

## SPATIAL DISTRIBUTION OF AVAILABILITY OF HOUSEHOLD AMENITIES IN SCHEDULED TRIBE POPULATION IN INDIA

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### **ABSTRACT**

*The present research paper is an attempt to make the regional analysis of availability of household amenities in scheduled tribe population in India. The study is based on secondary source of data, collected from Census of India, 2011. The State/Union Territory has been taken as the smallest unit of study. The study reveals that the development of household amenities is higher in eastern and southern parts of India, while, the central part of the country is least developed in this regard.*

**KEYWORDS:** Household Amenities, Scheduled Tribe Population, India, State, Union Territory

### **INTRODUCTION**

The premise of basic amenities includes drinking water, sanitation, and electricity (Shaw, 2007). Even a minimum standard of comfortable living requires the availability of these basic amenities. In general, the basic amenities that are required to prevent ill health and underdevelopment are shelter, water, medicine and education (Street en, 1984), while, household amenities include the amenities that are needed within the premises of households. Improvement of health and quality of the society depend significantly on the availability of modern household amenities like drinking water, sanitation facilities etc. (Nayar, 1997). Demand-supply gap, lack of financial aids, political interests, the inefficiency of institutions, a low socio-economic status of the people, lack of awareness, etc. lead to the absence or inadequacy of these facilities in any region. It is also being realized that key dependencies exist between water supply and sanitation and improvement in the overall human development (Dreze and Murthi, 2007).

According to Nayar, the factors which exert an impact on the health status of the population can possibly be delineated into three sets: (i) health factors which include medical intervention, (ii) health-promoting factors such as housing, water supply, sanitation and hygiene, (iii) non-health factors which include social and economic factors. The health-promoting factors such as housing conditions, availability of drinking water, sanitary facilities, etc. are much more required for health improvement among the population, sometimes, even more significantly than health services (Nayar, 1997).

Among the amenities, sanitation has now become a great matter of concern. Health condition depends on progress in sanitation and improved hygiene. But many people still do not have adequate means of disposing of their waste. These wastes cause infectious diseases mainly to the vulnerable groups like very young and the elderly people. Moreover, poorly controlled waste also means the daily exposure to an unpleasant environment. There is a need to improve

the sanitation facility. Likewise, electricity is no less important among the other household amenities. Being the backbone of economic development electricity is not only leading the economic development, but also leads the overall human development and quality of living is also greatly dependent on electrification (Dabhadker and Dabhadker, 2004).

Moreover, most of the scheduled tribe population lives in rural areas. In rural areas, much of cooking is done with poorly ventilated and crowded house, with the help of traditional 'CHULHAS' (traditional stove), which produces a high concentration of air pollutants. High levels of biomass smoke adversely affect the health of the people in general and that of women and children in particular (TERI, 1995).

According to the Census of India 2011, the percentage of scheduled tribe population in rural and urban areas of the country was 89.73 and 10.27 respectively. Most of the tribal groups are mainly characterized by a pre-agriculture level of technology, stagnant or declining population, extremely low literacy and subsistence level of the economy. They are also suffering from poverty, malnutrition, unhygienic living conditions (Statistical Profile of Scheduled Tribes in India, 2010). It is, therefore, an important aspect to study the level of availability of household amenities in the scheduled tribe population in India.

## OBJECTIVE

The present study aims to analyze the inter-state and union territory-wise variations in respect of the availability of modern household amenities namely, drinking water, electricity, latrine, kitchen and bathroom in the scheduled tribe population in India.

## Data and Methodology

The present research work is entirely based on secondary sources of data collected from Census of India publications, 2011, New Delhi, In this study, a set of five indicators of modern household amenities has been taken into account to determine the levels of development in respect of availability of modern household amenities in the twenty-eight states and seven union territories (UTs) of India.

These indicators are drinking water, electricity, latrine (within the premises), kitchen (inside the house) and bathroom (within the premises). In the first step, the raw data for each variable which determines the areal variation of levels of modern household amenities have been computed into a standard score. It is generally known as Z value or Z-score. The score quantifies the departure of individual observations from the arithmetic mean of all observations, expressed in a comparable form. This means it becomes a linear transformation of the original data. It may be expressed as:

$$Z_{ij} = \frac{X_{ij} - \bar{X}_i}{\sigma_i}$$

Where,

$Z_{ij}$  = Standardized value of the variable  $i$  in State/UT  $j$ .

$X_{ij}$  = Actual value of variable  $i$  in State/UT  $j$ .

$\bar{X}_i$  = Mean value of variable  $i$  in all States/UTs.

$\sigma_i$  = Standard deviation of variable  $i$  in all States/UTs.

GIS-Arc view programme (Version 3.2a) has been applied to show the spatial patterns of availability of selected household amenities in scheduled tribe population among the states through maps. Due to the proportionally very small size of the Union Territories, the cartographical representation is not made on maps for the UTs. However, their details in terms of selected infrastructure facilities of scheduled tribe population have been given in tables and examined in the descriptions.

### Study Area

For the present study, India, the second most populous country in the world, is taken as the study area and the state/union territory is selected as the unit. The country is comprised of twenty-eight states and seven union territories. India has the total geographical area of about 32, 87,240 square Kilometers (2.4 per cent of the world's geographical area). It is bounded by the Himalayas in the north and the Indian Ocean in the south, surrounded by Pakistan and Afghanistan in the north-west, China, Bhutan and Nepal in the north, Bangladesh and Myanmar in the east. The north-south extension of the country is 3,214 kilometers and east-west expansion is 2,933 kilometers.

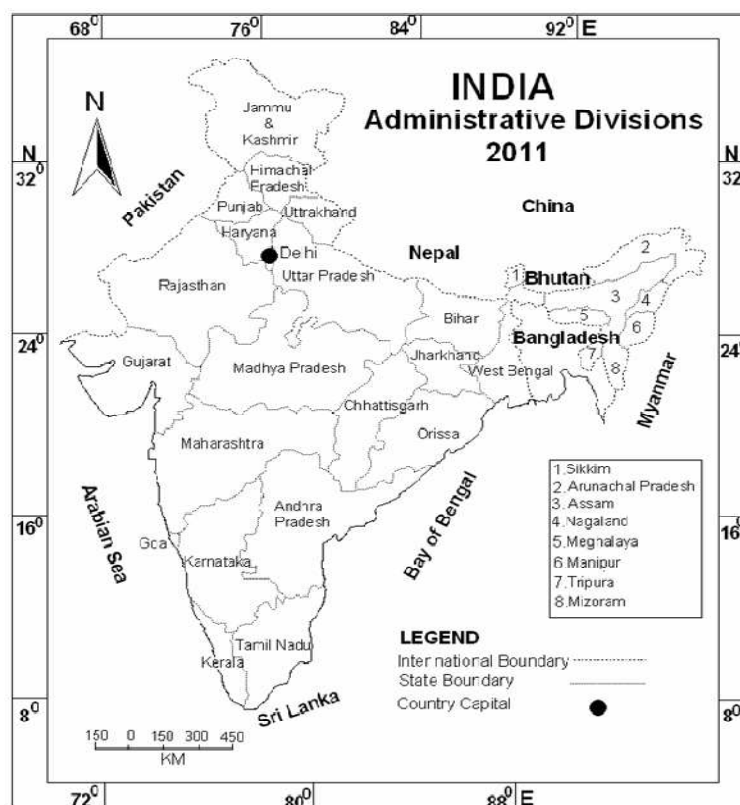


Figure 1

Source: Census of India .2011

The total land frontier is 15,200 kilometers and coastline is 7,516.5 kilometers. According to the census of 2011, India had a total population of 1210 million of which 68.84 per cent was rural and remaining 31.16 per cent was classified as urban. The population density of India is 382 persons per square kilometer. The general sex ratio, that is the number of females per thousand males, was 940 while in rural areas it was 947 and in urban areas 926. The literacy rate was 74 per cent. The percentage of literacy in rural and urban population was 68.9 per cent and 85 per cent respectively. Except for

two states namely, Punjab and Haryana and three union territories, namely, Chandigarh, NCT of Delhi and Pondicherry, scheduled tribe populations are notified in twenty-six states and four union territories of India. India had 104.55 million scheduled tribe populations, out of which 52.55 million are males and 52.00 million are females. As a whole, the scheduled tribe population constitutes 8.63 per cent of the total Indian population (Census of India, 2011).

## RESULTS AND DISCUSSIONS

State and union territory wise distribution of z-scores of drinking water, electricity, latrine, kitchen, and bathrooms are shown in Table 1.

### Drinking Water

Distribution of z-scores of availability of drinking water in the scheduled tribe households has been categorically shown in Table 2. Figure 2 depicts that there are seven states and three union territories in the high category (above 0.500 z-scores) of availability of drinking water. These states and union territories are Himachal Pradesh, Uttarakhand, Uttar Pradesh, Sikkim, Assam, Daman & Diu, Goa, Lakshadweep, Kerala and Andaman & Nicobar Islands. A contiguous region is located in the north, consisting of the states of Uttar Pradesh, Uttarakhand, and Himachal Pradesh. Other states namely, Sikkim and Assam are lying in the north-eastern part and remaining states and union territories, namely, Daman & Diu, Goa, Kerala, Lakshadweep, and Andaman and the Nicobar Islands are situated in the western and southern parts of the country and do not make any distinct region.

The middle category (-0.500 to 0.500 of z-scores) of drinking water is comprised of seven states and one union territory. These are Bihar, Arunachal Pradesh, Nagaland, Mizoram, Gujarat, Dadra & Nagar Haveli, Maharashtra, and Karnataka. Among these states and union territories, Gujarat, Maharashtra, Arunachal Pradesh and Dadra and Nagar Haveli form a region in the western margin of India. Besides, Arunachal Pradesh and Nagaland constitute a region in the north-eastern part of India.

In the low category (below -0.500 of z-scores) of drinking water, there are twelve states. These are Jammu & Kashmir, Rajasthan, Manipur, Tripura, Meghalaya, West Bengal, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Andhra Pradesh and Tamil Nadu. Except for Jammu & Kashmir, Meghalaya, Manipur, and Tripura, remaining eight states of this category are in a contiguous region from western to south-eastern India.

**Table 1: State/Union Territory-wise Z-Scores Distribution of the Household Amenities to Scheduled Tribe Population in India, 2011**

States/Union Territories	Drinking Water	Electricity	Latrine (within Premises)	Kitchen (Inside House)	Bathroom (within Premises)
Jammu & Kashmir	-0.871	-0.21	-0.612	0.242	-0.348
Himachal Pradesh	0.855	1.137	0.626	0.876	0.992
Punjab	N.A.				
Chandigarh <sup>#</sup>	N.A.				
Uttarakhand	1.209	0.717	0.069	-0.425	0.408
Haryana	N.A.				
NCT of Delhi <sup>#</sup>	N.A.				
Rajasthan	-1.092	-0.984	-1.273	-2.137	-1.002
Uttar Pradesh	0.549	-1.1	-0.305	-1.09	-0.203
Bihar	0.441	-2.071	-1.068	-1.858	-1.024

Sikkim	0.851	1.019	1.463	0.198	1.189
Arunachal Pradesh	0.216	0.043	0.498	1.183	-0.311
Nagaland	-0.316	0.62	1.075	1.329	0.758
Manipur	-0.923	-0.282	1.337	0.749	-0.206
Mizoram	-0.086	0.741	1.672	1.032	1.331
Tripura	-0.928	-0.703	0.685	0.2	-1.039
Meghalaya	-0.691	-0.23	0.589	0.462	-0.068
Assam	0.774	-1.434	-0.032	0.501	-0.751
West Bengal	-0.704	-1.293	-0.693	-1.123	-0.918
Jharkhand	-1.233	-1.383	-1.258	-1.422	-1.097
Odisha	-1.341	-1.912	-1.299	-0.393	-1.169
Chhattisgarh	-1.191	-0.322	-1.03	-0.421	-1.14
Madhya Pradesh	-1.228	-0.43	-1.251	-1.271	-1.088
Gujarat	-0.177	0.575	-0.695	0.008	-0.504
Daman & Diu #	1.299	1.217	-0.254	0.585	0.306
Dadra & Nagar Haveli #	-0.182	0.991	-0.956	1.011	-0.735
Maharashtra	0.084	-0.206	-0.494	-0.207	0.193
Andhra Pradesh	-0.582	0.577	-0.864	-1.668	-0.524
Karnataka	-0.262	0.714	-0.543	0.856	0.983
Goa	1.36	1.107	0.551	1.19	0.798
Lakshadweep #	2.655	1.336	1.897	0.271	2.592
Kerala	0.615	-0.091	0.953	1.092	0.367
Tamil Nadu	-0.577	0.744	-0.332	-0.428	0.08
Puducherry#	N.A.				
Andaman& Nicobar Islands #	1.475	1.117	1.545	0.659	2.129

**Source:** Calculation is based on the publication of Census of India, 2011, Data on Housing, Table H-Series, Data Dissemination Wing, Office of the Registrar General, New Delhi.

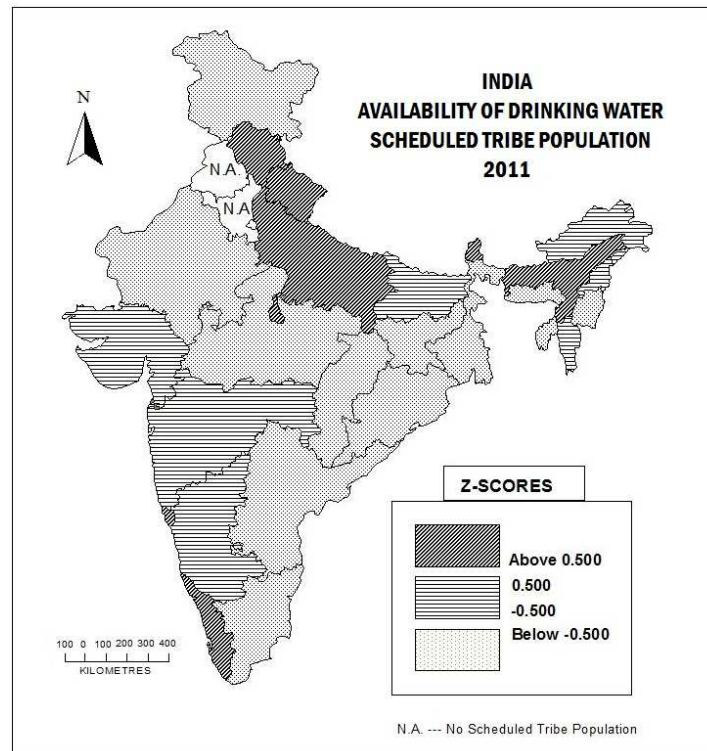
**Note:#:** Union Territory

N.A.: Not Available (No Scheduled Tribe Population).

**Table 2: Availability of Drinking Water in Scheduled Tribe Population in India**

Category	Z-scores	No. of States/UTs	Name of States/UTs
High	Above 0.500	10	Himachal Pradesh, Uttarakhand, Uttar Pradesh, Sikkim, Assam, Daman & Diu, Goa, Lakshadweep, Kerala, A & N Islands
Medium	-0.500 to .500	8	Bihar, Arunachal Pradesh, Nagaland, Mizoram, Gujarat, Dadra & Nagar Haveli, Maharashtra, Karnataka
Low	Below -0.500	12	Jammu & Kashmir, Rajasthan, Manipur, Tripura, Meghalaya, West Bengal, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Andhra Pradesh, Tamil Nadu

**Source:** Based on Table 1.



**Figure 2**

### Electricity

Table 3 shows the distribution of z-scores of availability of electricity in the scheduled tribe households and Figure 3 shows a state-wise graded pattern of their distribution. This table clearly depicts that the number of states and union territories in high category (above 0.500 of z-scores), medium category (-0.500 to 0.500 of z-scores) and low category (below -0.500 of z-scores) are fourteen, eight and eight respectively.

There are ten states and four union territories in the high level of availability of electricity in the scheduled tribe population. These states and union territories are Himachal Pradesh, Uttarakhand, Sikkim, Nagaland, Mizoram, Gujarat, Daman & Diu, Dadra & Nagar Haveli, Andhra Pradesh, Karnataka, Goa, Lakshadweep, Tamil Nadu and Andaman & Nicobar Islands.

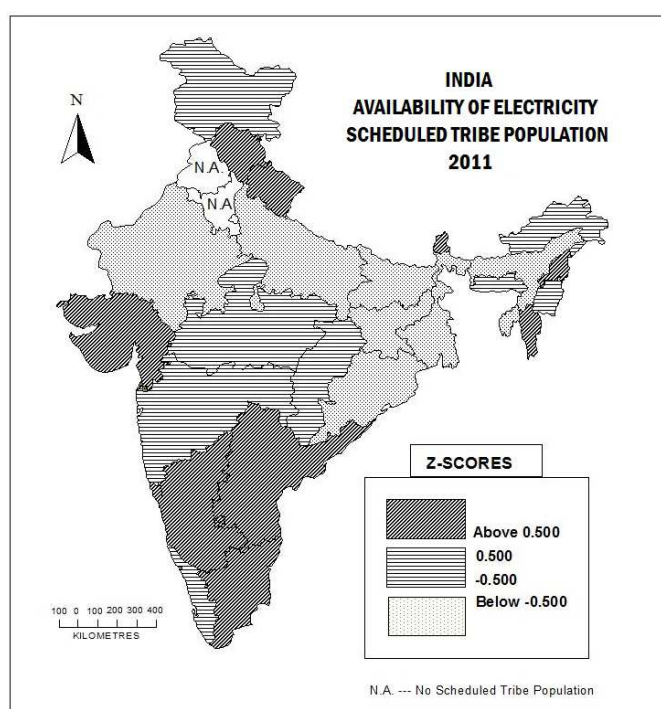
**Table 3: Availability of Electricity in Scheduled Tribe Population in India**

Category	Z-scores	No. of States/ UTs	Name of States/ UTs
High	Above 0.500	14	Himachal Pradesh, Uttarakhand, Sikkim, Nagaland, Mizoram, Gujarat, Daman & Diu, Dadra & Nagar Haveli, Andhra Pradesh, Karnataka, Goa, Lakshadweep, Tamil Nadu, A & N Islands
Medium	-0.500 to 0.500	8	Jammu & Kashmir, Arunachal Pradesh, Manipur, Meghalaya, Chhattisgarh, Madhya Pradesh, Maharashtra, Kerala
Low	Below -0.500	8	Rajasthan, Uttar Pradesh, Bihar, Tripura, Assam, West Bengal, Jharkhand, Odisha

Source: Based on Table 1.

Among them, Goa, Karnataka, Andhra Pradesh and Tamil Nadu form a region in South India. Himachal Pradesh and Uttarakhand also make a region in northern India. Other states and union territories of this category are spread over the western and eastern parts of India and they do not constitute any distinct identifiable region.

In the medium category of availability of electricity, there are eight states, namely Jammu & Kashmir, Arunachal Pradesh, Manipur, Meghalaya, Chhattisgarh, Madhya Pradesh, Maharashtra, and Kerala. A region, consisting of Madhya Pradesh, Maharashtra and Chhattisgarh are located in the middle portion of India. The remaining states of the medium category, i.e. Jammu & Kashmir in northern India, Kerala in southern India and Arunachal Pradesh, Meghalaya and Manipur situated in the eastern part of India fail to form any contiguous region.



**Figure 3**

Eight states namely, Rajasthan, Uttar Pradesh, Bihar, Tripura, Assam, West Bengal, Jharkhand and Odisha fall in the low category of availability of electricity facility. These states form a contiguous region extending from north-western to eastern parts of India.

### Latrine

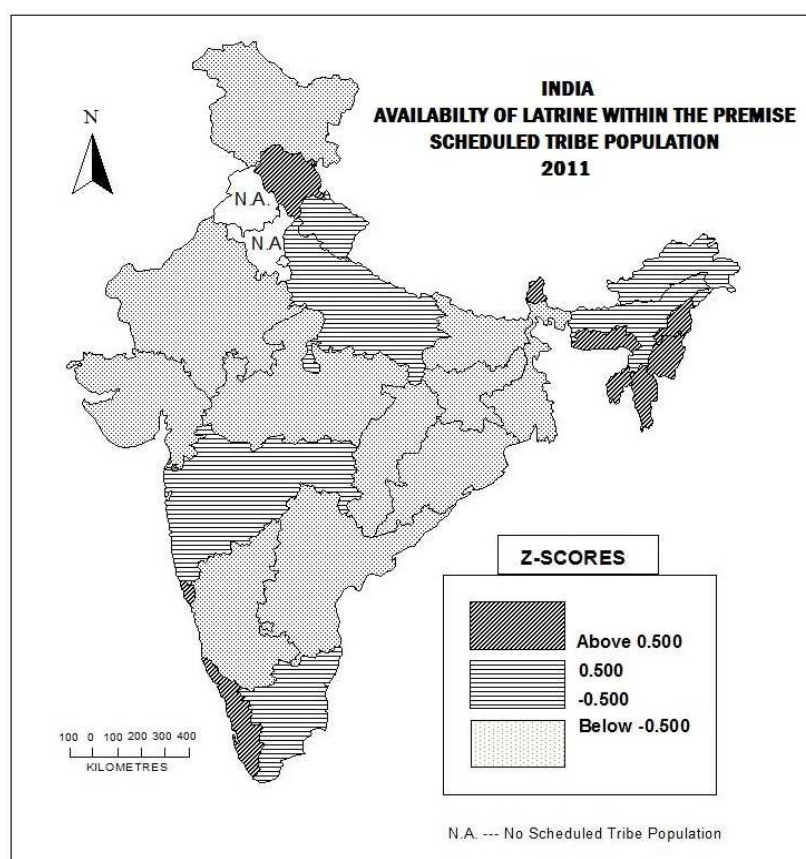
Availability of latrine among scheduled tribe population in India is shown in Table 4 and Figure 4 represents its patterns of distribution. There are nine states and two union territories in the high category (above 0.500 of z-scores), six states and one union territory in the medium category (-0.500 to 0.500 of z-scores) and eleven states and one union territory in the low category (below -0.500 of z-scores) of availability of latrine within the household premises.

The nine states and two union territories of the high category of availability of latrine are Himachal Pradesh, Sikkim, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Goa, Lakshadweep, Kerala and Andaman & Nicobar Islands. Among them, Nagaland, Manipur, Mizoram, and Tripura form a region in the north-eastern part of India and the states of Sikkim

**Table 4: Availability of Latrine Facility in Scheduled Tribe Population in India**

Category	Z-Scores	No. of States/ UTs	Name of States/ UTs
High	Above 0.500	11	Himachal Pradesh, Sikkim, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Goa, Lakshadweep, Kerala, A & N Islands
Medium	-0.500 to 0.500	7	Uttarakhand, Uttar Pradesh, Arunachal Pradesh, Assam, Daman & Diu, Maharashtra, Tamil Nadu
Low	Below -0.500	12	Jammu & Kashmir, Rajasthan, Bihar, West Bengal, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Gujarat, Dadra & Nagar Haveli, Andhra Pradesh, Karnataka

Source: Based on Table 1.

**Figure 4**

and Meghalaya of this category, is in the vicinity of this region but they are not part of it. Except for Himachal Pradesh in the north, the other states and union territories of this category are in the south-western and eastern parts of India.

In the medium category (-0.500 to 0.500 z-scores) of availability of latrine, there are six states, namely, Uttarakhand, Uttar Pradesh, Arunachal Pradesh, Assam, Maharashtra, and Tamil Nadu and one union territory, namely, Daman & Diu. Among these states and union territories, Uttar Pradesh and Uttarakhand form a region in northern India while Assam and Arunachal Pradesh constitute a region in the north-eastern part of India. However, Maharashtra and Daman & Diu situated in the western part and Tamil Nadu lying in the southern part of India, do not form any distinct



region. In the low category (below -0.500 z-scores) of availability of latrine, there are eleven states namely, Jammu & Kashmir, Rajasthan, Bihar, West Bengal, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Gujarat, Andhra Pradesh and Karnataka and one union territory, namely, Dadra & Nagar Haveli. Except for Jammu and Kashmir in the North, remaining states and union territories form a prominent region extending from the north-western to south-eastern parts of India.

### Kitchen

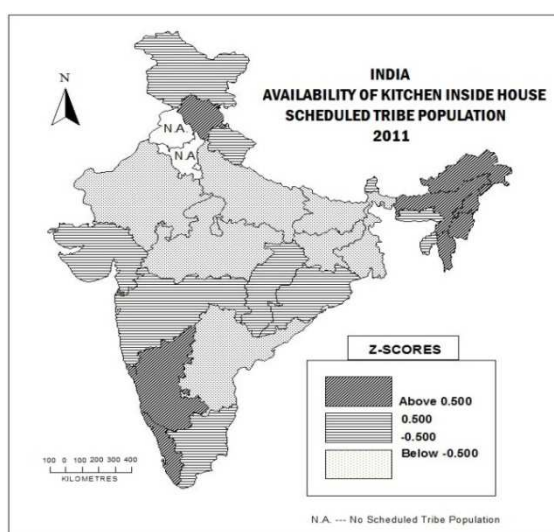
The distribution of z-scores of availability of kitchen in the scheduled tribe population is shown in Table 5. It clearly depicts that there are twelve states and union territories in the high category (above 0.500 of z-scores), eleven states and union territories in medium category (-0.500 to 0.500 of z-scores) and seven states and union territories in the low category (below -0.500 of z-scores).

**Table 5: Availability of Kitchen in Scheduled Tribe Population in India**

Category	Z-scores	No. of States/ UTs	Name of States/ UTs
High	Above 0.500	12	Himachal Pradesh, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Assam, Daman & Diu, Dadra & Nagar Haveli, Karnataka, Goa, Kerala, Andaman & Nicobar Islands
Medium	-0.500 to 0.500	11	Jammu & Kashmir, Uttarakhand, Sikkim, Tripura, Meghalaya, Odisha, Chhattisgarh, Gujarat, Maharashtra, Lakshadweep, Tamil Nadu
Low	Below -0.500	7	Rajasthan, Uttar Pradesh, Bihar, West Bengal, Jharkhand, Madhya Pradesh, Andhra Pradesh

Source: Based on Table 1.

The states and union territories of the high category are Himachal Pradesh, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Assam, Daman & Diu, Dadra & Nagar Haveli, Karnataka, Goa, Kerala and Andaman & Nicobar Islands. It would be seen from Figure 5 that there is a region of a high level of availability of kitchen in the north-eastern part of India comprising of the states of Arunachal Pradesh, Nagaland, Manipur, Mizoram, and Assam. Besides, there is also a region in the south-western part of India consisting of the states of Goa, Karnataka, and Kerala. Remaining states and union territories are in the northern, western and southern India but they do not form any region.



**Figure 5**

The states and union territories in the medium category are Jammu & Kashmir, Uttarakhand, Sikkim, Tripura, Meghalaya, Odisha, Chhattisgarh, Gujarat, Maharashtra, Lakshadweep and Tamil Nadu. Among these states and union territories Gujarat, Maharashtra, Chhattisgarh, and Odisha constitute a region in the middle portion of India extending from west to east direction, while, Jammu and Kashmir, Uttarakhand, Meghalaya, Tripura, Sikkim, Tamil Nadu and Lakshadweep fail to form any region.

The states in the low category of availability of kitchen are Rajasthan, Uttar Pradesh, Bihar, West Bengal, Jharkhand, Madhya Pradesh and Andhra Pradesh. Except for Andhra Pradesh in the south, all the states are in the upper middle part of India and form a contiguous region.

### Bathroom

Category-wise distribution of z-scores of the availability of bathroom to the scheduled tribe population has been shown in Table 6. It represents that the numbers of states and union territories in the high category (above 0.500 of z-scores), medium Category (-0.500 to 0.500 of z-scores) and low category (below -0.500 of z-scores) are eight, twelve and ten respectively. The states falling under each category have been represented in Figure 6.

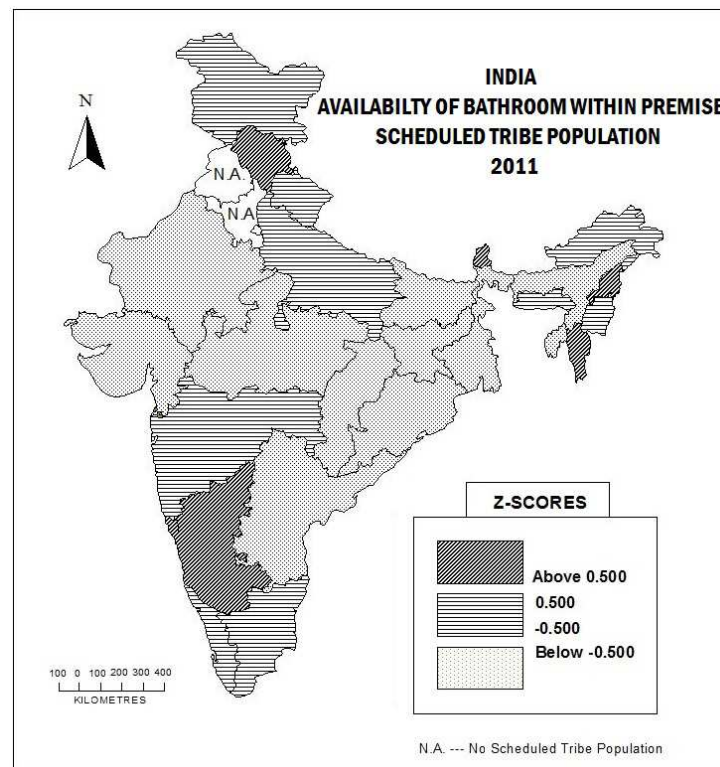
**Table 6: Availability of Bathroom in Scheduled Tribe Population in India**

Category	Z-scores	No. of States/ UTs	Name of States/ UTs
High	Above 0.500	8	Himachal Pradesh, Sikkim, Nagaland, Mizoram, Karnataka, Goa, Lakshadweep, Andaman & Nicobar Islands
Medium	-0.500 to 0.500	10	Jammu & Kashmir, Uttarakhand, Uttar Pradesh, Arunachal Pradesh, Manipur, Meghalaya, Daman & Diu, Maharashtra, Kerala, Tamil Nadu
Low	Below -0.500	12	Rajasthan, Bihar, Tripura, Assam, West Bengal, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Gujarat, Dadra & Nagar Haveli, Andhra Pradesh.

**Source:** Based on Table 1.

The states and union territories of the high category (above 0.500 of z-scores) are Himachal Pradesh, Sikkim, Nagaland, Mizoram, Karnataka, Goa, Lakshadweep and Andaman & Nicobar Islands. These states and union territories are scattered over northern, north-eastern, south-western and southern parts of India without forming any region except a small region, formed by Goa and Karnataka states.

There are twelve states and union territories in the medium level of availability of bathrooms to the scheduled tribe population. These states and union territories are Jammu & Kashmir, Uttarakhand, Uttar Pradesh, Arunachal Pradesh, Manipur, Meghalaya, Daman & Diu, Maharashtra, Kerala and Tamil Nadu. In this category, there are two regions; one is in the northern part of India consisting of Uttar Pradesh and Uttarakhand and another region formed by the states of Tamil Nadu and Kerala is in the southern part of India.



**Figure 6**

Ten states and union territories come to the category of low level of availability of bathrooms to the scheduled tribe population. These are Rajasthan, Bihar, Tripura, Assam, West Bengal, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Gujarat, Dadra & Nagar Haveli and Andhra Pradesh. All the states in this category form a contiguous region in the middle part of India extending from west to east direction.

## CONCLUSIONS

In the conclusion, we can say that the availability of drinking water to the scheduled tribe population is high in northern, south-western and north-eastern parts of India, while, eastern part experiences comparatively less development in terms of availability of drinking water. In general, southern India has better availability of electricity in the scheduled tribe population than northern India. Latrine facility in the scheduled tribe population is not good in India. Satisfactory development in terms of availability of latrine is found only in the north-eastern and south-western parts of India. There is a declining trend of availability of kitchen facility inside the houses of scheduled tribe populations from the southern to the northern part of India, but north-eastern part of India has more availability of kitchen in comparison to any other parts of the country. Accessibility of bathrooms within the household premises to the scheduled tribe population is not remarkable throughout India. Nevertheless, northern, eastern and southern parts of India have witnessed better availability of bathrooms within the premises in scheduled tribe population than the middle part of the country.

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