Urbanization In Arunachal Pradesh Of India: An Introspective Study Through Gini Concentration

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Abstract

Urbanization is characterized by the movement of people from small communities concerned solely with agriculture to other communities generally larger whose activities are primarily centered in trade, manufacture, or allied interests. The process of urbanization can be measured in terms of many demographic dimensions. This study is an introspective type of research based on secondary data gathered from books, articles, websites, web-based journals, Census Reports, and government offices. The objective of the study is to calculate the Gini Concentration Ratio (GCR) of the urban population i.e., the Co-efficient of urban concentration for the urban towns in Arunachal Pradesh.

Keywords: Agriculture, Trade, Manufacture, Demographic dimensions, Allied interests.

INTRODUCTION

The term "urbanization" refers to a process in which the industrial structure shifts away from basic industries and toward secondary and tertiary industries. Changes in working population from primary activities to secondary and tertiary activities. Urbanization also brought about drastic changes in lifestyle, behavior models, thinking patterns, norms, values, and culture. In terms of material development, urbanization often entails the creation of new urban infrastructure and public service facilities to accommodate these shifting economic and social conditions. Owing to this, urbanization is said to be a complicated and multidimensional process including people movement from rural to urban regions, land conversions between rural and urban areas, settlement reconfiguration, and changes in governance and administration (GU Chaolin, 2020). Urban areas currently shelter more than half of the world's population and generate more than two-thirds of global GDP (Jiang and Neill, 2017). (Acuto et.al. 2018; Seto et.al., 2017). More than two-thirds of the world's population will live in cities by 2050. (Jiang and Neill, 2017; Florke et.al. 2018; Li et.al., 2019) Fast urbanization provides opportunities for economic growth (Keeler et.al., 2019).

Urbanization, in a demographic sense, is an increase in the proportion of the urban population to the total population over a period. As long as, urban population to the total population increases, there is urbanization. Rapid urbanization has been a worldwide phenomenon

in the 20th century. In developing countries like India, the challenge of urbanization becomes more serious in the context of urban poverty, which is largely an extension of rural poverty. The term "Urbanization" "implies the movement of people to urban areas" as Thompson has defined it as" Urbanization is characterized by the movement of people from small communities concerned chiefly or solely with agriculture to other communities generally larger whose activities are primarily centered in government trade, manufacture, or allied interests" (Thompson, 1935). "Urbanization is the process whereby land and inhabitants become urban. It refers to a change in both places and people" (Smailes, 1975). Positive urbanization may help human settlements continue to evolve and advance; otherwise, urbanization-related difficulties and regional development issues would be more difficult to address in the future, particularly in rapidly urbanizing emerging nations. However, despite all planning attempts to curb urban sprawl, such as compact city laws and urban growth management programs, urban land use change will continue to rise globally (Angel et al. 2011). An important feature of urbanization is the degree of urbanization (Tufail, M., 2014).

The expansion of urban land use is a global trend that affects a variety of ecosystem services by reducing vegetation and biodiversity, habitat functions, agricultural resources, and soil (Haase et al., 2018). The effect of urbanization is destroying the scope of social forestry and causing ribbon development throughout all the state's metropolitan regions, particularly in the capital complex. Unplanned building is causing landslides, soil erosion, water logging, particularly during the rainy season, and a loss of fertility on adjacent agricultural land. It is once again causing sewage issues and traffic gridlock (Mandal et. al, 2020). The Atlas of Urban Expansion is a more contemporary publication that depicts worldwide urban development

(2019). Urbanization is a worldwide land use change megatrend that may be seen in all areas of the globe. By 2050, cities will house almost 70% of the world's population (Eurostat, 2016). The urban/rural status as a dynamic variable is significant because it distinguishes a much broader range of variation in settlement patterns throughout the rural-urban universe. From a conceptual perspective, they were discussed in relation to two key features of settlement patterns (Schroeder & Pacas, 2021).

The reasons why the world population is more drawn to city living than ever before have been extensively explored in the literature (Adli, 2017).

A great deal of works explored on the factors that explain why the world population is more drawn to city life now than it has ever been (Adli, 2017). Indeed, urbanization has shown to be the most important factor in the overall growth of emerging countries, as seen by the rise in employment, income, and the overall quality of life in these countries. However, because of these advancements, natural vegetation is being destroyed (Lonchung & Mandal, 2020).

Most urban development occurs in the suburbs. We live in a suburban world and are striving to urbanize it (Keil, 2017). According to Munir and Ameer (2021), urbanization and environmental degradation have similar relationship as do technological advancements and environmental pollution. They also examined the nonlinear effects of trade liberalization, economic development, and technology over the course of the twentieth century.

The urbanization in Northeast Region (NER) is going fast. This indicates that both the process of urbanization and development have concentrated in these states. Thus, in NER the situation and problems associated with the process of urbanization is more complex than elsewhere because of large concentration of urban population in capital towns than other towns. However, it is remarkable to note that the

percentage of urban population has decreased in the year 2011 in comparison to 2001 especially in Manipur, Meghalaya, and Tripura. Again, the overall percentage of urban population to total population in NER has decreased in 2011 in comparison to 2001 though there was an increasing trend up to 2001. But there is increasing trend in case of all India level also (Mandal, R.K, et al., 2022).

Peri-urban regions may become dense urban fabric over time, and rural areas can have centers with urban cores and a high degree of centrality and service quality because of suburbanization (Hugo, 2017). If you live in a polycentric region, where several cities are connected to create huge metropolitan areas, the line between rural and urban areas gets even more blurred (Danielzyk et al., 2016).

The term urbanization is mainly considered as a process of continuous change in the pattern of population distribution. Urbanization may be regarded as the yardstick of measuring the economic prosperity of a region2. The definition of the "Urban" is a complex matter and the diversity in the national definition of Urban cannot be eliminated. Even in India, this definition shows the evolution of the definition from Census to Census (Dubey, 1981). Subsequently, the 1991 census (series I, Vol. II, p.34) reviewed and adopted a definition for an urban place on the basis of administrative and population criteria as:

1. All statutory towns, i.e., all places with a municipality, corporation, cantonment board or notified town area committee etc. (Administrative criterion).
2. All other places which satisfy the following criterion
a) A minimum population of 5000
b) At least 75% of male population engaged in non- agricultural activities
c) A density of population of at least 400 persons /sq km.
d) Important tourist centers and
e) Outgrowth of urban centers

According to the above mentioned criteria, Indian census has classified the Indian towns into six categories, such as:

Class I	Towns having a population of 100,000 or more
Class II	Towns having 50,000 – 99,999 population
Class III	Towns having 20,000 – 49,999 population
Class IV	Towns having 10,000 – 19,999 population
Class V	Towns having 5,000 – 9,999
Class VI	Towns having less than 5,000 population

Objective of the Study

The objective of the study is to calculate the Gini Concentration Ratio (GCR) of urban population i.e., Co-efficient of urban concentration for the urban towns in Arunachal Pradesh.

METHOD AND MATERIALS

This study is a descriptive type in nature based on secondary sources of data of urbanization in Arunachal Pradesh of India. The data of secondary sources are collected from government offices, books, articles, websites, and web-based journals published at different times.

Data Analysis

The different materials collected from the different sources have been scrutinized, verified, and set up systematically under appropriate headings and data are arranged under appropriate headings of Column and row in systematic statistical tables. The different statistical tools are used to hold requisite presentation and conclusion.

RESULT AND DISCUSSION

Measurement of Urbanization: The process of urbanization can be measured in terms of many demographic dimensions: (i) The degree of Urbanization, (ii) Rate of Urbanization, (iii) The tempo of Urbanization, (iv) The Gini-concentration and dispersion of population and, (v) The components of urban growth, etc. Urban densities have also been used as an index of the degree of urbanization. Such densities are calculated by dividing the total urban population by the total area of the region. Thus, the share of each square kilometer in terms of the number of urban dwellers is calculated. Such calculations are more useful in the case of large-sized less developed countries. For instance, in India, while the percentage distribution may indicate a very low degree of urbanization, the urban densities may reveal that India has a fairly large urban population.

$$G_i = \sum_{i=1}^{n} X_i \, Y_{i+1} - \sum_{i=1}^{n} X_{i+1} \, Y_i$$

Similarly, a co-efficient of urban population concentration can also be computed with the help of the Gini-Concentration Ratio. We discuss the Gini-Concentration Ratio and dispersion of population for Urbanization. The formula to compute the Gini Concentration Ratio is given above.

Where G_i= Gini Concentration Ratio
X_i = Cumulative Proportion of Population
Y_i = Cumulative Proportion of units and
N= Number of Class Intervals
The value of G_i lies between one and zero.
$G_i = 1$ implies that the entire urban population has concentrated at one point.

$G_i = 0$ implies that the entire urban population has not concentrated. The entire urban population has scattered. Higher the value of ratio means higher the concentration of urban population and lower the value means lower the concentration of urban population. Now we measure the Gini Concentration Ratio for Arunachal Pradesh.

1. **Gini Concentration Ratio (GCR) of Urban Towns in 1971 Census**: In the first human population Census in Arunachal Pradesh was conducted in 1961, when there was no urban town in the State. In the second 1971 Census, the State had **4** Census Towns. They were Bomdila, Aalo, Pasighat and Tezo declared as Census towns shown in table-1 below.

Table 1: District wise Urbanization Status Arunachal Pradesh, 1971

District	Total Population	Census Town	Urban Population		Category Class of Town
			Total	Percentage	
Kameng	86001	Bomdila	3172	3.69	VI

Subansiri	112928	Nil	0	0	
Siang	108247	Aalo	4967*	4.58	VI
		Pasighat	4967*	4.58	VI
Lohit	62865	Tezo	4182	6.65	VI
Tirap	97470	Nil	0	0	
A.P.	467511		17288	3.70	

Source: Statistical Handbook of Arunachal Pradesh 1971-72, Directorate of Economics and Statistics, Arunachal Pradesh, Administration, Shillong. A.P. = Arunachal Pradesh. N.B.: *The urban population of Siang District was recorded as 9934 in Statistical Handbook of Arunachal Pradesh 1971-72 for two Census towns, Aalo and Pasighat. So, half of the urban population is considered for each Census town, Aalo and Pasighat subject to error.

Table 2: Classification of Urban Towns and Class wise Urban Population in 1971 Census

Category Class of Town	Name of the Census Towns	Number
I	Nil	Nil
II	Nil	Nil
III	Nil	Nil
IV	Nil	Nil
V	Nil	Nil
VI	Bomdila, Aalo, Pasighat and Tezo	4
	Total	**4**

Source: Constructed on the basis of table 1.

From table-1 and 2, all the Census towns were VI Class category type urban centre in the range of below 5000 population. Gini Concentration Ratio (GCR) is not possible to calculate due to availability of data in a single row. At least, it needs the data of two rows.

3. **Gini Concentration Ratio (GCR) for Urban Towns in 1981 Census**: As per 1981 Census, the State had **6** Census Towns. They were Bomdila, Naharlagun, Itanagar, Aalo, Pasighat, and Tezo shown in table- 3.

Table 3: District wise Urbanization Status in Arunachal Pradesh, 1981

District	Total Population	Census Town	Urban Population		Category Class of Town
			Total	Percentage	
West Kameng	63302	Bomdila	3860	6.08	VI
East Kameng	42736	0	0	0	
Lower Subansiri	112650	Naharlagun	7058*	6.27	V

		Itanagar	7058*	6.27	V
Upper Subansiri	39410	0	0	0	
West Siang	74164	Aalo	8074	10.89	V
East Siang	70451	Pasighat	9139	12.97	V
Dibang Valley	30978	0	0	0	
Lohit	69498	Tezo	6239	8.98	V
Tirap	128650	0	0	0	
A. P.	**631839**		**41428**	**6.56**	

Source: Statistical Atlas, Arunachal Pradesh 1984, Directorate of Economics and Statistics, Govt. of Arunachal Pradesh, Shillong. N.B.: *The urban population of Lower Subansiri District was recorded as 14116 in Statistical Handbook of Arunachal Pradesh 1971-72 for two Census towns, Aalo and Pasighat. So, half of the urban population is considered for each Census town, Aalo and Pasighat subject to error.

Computation of Gini Concentration Ratio for 1981 Census

The following Table-4 has been constructed to calculate the computing Gini Concentration Ratio (GCR). It gives the details of classification of urban towns based on its demographic characteristics and table-5 is constructed to calculate Gini Concentration Ratio for urban census towns in 1981 Census.

Table 4: Classification of Urban Towns and Class wise Urban Total Population in 1981 Census.

Size of Urban Place	Class	No of Units	Name of the Census Towns	Class wise Urban Total Population
100000	I		Nil	
50,000-99,999	II		Nil	
20,000-49,999	III		Nil	
10,000-19,999	IV			
5,000-9,999	V	5	Naharlagun, Itanagar, Aalo, Pasighat and Tezo	37568
<5,000	VI	1	Bomdila	3860
Total		**6**	**Total**	41428

Source: Constructed on the basis of table 3.

Table 5: Computation of Gini Concentration Ratio for Urban Towns in 1981 Census

Size of Urban Place	No. of Units	Population	Proportion of		Cumulative Proportion of		$X_i Y_{i+1}$	$X_{i+1} Y_i$
			Units	Population	Units (Y_i)	Population (X_i)		
Col. No. ⟶	1	2	3	4	5	6	7	8
100000	-	-	-	-	-	-	-	-
50,000-99,999	-	-	-	-	-	-	-	-
20,000-49,999	-							
10,000-19,999								

5,000-9,999	5	37568	0.8333	0.9068	0.8333	0.9068	0.9068	0.8333
<5,000	1	3860	0.1667	0.0932	1	1	-	-
Total	6	41428	1		1			0.9068	0.8333

Source: Self Calculation based on 2001 Census.

Computation of Gini Concentration Ratio

Table-5 has been constructed to calculate the method of computing Gini Concentration Ratio (GCR).

Step-1: Under Col. 1, we calculate the total number of category of towns and under Co. 2, we calculate the total population corresponding to the Size of Urban place.

Step-2: Under Col. 3 and Col. 4, we calculate the proportion of units and population corresponding to the Size of Urban place.

Step-3: Under Col. 5 and Col. 6, we calculate cumulative proportion (less than type) of units and population.

Step-4: Under Col. 7, we need the multiplication of first value under Col. 6 by the second value under Col. 5 and so on following $X_i Y_{i+1}$. Under Col. 8, similarly we are multiplying the second value under Col. 6 by the first value under Co. 5 and so on following $X_{i+1} Y_i$.

Step-5: we calculate the sum total of values under Col. 7 and under Col. 8 separately.

Step-6: Lastly we have to calculate the difference between the sum total of the values under Col. 7 and Col. 8 as per formula. The difference is the Gini Concentration Ratio (GCR) or Co-efficient of urban concentration.

Gini Concentration Ratio (GCR) for 1981
Census = 0.9068 - 0.8333 = 0.0735 < 0.1

The GCR is also called co-efficient of urban population concentration. The value of GCR is very low even less than 0.1. So the concentration of urban population is very negligible in census towns of 1981 Census.

3. Gini Concentration Ratio (GCR) for Urban Towns in 1991 Census: As per 1991 Census, the State had **10** Census Towns. They were Bomdila, Naharlagun, Itanagar, Ziro, Aalo, Pasighat, Roing, Tezo, Namsai and Khonsa.

Table 6: District wise Urbanization Status in Arunachal Pradesh, 1991

District	Total Population	Census Town	Urban Population		Category Class of Town
			Total	Percentage	
Tawang	28287	0	0	0	
West Kameng	56421	Bomdila	5655	10.02	V
East Kameng	50395	0	0	0	
Papum Pare	72811	Naharlagun	14369	19.73	IV
		Itanagar	16545	22.72	IV
Lower Subansiri	83167	Ziro	8862	10.66	V
Upper Subansiri	50086	0	0	0	
West Siang	89936	Aalo	13239	14.72	IV
Eest Siang	71864	Pasighat	14639	20.37	IV
Upper Siang	27779	0	0	0	

Dibang Valley	43068	Roing	6976	16.20	V
Lohit	109706	Tezo	15271	13.92	IV
		Namsai	7975	7.27	V
Changlang	95530	0	0	0	
Tirap	85508	Khonsa	7097	8.30	V
A.P.	**864558**		**110628**	**12.80**	

Source: Statistical Abstract of Arunachal Pradesh 1998, Directorate of Economics and Statistics, Govt. of Arunachal Pradesh, Itanagar.

Computation of Gini Concentration Ratio for 1991 Census

The following Table-7 has been constructed to calculate the computing Gini Concentration Ratio (GCR). It gives the details of classification of urban towns based on its demographic characteristics and table-8 is constructed to calculate Gini **Concentration** Ratio for urban census towns in 1981 Census.

Table 7: Classification of Urban Towns and Class wise Urban Total Population in 1991   Census.

Size of Urban Place	Class	No of Units	Name of the Census Towns	Class wise Urban Total Population	
100000	I		Nil		
50,000-99,999	II		Nil		
20,000-49,999	III		Nil		
10,000-19,999	IV	5	Naharlagun, Itanagar, Aalo, Pasighat and Tezo	74063	
5,000-9,999	V	5	Bomdila, Ziro, Roing, Namsai and Khonsa	36565	
<5,000	VI		Nil	110628	
Total		**10**	**Total**		

 Source: Constructed on the basis of table 6.

Table 8: Computation of Gini Concentration Ratio for Urban Towns in 1991 Census

Size of Urban Place	No of Units	Population	Proportion of		Cumulative Proportion		$X_i Y_{i+1}$	$X_{i+1} Y_i$
			Unit	Population	Units (Y_i)	Population (X_i)		
100000	-	-	-	-	-	-	-	-
50,000-99,999	-	-	-	-	-	-	-	-
20,000-49,999	-							
10,000-19,999	5	74063	0.5	0.66948	0.5	0.66948	0.66948	0.5
5,000-9,999	5	36565	0.5	0.33052	1.0	1.0	-	-
<5,000	-	-	-	-			-	-
Total	10	110628	1	1			0.66948	0.5

Source: Self Calculation based on 2001 Census.

Following the above steps, we get:

Gini Concentration Ratio (GCR) for 1991 = 0.66948 - 0.5 = 0.16948 < 0.2

The value of GCR is very low, which is less than 0.2. So the concentration of urban population is very low in census towns of 1991 Census but slightly better than that of 1981 Census.

4. Growth of Urban Centers in 2001: In 2001 Census, there were 17 Census Towns in the State. They were Tawang, Bomdila, Seppa, Naharlagun, Itanagar, Ziro, Daporijo, Aalo, Basar, Pasighat, Roing, Tezo, Namsai, Changlang, Jairampur, Khonsa and Deomali.

Table 9: District wise Urbanization Status in Arunachal Pradesh, 2001

District	Total Population	Census Town	Urban Population		Category Class of Town
			Total	Percentage	
Tawang	38924	Tawang	8376	21.52	V
West Kameng	74599	Bomdila	6693	8.97	V
East Kameng	57179	Seppa	15002	26.24	IV
Papumpare	122003	Itanagar	35022	28.71	III
		Naharlagun	27020	22.15	III
Lower Subansiri	55726	Ziro	12384	22.22	IV
Kurung Kumey	42518	0	0	0	
Upper Subansiri	55346	Daporijo	15756	28.47	IV
West Siang	103918	Aalo	17033	16.39	IV
		Basar	4079	3.93	VI
Eest Siang	87397	Pasighat	21965	25.13	III
Upper Siang	33363	0	0	0	
Dibang Valley	57720	Roing	10107	17.51	IV
Lohit	125086	Tezu,	15015	12.00	IV
		Namsai	11747	9.39	IV
Anjaw	18441	0	0	0	
Changlang	125422	Changlang	6469	5.16	V
		Jairampur	5919	4.72	V
Tirap	100326	Khonsa	9233	9.20	V
		Deomali	6061	6.04	V
A.P.	**1097968**		**227881**	**20.75**	

Source: Statistical Abstract of Arunachal Pradesh, 2008 and 2017, Directorate of Economics and Statistics, Govt. of Arunachal Pradesh, Itanagar.

Computation of Gini Concentration Ratio for 2001 Census

The following Table-10 has been prepared to calculate the computing Gini Concentration Ratio (GCR). It gives the details of classification of urban towns based on its demographic characteristics and Table-11 is constructed to calculate Gini Concentration Ratio for urban census towns in 2001 Census.

Table 10: Classification of Urban Centers in Arunachal Pradesh as per 2001 Census

Size of Urban Place	Class	No of Units	Name of Towns	Class wise Urban Total Population
100000	I	-	-	-
50,000-99,999	II	-	-	-
20,000-49,999	III	3	Itanagar, Naharlagun, Pasighat	84007
10,000-19,999	IV	7	Seppa, Ziro, Roing, Daporijo, Aalo, Tezu, Namsai	97044
5,000-9,999	V	6	Tawang, Bomdila, Changlang, Jairampur, Khonsa and Deomali	42751
<5,000	VI	1	Basar	4079
Total		17	17	227881

Source: Self Calculation based on 2001 Census.

Table 11: Computation of Gini Concentration Ratio for Urban Towns in 2001Census

Size of Urban Place	No of Units	Population	Proportion Unit	Proportion Population	Cumulative Proportion Units (Y_i)	Cumulative Proportion Population (X_i)	$X_i Y_{i+1}$	$X_{i+1} Y_i$
100000	-	-	-	-	-	-	-	-
50,000-99,999	-	-	-	-	-	-	-	-
20,000-49,999	3	84007	0.1765	0.3686	0.1765	0.3686	0.216847	0.1402292
10,000-19,999	7	97044	0.4118	0.4259	0.5883	0.7945	0.747783	0.5777694
5,000-9,999	6	42751	0.3529	0.1876	0.9412	0.9821	0.9821	0.9412
<5,000	1	4079	0.0588	0.0179	1.0000	1.0000		
Total	17	227881	1.0000	1.0000			1.94673	1.6591986

Source: Self Calculation based on 2001 Census.

Therefore, Gini Concentration Ratio (GCR) for 2001= 1.94673 - 1.6591986 = 0.287531 < 0.3

From the table-11 above, the computed value of Gini concentration ratio for the urban population living in various size categories of urban centers in Arunachal Pradesh as per 2001 Census are 0.287531, which is less than 03. It is a very low coefficient of urban concentration, implying that only three urban centers (as shown in Table-9) have a disproportionately somewhat large share of the State's total urban population that ranges between 20,000-49,999,

categorized as III Class towns. The remaining 14 small urban centers account for only an insignificant the proportion of State's total urban population.

5. Growth of Urban Centers in 2011: In 2011 Census, there were 27 Census Towns in the State. They were Tawang, Bomdila, Dirang, Rupa, Seppa, Itanagar, Naharlagun, Sagalee, Ziro, Koloriang, Daporijo, Aalo, Basar, Boleng, Pasighat, Yingkiong, Anini, Roing, Tezo, Namsai, Hawai, Changlang, Jairampur, Miao, Deomali, Khonsa, and Longding.

Table 12: Urbanization Status in Arunachal Pradesh, 2011

District	Population	Census Town	Urban Population		Town Class
			Total	Percentage	
Tawang	49977	Tawang	11202	22.41	IV
West Kameng	83947	Bomdila	8370	9.97	V
		Dirang	3750	4.47	VI
		Rupa	3812	4.54	VI
East Kameng	78690	Seppa	18350	23.32	IV
Papumpare	176573	Itanagar	59490	33.69	II
		Naharlagun	36158	20.48	III
		Sagalee	1315	0.74	VI
Lower Subansiri	83030	Ziro	12806	15.42	IV
Kurung Kumey	92076	Koloriang	2345	2.55	VI
Upper Subansiri	83448	Daporijo	13405	16.06	IV
West Siang	112274	Aalo	20684	18.42	III
	0	Basar	4284	3.86	VI
East Siang	99214	Boleng	2979	3.00	VI
		Pasighat	24656	24.85	III
Upper Siang	35320	Yingkiong	6540	18.52	V
Dibang Valley	8004	Anini	2384	29.79	VI
Lower Dibang Valley	54080	Roing	11389	21.06	IV
Lohit	145726	Tezu	18184	12.48	IV
		Namsai	14246	9.78	IV
Anjaw	21167	Hawai	982	4.64	VI
Changlang	148226	Changlang	6236	4.21	V
		Jairampur	7151	4.82	V
		Miao	5841	3.94	V
Tirap	111975	Deomali	6648	5.94	V
		Khonsa	9928	8.87	V
		Longding	4234	3.78	VI
A P	**1383727**		**317369**	**22.94**	

Source: Statistical Abstract-2017, Directorate of Economics and Statistics, Govt. of Arunachal Pradesh, Itanagar.

Computation of Gini Concentration Ratio for 2011 Census

The following Table-13 has been constructed to calculate the computing Gini Concentration Ratio (GCR). It gives the details of classification of urban towns based on its demographic characteristics and Table-14 is constructed to calculate Gini Concentration Ratio for urban census towns in 2011 Census.

Table 13: Classification of Urban Centers in Arunachal Pradesh 2011

Size of Urban Place	Class	No of Units	Name of Towns	Class wise Urban Total Population
100000	I	-	-	-
50,000-99,999	II	1	Itanagar,	59490
20,000-49,999	III	3	Naharlagun, Aalo, Pasighat	81498
10,000-19,999	IV	7	Tawang, Seppa, Ziro, Daporijo,Roing, Tezu, Namsai	99582
5,000-9,999	V	7	Bomdila, Yingkiong, Changlang, Jairampur, Miao , Deomali, Khonsa,	50714
<5,000	VI	9	Dirang, Rupa, Sagalee, Koloriang, Basar, Boleng, Anini, Hawai, Longding	26085
Total		27		317369

Source: Self Counted based on 2011 Census is subject to error.

Table-14: Computation of GINI Concentration Ratio for Urban Towns in 2011

Size of Urban Place	No of Units	Population	Proportion of		Cumulative Proportion of		$X_i Y_{i+1}$	$X_{i+1} Y_i$
			Unit	Population	Units (Y_i)	Population (X_i)		
100000	-	-	-	-	-	-	-	-
50,000-99,999	1	59490	0.0370	0.1874	0.037	0.1874	0.027754	0.016435
20,000-49,999	3	81498	0.1111	0.2568	0.1481	0.4442	0.180967	0.11226
10,000-19,999	7	99582	0.2593	0.3138	0.4074	0.758	0.505359	0.373912
5,000-9,999	7	50714	0.2593	0.1598	0.6667	0.9178	0.9178	0.6667
<5,000	9	26085	0.3333	0.0822	1.0000	1.0000	-	-
Total	27	317369	1.0000	1.0000			1.63188	1.169307

Therefore, Gini Concentration Ratio (GCR) for 2011 Census=1.63188 - 1.16930 = 0.46258 < 0.5

From the Table-14, the computed value of Gini Concentration ratio for urban population living in various size categories of urban centers in Arunachal Pradesh as per 2011 Census is 0.462573, which is less than 05. It is a very low coefficient of urban concentration, implying that only one urban centre in the range of (50,000-99,999) population and three urban centers in the range of (20,000-49,999) population (as shown in Table-13) have a disproportionately somewhat large share of state's total urban population categorized as II and III Class towns respectively.

The remaining 23 small urban centers in the range of below 10,000 populations account an insignificant proportion of State's total urban population.

Over all View of Gini Concentration Ratio for Different Census Years since 1981

Now all the values of Gini Concentration Ratio for 1981, 1991, 2001 and 2011 are shown in a single table-15 and try to explain the mechanism of urbanization in the State.

Table 15: Over all View of Gini Concentration Ratio for Different Census Years

Census Year	Values of Gini Concentration Ratio	
1981	0.0735	< 0.5
1991	0.16948	< 0.5
2001	0.287531	< 0.5
2011	0.462573	< 0.5

Fig. 1: Values of Gini Concentration Ratio
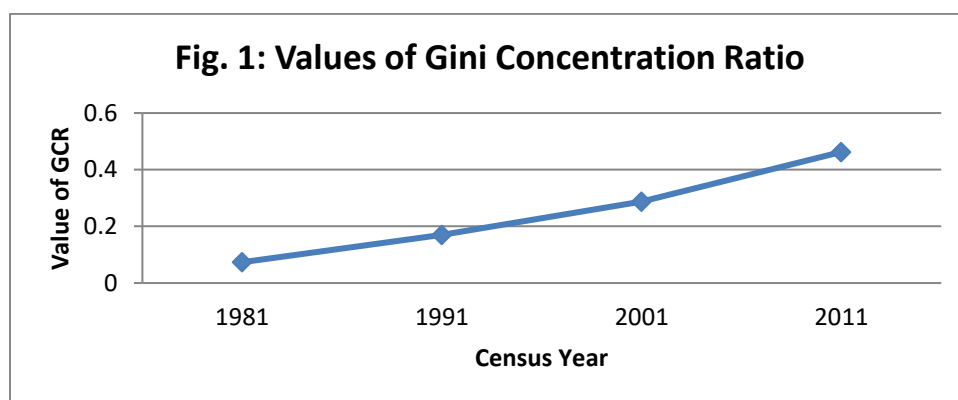
Findings

It is observed from the above calculated values of GCR since 1981 that its value was very small in 1981 and since then its value was increasing slowly. At the very beginning of urbanization, it was very sparse. The concentration of the population was very low and negligible. But census wise the value of GCR was increasing and in the last census, 2011 its value was 0.462573, which is far better than the beginning indicating that the urbanization is advancing. That is why; the curve is upward rising steadily observed in fig.1.

CONCLUSION

The level of disparity in the rate of urbanization can be minimized by giving importance to socio-economic development between rural and urban areas. Urbanization is considered a part of the development process but if it is unplanned it creates shortages of housing, shelter, basic health services, sanitation, clean air, potable water, education, transport, energy, etc. There is a need for broad-based policy to urbanize the poor State like Arunachal Pradesh in the interest of the overall economic development of the country. Hence, a more scientific, systematic, and in-depth study is required before urban planning. Comprehensive land-use planning and revision of planning standards and administrative procedures should be properly investigated before implementation.

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