

# Linkages between Various Socio-Economic Aspects and Basic Amenities in Hilly States of India



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## Abstract

This paper measures the factors which affect the availability of basic amenities in five hilly states in India. The unit level data from District Level Household and Family Survey and Census of India have been used for the present study. A multiple simple linear regression technique is used to estimate the impact of various socio-economic factors such as female literacy rate, agriculture land, television, below poverty line population and schedule tribe population on Access of basic amenities. The results reveal that variables like percentage of households have below poverty line card, density and percentages of households have a television has a positive relationship with basic amenities. It means that access to below poverty line card and television leads to more access to basic amenities in hilly areas. Moreover, the study also found that the percentage of schedule tribe population and percentage of households who own agricultural land has a negative relationship with basic amenities. The study concluded that the areas where schedule tribe population is more, the access to basic amenities are less, because per capita expenditure for infrastructure development is high in these areas.

**Keywords:** Amenities, Socio-Economic, Households, Hilly States, India.

## Introduction

“Over the years the world has reconciled to an entirely different phase of development discourse where progress in development is no more certified on the basis of overall income growth of the economy, but rather on the quantum reduction in the share of population deprived with 'basic human needs'”(Mishra, U. S., & Shukla, V. 2015). The access to basic amenities such as safe drinking water, sanitation, electricity, housing, toilet facility, etc is crucial to the well-being as they contribute to physical and material comfort and quality of life. Access to basic amenities is not only an important measure of development but also a fundamental element of growth in hilly areas. The need for these basic amenities has been worldwide recognized (Rana, 2018).

The hilly States of India have been facing various problems on account of very difficult terrain, Remoteness and severe weather conditions. These states suffer from the unavailability of basic amenities which constrain their development. “India is on track to meet the target on reducing the proportion of people without sustainable access to safe drinking water; though it is struggling to keep pace with population growth and ever-accelerating urbanization” (Kumar & Das, 2014). The pace of development of the Indian Himalayan Regions is slow when compared to the rest of the country because of its fragile nature. There are various factors acting as constraints based on social economic groups leading to denial on access to basic amenities. While the link between various social-economic aspects and access to basic amenities is an established fact in hilly areas. This article, therefore, measures the linkages between various social-economic aspects and basic amenities in five hilly States namely Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh in India.

## Review of Literature

Tiwari, R., & Nayak, S. (2013) analyzed the impact of female literacy rate and per capita income on sanitation services in Uttar Pradesh. They also highlighted the inter-regional disparity in coverage of drinking water and sanitation services and found low coverage of both the services

as compared to all India level. The study concluded that the female literacy rate plays a very important role in improving access to sanitation facilities.

Kumar, A., & Das, K. C. (2014) analyzed the trends and progress rate of basic sanitation facility and also examined the association between diarrhea and water sanitation across the country. Binary regression technique was used to explain the association. The results show that access to safe drinking water is improving with a sharp decline in urban-rural disparities. The study concluded that households with poor latrine facility are more affected by diarrhea among children under five.

Kumar, A. (2014) examined the access of basic amenities in rural and urban India during 1993, 2002 and 2008-09. The results indicate that the accessibility of basic amenities was improved over the years in both areas. The study also found a huge variation in access to basic amenities in different social groups. The rate of improvement was lower than others in case of SC and ST groups.

Banerjee, A. N., Banik, N., & Dalmia, A. (2017) analyzed the household preferences for having a toilet over the preference of other household durable goods. The study found that the toilet gets a lower preference as compared to other durable goods and household with an educated woman prefer toilet than a household with an illiterate woman. The results show that the sanitation problem is more concentrated in rural parts of India. So, the study concluded that the government should make policies focusing on rural areas.

Chowdhury, S., Gupta, I., Prinja, S., & Trivedi, M. (2017) studied the linkages between health and basic amenities such as housing, water and sanitation in three states of India. The study found that access to basic amenities does not affect the likelihood of communicable disease.

**Research Questions**

Research questions are how different social-economic variables like (a) literacy of male and female, (b) own agricultural land, (c) who have a BPL card, (d) households who have a television, (e) ST population (f) urban households out of total households impact basic amenities? Whether they are positively or negatively related to the basic amenities?

**Data and Methodology**

The objectives of this study are to find various factors which affect basic amenities in hilly areas. It is a district level study of five hilly states

namely Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh. The present study is based on District Level Household and Family Survey (DLHS) data collected from 611 districts in India and the Census of India. The Ministry of Health and Family Welfare (MoHFW), Government of India has designated the International Institute for Population Sciences (IIPS), Mumbai as the nodal agency for conducting the DLHS. The total number of households representing a district varies from 1000 to 1500 households. The DLHS is designed to provide information on family planning, maternal and child health, reproductive health of ever-married women and adolescent girls, utilization of maternal and child healthcare services at the district level for India. For the purpose of empirical testing factors responsible for improving or impacting basic amenities all independent and dependent variables are taken from the DLHS. The dependent variables include access to electricity connection, toilet, drinking water, LPG connection; live in the pucca house and mobile phone (all these indicators are in percentage).

A simple multiple linear regression is used to study the impact of various determinants on access to basic amenities. The dependent variable is in the form of an index of basic amenities which is calculated by the Principal Component Analysis (PCA) method. The independent variables are percentage of population male literate (7+age) for male and female separately, own agricultural land, have a BPL card, have a television, ST population in a district and Urban households.

**Results and Discussions**

**Regression analysis**

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + u_i$$

Where Y is dependent variable (Index value). Dependent variable is the index value of 6. Percentages of households have electricity connection (0.46), access to toilet facility (0.23), source of drinking water (0.44), use LPG for cooking (0.44), live in a pucca house (0.33) and a mobile phone (0.54). Independent variable are X<sub>1</sub>- Literacy of females, X<sub>2</sub>- Have a BPL card, X<sub>3</sub>- Own Agricultural Land, X<sub>4</sub>- Have a Television, X<sub>5</sub>- Urban Households, X<sub>6</sub>- Density, X<sub>7</sub>- Population of Schedule Tribe. U<sub>i</sub> -is the residual term. Before using regression technique, we have analyzed results with the help of descriptive statistics and correlation matrix. The results are given in table 1 and 2.

**Table 1: Descriptive Statistics**

	Index value	Female Literacy	Male Literacy	BPL card	Own agriculture land	Have Television	Urban Households	Density	ST population
Mean	22.63	67.97	85.14	30.97	67.77	59.93	18.43	188.72	26.9
Median	22.66	69.7	84.3	29.7	75.6	62.3	15.26	125	8.285
Variance	12.64	58.09	33.5	196.15	378.3	242.9	265.54	40088.51	1033.152
Standard Deviation	3.555	7.621	5.788	14.005	19.45	15.58	16.29	200.22	32.14
Range	16.075	36	25.2	59.5	64.6	60.1	98.39	814	90.07

**Source:** Authors calculations using DHLS and Census of India unit level data.

It is clear from descriptive statistics in given table 1 that variation is high in case of density and ST population in districts of five hilly states. There is a substantial gap between the literacy rate of males (85

percent) and females (68 percent). Being hilly states, urbanization is less in these districts; it is only 18 percent on an average.

**Table2: Correlation Matrix**

	Index value	Female Literacy	Male Literacy	BPL Card	Own agriculture land	Have Television	Urban Households	Density	ST population
Index value	1								
Female Literacy	0.27	1							
Male Literacy	0.105	0.62	1						
BPL card	-0.24	-0.5	0.0005	1					
Own agriculture land	-0.34	-0.33	0.26	0.68	1				
Have Television	0.76	0.501	0.25	-0.57	-0.44	1			
Urban Households	0.018	0.065	-0.099	-0.247	-0.35	-0.0314	1		
Density	0.501	-0.18	-0.023	0.0169	-0.055	0.29	0.063	1	
ST Population	-0.26	0.057	-0.45	-0.2637	-0.39	-0.13	0.01	-0.585	1

**Source:** Authors calculations based on DHLS and Census of India unit level data

Table 2 shows that there is a high correlation between literacy of males and females therefore only female literacy is taken as independent variables. Because literature also supports that the impact of female education is more on development as compared to male. Moreover, in almost in most of Indian states literacy of males is more than literacy of females, means if females are literate than males are literate. There is also a high correlation between have

a BPL card and Own agricultural land. Similarly, it also shows a high correlation between ST population and density.

Now, regression results are shown in table 3 after analyzing the correlation metrics. Two different regressions are applied, in one case, weight-ages are given by PCA method for calculating index for independent variable and in other case, equal weight-ages are given.

**Table: 3 Regression Results**

Index value	Coefficient*	Standard Error*	t *	P> t *	Number of Observation= 55
literacy of female	0.020 (0.014)	0.135 (0.045)	0.15 (0.32)	0.882 (0.753)	R-Squared=0.742* (0.669)
Have a BPL card	0.290 (0.106)	0.890 (0.029)	3.27 (3.58)	0.002 (0.001)	Adj R-squared=0.704* (0.619)
Own Agricultural land	-0.200 (-0.96)	0.068 (0.022)	-2.91 (-2.61)	0.005 (0.012)	F-statistic=19.37* (13.57)
Have a television	0.411 (0.172)	0.411 (0.025)	5.48 (6.87)	0.000 (0.000)	
Urban households	-0.021 (0.004)	-0.021 (0.018)	-0.39 (0.21)	0.696 (0.833)	
Density	0.010 (0.004)	0.010 (0.001)	1.85 (2.15)	0.071 (0.037)	
ST population	-0.002 (-0.004)	-0.040 (0.013)	-0.06 (-0.35)	0.950 (0.727)	
Constant	36.35 (11.499)	12.81 (4.291)	2.84 (2.68)	0.007 (0.01)	

**Source:** Authors calculations based on DHLS and Census of India

Note: 1. \* indicates the results of the index value calculated by the PCA method.

2. The values in the parentheses are index value calculated by giving equal weight-ages.

It is clear from the regression results that percentage of literacy of females, percentage of urban households and percentage of ST population are insignificant at 1%, 5% and 10% level of significance. The percentage of households have BPL card and percentage of households have television has a positive relationship with the dependent variable. They are significant at 1% level of significance.

Density is significant at 5% level of significance. Percentage of households own agriculture land has a negative relationship with the dependent variable and it is significant at 1% level of significance. Moreover, the percentage of households have BPL cards is positively related to the dependent variable. There is two possible reasons for this, (a) categorization of

BPL households is not proper and (b) government is helping BPL households to improve basic amenities.

The coefficient of determination is 0.74 and 0.66 under PCA and equal weight-age methods. This indicates that 74% of the variation in Index value can be explained by all these independent variables in case of PCA and it is 66% in case of equal weight-age.

### Iterated Regression

After analyzing regression results shown in table 3, we have applied regressions again by

dropping insignificant variables one by one. The results found that when density variable is dropped from independent variables, the variable of percentage of ST population get significant results and its coefficient is negative (significant at 5 % level of significance). It may be because density and ST population variables are correlated. The results are shown in table 4, where the density variable is dropped.

**Table 4: Density Dropped**

Index value	Coefficient	Standard Error	t	P> t	Number of Observation=55
Lit. Female	-.1515	.2582	-0.59	0.560	
Own agricultural land	-0.457	0.135	-2.09	0.001	R-Squared=0.7174
Have a television	1.11	0.151	7.40	0	Adj R-squared=0.6820
Have a BPL card	0.6604	0.185	3.56	0.002	F-statistic=20.30*
Urban	0.020	.114	0.18	0.86	
ST population	-.136	0.065	-2.09	0.041	
Constant	11.71	1.962	5.97	0	

**Source:** Authors calculations based on DHLS and Census of India unit level data

However, table 5 shows the regression results after excluding ST population from independent variables and table 6 shows the results when the ST population is added and density is excluded.

**Table 5: When ST population is dropped from Independent Variables**

Index value	Coefficient	std.error	t	P> t	Number of Observation=59
Own agricultural land	-0.047	0.0187	-2.56	0.013	R-Squared=0.7034
Have a television	0.17	0.0219	7.78	0	Adj R-squared=0.6815
Have a BPL card	0.095	0.0291	3.26	0.002	F-statistic=32.02*
Density	0.005	0.0014	3.82	0	
Constant	11.71	1.962	5.97	0	

**Source:** Authors calculations based on DHLS and Census of India

**Table 6: When ST population is added and density is dropped from Independent Variables**

Index value	Coefficient	Standard Error	t	P> t	Number of Observation=55
Own Agricultural Land.	-0.769	.0208	-3.69	.001	R-sqr=0.707
Have a T.V.	.178	.0224	7.93	.000	Adj R-sqr=0.684
Have a BPL Card.	.112	.0291	3.85	.000	F-stat=30.78*
ST Population	-.02664	.01008	-2.64	.011	
Constant	14.57	2.4587	5.93	.000	

**Source:** Authors calculations based on DHLS and Census of India)

It is clear from the above results that various socio-economic aspects like percentage of households have BPL card, density and percentage of peoples have a television has a positive linkage with basic amenities. The result also shows that the percentages of households who have BPL card are positively linked with the basic amenities in hilly states of India. However, the percentage of schedule tribe population and percentage of households who own agricultural land has a negative relationship with basic amenities. It shows that the areas where schedule tribe population is more the accessibility of basic amenities are less. Similarly, results also observed a negative relationship between households who own agricultural land and basic amenities. It means that

the income from agricultural activities is very less. It may be because land holdings in hilly areas are very small.

### Conclusion

From the above study, it can be concluded that there is a positive and negative linkage between various socio-economic aspects and accessibility of basic amenities. The regression analysis confirms positive linkages between the availability of television and basic amenities. This shows that the media is playing an important role in improving to access of basic amenities in hilly areas. However, the percentage of schedule tribe population and percentage of households who own agricultural land has a negative relationship with basic amenities. It

shows that the areas where schedule tribe population is more the accessibility of basic amenities are less because these areas are remote and per capita expenditure on infrastructure development is high. Therefore, it can be concluded that hilly areas need more infrastructure.

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