MULTI-DIMENSIONAL POVERTY INDEX

Shweta, Sonam, Swati
B-Tech, Sem-III, ECE-II, Dronacharya College of Engineering, Gurgaon, India

***Abstract*- The MPI (Multi-dimensional poverty index) is an index of acute Multi-dimensional poverty. It assesses the nature and intensity of poverty at the individual level, creating a vivid picture of people living in poverty within and across the regions. (*The MPI by OPHI for UNDP's 2011 HDR).* The MPI reflects both the incidence - headcount ratio (H) of poverty – the proportion of the population that is Multi-dimensional poor – and the average intensity (A) of their poverty – the average proportion of indicators in which poor people are deprived. The MPI has three dimensions (Health, Education, and Living Standards) and these are measured using 10 indicators *(Alkire, Sabina; et.al 2011).* The MPI can be used as an analytical tool to identify Multi-dimensional poor people, show aspects in which they are deprived and help to reveal the interconnections among deprivations. It can also identify the poorest among the poor, reveal poverty patterns within countries by province or social group, and track changes over time. The MPI is calculated by multiplying the incidence of poverty by the average intensity across the poor (H*A). The first component is called the Multi-dimensional headcount ratio. Headcount ratio (H) can disclose the clear picture on the prevalence of poverty among the population. An average Headcount ratio of tribes in Attappady is 0.930, i.e. in Attappady 93 percent of the tribal population are lived in Multi-dimensional poor status. Headcount ratio of Kurumba community (0.097) is highest among three tribal groups. The intensity of deprivation – that is, the average percentage of deprivation (A) experienced by people living in Multi-dimensional poverty – in Attappady is 53.4 percent. An analysis of tribal in Attappady Block shows that an average MPI value of tribes in Attappady is 0.496 and the highest proportion of MPI poor is among Kurumba community. This research can enable policy makers to target resources and design policies more effectively.**

***Index Terms*- MPI index, poverty status, Kerala.**

I. INTRODUCTION

society. And they are the poorest; most marginalized, oppressed, and deprived people in the country. India has the second largest tribal population in the world after Africa. After independence, the Government of India have opted an integrated approach in tribal development which offered the tribal communities the freedom for decision making about their lives rather than forcing them to replicate the lifestyles of the larger society. Despite numerous efforts taken for the welfare of these communities (especially in the form of positive discrimination), even today tribal communities stands at the lower most end of the socio economic ladder in the country. Considering the importance of these socio-economic factors in determining the level of social wellbeing, it is obvious that the presently existing wide tribal non tribal differential in the same will prove to be highly unfavorable to meet the long term goals of tribal development.

This study points out that marginalization of these communities was found in its worst form in Kerala; the state otherwise becomes the center of academic discussions on account of its amazing human development achievements. The high degree of tribal backwardness in the state comes as an eye-opener for those who wrongly assume a matching high quality of tribal life in the state merely because of its rosy picture in human development *(Deepa Chandran, 2012).* The present study focuses on the examination of Development status tribes using MPI *(Alkire, Sabina; et.al (2011).* The investigations were carried out in Attappady Block, Palakkad District, Kerala, which is one of the three major tribal centre of the state. The MPI can be used as an analytical tool to identify Multi-dimensional poor people, show aspects in which they are deprived and help to reveal the interconnections among deprivations. It can also identify the poorest among the poor, reveal poverty patterns within countries by province or social group, and track changes over time. This can enable policy makers to target resources and design policies more effectively.

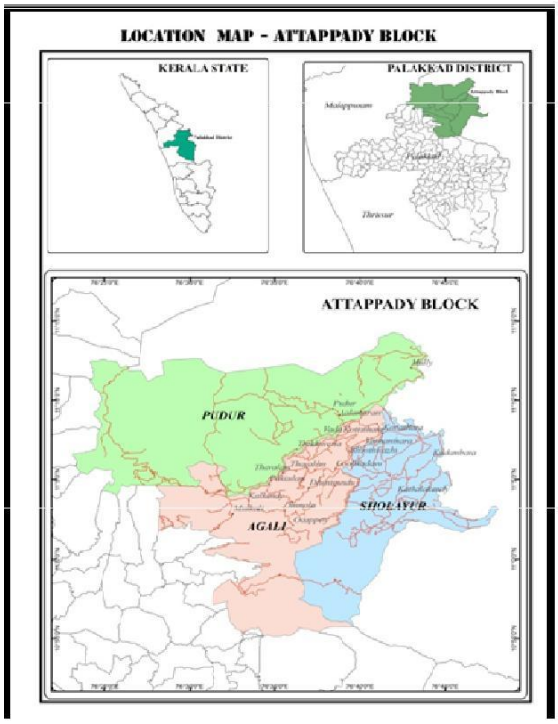


Figure 1: Location map

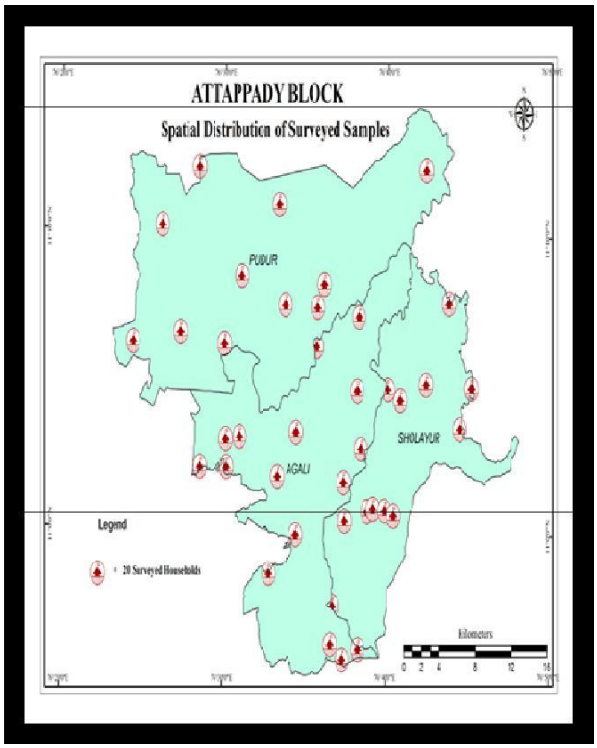


Figure 2: Attappady block map

II. METHODOLOGY

1. The study was based on both primary and secondary data. Primary data were collected through a sample survey conducted among the three tribal groups (Irula, Kurumba and Mudugas) in the Attappady block. From each tribal group 10% of samples were collected based on random sampling and thus a total of 3112 samples are selected for the study. Socio-economic details collected through the respondents by using a structured interview schedule.

2. Land use details collected from land use board Kerala. Geomorphological and Terrain information developed through 1:50000 scale Toposheet prepared and published by SOI.

3. Multi-dimensional Poverty Index, is calculated through the formula or methodology developed *by OPHI for UNDP's 2011 HDR (http://hdr.undp.org/en/).*

4. Computing the MPI - the MPI combines two key pieces of information: (1) the proportion or incidence of people (within a given population) who experience multiple deprivations and (2) the intensity of their deprivation: the average proportion of (weighted) deprivations they experience. Formally, the first component is called the Multi-dimensional headcount ratio (H):

5. Here q is the number of people who are multi dimensionally poor and n is the total population.

$$A = \frac{\sum_{i-1}^{n} c_i(k)}{q}$$

6. The second component is called the intensity (or breadth) of poverty (A). It is the average deprivation score of the multi dimensionally poor people and can be expressed as:

7. Where Ci (k) is the censored deprivation score of individual i and q is the number of people who are multi dimensionally poor.

8. The MPI is the product of both: MPI = $H \times A$.

9. GIS technology is used for various land use and terrain analysis and preparing suitable maps for the study, socio economic data analysis are done with support of statistical software's.

10. The secondary data were gathered from reports of Integrated Tribal Development Programme (ITDP), Kerala Institute of Local Administration (KILA) Thrissur, Attappady Hill Area Development Society (AHADS) of Attappady, Census Reports, Reports of Kerala Institute for Research, Training and Development studies of Scheduled Caste and Scheduled Tribes (KIRTADS) and relevant books and journals.

III. OBJECTIVES OF THE STUDY

1. To examine the socio-economic conditions of the tribes in the Attappady Block. 2. To calculate Multi-dimensional poverty index (MPI) of tribes in Attappady Block.

IV. RESULTS AND DISCUSSIONS

Kerala has made substantial progress in reducing the incidence of both rural and urban poverty. The percentage of rural population below poverty line was

$$H = \frac{q}{n}$$

Dimension / Indicators	Irula	Kurumba	Muduga	Pudur	Sholayur	Agali
Total population or Sample size	**1736**	**897**	**488**	**1316**	**693**	**1112**
Education Dimension						
No one has completed five years of schooling	0.079	0.096	0.088	0.087	0.079	0.083
At least one school-age child not enrolled in school	0.015	0.033	0.020	0.024	0.014	0.017
Health Dimension						
At least one member is malnourished	0.151	0.163	0.150	0.157	0.151	0.150
One or more children have died	0.023	0.026	0.023	0.025	0.023	0.023
Standard of living Dimension						
No electricity	0.036	0.041	0.038	0.038	0.036	0.037
No Sanitation	0.047	0.050	0.048	0.048	0.047	0.048
No access to clean water	0.028	0.048	0.042	0.038	0.028	0.035
House has dirt floor	0.021	0.044	0.023	0.033	0.021	0.022
Household uses "dirty" cooking fuel.	0.055	0.055	0.055	0.055	0.055	0.055
Household has no car and owns at most one bicycle, motorcycle, radio, refrigerator, telephone or television.	0.032	0.039	0.033	0.036	0.032	0.033
Score *Ci* (sum of each deprivation multiplied by its weight)	**0.487**	**0.595**	**0.520**	**0.541**	**0.486**	**0.503**
Is the house hold poor ($C = 1/3 = 0.333$)?	**yes**	**yes**	**yes**	**yes**	**yes**	**yes**
Censored score Ci(k)	**0.487**	**0.595**	**0.520**	**0.541**	**0.486**	**0.503**

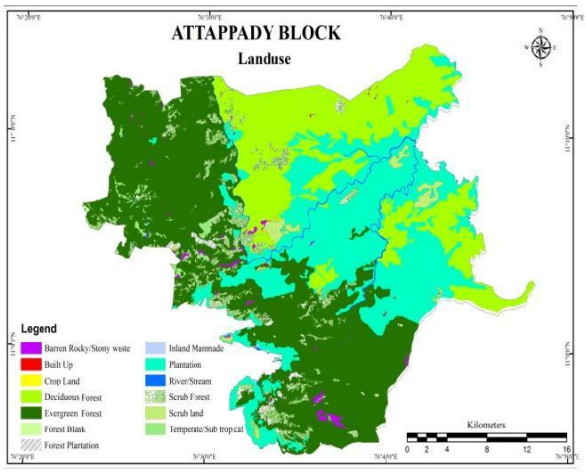
59.19 percent and urban poverty was 62.74 percent during 1973-74, but in India, 56.4 percent of the rural and 49.00 percent of the urban population were lived below poverty line during the same period .The combined poverty ratio was 59.79 percentage for Kerala and 54.44 percent for India *(In Sen & Dreeze – India Selected Regional Perspectives - Oxford).* These figures declined to 12 percentages for rural people and 12.1 percentages for the urban in Kerala for the period 2009-10 and with a combined poverty ratio of 12 percentages. In the same period the rural and urban poverty for India is 33.8 percentage and 20.9 percentages respectively with a combined poverty ratio of 29.80 percentages (*Human Development Report Kerala - 2005.).* But this is not the image among the tribes or socially and economically excluded communities, these groups face acute poverty and economic, political and social exclusion even now. News and report from the hamlets of Attappady discloses the real image of tribes and point out the prevalence of inequality between tribes and non tribes.

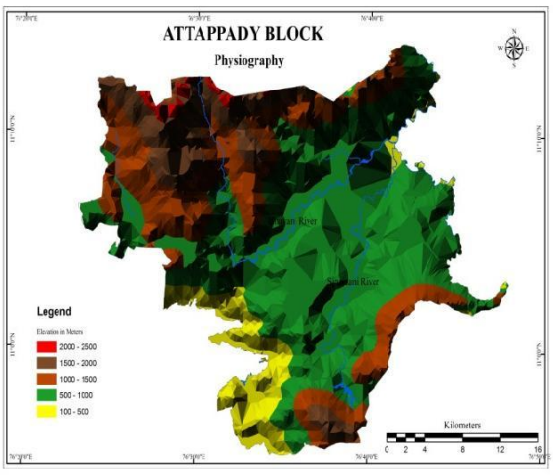
Figure 3: Landuse map**Figure 4:** Physiography map

Table 1: Computation of multi-dimensional Poverty Index (MPI) of tribes in Attappady block

(The indicators are weighted, and the deprivation scores are computed for each household in the survey. A cut-off of 33.3 percent, which is the equivalent of one-third of the weighted indicators, is used to distinguish between the poor and nonpoor. If the household deprivation score is 33.3 percent or greater, that household (and everyone in it) is Multi-dimensionally poor. Households with a deprivation score greater than or equal to 20 percent but less than 33.3 percent are vulnerable to or at risk of becoming Multi-dimensionally poor).

The MPI is calculated by multiplying the incidence of poverty by the average intensity across the poor (H*A). The first component is called the Multi-dimensional headcount ratio. Headcount ratio (H) can disclose the clear picture on the prevalence of poverty among the population. An average Headcount ratio of tribes in Attappady is 0.930, i.e. in Attappady 93 percent of the tribal population are lived in Multi-dimensional poor status *(Table 2 and figure 5).* Headcount ratio of Kurumba community (0.097) is highest among three tribal groups. The intensity of deprivation – that is, the averag





e percentage of deprivation (A) experienced by people living in Multi-dimensional poverty – in Attappady is 53.4 percent. An analysis of tribal hamlets of Attappady shows that the highest proportion of MPI poor is in Kurumba, 0.580 and Irula and Muduga having the same score. Below figure - 6 furnish a clear picture on MPI of Attappady tribes and further details. In Attappady block nearly 48.2% of tribes experience severe poverty and 5.8% of tribes are vulnerable poverty respectively. Those identified as "Vulnerable to Poverty" are deprived in 20% - 33% of weighted indicators and those identified as in "Severe Poverty" are deprived in over 50%. Below mentioned figure - 6 shows further details regarding this.

Table 2: MPI of Tribes in Attappady

Values	Irula	Kurumba	Muduga	Average
(H) Head Count Ratio	0.91	0.97	0.9	0.93
(A) Average Intensity of Poverty	0.487	0.595	0.52	0.534
MPI	0.44	0.58	0.47	0.496

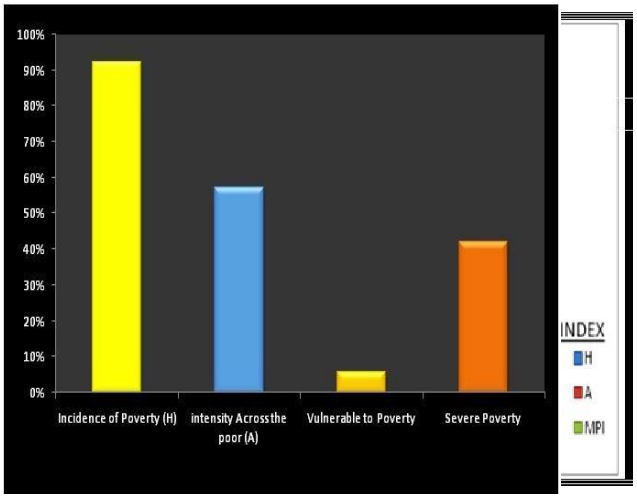


Figure 6: MPI of tribes in study area

Figure 7: Poor and deprived people status

The MPI uses 10 indicators to measure poverty in three dimensions: education, health and living standards. The bar chart (figure – 7) to the bottom reports the proportion of the tribal population that is poor and deprived in each indicator. We do not include the deprivation of non-poor people. The spider diagram (figure – 8) compares the proportions of the tribal population that are poor and deprived across different indicators. At the same time it compares the performance of three tribal groups. The MPI can be broken down to see directly how much each indicator contributes to Multi-dimensional poverty. The following figure shows the composition of the MPI using a pie chart (figure – 9). Each piece of the pie represents the percentage contribution of each indicator to the overall MPI of the country. The larger the slice of the pie chart, the bigger the weighted contribution of the indicator to overall poverty and pie chart expose contribution of indicators to the MPI and information regarding this.

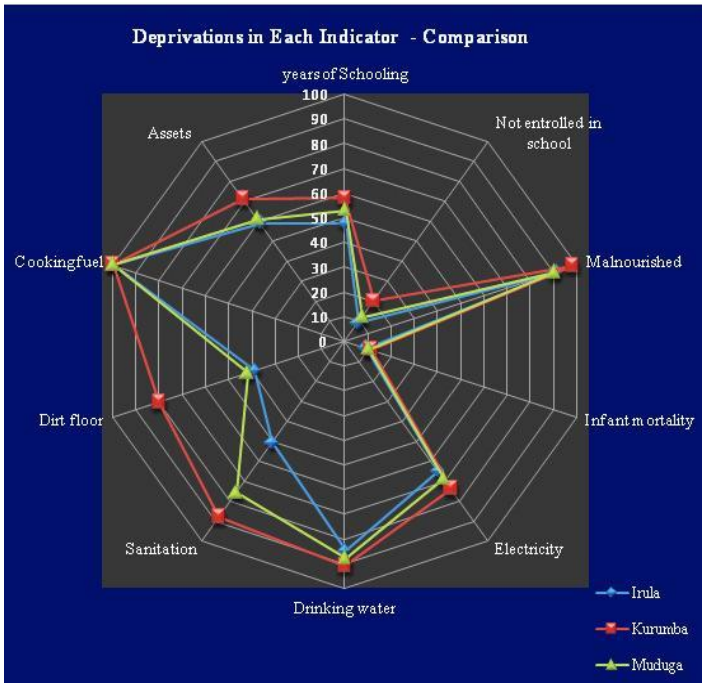


Figure 8: Comparison of deprivation in each indicator

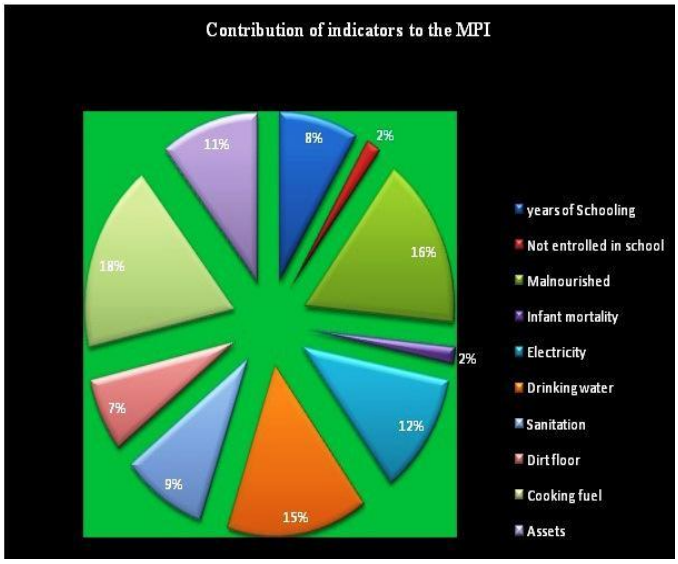
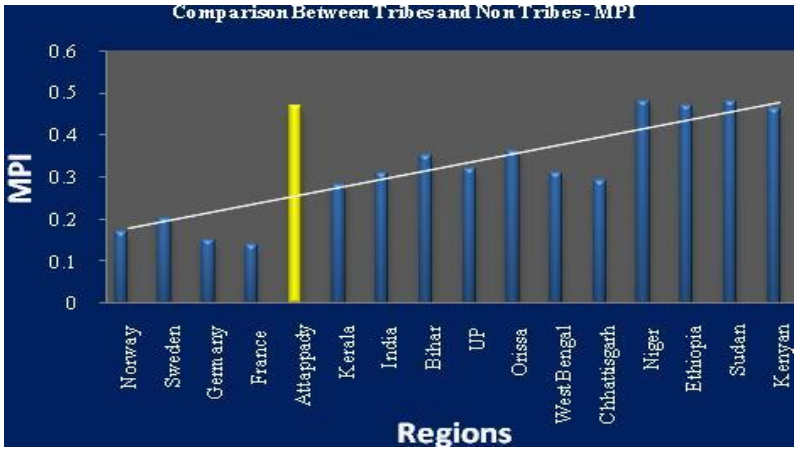


Figure 9: Contribution of indicators to the MPI

The following figures show the percentage of MPI poor people who experience different intensities of poverty. The chart below (figure – 10) breaks the poor population into seven groups based on the intensity of their poverty. For example, the first slice shows



deprivation intensities of greater than 20% but strictly less than 33% and second bar shows deprivation intensities of greater than 33% but strictly less than 40%. It shows the proportion of poor people whose intensity (the percentage of indicators in which they are deprived) falls into each group. Following figure point out the variations in the intensity of poverty among tribes in Attappady block. Majority of tribes lies in the category of severe poverty i.e., tribes in Attappady are affected in more than 50% deprivation indicators *(they became poor due the lacking or in accessibilities of more than five lively hood indicators)*. Below mentioned graph

also reveals percentage of people deprived in MPI of three tribes groups in Attappady block and details regarding this.

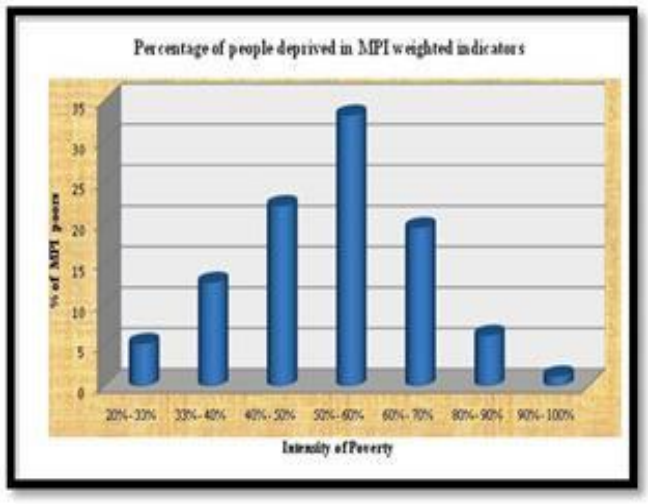


Figure 10: Percentage of people deprived tribe's comparison

In addition to providing data on Multi-dimensional poverty at the national level, the MPI can also be 'decomposed' by sub-national regions to show disparities in poverty within countries. This analysis can be easily performed when the survey used for the MPI is representative at the sub-national level. The following graph (figure – 11) shows the MPI value and its two components at the sub-national level: MPI

Figure 11: Tribes and non values of tribes in Attappady are more or less equal to status of poorest countries like Ethiopia and Niger. The MPI also reveals variation in poverty status among Irula, Kurumba, and Muduga. Kurumba is the community that having very low headcount ratio, intensity of poverty and MPI value among three tribal communities in Attappady hills. Below mentioned Table compares Multi-dimensional deprivations of three tribes groups in Attappady block and details regarding this.

V. CONCLUSION

In contrary to the general perception, marginalization of tribal population is found in its worst form in Kerala which often goes unnoticed due to various reasons. From the above discussion, it is clear that though Kerala presented a scene of a "paradox within a paradox" in terms of acute marginalization of its tribal communities in the midst of high human development achievements, signs of positive change can be traced in various realms.

REFERENCES

1. Alkire, S. and Foster, J., (2011), Counting and Multi-dimensional poverty measurement. Journal of public economics.

2. Alkire, S. J.M. Roche, M.E. Santos, S. Seth., (2011), Multi-dimensional Poverty Index Brief Methodological Note. OPHI Website.

3. Alkire, S. J.M. Roche, S. Seth., (2011), Sub-national Disparities in Multi-dimensional
Poverty across Developing Countries. OPHI Working Paper.

4. CDS and Kerala State Planning Board, (2005), Human Development Report Kerala.

5. Deepa Chandran, (2012), A paradox within a paradox: Emerging signs of change in the unappealing tribal scenario In Kerala, India. ISSN 2224-607X (Paper) ISSN 2225-0565.

6. V.K. Ramachandran on Keralas Development Achievements. In Sen & Dreeze – India Selected Regional Perspectives. - Oxford

7. Various Issues of - Economic Review, Census Report, Statistics for Planning.

8. Rajan K (Ed) – Kerala Economy: Trends during the post Reform period – Serials publication.