

Poverty Hotspots in Rural India

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Abstract

The present paper focusses on the geographical concentration of poverty across in rural India. The paper follows the household assets-based approach of identifying poor households with the objective of analysing village level concentration of poor (assetless) households. Based on the village level data available through the 2011 population census, the analysis helps in uncovering the extent of heterogeneity across villages which can be useful for the purpose of spatial targeting of poverty eradication efforts. Our analysis suggests that around 23 per cent of the households in the country as enumerated at the 2011 population census were not having any of the seven household assets – radio/transistor; television black and white or colour; telephone mobile or landline or both; computer with or without internet; bicycle; scooter/motorcycle/moped; and car/van/jeep. The paper also identifies villages where at least 40 per cent of the households did not own any of the seven household assets at and label these villages as geographical hotspots of poverty. The paper also analyses the distribution of villages in terms of the proportion of assetless households across states, districts and sub-districts of the country. Finally, the paper applies data mining techniques to identify the defining characteristics of hotspot villages.

Introduction

Concerns for eradicating poverty and improving the quality of life of the people in India has been a pertinent development agenda in India right since independence. A concomitant feature of this concern has been the measurement of poverty. The most commonly used definition of poverty is the exclusion from ordinary living patterns, customs and activities due to lack of resources (Townsend, 1979). Following this definition, the official approach of measuring poverty in India has been the consumption-based approach in which the consumption expenditure of households at a particular point in time is compared with a cutoff consumption expenditure which is commonly known as the poverty line (Government of India, 2013). All households having consumption expenditure less than the poverty line are classified as poor households and the proportion of these households is a measure of the prevalence of poverty in the country. This approach sees consumption as the alternative or as the best possible proxy measure of well-being (Ruggeri, Saith and Stewart, 2003). A major

limitation of this approach of poverty measurement, however, is that it tells little about who the poor are, why are they poor and the material situation is likely to change over time (Carter, 2014). Consumption-based measures usually account for "current income" and not for wealth (e.g., savings or other liquid assets), debt, or access to credit that may be used to obtain goods and services. Goods may also be obtained without income, savings or credit - they may be acquired as gifts, exchanged via barter, received as free services or public goods from the government (Ringen, 1988). Households may also meet their basic needs through accumulated wealth or credit or through other markets. In such a situation, consumption-based measures are likely to misrepresent the ability of a households to meet its basic needs. The living conditions of a household are not shaped by current consumption alone and households may experience different living standards for reasons not explained by current consumption (Beverly, 1999; Edin and Lein, 1997; Mayer and Jencks, 1989, 1993; Rector et al, 1999). Moreover, consumption-based approach of estimating the prevalence of poverty is based on self-reported consumption data collected from a sample of households. Consumption-based measures of poverty are also insufficient to characterise and analyse well-being because these measures relate to means to achieve ultimate ends rather than the ends in themselves (Hulme and McKay 2005).

An alternative that has been suggested to address limitations of the consumption-based measures of poverty is to focus on asset poverty. Asset poverty is defined as the inability of a household to access wealth resources to provide for its basic needs. Basic needs refer to the minimum standards for consumption and acceptable needs. It is a more complete understanding of what it really means to be living in poverty. Assets that a household possesses, or to which, it has an access, can be related to household consumption in the sense that the latter may be conceptualised as returns to these assets. In this view, household consumption reflects the assets it commands and the returns, it is able to earn on these assets. Assets may also be important to households in their own right. Having a sufficient level of household assets also offers security. Households having assets can insure themselves against shocks and gain easier access to credit. Assets also capture long term dynamics of household economics much better than the measure of consumption or income at one or two points in time. Household assets, in principle, can be considered in a range of different dimensions of the capital including the social capital. The assets-based approach is also associated with the concept of poverty in a more intuitive way than simple income or consumption-based measures of poverty. Similarly, deprivation of household assets is a better measure of the 'persistence' of ill-being than the contemporary income or consumption-based measures of poverty. Identification of households without a specific set of household assets, therefore, provides a new perspective of poverty that is linked to the standard of living than the conventional income or consumption-based measure of poverty.

In this paper, we measure poverty in terms of the proportion of households without any of a specified set of household assets or the proportion of assetless households. Based on this measure of poverty, we identify villages in India in which at

least 40 per cent households do not own any of the seven specified assets and label these villages as poverty hotspots in rural India. Our approach of characterising household poverty on the basis of the availability of household assets is also related to the concept of fuzzy poverty which conceptualises the state of poverty in the form of “fuzzy sets” to which all members of the population belong but to varying degrees (Cerioli and Zani, 1990; Cheli and Lemmi, 1995; Betti and Verma, 2008; Betti, Mangiavacchi, Piccoli, 2017). The objective of the paper is to uncover the extent of heterogeneity or intrahousehold inequality across villages. At the same time, the analysis may also be useful for geographically targeting the poverty alleviation efforts. Finally, we apply the data mining techniques to explore the defining characteristics of villages which may be termed as poverty hotspots.

The paper is organised as follows. The next section of the paper describes the data source used in the analysis. The paper is based on the house level primary census abstract (HLPCA) of the 2011 population census. The third section of the paper analyses the level and the regional variation in the proportion of assetless households across the villages of the country. The fourth section of the paper applies the defining characteristics of villages with different proportion of assetless households. The last section of the paper summarises main findings of the analysis and discusses its policy and programme implications.

Data Source

Information about the availability of seven household assets - radio or transistor; television, black and white or colour; telephone, landline, mobile or both; computer, with or without internet; bicycle, scooter or motorcycle or moped or any other two-wheeler; and jeep or car or any other four-wheeler – in every household of the country is available through the 2011 population census as the household level primary census abstract (HLPCA). The HLPCA also provides the information about the proportion of households which were having none of the seven household assets at the time of the 2011 population census in every village in rural areas and in every municipal ward in urban areas of the country. The present analysis is confined to only the rural areas of the country and the proportion of the assetless households – households having none of the seven household assets – has been taken as the indicator of the prevalence of poverty in the village - the higher this proportion the higher the prevalence of poverty in the village.

In addition to HLPCA, the present analysis also uses the data available from the primary census abstract (PCA) of the 2011 population census to identify the defining characteristics of villages having different proportion of assetless households through the application of data mining techniques. The PCA permits analysis of how gender balance, social class structure, level of literacy or, equivalently, extent of illiteracy, work participation rate and broad age composition of the village are related to the prevalence of poverty in the village.

At the 2011 population census, there were 640867 villages in India. Out of these, 43330 villages were uninhabited. The present analysis is, however, limited to those 597478 villages as which were having at least one household at the time of 2011 population census. Total number of households in these villages varied from 1 household to 15595 households which shows that villages in India vary widely in terms of household size.

Household Assetlessness in India

According to the 2011 population census, there were 168563192 households in the 597478 villages of the country. Out of these villages 38438675 households were not having any of the seven household assets about which information was collected at the 2011 population census (Table 1). This means that around 22.8 per cent of the households in rural India were assetless households in terms the seven household assets - radio or transistor; television, black and white or colour; telephone, landline, mobile or both; computer, with or without internet; bicycle, scooter or motorcycle or moped or any other two-wheeler; and jeep or car or any other four-wheeler. These households may be classified as poor households. According to the estimates prepared by the Government of India, the proportion of population living below the poverty line in rural India was 25.7 per cent in 2011-12 (Government of India, 2013). Since the average household size of a poor household is larger than the average household size of a non-poor household, the proportion of assetless households is a very close approximation of the prevalence of poverty estimated by the Government of India.

Table 1: Assetless households in villages of India by village size

Village size Number of households	Total number of villages	Number of households	Assetless households	Household Poverty
<50	101933	2583045	719332	27.85
50-100	95644	7175196	1817615	25.33
100-200	142998	20948603	5165591	24.65
200-600	193599	66144400	15694822	23.73
600-1000	39034	29623104	6609116	22.31
≥ 1000	24128	42088844	8432149	20.03
All	597336	168563192	38438625	22.80

Source: Author. Based on data from 2011 population census.

Table 1 also suggests that the proportion of assetless households varies widely by the size of the villages. In villages with less than 50 households, this proportion is almost 28 per cent but in villages with at least 1000 households, this proportion is around 20 per cent. The proportion of assetless households decreases with the increase in the number of households in the village which implies that poverty in rural India is essentially concentrated in small villages.

Table 2: Assetless households in India and states/Union Territories, 2011.

State/Union Territory	Total number of households	Assetless households		Rural population below poverty line 2011-12
		Number	Proportion (%)	
India	168563192	38438625	22.80	25.70
Jammu & Kashmir	1553433	341184	21.96	11.54
Himachal Pradesh	1312510	125658	9.57	8.48
Punjab	3358113	172844	5.15	7.66
Chandigarh	7140	206	2.89	1.64
Uttarakhand	1425086	252660	17.73	11.62
Haryana	3043756	361731	11.88	11.64
Delhi	79574	3985	5.01	12.92
Rajasthan	9494903	2423364	25.52	16.05
Uttar Pradesh	25684729	3115260	12.13	30.40
Bihar	16862940	4513741	26.77	34.06
Sikkim	93288	22169	23.76	9.85
Arunachal Pradesh	200210	75978	37.95	38.98
Nagaland	277491	113952	41.07	19.93
Manipur	338109	76019	22.48	38.80
Mizoram	105812	34914	33.00	35.43
Tripura	616582	212269	34.43	16.53
Meghalaya	430573	184375	42.82	12.53
Assam	5420877	1416316	26.13	33.89
West Bengal	13813165	3924150	28.41	22.52
Jharkhand	4729369	1164100	24.61	40.84
Odisha	8089987	2278556	28.17	35.69
Chhattisgarh	4365568	1361107	31.18	44.61
Madhya Pradesh	11080278	4449859	40.16	35.74
Gujarat	6773558	1865364	27.54	21.54
Daman and Diu	12744	1034	8.11	0
Dadra & Nagar Haveli	36094	15259	42.28	62.59
Maharashtra	13213680	3900852	29.52	24.22
Andhra Pradesh	14234387	3561474	25.02	10.96
Karnataka	7946657	1576370	19.84	24.53
Goa	128208	9551	7.45	6.81
Lakshadweep	2710	85	3.13	0
Kerala	4149641	253597	6.11	9.14
Tamil Nadu	9528495	614773	6.45	15.83
Puducherry	95018	9166	9.65	17.06
AN Islands	58507	6701	11.45	1.57

Source: Author

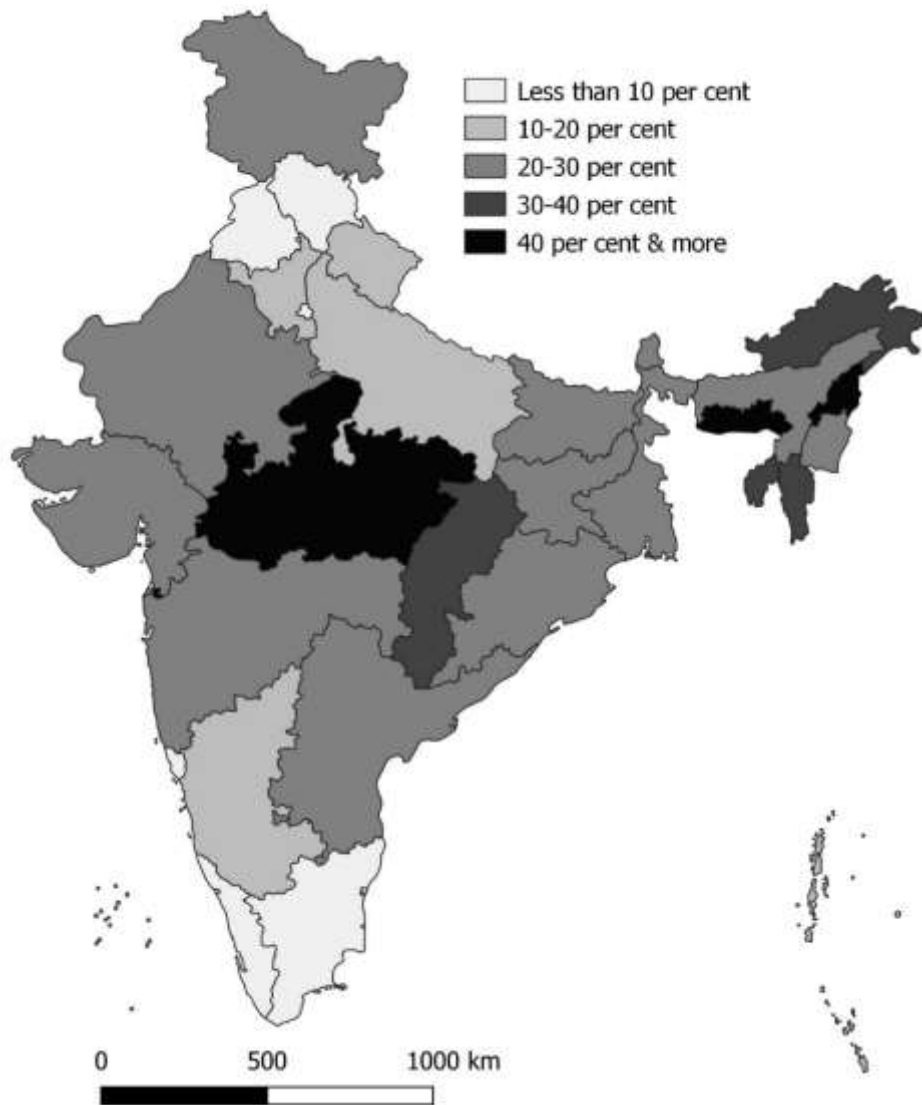


Figure 1: Proportion (per cent) of assetless households in states/Union Territories of India

The proportion of assetless households vary widely across the states/Union Territories of the country (Table 2). There are four states/Union Territories – Meghalaya, Dadra and Nagar Haveli, Nagaland and Madhya Pradesh – where more than 40 per cent of the households were found to be having none of the seven specified assets at the 2011 population census with the highest proportion of assetless households in

Meghalaya. By contrast, in 11 states/Union Territories, this proportion is found to be less than 10 per cent with the Union Territory of Chandigarh having the lowest proportion of households having none of the specified assets. In Haryana, Uttar Pradesh and West Bengal also, the proportion of assetless households has been found to be quite low according to the data available from the 2011 population census. On the other hand, poverty, as measured by the proportion of assetless households, appears to be quite pervasive in Arunachal Pradesh, Mizoram and Tripura. In these states, more than one third of the households were found to be having none of the seven specified assets at the 2011 population census.

Table 3: Distribution of districts and sub-districts by the proportion of assetless households, 2011.

Proportion of assetless households (Per cent)	Districts		Sub-districts		Villages	
	Number	Per cent	Number	Per cent	Number	Per cent
< 10	122	19.3	716	12.2	171469	29.2
10-20	166	26.3	1527	26.0	138671	23.3
20-30	155	24.6	1729	29.4	98636	16.6
30-40	104	16.5	1038	17.7	65812	11.0
≥40	84	13.3	868	14.8	118690	19.9
All	631	100.0	5878	100.0	595978	100.0
No data	9				1559	

Source: Author

The proportion of assetless households varies widely across 631 districts as they existed at the 2011 population census. There were 640 districts in the country at the time of the 2011 population census but in nine districts, there was no rural population. There is only one district, district East Delhi in the National Capital Territory of Delhi, where there was no assetless household. There was only one village in this district and all households in the village were having at least one of the seven specified assets. On the other hand, there were two districts – district East Kameng in Arunachal Pradesh and district Dindori in Madhya Pradesh – where more than two-third of the households were having none of the seven specified assets. In all, there were 84 (13.3 per cent) districts where at least 40 per cent of the households were having none of the specified assets at the time of 2011 population census. These districts may be termed as the hotspots of poverty in the country. On the other hand, in 288 (45.6 per cent) districts, less than 20 per cent households were assetless households. The evidence available from the 2011 population census suggests concentration of poverty in selected districts of the country.

The variability in the proportion of assetless households is even wider across the sub-districts. There are 868 (14.8 per cent) sub-districts in the country where more than 40 per cent of the households were having none of the specified assets at the time of 2011 population census. These sub-districts are the hotspots of poverty in the

country. In the Migging sub-district of district Upper Siang of Arunachal Pradesh, more than 99 per cent of the households enumerated at the 2011 population census were having none of the seven specified assets and this proportion was the highest among all sub-districts having rural population. In sub-district Parsi-Parlo of district Kurung Kumey and in sub-district Payum of district West Siang of Arunachal Pradesh also, more than 90 per cent of the households were not having any of the seven household assets at the 2011 population census. On the other hand, there were two sub-districts – subdistrict Preet Vihar in district East Delhi of the National Capital Territory of Delhi and sub-district Kochilaput of district Lingraj in Odisha – where there was no a single assetless household at the 2011 population census.

Finally, there were 118690 (19.9 per cent) villages in the country where more than 40 per cent of the households in the village were not having any of the seven specified assets at the time of the 2011 population census. These villages may be termed as the poverty hotspots in the country. More than 42 per cent of these villages are located in only three states – Madhya Pradesh (20.4 per cent); Odisha (11.43 per cent) and Maharashtra (10.58 per cent). In addition, more than 30 per cent of these villages are located in five states – Rajasthan (7.3 per cent); Bihar (6.4 per cent); West Bengal (5.7 per cent); Andhra Pradesh (5.7 per cent); and Jharkhand (5.6 per cent). This means that more than 73 per cent of the poverty hotspot villages of the country are located in only eight states of the country. On the contrary, in the Union Territories of Daman and Diu, Lakshadweep and Puducherry, there was not a single village where at least 40 per cent of the households were having none of the specified assets.

Within state/Union Territory distribution of villages by the proportion of assetless households presents a different picture because total number of villages varies widely across states/Union Territories. There are six states/Union Territories where more than 40 per cent villages were having at least 40 per cent of households were without any of the seven household assets. These states/Union Territories are Dadra and Nagar Haveli (55.4 per cent); Meghalaya (53.1 per cent); Arunachal Pradesh (51.8 per cent); Nagaland (47.2 per cent); Madhya Pradesh (46.7 per cent); and Tripura (42.1 per cent). In Mizoram (39.0 per cent); Manipur (36.5 per cent); Maharashtra (30.7 per cent); Odisha (28.5 per cent); Chhattisgarh (28.3 per cent); and Andhra Pradesh (25.7 per cent) also, a substantial proportion of villages had at least 40 per cent assetless households according to the 2011 population census. The proportion of villages with at least 40 per cent of the assetless households is found to be substantial throughout the north-eastern states of the country.

At the same time, in 171469 (29.2 per cent) villages of the country, less than 10 per cent households in the village were not having any of the seven specified household assets. Almost one third (32.3 per cent) of these villages were located in Uttar Pradesh which is the largest state of the country. In addition, around 27 per cent of these villages are located in four states – Tamil Nadu (7.3 per cent); Himachal Pradesh (6.9 per cent); Punjab (6.3 per cent); and Rajasthan (6.3 per cent). More specifically, there were 5256 (0.9 per cent) villages in the country at the time of the 2011 population

census where there was not a single household in the village which was having at least one of the seven specified household assets which suggests that poverty, in these villages, was universal. On the contrary, in 30716 (5.2 per cent) villages, all households in the village were having at least one of the seven specified household assets which means that there was no poor household or there was no poverty in these villages.

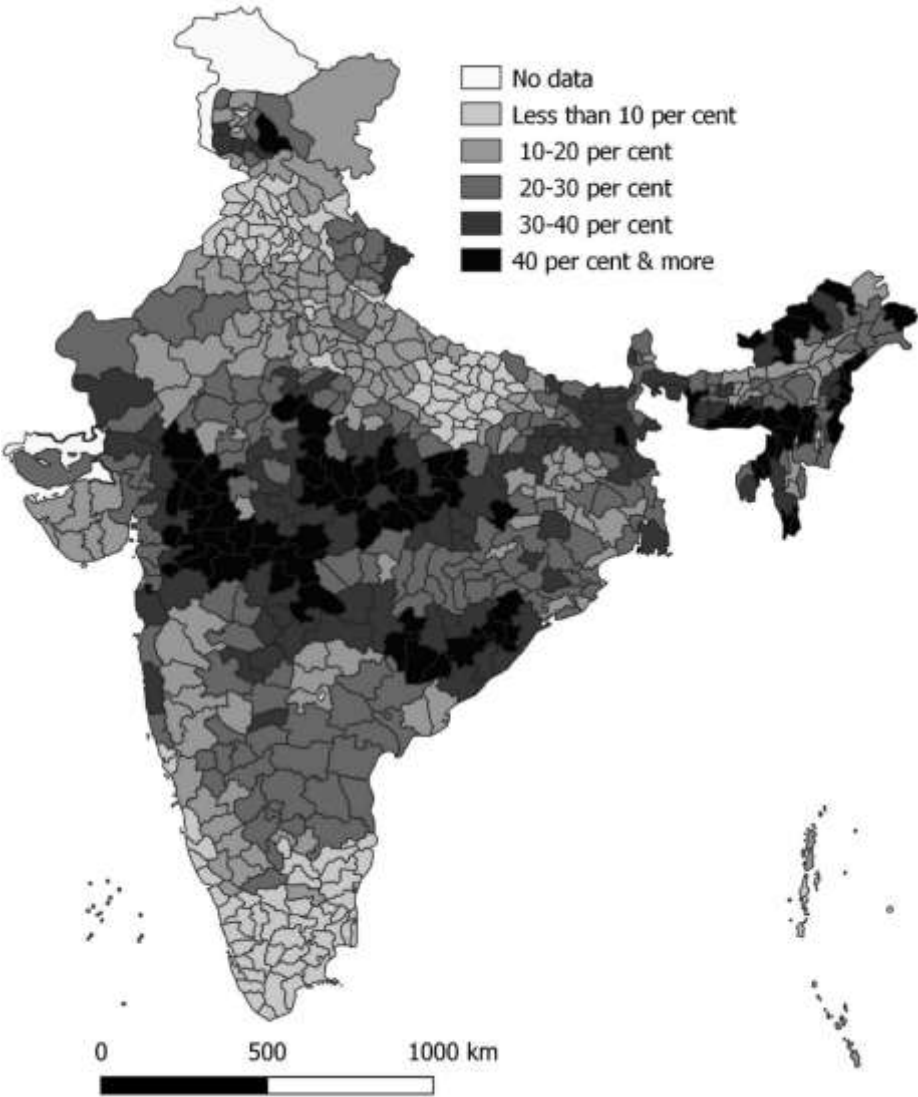


Figure 2: Proportion (per cent) of assetless households in districts of India

Table 4: Poverty hotspots in rural India

State/Union Territory	Total number of villages	Number of poverty hotspots villages	Proportion of poverty hotspots in the country	Proportion of poverty hotspots in the state
Jammu & Kashmir	6321	907	0.76	14.35
Himachal Pradesh	17844	570	0.48	3.19
Punjab	12152	23	0.02	0.19
Chandigarh	5	0	0.00	0.00
Uttarakhand	15685	2531	2.13	16.14
Haryana	6636	103	0.09	1.55
Delhi	101	2	0.00	1.98
Rajasthan	43180	8715	7.34	20.18
Uttar Pradesh	97654	1928	1.62	1.97
Bihar	39009	7607	6.41	19.50
Sikkim	425	61	0.05	14.35
Arunachal Pradesh	5220	2705	2.28	51.82
Nagaland	1399	660	0.56	47.18
Manipur	2353	858	0.72	36.46
Mizoram	703	274	0.23	38.98
Tripura	862	363	0.31	42.11
Meghalaya	6454	3430	2.89	53.15
Assam	25345	5057	4.26	19.95
West Bengal	37140	6773	5.71	18.24
Jharkhand	29423	6627	5.58	22.52
Odisha	47607	13570	11.43	28.50
Chhattisgarh	19434	5491	4.63	28.25
Madhya Pradesh	51847	24225	20.41	46.72
Gujarat	17819	4513	3.80	25.33
Daman and Diu	19	0	0.00	0.00
Dadra and Nagar Haveli	65	36	0.03	55.38
Maharashtra	40862	12552	10.58	30.72
Andhra Pradesh	26264	6737	5.68	25.65
Karnataka	27343	2257	1.90	8.25
Goa	320	5	0.00	1.56
Lakshadweep	5	0	0.00	0.00
Kerala	1017	2	0.00	0.20
Tamil Nadu	15006	44	0.04	0.29
Puducherry	90	0	0.00	0.00
AN Islands	369	64	0.05	17.34
India	595978	118690	100.00	19.92

Source: Author

Classification of Villages

Given the wide variation in the proportion of assetless households across villages, it may be hypothesised that there are village-specific characteristics that impact upon household level assetlessness in the village. We have used the classification modelling approach (Tan, Steinbach, Kumar, 2006; Han, Kamber, Pei, 2012) to examine how the proportion of assetless households in the village is related to selected village characteristics. Classification modelling involves classifying villages on the basis of the proportion of assetless households as the classification variable and selected village characteristics as predictor variables. The village characteristics used included: 1) proportion of population aged 0-6 years; 2) proportion of illiterate population to the population aged 7 years and above; 3) proportion of females; 4) proportion of Scheduled Castes; and 5) proportion of Scheduled Tribes. The classification and regression tree (CRT) method (Breiman et al, 1984) was used for classification modelling. CRT is a nonparametric method that divides villages into different categories so that within category homogeneity with respect to the classification variable is maximised. It recursively partitions the data space so that the partition can be represented as a decision tree (Loh, 2011). When the classification variable takes finite number of unordered values, the method generates classification tree. When the classification variable is either a continuous variable or an ordered discrete variable, regression tree is generated. The villages are sorted according to the classification variable into mutually exclusive categories based on the predictor variable that causes the most effective split on the basis of a similarity measure. The process is repeated until either the perfect similarity is achieved, or the stopping criterion is met (Ambalavanan et al, 2006; Lemon et al, 2003). A category in which all villages have the same value of the classification variable is termed as “pure.” If a category is not “pure”, then impurity within the category can be measured through impurity measures. We have used the Gini coefficient of impurity. The Statistical Package for Social Sciences (SPSS) has been used for classifying villages. The classification variable is a continuous variable so the regression tree was generated.

The classification modelling exercise was confined to 529129 villages which were having at least 10 households at the 2011 population census. Results of the classification modelling exercise are presented in table 5 and the classification tree is depicted in figure 1. The exercise suggests that 529129 villages of the country can be grouped into 10 clusters having distinguished village characteristics and different proportion of assetless households. The proportion of assetless households is the highest in villages where Scheduled Tribes population constitutes more than 94.3 per cent of the village population and where illiteracy rate is at least 48 per cent. There are 16210 (3.1 per cent) such villages and the average proportion of assetless households in these villages is 57.6 ± 0.28 per cent. The second highest assetlessness is in those villages where the proportion of Scheduled Tribes ranges between 30.6-94.3 per cent and where illiteracy rate is at least 48 per cent. There are 17109 (3.2 per cent) such villages and the average proportion of assetless households in these villages is

44.9 ± 0.24 . The third cluster comprises of villages where Scheduled Tribes constitute at least 30.6 per cent population, illiteracy rate is less than 48 per cent and the proportion of the population aged 0-6 years is at least 16.4 per cent. There are 24884 (4.7 per cent) such villages and the average proportion of assetless households in these villages is 40.2 ± 0.248 . On the other hand, the proportion of assetless households is the lowest in those villages where there is no Scheduled Tribes, illiteracy rate is less than 39 per cent and the proportion of the population aged 0-6 years is less than or equal to 17.2 per cent. There are 156410 (29.8 per cent) such villages and the proportion of assetless households in these villages is 14.7 ± 0.142 . The proportion of assetless households has also been found to be relatively low in those villages where Scheduled Tribes is less than 10 per cent and illiteracy is low although proportion of the population aged 0-6 years is high. The classification modelling exercise reveals that household assetlessness is determined, to a significant extent, by the defining characteristics of the village.

Table 5: The classification table.

Node	Village characteristics			Proportion of households without assets		N
	Proportion Scheduled Tribes	Proportion illiterate	Proportion 0-6 years	Mean	SD	
0	All	All	All	0.242	0.202	529129
1	≤ 0.306			0.203	0.167	417207
2	> 0.306			0.387	0.253	111921
3	≤ 0.306	≤ 0.389		0.181	0.153	312482
4	≤ 0.306	> 0.389		0.268	0.188	104725
5	> 0.306	≤ 0.480		0.335	0.227	78602
6	> 0.306	> 0.480		0.510	0.288	33319
7	0	≤ 0.389		0.155	0.148	184398
8	$> 0, \leq 0.306$	≤ 0.389		0.217	0.152	128083
9	≤ 0.306	$> 0.389, \leq 0.497$		0.246	0.171	70513
10	≤ 0.306	> 0.497		0.315	0.211	34212
11	> 0.306	≤ 0.480	≤ 0.164	0.304	0.209	53738
12	> 0.306	≤ 0.480	> 0.164	0.402	0.248	24884
13	$> 0.306, \leq 0.943$	> 0.480		0.449	0.240	17109
14	> 0.943	> 0.480		0.576	0.260	16210
15	0	≤ 0.389	≤ 0.172	0.147	0.142	156410
16	0	≤ 0.389	> 0.172	0.201	0.171	27989
17	$> 0 \& \leq 0.081$	≤ 0.389		0.201	0.146	86906
18	$> 0.081, \leq 0.306$	≤ 0.389		0.250	0.159	41177

Source: Author

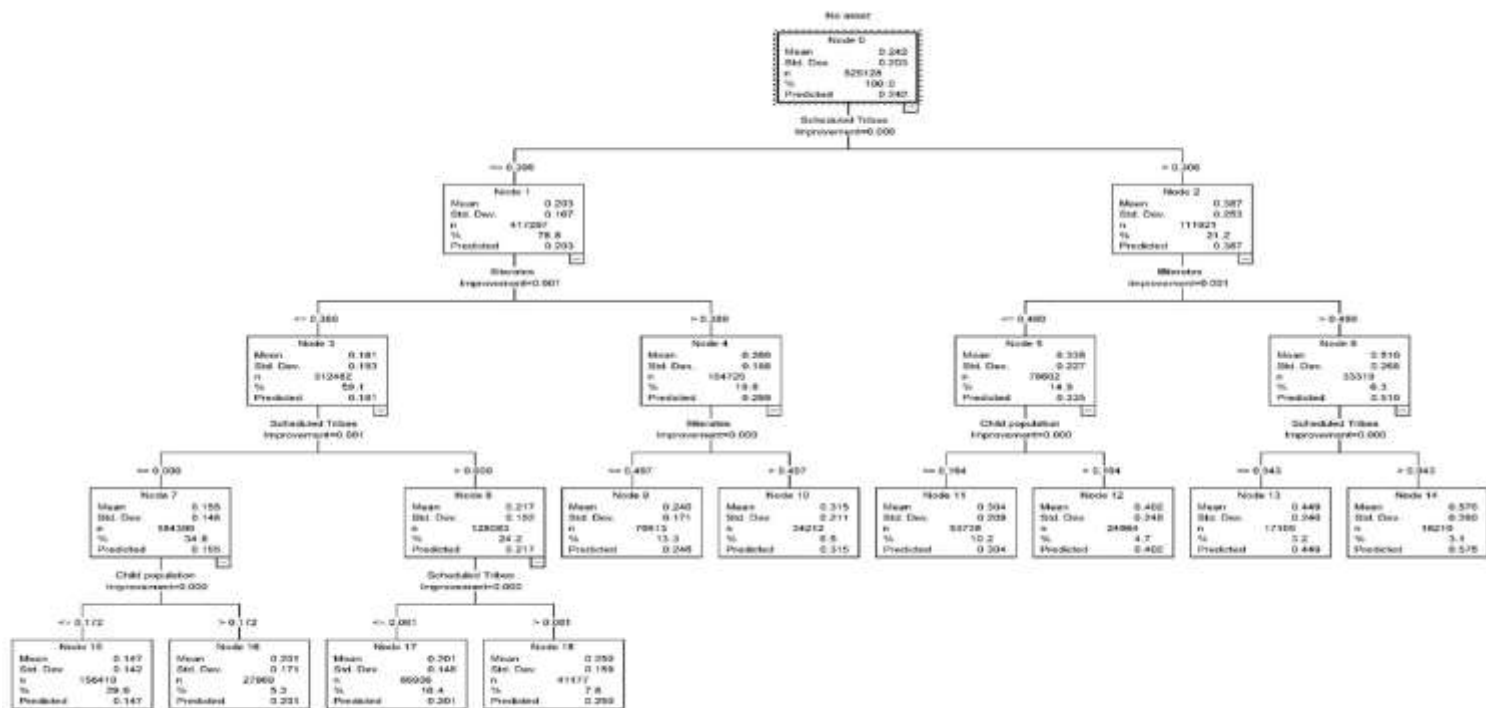


Figure 1: The classification tree

Table 6: Cluster characteristics

Cluster number	Number of villages	Number of households	Assetless households		Average household size	0-6 years (%)	Scheduled		Literates (%)
			N	%			Castes (%)	Tribes (%)	
15	156410	39857799	5847599	14.7	5.12	13.08	23.11	0.00	74.08
17	86906	46669856	8761959	18.8	4.69	12.80	19.89	1.81	75.62
16	27989	6563659	1379113	21.0	5.86	18.91	19.67	0.00	68.10
18	41177	14063693	3525452	25.7	4.58	12.85	17.06	16.60	74.27
9	70513	25999288	6578059	25.3	5.07	16.41	19.94	2.76	56.49
11	53738	11242409	3477008	30.9	4.62	12.92	7.73	62.73	69.44
10	34212	10704636	3314451	31.0	5.28	18.75	16.72	2.39	43.40
12	24884	4084972	1711059	41.9	5.10	18.87	5.42	73.84	63.37
13	17109	3520730	1550121	44.0	4.76	17.81	8.08	66.47	42.99
14	16210	2051770	1233295	60.1	5.14	19.44	0.45	98.53	37.69
All	529128	164758812	37378116	22.7	4.94	14.51	18.61	10.95	67.82

Source: Author

Table 6 presents the characteristics of households in different clusters of villages identified through the data mining exercise. The proportion of assetless households varies from less than 15 per cent in villages of cluster 15 to more than 60 per cent in villages of cluster 14. Almost entire population of the villages of cluster 14 is constituted by the Scheduled Tribes population while the proportion of child population in these villages is almost 20 per cent of the total population. On the other hand, the level of literacy is the lowest among the ten clusters identified through the data mining exercise. On the other hand, there is no Scheduled Tribes population in villages of cluster 15; the proportion of child population constitute only about 13 per cent of the total population and the literacy rate in villages of this cluster is the highest among all clusters. An important characteristic of villages of this cluster is the substantial proportion of Scheduled Castes population. Table 4 again confirms that the household level assetlessness in the villages of the country is influenced by the level of fertility, extent of literacy and the social class composition of the village population. Household poverty is high in those villages where literacy is low and fertility is high and where majority of the population is constituted by Scheduled Tribes.

Conclusions

The present analysis shows that poverty, measured in terms of the proportion of assetless households varies widely across the villages of the country and the proportion of assetless households is very close to the proportion of population below the poverty line in rural India at the national level, although, at the state/Union Territory level, asset poverty depicts a different picture of poverty than that depicted by the consumption-based measure of poverty. There are almost one fifth villages in the country which can be termed as poverty hotspots as more than 40 per cent households

in these villages were not having any of the seven household. More than 40 per cent of these villages are located in Madhya Pradesh, Odisha and Maharashtra. Among different states/Union Territories of the country, the proportion of villages having at least 40 per cent assetless households is very high throughout the north-eastern states and in Madhya Pradesh where at least one third of the villages are poverty hotspots.

The analysis suggests that the main determinants of household assetlessness in the village is the share of the Scheduled Tribes population, level of illiteracy and the proportion of population aged 0-6 years which is an indication of the level of fertility. This means that efforts to reduce village poverty should focus on villages which are dominated by Scheduled Tribes population with an attempt to increase literacy and reduce fertility. The proportion of assetless households is the lowest in those villages where there is no Scheduled Tribes population, literacy is high and fertility is low. This means that increase in income alone may not be sufficient to reduce village poverty unless income enhancing efforts are associated with efforts to improve literacy and reduce fertility. The analysis also emphasises the need of directing poverty reduction efforts should be specifically to villages where Scheduled Tribes constitute a dominating proportion of the village population. The analysis suggests that all those villages where Scheduled Tribes constitute at least two third of the village population are poverty hotspots.

References

- Ambalavanan N, Carlo WA, Shankaran S, Ban CM, Emrich SL, Higgins RD, Tyson JE, O'Shea TM, Laptook AR, Ehrenkranz RA, Donovan EF, Waleh MC, Goldberg RN, Das A, National Institute of Child Health and Human Development Neonatal Research Network (2006) Predicting outcomes of neonates diagnosed with hypoxemic-ischemic encephalopathy, *Pediatrics* 118(5):2084-93.
- Betti G, Verma V (2008) Fuzzy measures of the incidence of relative poverty and deprivation: a multi-dimensional perspective. *Statistical Methods and Applications* 17(2):225–250.
- Betti G, Mangiavacchi L, Piccoli L (2017) Individual poverty measurement using a fuzzy intrahousehold approach. Bonn, Germany, IZA Institute of Labor Economics, IZA DP No. 11009.
- Beverly SG (1999) Economic poverty reconsidered: Material hardship and income-poverty in the United States. Washington University, St. Louis, Missouri.
- Brieman L, Friedman JH, Olshen RA, Stone CJ (1984) *Classification and Regression Trees*. CRC Press.
- Carter MR (2014) what can we learn from asset-based approaches to poverty. Madison, University of Wisconsin.

- Ceroli A, Zani S (1990) A fuzzy approach to the measurement of poverty. In *Income and Wealth Distribution, Inequality and Poverty*. Springer 272–284.
- Cheli B, Lemmi A (1995) A totally fuzzy and relative approach to the multidimensional analysis of poverty. *Economic Notes* 24:115–134.
- Edin K, Lein L (1997) *Making ends meet: how single mothers survive welfare and low-wage work*. New York, Russell Sage Foundation.
- Government of India (2013) Press note on poverty estimates 2011-12. New Delhi, Planning Commission.
- Han J, Kamber M, Pei J (2012) *Data Mining. Concepts and Techniques*. Amsterdam, Elsevier.
- Hulme D, McKay A (2005) Identifying and measuring chronic poverty: Beyond monetary measures. Paper presented in the International Conference on The Many Dimensions of Poverty, Brasilia, Brazil.
- Lemon SC, Roy J, Clark MA, Friedman PD, Rakowski W (2003) Classification and regression tree analysis in public health: methodological review and comparison with logistic regression, *Annals of Behavioral Medicine* 26(3):172-81.
- Loh WY (2011) Classification and regression trees. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery* 1:14-23.
- Mayer SE, Jencks C (1989) Poverty and the distribution of material hardship. *The Journal of Human Resources* 24(1):88-113.
- Mayer SE, Jencks C (1993) Recent trends in economic inequality in the United States: Income versus expenditures versus material well-being. In EN Wolff (Ed) *Poverty and Prosperity in the USA in the Late Twentieth Century*. New York: St. Martin's Press:121-203.
- Rector R, Johnson K, Youssef S (1999) The extent of material hardship and poverty in the United States. *Review of Social Economy* LVII(3):351-385.
- Ringen S (1988). Direct and indirect measures of poverty. *Journal of Social Policy* 17(3):351-365.
- Ruggeri C, Saith R, Stewart F (2003) Does it matter that we do not agree on the definition of poverty? A comparison of four approaches. *Oxford Development Studies* 31(3):243-274.
- Townsend P (1979) *Poverty in the United Kingdom: A survey of Household Resources and Standards of Living*. Los Angeles, University of California Press.