म संख्या, २०१८

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Threat to Human Civilization

"Civilization begins with order

Grows with liberty and dies with chaos"

- Will Durant

There's always an important role to be played by us towards the place we live in. Thus, we have an equivalent responsibility towards our planet we live on, right now. Our earth is 4.5 billion years old but human evolved only around two thousand years ago. Civilization is only about 6000 years old, with industrialisation starting in the earnest only in the 1800s.

Our existence on earth have both positive and negative effect. Most of the times we are unaware of the negativities we cause. We have been able to survive in vivid environment, even in harsh ones such as Antarctica. Every year we destroy forest and other natural habitat, driving different species into smallest areas of endangerment. In order to fulfill our own basic needs we have been continuously destroying the ecosystem. The frequency of destruction is gradually increasing with growing population. All these factors can pose big problem for the human civilization.

Global warming is a major threat to human civilization. It reflects abnormal variation in the estimated climate within the earth's atmosphere and surface with effects on the other parts of the earth. Over the change of the time and human's odd behavior towards Mother earth can lead to further global warming. As in the last few years, and an increase in the frequency and severity of some extreme weather change. Affects of global warming include loss of diversity, stresses to existing food producing system, increased spread of contagious disease such as malaria and rapid mutation of micro organisms.

Another threat to human civilization is Nuclear War. Two nuclear weapons that have been used in wars so far are – at Hiroshima and Nagasaki in World War II and nuclear stockpile use in cold war. However, it is a mistake to think that nuclear war is impossible now.

Master mind like Stephen Hawking, Elon Musk and Bill Gates have raised their concern over the potential risk of artificial intelligency to humanity in near future. Stephen Hawking said that we should be cautious in attempting to contact aliens, warning that advanced extraterrestrial life may not be friendly towards us and could try to destroy the human race. Moreover, we have the most important role to play towards safeguarding our planet and our individual move can bring about a big change in our ecosystem. Thus, it is high time to think about it, to implement our ideas and to survive in our planet with a safe and healthy

ISSN 0976 - 4283

pragyan

15th Year ■ 1st Issue, 2018

A Bi-annual & Bi-lingual Journal of Academic,
Intellectual & Career Pursuit



Published by
ACTA, Tinsukia College Unit, Tinsukia, Assam

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ASSAM ECONOMIC JOURNAL

A Peer-reviewed Journal

**DEPARTMENT OF ECONOMICS
DIBRUGARH UNIVERSITY
ASSAM, INDIA**

ISSN 0970-7530

ASSAM ECONOMIC JOURNAL

Volume XXIX

2019



DEPARTMENT OF ECONOMICS
DIBRUGARH UNIVERSITY
ASSAM, INDIA

ASSAM ECONOMIC JOURNAL

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Volume XXIX

2019

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MULTIDIMENSIONAL ANALYSIS OF RURAL POVERTY IN TINSUKIA AND JORHAT DISTRICTS OF ASSAM

* Monika Das

** Dr. N. B. Baruah

ABSTRACT

(This paper attempts to make a multidimensional analysis of rural poverty in Tinsukia and Jorhat districts of Assam. Drawing the Capability approach as conceptual base, the paper tries to show that the income poverty line approach may yield pertinent information on its chosen scale, but overlooks the multifaceted nature of human deprivation. To overcome this limitation and to understand different aspects of poverty, a multidimensional analysis of rural poverty is essential, as most of the poor are concentrated in rural areas. Though poverty has been analysed at state and national level as a whole, a micro level study of multidimensional rural poverty is essential from policy implications point of view. This paper is an attempt to carry out such an exercise. Using the primary data collected through a structured questionnaire, the study finds that multidimensional poverty among the rural population in Tinsukia and Jorhat districts is higher than that of Assam and India as a whole. Income poverty ratio that is showing a decline in the state and national level has failed to capture the multidimensional deprivation of people in the rural areas of these two districts. And the proportional contribution of nutrition indicator to Multidimensional poverty in these two districts shows higher ratio followed by years of schooling, housing floor and cooking fuel indicators.

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Introduction

The existence of poverty in living standard between classes of people is widely believed to be an important development challenge across the world. Realizing the fact, efforts have been made at different levels to quantify the poor on the basis of the poverty line reckoned in money metrics terms for operational phase of interventions. UN, in its Millennium Development Goals (MDG) targeted to halving the proportion of poor living in income less than \$1.25 by 2015. According to the MDG Report, 2015, although the targets for eradication of extreme poverty and hunger have been met or almost met, the world is still having 825 million people living in extreme poverty and 821 million suffering from hunger in 2017 (New UN Report, 2018). This signifies that measuring poverty in income dimension may yield some pertinent information on its chosen scale, but perhaps overlooks the multifaceted nature of human deprivation. Therefore, there has been a shift of conceptualizing poverty beyond its income dimension. The "capability approach" developed by Amartya Sen, has been key in prompting a 'fundamental reconsideration of the concept of poverty, particularly in economics broadly conceived. In capability approach Sen viewed poverty as capability failure and thus rooted poverty as multidimensional. By portraying poverty in multidimensional space in terms of capability failure, Sen, invites direct attention to a range of specific capabilities relating to health, education, shelter and basic amenities. Unlike Sen, many scholars hold the view that for poverty reduction, rise in individual income can of course be very important but simultaneously it needs some social and economic arrangement such as facilities for education and health care as well as political and civil right. The framework of Chamber & Conway's livelihood approach, Basic needs approach of Hicks and Streeten, Atkinson's & Marlier's social inclusion, UNRISD's social protection, the concept of human security etc throw light on the multidimensional aspect of poverty. Over the last decades, both the theory and the practical measurement of multidimensional poverty have made rapid advance. The evolution of the human development paradigm in 1990 led to the strong theoretical foundation to measure multidimensional poverty. Human Development Report, 2010, introduces the global multidimensional poverty index which directly measures the combination of deprivations that each household experience.

The case for distinct focus on multidimensional poverty rest in the proposition that there are many aspects of poverty which for a variety of reasons may not be adequately captured by income or consumption. In addition, it is also worth noting that a focus on multidimensional poverty has the potential to draw attention to government failure especially in relation to provision of public goods and how market function. While these conceptual arguments

Multidimensional Analysis of Rural Poverty in Tinsukia and Jorhat Districts of Assam

for an independent focus on measuring multidimensional poverty apply to all countries, there is also a significant relevance for India and Assam too. In Assam despite declining trend of poverty in recent years, 77 percent of rural people are without access to sanitation facilities, 14.2 percent are without having safe drinking water and 36.2 percent have no access to electricity facility (the Human Development Report, 2016). With this view an attempt has been made in this paper to analyze the multidimensional rural poverty in two districts i.e Tinsukia and Jorhat districts of Assam. Specifically, the prime objectives of this paper are:

1. To analyse the extent of rural poverty in Tinsukia and Jorhat districts of Assam in the light of Multidimensional Poverty Index
2. To evaluate the proportional contribution of each dimension and indicator to Multidimensional Poverty Index.

Data Base and Methodology

This study is based on primary data collected through a multi-stage sampling technique. Data have been collected from two districts of Assam i.e Tinsukia and Jorhat district (undivided). From each district, one development block and from each block, one gaon panchayat has been purposively selected. From each panchayat 3 villages have been selected and finally from each village 25 percent households have been selected randomly for the study. In Tinsukia district, out of seven development blocks, Guijan block has been selected purposively. In this block there are eight gaon panchayats and out of these, Gottong Panchayat has been selected. Three villages from this panchayat have been selected as sample villages and finally 25 percent of total households have been selected from each sample village (total 158 households). In Jorhat district (undivided), out of eight development blocks, Majuli development block has been selected. In Majuli development block, there are twelve gaon panchayats and out of twelve panchayats, Kamalabari gaon panchayat has been selected and from this panchayat 3 villages have been selected as sample villages. From each selected village, 25 percent of the household i.e 102 households have been selected randomly to collect the require data. Thus there are 6 villages and 260 households in all in the study.

For analytical purpose, the study will make use of the Global Multidimensional Poverty Index developed in 2010 by Alkire-Foster counting methodology or AF methodology. The AF methodology of multidimensional poverty developed in 2010 comprises two steps i.e identification and aggregation of the poor to measure poverty. For identifying the poor, this

method sets three dimensions made up of ten indicators. The dimensions are health, education and standard of living measured by using ten indicators. The dimensions of health include child mortality and nutrition indicators, education include years of schooling and child school attendance indicators and standard of living includes six indicators comprises deprivation of housing floor, sanitation, cooking fuel, water, electricity and household assets. Each indicator has definite norms and on the basis of that norm people are identified as poor.

In the AF methodology to identify the poor, dual cutoff method is used. One is set off deprivation cutoff which identify whether a person is deprived with respect to each dimension. If a person is identified as deprived in respective indicators based on the specified norms or cutoff, a value of 1 is assigned and if non-deprived according to the definite cutoff a value of 0 is assigned. The base information in multidimensional poverty measurement is represented by an $n \times d$ dimensional achievement matrix X , where X_{ij} is the achievement of person i in dimension j , for each dimension j , a threshold z_j is defined as the minimum achievement required in order to be non-deprived. This threshold is called the deprivation cutoff.

Deprivation cutoffs are collected in the d dimensional vector $z = (z_1, \dots, z_d)$. Given each person's achievement in each dimension x_{ij} , if the i^{th} person's achievement level in a given dimension j fall short of the respective cutoff z_j , the person is said to be deprived in that dimension (that is, if $x_{ij} < z_j$). From achievement matrix x and the vector of deprivation cutoff z , we can obtain a deprivation matrix g_0 such that $g_{ij}^0 = 1$ whenever $x_{ij} < z_j$ and $g_{ij}^0 = 0$ otherwise. The matrix g_{ij} summarizes the deprivation status of all people in all dimensions matrix x , the vector g_i^0 summarizes the deprivation status of person i in all dimensions, and vector g_j^0 summarizes the deprivation status of all persons in dimension j .

The deprivation in each of the dimensions may not have the same relative importance. Thus, a vector $w = (w_1, \dots, w_d)$ of weights or deprivation value is used to indicate the relative importance of a deprivation in each dimension. The deprivation value attached to dimension j is denoted by $w_j > 0$. In the AF methodology, each dimension is equally weighted i.e 1/3. In health dimension, child mortality and nutrition have been assigned the weight of 1/6 and in the education dimension; years of schooling and child school attendance have the same weight of 1/6. The standard of living has the six indicators and so weight is assigned 1/18 in each indicator.

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Table. 1 Dimensions, indicators, deprivation cutoff, and weights of the global MPI

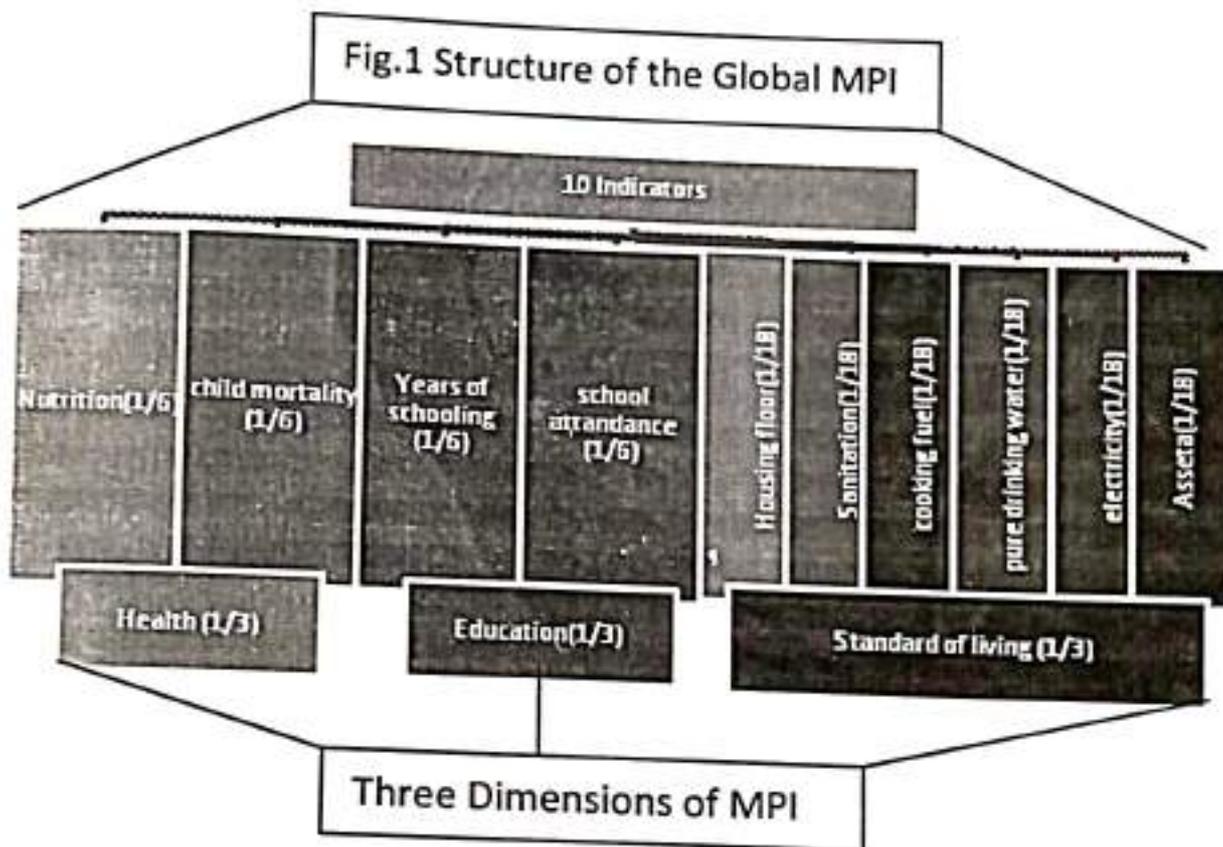
Dimension	Indicator	Deprivation Cutoff	weight	
Education	Years of schooling	No household member has completed five years of schooling.	1/6	
	Child enrolment	Any school age child in the household is not attending school up to class 8.	1/6	
Health	Nutrition	If any adult or child in the household is undernourished.	1/6	
	Mortality	Any child has passed away in the household in last five years	1/6	
Standard of living	Floor	The household has a dirt, sand, or dung floor	1/18	
	Sanitation	The household's sanitation facility is not improved.	1/18	
	Cooking fuel	Water	The household doesnot have access to safe drinking water.	1/18
		Electricity	The household has no electricity	1/18
		Assets	The household owns at most one of the following: radio, telephone, TV, bike, refrigerator, and doesnot own a car or truck.	1/18

Source: Alkire and Santos (2010, 2014), cf. Alkire, Roche, Santos, and Seth (2011) and Alkire, Conconj, and Roche(2013)

Based on the deprivation profile, each person is assigned a deprivation score that reflects the breadth of each person's deprivations across all dimensions. The deprivation of each person is the sum of weighted deprivation which is formally given by

$$C = \sum_{j=1}^d w_j g_{ij}^0$$

The other cutoff or threshold to identify the multidimensional poor i.e poverty cutoff is defined and denoted by k ($k=1/3$). A person is identified as poor if the person's deprivation score is equal to $1/3$.



After setting the poverty cutoff, a censored deprivation score vector is obtained by multiplying each entry by the identification function. Alternatively, it can be derived directly from the censored deprivation matrix and can be obtained as

$$C_i(k) = \sum_{j=1}^d w_j g_{ij}^0(k)$$

Multidimensional Analysis of Rural Poverty in Tinsukia and Jorhat Districts of Assam

The censored deprivation score vector is denoted by $c(k)$.

Construction of Multidimensional Poverty Index:

In the aggregation step, censoring deprivation of the non-poor and computing the proportion of people who have been identified as multidimensionally poor in the population, the head count ratio of multidimensional poverty (H) is counted which represent the incidence of multidimensional poverty. This is obtained by the formula...

$$H = \frac{q}{n} \quad \dots\dots\dots (i)$$

Where q is the number of people who are multidimensionally poor and n is the total population.

In the AF methodology, after counting the incidence of poverty, the intensity of poverty (A) is derived by computing the average share of weighted indicators in which poor people are deprived. This is obtained by

$$A = \frac{\sum_{l=1}^n c_l(k)}{q} \quad \dots\dots\dots (ii)$$

Where $c_l(k)$ is the censored deprivation score of individual 1 and q is the number of people who are multidimensionally poor.

After counting H and A , the multidimensional poverty index is constructed by the product of H and A ($MPI = H \times A$), which is also the sum of the weighted deprivation that poor people experience, divided by the total population. Thus

$$MPI = H \times A = \frac{q}{n} \times \frac{1}{q} \sum_{l=1}^n c_l(k) \quad \dots\dots (iii)$$

The AF methodology built upon Foster, Greer and Thorbecke (FGT) of unidimensional poverty measures generates a parametric class of measures and thus builds the Adjusted Headcount ratio, Adjusted Poverty gap ratio and Adjusted FGT or Squared poverty.

The Adjusted headcount ratio can be defined as

$$M_0 = \frac{1}{n} \sum_{l=1}^n \sum_{j=1}^d w_j g_{ij}^0(k) \quad \dots\dots\dots (iv)$$

The Adjusted Poverty Gap measure $M_1(x; z)$ can be defined as

$$M_1 = \frac{1}{n} \sum_{i=1}^n \sum_{j=1}^d w_j g_{ij}^1(k) \dots\dots\dots(v)$$

And the Adjusted FGT or Squared poverty Gap measure M_2 can be defined as

$$M_2 = \frac{1}{n} \sum_{i=1}^n \sum_{j=1}^d w_j g_{ij}^2(k) \dots\dots\dots(vi)$$

Review of literature

Poverty has many dimensions, Alkire, Sabina (2002), in the paper "Dimension of Human Development" portrayed the account of dimensions of human development and its usefulness and limitations both in general and in relation to Amartya Sen's capability approach. According to the author, if human development is 'multidimensional' then it is necessary to know what we mean by multidimensional, what are the dimensions? And the multiple dimension of interest? Explaining dimension as any of the component aspects of a particular situation, the author stated that theoretically though the coexisting components of well being is very simple, a rough set of dimensions such as being able to live to the end of human life of normal length, bodily health, bodily integrity, emotions, material well being, bodily well being, social well being, security, psychological wellbeing, but specification of these dimensions are essential to give secure epistemological and empirical footing to the multidimensional objective of human development, to identify unintended impacts, to relate the political-economy of ideas: theories that are not user-friendly do not spread. For example the basic needs approach which Sen criticized as 'commodity fetish'. And Sen's capability approach has been criticized because Sen does not give more direction as to what capabilities are especially valued. Taking a fundamental account of dimension, the author stated that in order for human development to become an operational objective in the sense of a feasible goal for which planning, monitoring and evaluation frameworks can be designed, heroic specification of dimension is required.

Criticizing the absolute income method of measuring poverty for its limitation of unique way of defining poverty line, Kakwani, Nanak & Silber, Jacques (2007), in the book "The Many Dimensions of Poverty" portrayed multidimensional aspect of poverty in Sen's Capabilities and functioning framework. Presenting five different perspectives of many dimensions of poverty i.e from economist, socialist, anthropologist to new institutional and physiologist perspectives, authors explored that an individual requires a minimum level of wellbeing contributed by a set of attributes like longevity, literacy, provisions of public goods and social security. Using income

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as the sole indicator of wellbeing is limited as it does not incorporate such key dimensions of poverty. Individuals differ in their ability to convert commodities and their associated characteristics into the achievement of functioning due to personal, social and environmental factors. Human functioning also depends on public provision of key services; the value is not typically included in monetary measure of well being. Targeting efficiency of government programme across socio-economic groups, authors suggested multidimensional approach to poverty measure.

Alkire and Seth (2008) criticized the 2002 BPL methodology used in the rural areas of India to identify eligible beneficiaries. In the paper "Measuring Multidimensional Poverty in India: A New Proposal" they stated how the basis of poverty measurement evolved from income based approach to basic need approach. Highlighting the methodological drawbacks in identification and aggregation of BPL indicators, the study found that there were loopholes in 2002 BPL methodology because the data were of poor quality and coverage and that it was also influenced by corruption. Using NFHS-3 data, the study found that about 77 per cent of the population did not have access to improved sanitation facility and 44 per cent of population had no access to electricity. The main finding of this study was that 33 percent of the extremely poor rural household would not have received BPL card using 2002 BPL method.

In "Towards a Multidimensional Poverty Index for Germany", the OPHI working paper 98, Suppa Nicolai (2015) constructed multidimensional poverty index for Germany by using the Alkire-Foster method. Taking the dimension of education, health, housing, social participation, material deprivation and employment on the basis of indicators set for each dimension, Suppa estimated the deprivation score of each dimension in respect to the weight assigned to each dimension. Suppa pointed out the limitation of income approach to poverty measure on the conceptual and empirical ground and highlighted that income poverty cannot replace the multidimensional poverty index.

Multidimensional poverty comparisons can be sensitive to the choice of welfare indicators, the weights assigned to the indicators as well as aggregate poverty measures used. Gaurav Datt(2017), in his study of multidimensional poverty in Philippines during 2004-2013 examined the robustness of multidimensional poverty trend by estimating three alternative weighing scheme and three poverty measures. The weighing scheme range from Nested Uniform Weights of UNDP's Global Multidimensional Poverty Index to weights based on inverse incidence of different deprivations and those derived from estimated relationship of deprivations

to a survey based measure of subjective welfare. Using the data for 2004 to 2013, Datt found evidence of significant decline in multidimensional poverty that is robust to these alternatives, although the magnitude of the decline in, and especially the dimensional contributions to, aggregate multidimensional poverty are quite sensitive to the alternatives considered.

The Planning Commission of Nepal (2018) computed Nepal's official Multidimensional methodology of multidimensional poverty, the study found that the incidence of multidimensional poverty in Nepal is 28.6 % and its average intensity is 44.2%. Counting the level of Multidimensional Poverty, MPI across rural and urban, composition of MPI indicators, age and gender group, the study revealed that rural poverty is much higher than urban and largest contributing indicators to over all poverty in Nepal and rural Nepal are malnutrition and insufficient years of schooling.

Konwar, Pranab and Mazumder, Ritwik(2015), in the paper, " Poverty and Human Development among the Mishing Tribe in Assam" have assessed the absolute and relative poverty and the relationship between Human Development Index and Multidimensional Poverty Index in Dhemaji and Sibsagar districts of Assam. Their study shows that demographic composition and remoteness affects poverty and human development. Using the Atkinson and Theil poverty index, the study found higher absolute poverty in Dhemaji district and higher relative poverty in Sibsagar district. In both these districts, the authors found negative relationship between human development index and multidimensional poverty index.

Results and Analysis

Tinsukia district is one of the 27 administrative districts of Assam. It is situated in between 27.230N to 27.480 N latitudes and 93.380 E longitudes at the north covering an area of 3790 sq.km. The district is surrounded by Arunachal Pradesh in the East, Dibrugarh district in the west and in the north river Brahmaputra, in the south Arunachal Pradesh. As per 2011 census, total population of the district is 1325263 with population density of 350 persons. The literacy rate is 69.66 percent. Tinsukia district has 3 sub-divisions, 7 revenue circles, 7 development blocks and 86 goan panchayats. The number of villages in this district is 1168 and 80.60 percent of population live in rural areas. The economy of this district is based on agriculture and industry

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Jorhat district (undivided) is an administrative district of Assam located in the central part of Brahmaputra valley. It is situated at 26.750N and 94.220 E. The district is bounded by Lakhimpur district on north, Nagaland state on the south, Sivasagar district on the East and Golaghat district on the west. Occupying 2851 sq km, it has 3 sub-divisions, 8 development blocks, 102 goan panchayats and 848 numbers of villages. According to 2011 census, the total population of this district is 1092256 and density of population is 383. Literacy rate of this district is 82.52 percent. The economy of the district is trade, tourism and agriculture

In the computation of global MPI, a person is identified as poor if the person is deprived in one-third of the indicators or his deprivation score is equal to 0.333 (k ? 33.3 %) Table .2 depicts the results pertaining to multidimensional poverty in terms of incidence (H), intensity (A), multidimensional poverty Index (MPI), Adjusted Poverty Gap Index(M1), Adjusted Foster Greer Thorbecke Index(M2), based on responses of the household on the ten fabricated indicators for the multidimensional measurement of poverty both in Tinsukia and Jorhat District of Assam.

Table .2

District-wise Multidimensional Poverty Index

DISTRICT/VILLAGE	H	A	M ₀ (MPI)	M ₁	M ₂
Tinsukia	0.728	0.459	0.334	-0.304	0.272
Gotong	0.747	0.460	0.344	-0.335	0.308
Dhelakhat	0.722	0.485	0.350	-0.285	0.210
Limbuguri	0.711	0.426	0.303	-0.261	0.264
Jorhat	0.580	0.444	0.258	-0.187	0.132
Pohar Dia	0.613	0.389	0.238	-0.110	0.029
Upper Katoni	0.504	0.452	0.228	-0.187	0.180
Bhugpur	0.621	0.374	0.233	-0.255	0.180

Source: Author's calculation from primary data

H= Incidence of poverty or multidimensional Headcount Index, A- intensity of poverty, MPI= Multidimensional poverty Index, M₁= Adjusted poverty gap Index, M₂= Adjusted FGT Index

Uncensored Headcount Ratio (H):

In the sample districts, as per the Table 2, a higher multidimensional headcount ratio is found in Tinsukia district. The MPI value found in this district is 0.728 i.e. 73 percent population is in this district are multidimensionally poor, while in Jorhat district, the value is 0.580 i.e. 58 percent population are multidimensionally poor. If we compare this ratio with national and the state average we find very high ratio in these two districts. This has been depicted in the Fig.2. At the state and national level, the headcount ratio of multidimensional poverty is 35.8 percent and 27.5 percent respectively (Global MPI Report, 2018)

Fig. 2 Uncensored Headcount Ratio



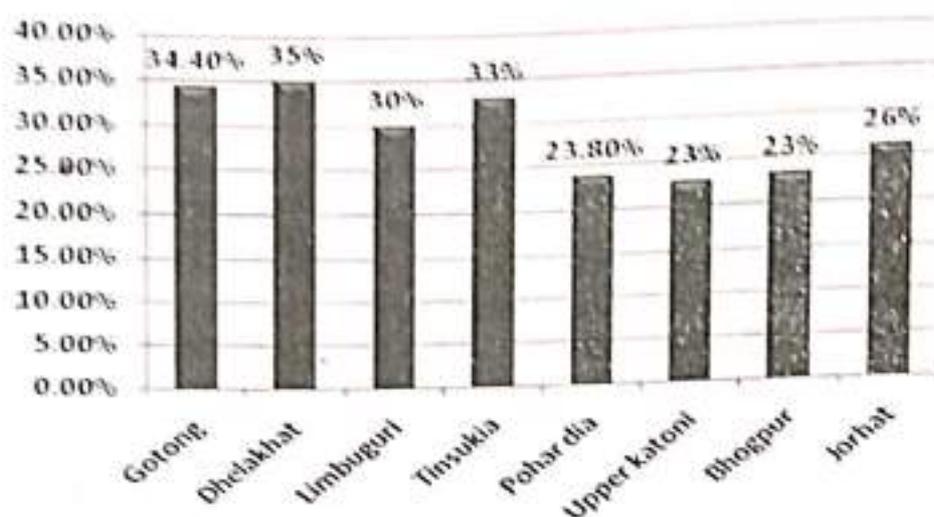
Adjusted Headcount Ratio or MPI: (Incidence of Poverty)

The multidimensional headcount ratio (H), does not satisfy the dimensional monotonicity property, and so it does not change if any poor of the total poor households become deprived in an additional dimension. To overcome this limitation adjusted headcount ratio or MPI is counted by censoring the deprivation scores of poor as 1 and in case of non poor as 0. Thus by calculating the MPI i.e the mean of censored deprivation score vector, higher value (0.334) is found in Tinsukia district compared to Jorhat district (0.258) implying that while in Tinsukia district, 33 percent of total populations are multidimensionally poor, the corresponding percentage in Jorhat district is 26 percent (The value of M0 in Table. 2 and shown in Fig.3). In both these two districts, the value that is found is higher than the state and

Multidimensional Analysis of Rural Poverty in Tinsukia and Jorhat Districts of Assam

the national level. In the state level the ratio is 16 percent and in the national level, it is 12 percent in 2016 (Global MPI Report, 2018)

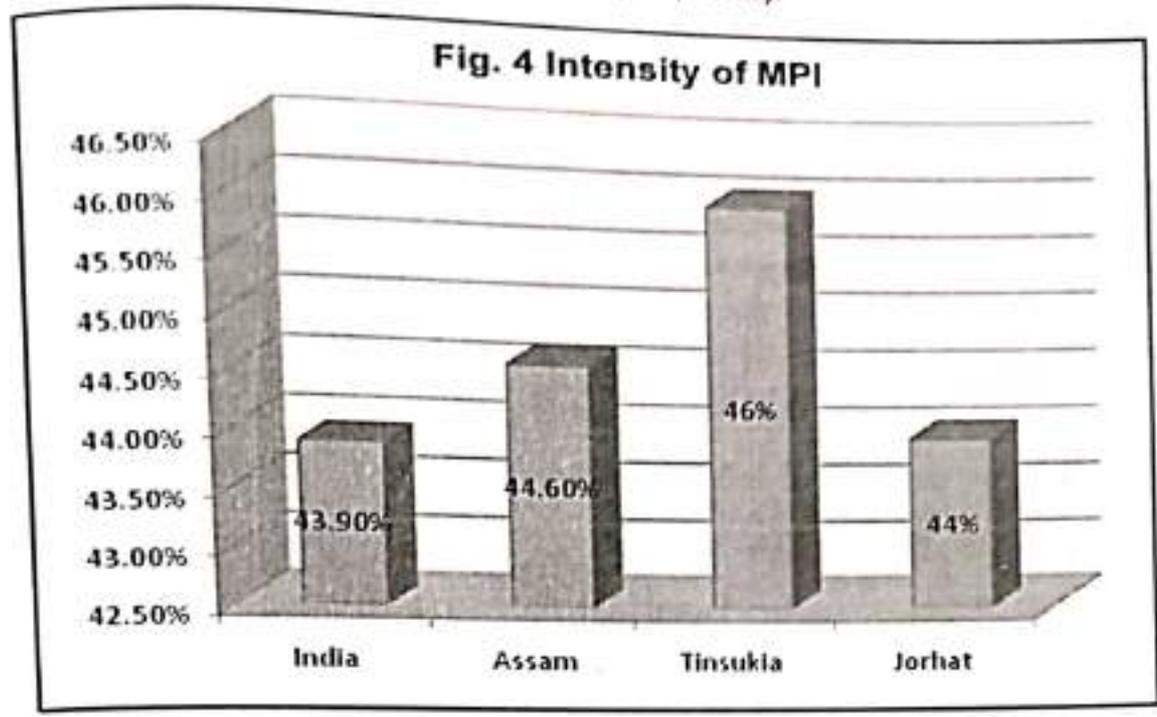
Fig. 3 District and Village-wise MPI



Intensity of Multidimensional Poverty (A):

The headcount ratio of poverty measurement doesn't explain how poor the poor people are or the intensity of poverty. Therefore for better understanding of poverty, it is necessary to compute the intensity of poverty along with headcount ratio. The intensity of poverty is the average proportion of dimensions in which poor people are deprived. It is the degree to which poor people are deprived. In the A.F model, the intensity of multidimensional poverty is the proportion of weighted indicators in which people are deprived. Based on this method, the intensity of multidimensional poverty in Tinsukia district is found to be 0.459 and in Jorhat district, it is 0.444 (Table.2). In respect of intensity, it is observed that to some extent, there is a similarity in intensity of poverty in both the districts with the national and state average. At

the national average, the intensity of multidimensional poverty is 43.9 percent and in state level it is 44.6 percent in 2015-16 (Global MPI Report, 2018).



Adjusted Poverty Gap (M1)

Reflecting both the share of people in poverty and the degree to which poor people are deprived, the MPI tried to portray poverty, but fails in reflecting the depth of the poverty. To overcome this limitation, the adjusted poverty gap is counted. In Table.2, the calculation of poverty gap has been shown for the two districts. In Tinsukia district, the poverty gap value is found -0.304 and corresponding value in Jorhat district is -0.187.

Adjusted Squared Poverty Gap (M2):

To incorporate sensitivity to one form of inequality among the poor, as embodied by the transfer property, the adjusted Squared Poverty Gap has been calculated which is the sum of the weighted normalized gap of the poor divided by the total population (n). It shows the severity of multidimensional poverty. In the sample district, the severity of multidimensional poverty (Table.2) is found higher in Tinsukia District i.e. 0.272 compared to Jorhat district (0.132).

Analysis of the composition of the components of Multidimensional poverty:

Dimensional breakdown: The AF methodology has a dimensional breakdown property which makes it possible to compute the percentage of people who are multidimensionally poor and simultaneously deprived in each indicator. This is known as censored head count ratio of an indicator or the incidence of head count ratio in an indicator. Poverty information gathered from analyzing the indicator wise distribution of population in MPI is useful for monitoring the effects of policy shift and programme changes. In the sample districts, the incidence of indicator-wise headcount ratio of deprivation have been presented in the Table.3 and in Fig.5

Table.3

Indicator -wise Censored Headcount Ratio

District	years of schooling	Child school attendance	Child mortality	Nutrition	Housing floor	Sanitation	Cooking fuel	Drinking water	Electricity	Assets
Tinsukia	0.264	0.094	0.024	0.593	0.685	0.593	0.596	0.664	0.353	0.367
Jorhat	0.306	0.035	0.013	0.484	0.506	0.496	0.549	0.309	0.144	0.304

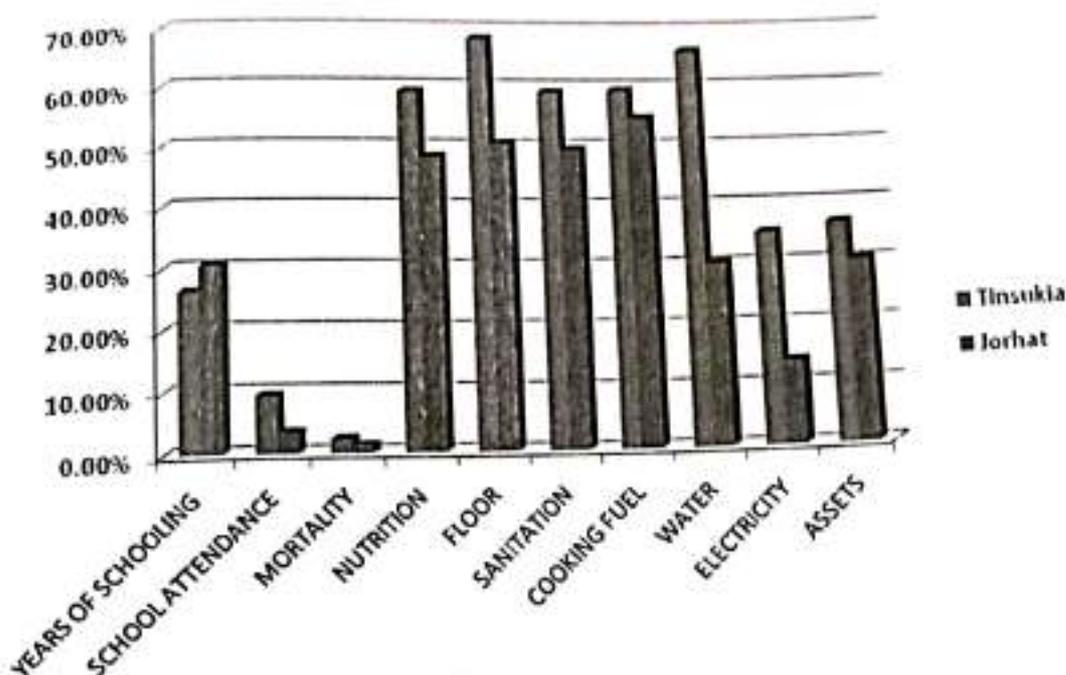
Source: Author's calculation from primary data

In Tinsukia district, higher headcount ratio is found in case of housing floor indicator followed by drinking water. Out of total population of the sample households, 69 percent is deprived in housing floor and in safe drinking water the headcount ratio is 66 percent. In nutrition and in sanitation same headcount ratio is found i.e. 59.3 percent and in case of cooking fuel headcount ratio is 59.6 percent. Lower ratio is found in case of child mortality. Headcount ratio regarding deprivation of electricity and assets is found 35.3 percent and 36.7 percent respectively.

In Jorhat district, highest headcount ratio is found in case of cooking fuel i.e. 54.9 percent followed by housing floor and sanitation i.e. 50.6 percent and 49.6 percent respectively. In case of nutrition indicator headcount ratio found is 48.40 percent and lowest headcount ratio

is found in child mortality. In years of schooling and safe drinking water the ratio found is 30.6 percent and 30.9 percent respectively.

Fig. 5 Indicator-wise Censored Headcount Ratio



Percentage Contribution of Dimension Indicators to MPI:

Though the censored headcount ratio shows the extent of deprivation among the poor, it does not reflect the relative value of the indicators. Two indicators may have the same censored headcount ratio but contribution to overall poverty may be different, because the contribution depends both on censored headcount ratio and the weight assigned to each indicator. Therefore, a complimentary analysis to the censored headcount ratio is the percentage contribution of each indicator to overall multidimensional poverty. In the sample district, in education dimension, the contribution of deprivation of years of schooling indicator to MPI is found higher in Jorhat district i.e. 19.64 percent while in the Tinsukia district the percentage found is 13.34 percent. In child school attendance, higher contribution ratio is found in Tinsukia district i.e. 4.75 percent and in Jorhat district; it is 2.27 percent (Table.4 and Fig.6)

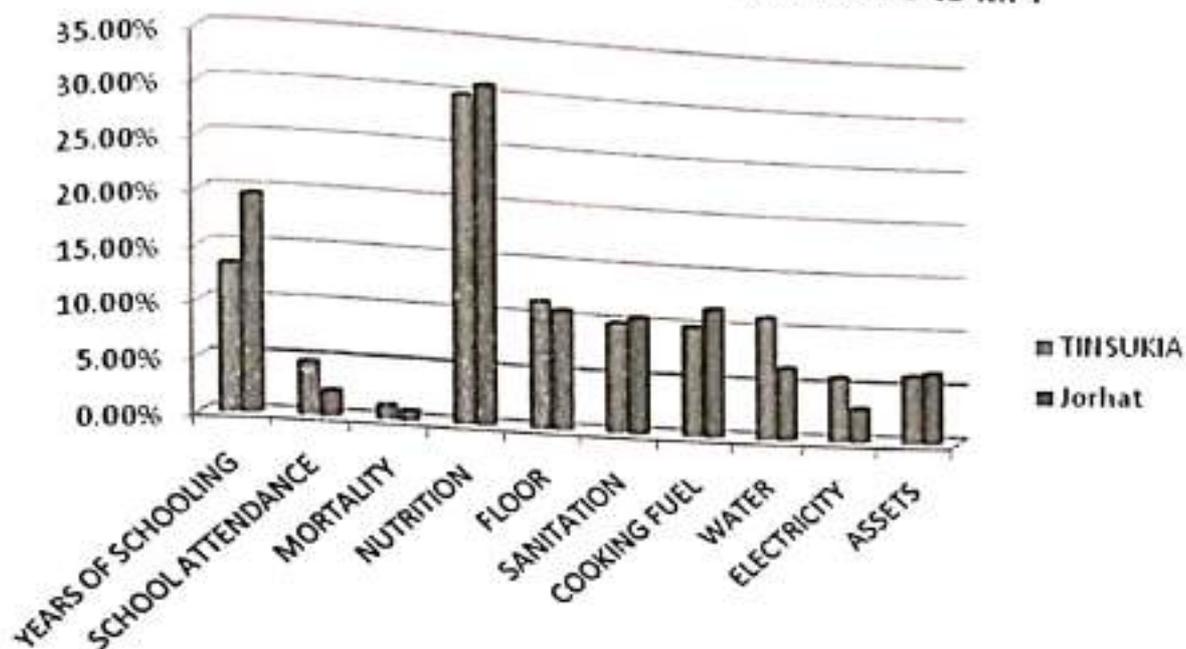
Table.4
Percentage Contribution of Dimension Indicators to MPI

District	Years of schooling	Child school attendance	Child Mortality	Nutrition	Housing floor	Sanitation	Cooking fuel	Pure drinking water	Electricity	Household Assets
Tinsukia	13.34	4.75	1.19	29.97	11.53	9.99	10.03	11.18	5.94	6.18
Jorhat	19.64	2.27	0.81	31.00	10.82	10.60	11.74	6.60	3.08	6.49

Source: Author's calculation from primary data

In health dimension, the child mortality shows higher contribution in Tinsukia district i.e 1.19 percent while in Jorhat district the corresponding percentage found is 0.81. In Nutrition indicator, higher ratio is found in Jorhat i.e 31 percent than in Tinsukia district i.e 29.97 percent. In case of housing floor, a higher percentage is found in Tinsukia district i.e 11.53 and in Jorhat district, the percentage found is 10.82 percent. In sanitation, a higher contribution ratio is found in Jorhat district i.e 10.60 percent than in Tinsukia i.e 9.99 percent. In case of cooking fuel higher percentage found in Jorhat district i.e 11.74 percent while the corresponding percentage found in Tinsukia district is 10.03 percent. In case of pure drinking water, the higher ratio is found in Tinsukia district. i.e 11.18 percent and in Jorhat district, it is 6.60 percent. In electricity indicator, Tinsukia district has higher ratio i.e 5.94 percent and in Jorhat district, the percentage found is 3.08 percent. In case of asset indicator, a higher percentage is found in Jorhat district i.e 6.49 percent than in Tinsukia district, i.e 6.18 percent.

Fig. 6 Contribution of Dimension Indicators to MPI



An interesting aspect of indicator-wise censored headcount ratio to be noted is that in different indicators, the headcount ratio may be the same but proportional contribution to MPI may be different. This has been shown in Table.5

Table.5
Comparison of Censored Headcount Ratio and Percentage Contribution of Dimension Indicators to MPI

Dimensions	Indicators	Tinsukia		Jorhat	
		Censored headcount ratio	percentage contribution	Censored headcount ratio	percentage contribution
Education	Years of schooling	0.264	13.34%	0.306	19.64%
	Child school attendance	0.094	4.75%	0.035	2.27%
Health	Child mortality	0.024	1.19%	0.013	0.81%
	Nutrition	0.593	29.97%	0.484	31%
Standard of living	Housing floor	0.685	11.53%	0.506	10.82%
	Sanitation	0.593	9.99%	0.496	10.60%
	Cooking fuel	0.596	10.03%	0.549	11.74%
	Drinking water	0.664	11.18%	0.309	6.60%
	Electricity	0.353	5.94%	0.144	3.08%
	Assets	0.367	6.18%	0.304	6.49%

Source: primary survey, own calculations.

In Table.5 it has been depicted that in Tinsukia district, though in nutrition and sanitation indicators, the same headcount ratio is found but the proportional contribution of these two indicators to overall multidimensional poverty is different due to the differences in censored headcount ratio and the weight assigned to these indicators.

Conclusion:

The study finds that multidimensional poverty among the rural population in Tinsukia and Jorhat districts is higher than that of Assam and India as a whole. The highest contribution of the indicators to overall multidimensional poverty is found in nutrition followed by housing

floor, sanitation cooking fuel and safe drinking water. This implies that the income poverty ratio, that is showing decline in state and national level fail to capture the multidimensional deprivation in these sample districts. Therefore we may conclude that for effective implementation of poverty alleviation policies, a multidimensional analysis of poverty is indispensable.

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