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### Ranking of districts in North East states of India by the use of Standard of Living Index using 2001 and 2011 census.

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**Abstract:** Due to limited literature available to highlight the economic level and status for states and districts of North east India, the present study attempt to capture the same by extracting the information on living standards of the people through the eight variables collected during the 2001 and 2011 census. Standard of living index is constructed through the use of Principal component analysis, where state and districts in the region are rank. This study can have important policy implications concerning directing the resources to those districts of the region which have slip in the rank between the two censuses.

**Keywords:** North east India, Standard of living, Principal component analysis, Census of India

**JEL classification codes:** C38, J11, O11

#### 1. INTRODUCTION

The economic strength of a household, family or individual depends not just on its income but also on its asset base. Standard of living is the level of wealth, comfort, material goods and necessities available to a certain socioeconomic class in a certain geographic area. Broadly, this may include factors such as income, quality and availability of employment, class disparity, poverty rate, quality and affordability of housing, affordable (or free) access to quality healthcare, quality and availability of education, life expectancy, incidence of disease, cost of goods and services, infrastructure, economic and political stability, political and religious freedom, environmental quality, climate and safety. In short, standard of living of the people means the quantity and quality of their consumption for fooding, clothing, housing, entertainment, etc, and can be state as a mode of living, closely related to quality of life.

The major objective of the government of a country is to provide a good standard of living to its people. In fact, there are marked inequalities in the standard of living of people in different countries of the world. According to a report (by the Department of economic and social affairs 2010) faster rates of

decline in the number of people living on less than \$1.25 a day occurred between 1999 and 2005. A significant proportion of this decline can be largely attributed to the rise in living standards in East Asia and the Pacific which accompanied explosive economic growth, particularly in China. In India, regional differences in levels of living standards have also been noted. Although there has been a steady decline in the incidence of poverty in India, the efforts of the Government have not resulted in a uniform impact across regions and there remain regions where the poverty is still deep and severe.

A report by Beinhocker and Farrell (2007) highlighted that India which is considered as one of the fastest growing economies in the world, clocked at a growth rate of 8.3% in 2010, is fast on its way to becoming a large and globally important consumer economy. The Indian middle class was estimated to be 50 million persons (reckoning vehicle owners only) in 2000 and the country per capita purchasing power parity will significantly increase from 4.7 to 6.1 per cent of the world share by 2015 (World economic outlook and Global financial stability 2010).

India's north eastern region comprises of eight states; Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. The entire region (8 states) covers a total area of 262,000 sq. kms, accounting for about 3.7 per cent of the country's total geographic area. With a population of 45.6 million (Census 2011), it accounts for 3.67 percent of the country's population. The region has a long international border (98 per cent); it is bounded by China and Bhutan in the north, Myanmar in the east, Nepal in the west and Bangladesh in the south and west. Most of the region is characterized by hilly terrain, inhabited by tribes and people belonging to different cultural and ethnic groups. The region is home to over 200 tribal communities which constitute about one-fourth of the region; Mizoram and Nagaland comprising the majority of the tribal population (Lyngdoh 2015).

However, in spite of being endowed with vast natural resources in terms of forests, biological diversity, hydro-electricity, the region has remained largely underdeveloped.

A key constraint to the growth has been poor infrastructure and limited connectivity, both within the region as well as with the rest of the country. The region, which is heavily dependent on agriculture and services sectors and stands way below in comparison with the rest of India in socio-economic indicators (Indian chamber of commerce 2013).

The findings of the work done by Nayak (2013) on the Human development in Northeastern region of India reveals that achievement of the region is quite satisfactory in comparison to all India average achievements in some dimensions of human development but it has miserably failed in bringing commensurate economic growth and equitable distribution. There exists wide spread disparity of socioeconomic achievements across different states and within, from urban to rural areas and between male and female. If the problems of poor economic growth, poverty, gender disparity and general health of the people are not properly addressed the region may fall into the trap of vicious quadrant instead of moving to a virtuous one. The way out from this trap is through achievement of a productive, balanced and sustainable economy with appropriate intervention in health sector and poverty alleviation programs.

## **2. NEED OF STUDY**

In light of the above discussions, the researcher feels that there is a need to develop an index which will reflect the present socio economic status of the region. Apart from the Human development reports

prepared by the different states of the region, there is scanty academic material to highlight the socio economic status, neither of the region nor of the states after 2010. Thus the construction of a socio-economic indices becomes important to address the above issue. One approach is to use “direct” measures, such as income, expenditure, or consumption. Another is to use a proxy measure and one of them is the Standard of living, making the best use of available data from information on household ownership of durable goods and housing characteristics.

The most direct (and popular) measures of living standards are income and consumption. In general terms, income refers to the earnings from productive activities and current transfers. It can be seen as comprising claims on goods and services by individuals or households. In contrast, consumption refers to resources actually consumed. Although many components of consumption are measured by looking at household expenditures (Owen Donnell, Doorslaer, Wagstaff and Lindelow 2008).

Income and expenditure data are both difficult to collect (Planning commission 2014; Brewer and O’Dea 2012). In developed countries, in which a large proportion of the population works in the formal sector and in which consumption patterns are very complex, the balance often tips in favour of measuring income rather than consumption. Even so, these surveys often have considerable problems dealing with self-employment, informal economic activities, and widespread reluctance to disclose information on income to survey enumerators. In developing countries, formal employment is less common, many households have multiple and continually changing sources of income, and home production is more widespread. In these contexts, it is generally far easier to measure consumption than income.

These concerns have prompted researchers to use data based on economic proxies, such as consumer durables, housing qualities, sanitary facilities and size of land holdings that reflect the long-term economic status of households to construct alternative measures of welfare or living standards (Bollen *et al.* 2001; Filmer and Pritchett 2001; Montgomery *et al.* 2000; Sahn and Stifel 2003; Mohanty 2009). This approach has the considerable merit of requiring only data that can be easily and quickly collected in a single household interview and, although lacking somewhat in theoretical foundations, can provide a convenient way to summarize the living standards of a household. These economic proxies composite indices (Mohanty 2009) can then be useful in ranking countries, states or districts, measuring multi-dimensional issues, framing policies and implementing various programmes. Notable among these are the human development index, the gender development index, the human poverty index, a socio economic status index, and the standard of living index

### **3. DATA AND METHODOLOGY**

There are many approaches to constructing welfare indices, which differ in how different household assets and characteristics are weighted in the overall index. Principal components and factor analysis is an alternative to a simple sum of asset variables that are available in the data, it is possible to use statistical techniques to determine the weights in the index (Jolliffe 2002). These are essentially tools for summarizing variability among a set of variables. Specifically, principal components analysis (PCA) seeks to describe the variation of a set of variables as a set of linear combinations of the original variables, in which each consecutive linear combination is derived so as to explain as much as possible of the variation in the original data, while being uncorrelated with other linear combinations.

In order to develop a standard of living index (SLI) across the north eastern states, eight indicators have been considered. These data is collected from the houselisting and housing Census of India, 2011 and Census of India, 2001, and tabulated given in census table HH-14 as the percentages of household to total household by amenities and assets.

The following indicators are used in the construction of the standard of living index by the use of principal component analysis

- $X_1$ : Percentage of household by condition of residential house.
- $X_2$ : Percentage of household by material of the roof of the house
- $X_3$ : Percentage of household by ownership status of the house
- $X_4$ : Percentage of household by main source of drinking water.
- $X_5$ : Percentage of household by type of fuel use for cooking.
- $X_6$ : Percentage of number of households having latrine facility within the premises.
- $X_7$ : Percentage of number of households availing banking services.
- $X_8$ : Percentage of household by availability of assets.

The following formula (Mehta, A.C. and Siddiqui, S.A.2008) is used to determine the standard of living Index by PCA is

$$I = \frac{\sum_{i=1}^n X_i \left( \sum_{j=1}^n |L_{ij}| \cdot E_j \right)}{\sum_{i=1}^n \left( \sum_{j=1}^n |L_{ij}| \cdot E_j \right)}$$

where I is the index,  $X_i$  is the  $i^{th}$  indicator;  $L_{ij}$  is the factor loading value of the variable on the factor;  $E_j$  is the eigen value of the factor.

The analysis is carried in Exelsheet and the PCA is performed in SPSS 16.0

#### 4. DISCUSSION

Base on the methodology highlighted above on the construction of SLI using Principal component analysis, Table 1 reveals that in the 2001 census, Manipur state has the highest SLI of 0.5515 and is rank first and is followed by Mizoram with SLI value 0.5259. These two states have maintained their respective rank in the 2011 census. Meghalaya, Tripura and Sikkim have seen improvement in their SLI from 2001 to 2011 while Arunachal Pradesh have slip from 3<sup>rd</sup> to 7<sup>th</sup> rank in SLI between the two consecutive census. The lowest figure were recorded for the state of Assam with SLI value of 0.3942.

In Manipur state, Churachandpur and Chandel are those district where the ranks of SLI have improved between 2001 and 2011 census (Table 2). Serchhip and Mamit districts in Mizoram slip from 2<sup>nd</sup> to 5<sup>th</sup> and 5<sup>th</sup> to 7<sup>th</sup> position in their respect SLI ranks (Table 3). Table 4 reveals that in the 2001 census, Dimapur district has the highest SLI of 0.6401 and is rank first and is followed by Kohimadistrict with SLI value

**Table 1**  
**Ranking of SLI by states in North East India for 2011 and 2001**

<i>North East States</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
Manipur	0.5622	1	0.5515	1
Mizoram	0.5069	2	0.5259	2
Meghalaya	0.4746	3	0.4743	5
Tripura	0.4592	4	0.4682	6
Sikkim	0.4420	5	0.4679	7
Nagaland	0.4150	6	0.4829	4
Arunachal Pradesh	0.3835	7	0.4934	3
Assam	0.3367	8	0.3942	8

Source: Extracted from Census, 2011 and Census, 2001 HH tables

**Table 2**  
**Ranking of SLI by Districts of Manipur state for 2011 and 2001**

<i>Manipur State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
Imphal West	0.6484	1	7001	1
Imphal East	0.5751	2	0.5289	2
Churachandpur	0.4976	3	0.3269	6
Bishnupur	0.4451	4	0.3762	3
Thoubal	0.4144	5	0.3525	4
Chandel	0.3281	6	0.3054	9
Ukhrul	0.2946	7	0.3514	5
Senapati	0.2870	8	0.3183	8
Tamenglong	0.2548	9	0.3202	7

Source: Extracted from Census, 2011 and Census, 2001 HH tables

Total No of Households: census 2001 - 397656; census 2011 - 507152

**Table 3**  
**Ranking of SLI by Districts of Mizoram state for 2011 and 2001**

<i>Mizoram State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
Aizawl	0.7029	1	0.6285	1
Kolasib	0.4797	2	0.4621	3
Champhai	0.4717	3	0.3728	6
Lunglei	0.4603	4	0.4518	4
Serchhip	0.4111	5	0.4867	2
Saiha	0.3585	6	0.3584	7
Mamit	0.3390	7	0.3733	5
Lawngtlai	0.2997	8	0.3066	8

Source: Extracted from Census, 2011 and Census, 2001 HH tables

Total No of Households: census 2001 - 160996; census 2011 - 221077

0.5480. These two district have maintained their respective rank in the 2011 census and except for Mokokchung and Zunheboto district, others have slip in SLI rank between the two census. Peren and Longleng are districts form after the 2001 census.

Lower Subansari and Lohit are the two districts in Arunachal Pradesh which have shown significant improvement in their SLI ranks between the two census (Table 5). South Garo Hills district have shown

**Table 4**  
**Ranking of SLI by Districts of Nagaland state for 2011 and 2001**

<i>Nagaland State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
Dimapur	0.7002	1	0.6401	1
Kohima	0.5447	2	0.5480	2
Mokokchung	0.4420	3	0.4779	4
Wokha	0.4278	4	0.5004	3
Zunheboto	0.3496	5	0.3625	7
Peren	0.3485	6	NA	NA
Longleng	0.3355	7	NA	NA
Phek	0.3277	8	0.3776	5
Mon	0.2976	9	0.3629	6
Tuensang	0.2354	10	0.3160	8
Kiphire	0.1970	11	NA	NA

*Source:* Extracted from Census, 2011 and Census, 2001 HH tables

Total No of Households: census 2001 - 332050; census 2011 - 399965

**Table 5**  
**Ranking of SLI by Districts of Arunachal Pradesh state for 2011 and 2001**

<i>Arunachal Pradesh State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
Papum Pare	0.6897	1	0.5675	1
Tawang	0.4364	2	0.5037	2
Lower Subansari	0.4234	3	0.3859	9
East Siang	0.3941	4	0.4395	4
West Kameng	0.3879	5	0.4377	5
West Siang	0.3476	6	0.4486	3
Lohit	0.3459	7	0.3218	13
Tirap	0.3458	8	0.4125	6
Changlang	0.3387	9	0.3787	10
Upper Siang	0.3271	10	0.3638	11
Lower Dibang valley	0.3230	11	NA	NA
East Kameng	0.3215	12	0.3594	12
Dibang Valley	0.2964	13	0.3951	8
KurungKumey	0.2914	14	NA	NA
Upper Subansari	0.2705	15	0.4027	7
Anjaw	0.2606	16	NA	NA

*Source:* Extracted from Census, 2011 and Census, 2001 HH tables, NA- Not available

Total No of Households: census 2001 - 212615 ; census 2011 - 261614

improvement in SLI rank whereas West Khasi Hills district in Meghalaya have falling by two places in SLI ranking between 2001 to 2011 (Table 6). Tripura is the only state in North east where all the four districts maintains their respect SLI rank between the two consecutive census. In Sikkim, East District have falling from 1<sup>st</sup> to 3<sup>rd</sup> whereas North District have moved from 3<sup>rd</sup> to 2<sup>nd</sup> between the two census.

Five new district were created in Assam state between 2001 and 2011 census (Table 9). With the formation of Kamrup Metropolitan district, Kamrup district SLI rank fall from 1<sup>st</sup> to 11<sup>th</sup> rank. KarbiAnglong, Bongaigaon, Kokrajhar, Hailakandi, Lakhimpur and Morigaon are those districts which have shown relative improvements in the SLI rank between the two census.

**Table 6**  
**Ranking of SLI by Districts of Meghalaya state for 2011 and 2001**

<i>Meghalaya State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
East Khasi Hills	0.6624	1	0.7422	1
Jaintia Hills	0.4625	2	0.4592	2
West Garo Hills	0.4147	3	0.3738	4
RiBhoi	0.3912	4	0.4157	3
South Garo Hills	0.3531	5	0.2467	7
East Garo Hills	0.3359	6	0.2865	6
West Khasi Hills	0.2988	7	0.3392	5

*Source:* Extracted from Census, 2011 and Census, 2001 HH tables

Total No of Households: census 2001 - 420426 ; census 2011 - 538299

**Table 7**  
**Ranking of SLI by Districts of Tripura state for 2011 and 2001**

<i>Tripura State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
West Tripura	0.6407	1	0.6479	1
North Tripura	0.5130	2	0.4929	2
South Tripura	0.4609	3	0.3943	3
Dhalai	0.3415	4	0.3593	4

*Source:* Extracted from Census, 2011 and Census, 2001 HH tables

Total No of Households: census 2001 - 662023; census 2011 - 842781

**Table 8**  
**Ranking of SLI by Districts of Sikkim for 2011 and 2001**

<i>Sikkim State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
South District	0.5563	1	0.4798	2
North District	0.4964	2	0.4305	3
East District	0.4881	3	0.5532	1
West District	0.4434	4	0.3213	4

*Source:* Extracted from Census, 2011 and Census, 2001 HH tables

Total No of Households: census 2001 - 104738; census 2011 - 128131

**Table 9**  
**Ranking of SLI by Districts of Assam for 2011 and 2001**

<i>Assam State</i>	<i>2011</i>		<i>2001</i>	
	<i>SLI</i>	<i>Rank</i>	<i>SLI</i>	<i>Rank</i>
Kamrup Metropolit	0.6010	1	NA	NA
Dima Hasao	0.4091	2	NA	NA
Dibrugarh	0.3840	3	0.5578	4
Jorhat	0.3688	4	0.5733	2
Sivasagar	0.3663	5	0.5673	3
Tinsukia	0.3517	6	0.4927	5
Karbi Anglong	0.3349	7	0.3550	14
Cachar	0.3292	8	0.4580	7
Bongaigaon	0.3175	9	0.3622	13
Golaghat	0.3095	10	0.4315	8
Kamrup	0.3031	11	0.5992	1
Sonitpur	0.2957	12	0.3972	10
Chirang	0.2934	13	NA	NA
Kokrajhar	0.2914	14	0.2790	22
Hailakandi	0.2872	15	0.3843	11
Lakhimpur	0.2863	16	0.3777	12
Nagaon	0.2856	17	0.3358	15
Morigaon	0.2817	18	0.2834	21
Goalpara	0.2808	19	0.3276	17
Udalguri	0.2801	20	NA	NA
Nalbari	0.2785	21	0.3347	16
Dhemaji	0.2765	22	0.3233	18
Karimganj	0.2709	23	0.4014	9
Baksa	0.2617	24	NA	NA
Dhubri	0.2588	25	0.2665	23
Barpeta	0.2582	26	0.3200	19
Darrang	0.2464	27	0.3128	20
North Cachar	NA	NA	0.4865	6

*Source:* Extracted from Census, 2011 and Census, 2001 HH tables , NA- Not available.

Total No of Households: census 2001 - 4935358; census 2011 - 6367295

## 5. CONCLUSION

Standard of living of the inhabitants of any state or country indirectly reflects the economic status of the people and this study attempts to capture this status by extracting the information on the living standards of the people of North East of the country through the eight variables highlighted in the methodology, by the data collected in the 2001 and 2011 census, through the Household scheduled during the House listing

exercise. Since few write ups are available in about North East and respected states highlighting the economic level and status of the people in the region, the present study thus focus only on the region, however the same exercises can be carried over all the districts in the entire country using the similar methodology and data sources. This study can be an eye opener for policy makers in directing the resources to those districts which have slip in SLI ranks between the two respect census.

## NOTES

1. In connection with the variable on condition of residential house, census 2011 categorise this characteristics as good, liveable and dilapidated. *Criteria for ascertaining the condition of the Census house : Those houses which are showing signs of decay or those breaking down and require major repairs or those houses decayed or ruined and are far from being in conditions that can be restored or repaired may be considered as 'Dilapidated' . Those houses which require minor repairs may be considered as 'Livable' and those houses which do not require any repairs and in good condition may be considered as 'Good' .*
2. Ownership status of the house is characterised by Owned or Rented or any other. *Criteria for ascertaining ownership status of this house ; If a household is occupying the Census house owned by itself and is not making payments in the form of rent to anyone, then the household may be considered as living in owned house. A household living in a Flat or a house taken on 'ownership' basis on payment of installments, should also be regarded as owning the house, notwithstanding the fact that all the installments have not been paid. A housing unit is rented if rent is paid or contracted for by the household in cash or even in kind. In a few cases, it may also be possible that the household has actually taken the house on rent but not paying the rent on account of dispute with the owner or for some other reason. In this situation too, the household would be treated as living in a rented house. Rented accommodation provided by employer like Government quarters and similar accommodation, will be . If the household lives in a house which is neither owned nor rented which will include the cases where rent free accommodation is provided to employees by their employers or where the ownership either of the land or of the structure does not belong to the household, i.e., houses constructed on encroached land in un-regularized slums or anywhere else. Also, the households living in unauthorized manner in abandoned buildings, buildings under construction and buildings identified for demolition for which they have not to pay any rent and the households living in caves and similar natural shelters are also covered under this category.*

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