

# **“CHANGING PATTERN OF SPATIAL ORGANISATION AND HEIRARCHY OF URBAN CENTRES IN ASSAM”.**

➤ A Geo Spatial Analysis

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# STATEMENT OF PROBLEM

The distribution of urban centres is not uniform throughout the study area; there is rather significant variation in the hierarchy of urban centres which is spread throughout the study area. Although the number of urban centres in the state has increased from as small as 72 in 1971 to as large as 214 in 2011, the proportion of urban population has witnessed an increase from 8.8 % to only 14 % during the said period. However, the state has experienced a remarkable rate of urban growth both in terms of urban population and urban centres immediately after its independence. With this background, an attempt is being made to analyse the changing pattern of spatial organisation and hierarchy of urban centres in Assam particularly during the period 1971-2011.

# OBJECTIVES

- to study the changing spatial patterns of urban centres, urban population and class-wise growth of urban centres in the state of Assam;
- to show the trend of urbanization in respect of its growth of population and urban centres;
- to find out the spatial hierarchy in urban centres;
- to show the distribution pattern of urban centres;
- to understand the spacing of the urban centres of different categories;
- to study the pattern of relationship and development of urban centres.

# DATABASE AND METHODOLOGY

- Secondary sources particularly the analysis is made on the basis of information and data collected from the Economic Survey, Govt. Of Assam, Statistical Handbook of Assam, and has consulted various journals, periodicals, internet and books related to research problem.

Different techniques of tabulation & calculation, cartographic representation & map preparation have constituted the essential part of analysis. The cartographic techniques such as maps & tables have proved helpful in giving the geographical treatment to the study on a sound base.

# BRIEF REVIEW OF RELEVANT LITERATURE

- Carl O Sauer became influential in urban geography as he motivated geographers to study a city's population and economic aspects with regard to its physical location.
- In terms of a hierarchy of cities — a tradition that goes all the way back to Walter Christaller's classic work written in 1933, *Central Places in Southern Germany*.
- O.H.K Spate and E. Ahmad (1950) their article was published in Geographical review under the title of “five cities of Gangetic Plain”.
- R.L singh in 1995 studied the Slums of Allahabad under low urbanization.
- Ashish Bose (1980) studied the India's Urbanization 1901-2001. Amitabh kundu (1992) published his book urban development and Urban Research in India. R. Ramachandran (1995) studied Urbanization and Urban System in India.
- J.B Ganguly (1995) authored a book “Urbanization and development in North East India”.
- . B.K Prasad (2003) he outline the various factors affecting the urban development pattern in Assam.

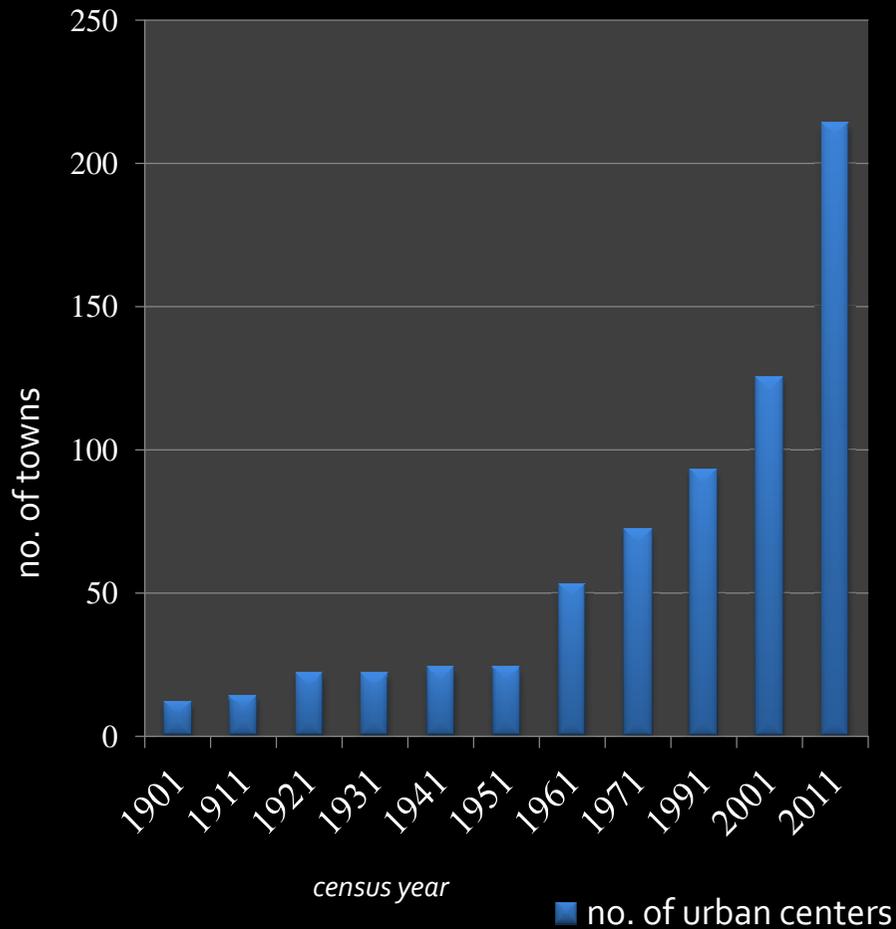
## TREND OF GROWTH OF URBAN CENTRES AND URBAN POPULATION

Census Year	No. of Urban Centres	Urban Population	%Urban population to the total population	Growth Rate of Urban Population (%)
1901	12	77,074	2.34	--
1911	14	92,916	2.41	20.5
1921	22	127,107	2.74	36.8
1931	22	162,166	2.92	27.58
1941	24	208,067	3.11	28.30
1951	24	344,831	4.29	65.73
1961	53	781,288	7.21	126.57
1971	72	12,89,222	8.82	65.01
1991	93	24,87,795	11.10	92.97*
2001	125	34,39,240	12.72	36.24
2011	214	43,88,756	14.10	27.60

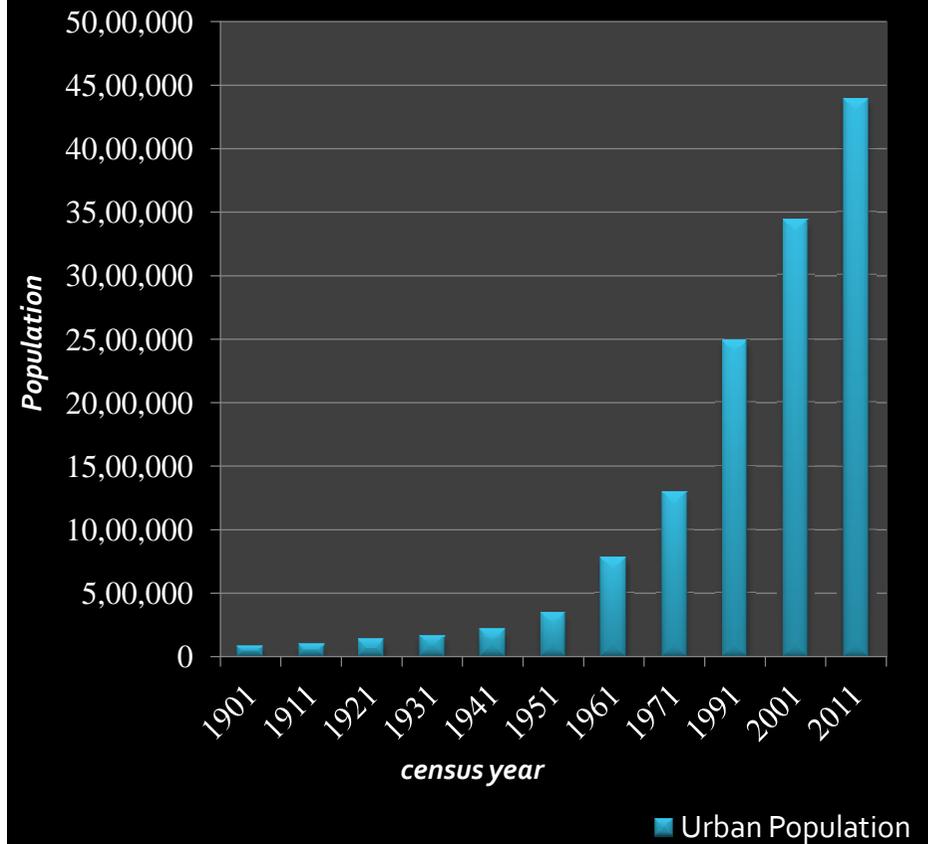
- \* Growth rate during 1971-2011, as there was no Census in Assam in 1981.
- Source: Census of India, 2001, General Population Tables, Assam; and Census of India, 2011, Provisional Population Totals, Vol. 2, Assam.

# TREND OF GROWTH OF URBAN CENTRES AND URBAN POPULATION

## Trend of growth of urban centres, 1901 - 2011

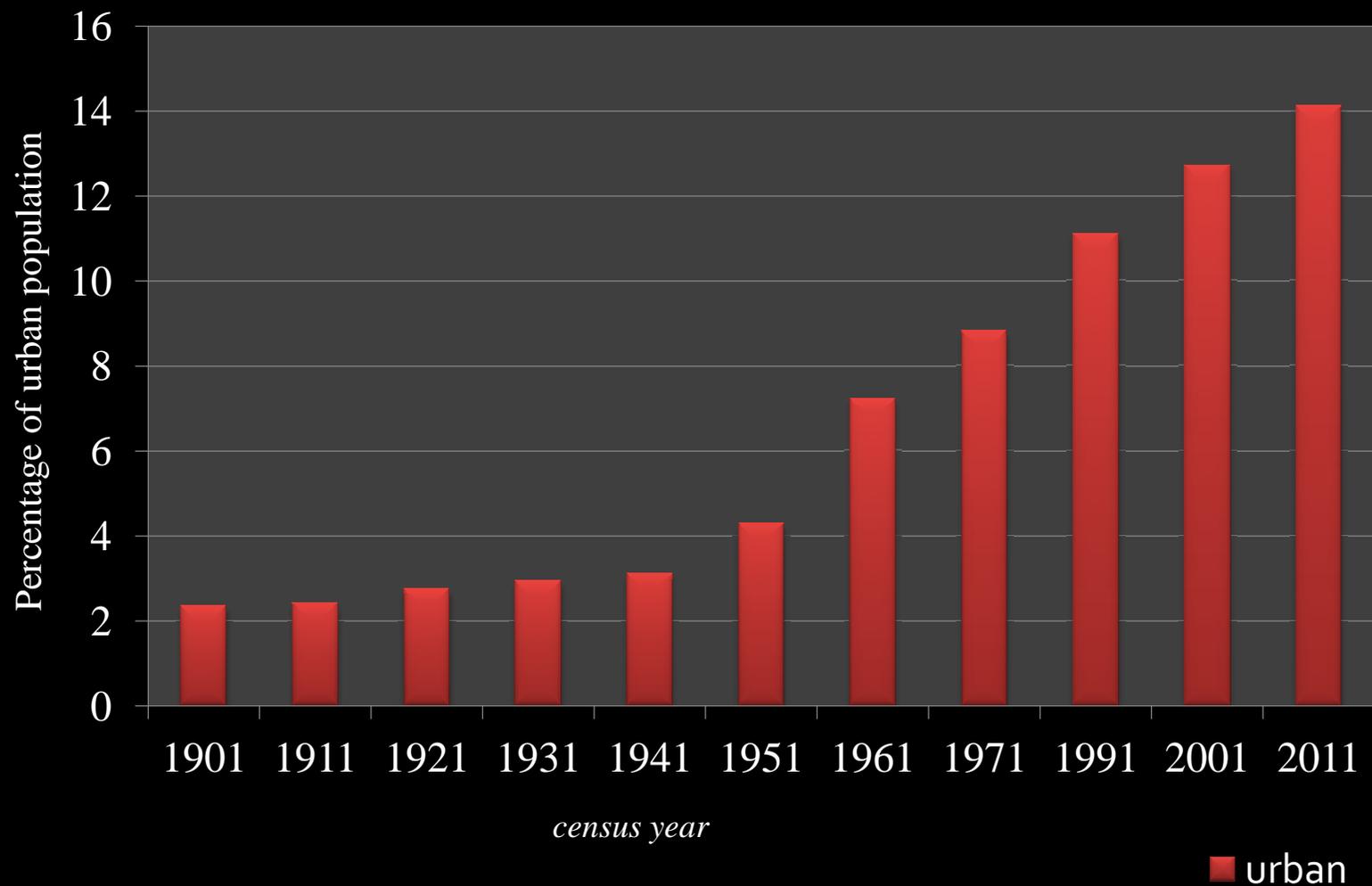


## Trend of growth of urban population in Assam 1901-2011



# TREND OF URBANIZATION LEVEL IN ASSAM

## Trend of urbanization level in Assam, 1901- 2011

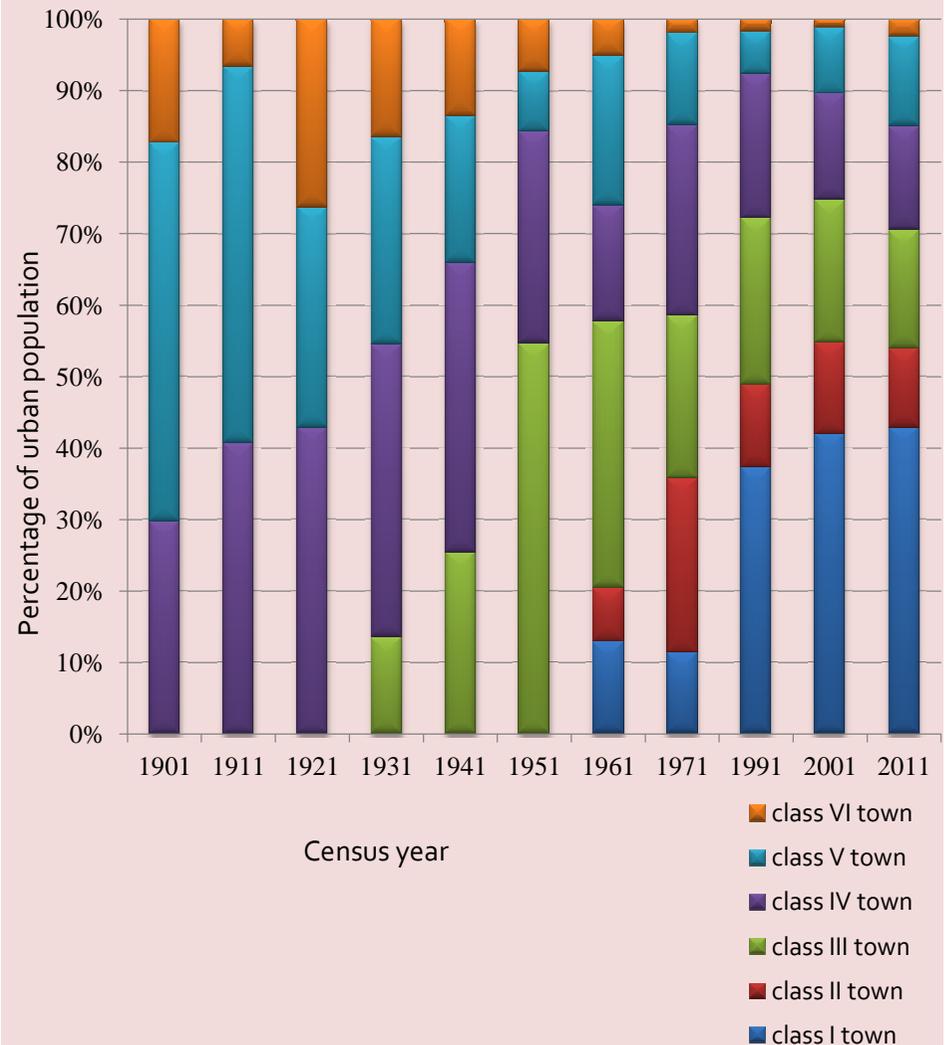


# CATEGORY WISE GROWTH OF URBAN CENTRES AND URBAN POPULATION IN ASSAM

## Class wise distribution of urban centres

YEAR	Class I	Class II	Class III	Class IV	Class V	Class VI	TOTAL	
1901					2	6	4	12
1911					3	8	3	14
1921					4	6	12	22
1931				1	5	7	9	22
1941				2	6	6	10	24
1951				6	7	4	7	24
1961	1	1	10	9	21	11	53	
1971	1	5	9	26	23	8	72	
1991	4	4	20	32	15	12	87	
2001	7	7	22	31	35	8	110	
2011	7	8	24	45	78	27	214	

## Percentage Of Class Wise Distribution Of Urban Population In Assam During 1901- 2011



## DISTRIBUTION PATTERN OF URBAN CENTRES USING CHI-SQUARE STATISTICS , 1971

Region	Area (in km <sup>2</sup> )	No. Of Urban Centre (Observed)	No.Of Urban Centre (Estimated)	Calculated $\chi^2$	Tabulated Value of $\chi^2$	Remarks
Upper Assam	21,706	22	20	17.14	1% Significant Level=13.28	Distribution of Urban Centres in Assam Is uneven
Middle Assam	14,340	11	13			
Lower Assam	20,148	29	18.5			
Barak Valley	6,922	8	6.5			
Hills	15,322	2	14			
Total	78,438	72				

## DISTRIBUTION PATTERN OF URBAN CENTRES USING CHI-SQUARE STATISTICS , 1991

Region	Area (in km <sup>2</sup> )	No. Of Urban Centre (Observed)	No.Of Urban Centre (Estimated)	Calculated X <sup>2</sup>	Tabulated Value of X <sup>2</sup>	Remarks
Upper Assam	21706	34	24.07	14.14	1% Significant Level=13.28  5% Significant Level= 9.49	Distribution of Urban Centres of Assam Is Uneven
Middle Assam	14340	15	16			
Lower Assam	20148	23	22.3			
Barak Valley	6922	6	7.7			
Hills	15322	9	17			
<b>Total</b>	<b>78438</b>	<b>87</b>				

## DISTRIBUTION PATTERN OF URBAN CENTRES USING CHI-SQUARE STATISTICS , 2011

Region	Area	No. Of Urban Centre (Observed)	No.Of Urban Centre (Estimated)	Calculated X <sup>2</sup>	Tabulated Value	Remarks
Upper Assam	21706	55	59.2	41.88	1% Significant Level=13.28  5% Significant Level= 9.49	Distribution Of Urban Centres of Assam is Uneven
Middle Assam	14340	37	39.2			
Lower Assam	20148	82	55.0			
Barak Valley	6922	29	18.8			
Hills	15322	11	41.8			
<b>Total</b>	<b>78438</b>	<b>214</b>				

## DISTRIBUTION PATTERNS USING NEAREST NEIGHBOUR STATISTICS

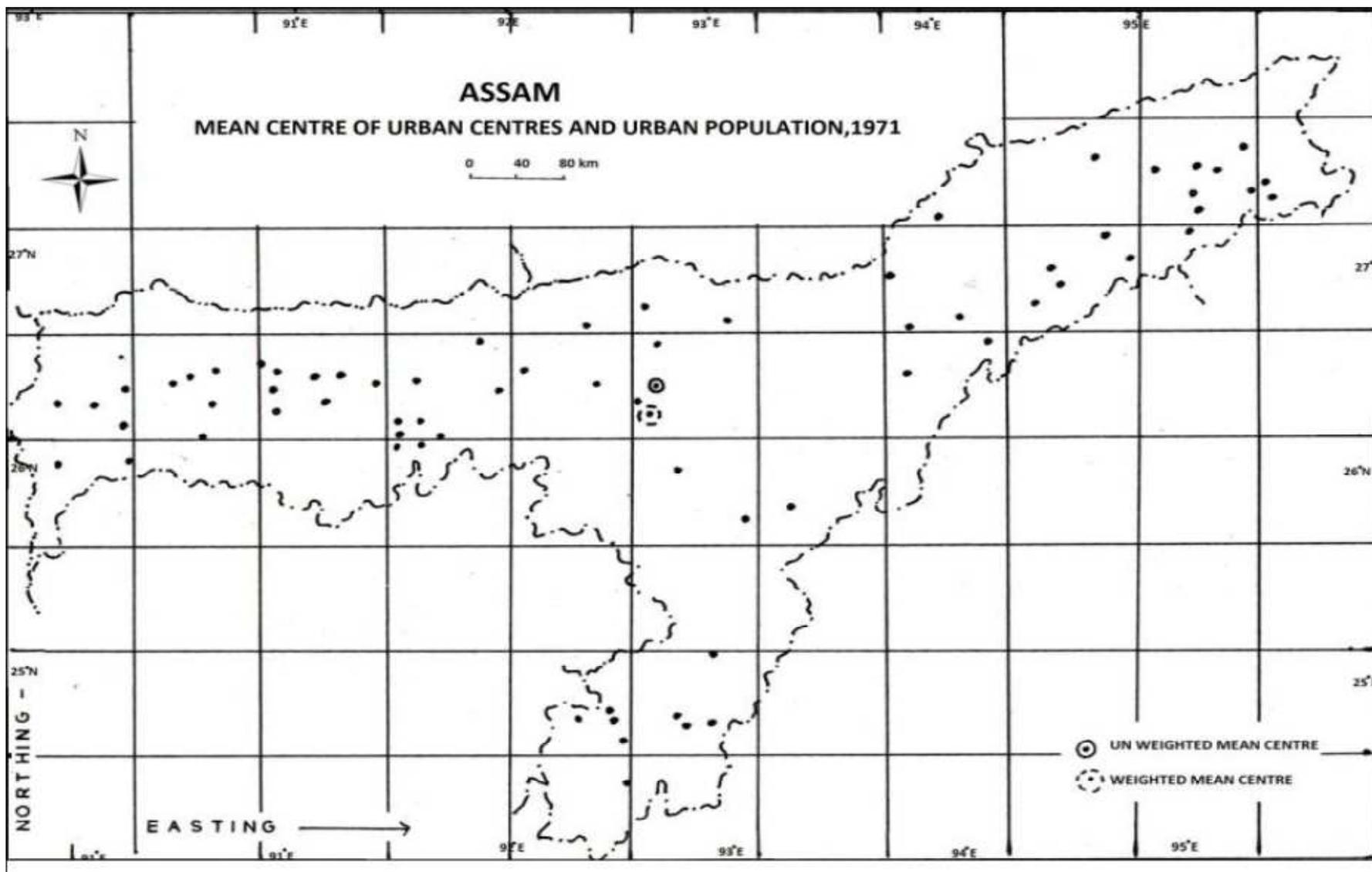
Year	No. Of Urban Centres	Area (in km <sup>2</sup> )	DO (Observed Mean Distance, km)	DE (Expected Mean Distance, km)	Rn	Remark
1971	72	78,438	14.12	33.47	0.42	Approaching Clustered
1991	87	78,438	14.7	30.0	0.49	Approaching Clustered
2011	214	78,438	7.85	21.6	0.46	Approaching Clustered

It is observed that the distribution of urban centres in all the regions of Assam, 1971-2011 is approaching towards clustered. Except Hilly and middle region of Assam in 1971 have slight approaching towards random distribution due to the low urbanisation in hilly region with inaccessible terrain, less fertile land agriculture and low infrastructural development. The urban centres in all the regions of Assam in the last three decade are found to be clustered.

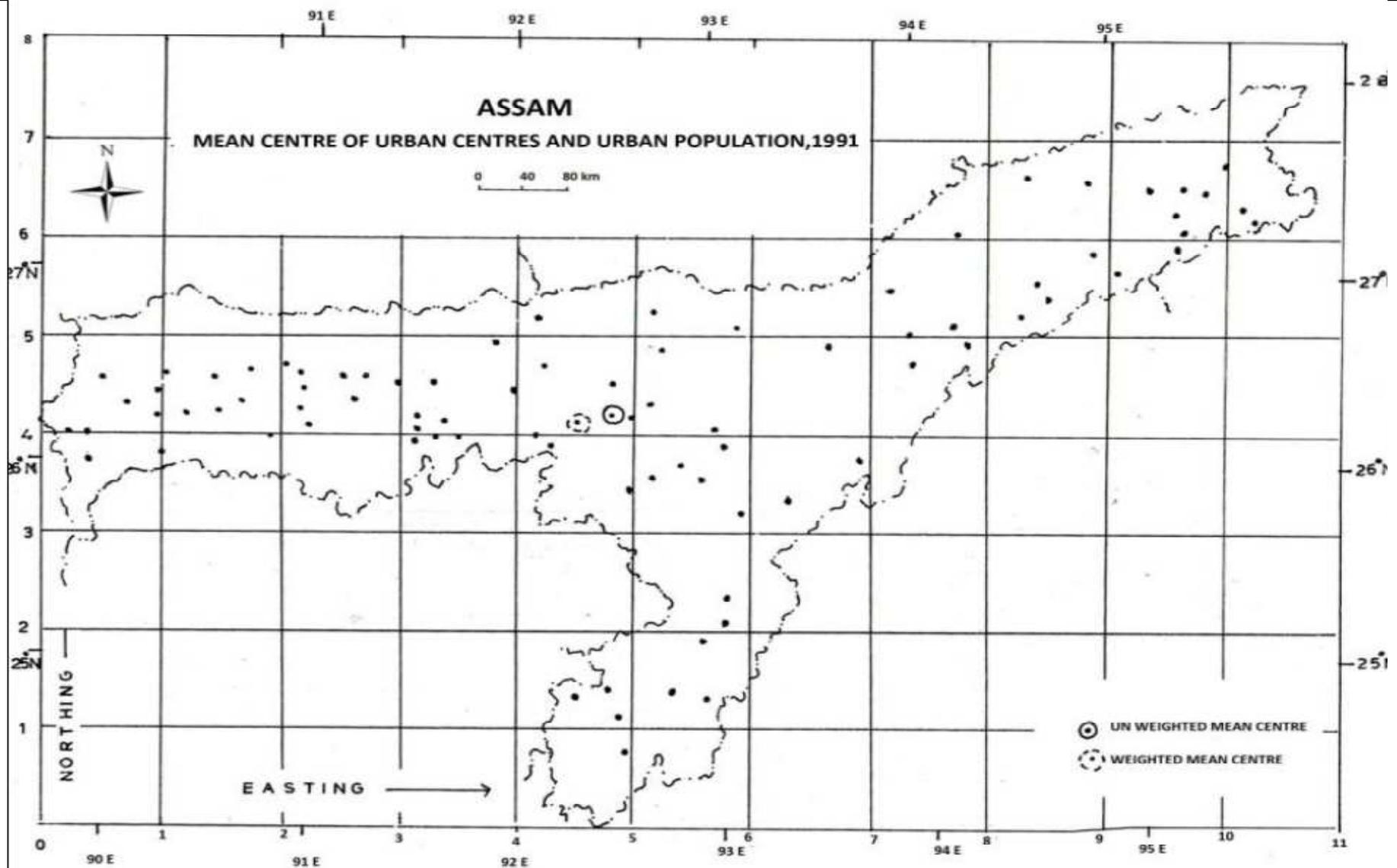
## SPATIAL MEAN CENTRE OF URBAN POPULATION

- Mean centre of population may be defined as the centre of gravity of population of an area implying the point upon which the place would be balanced. It is also called as the point of equilibrium.
- The mean centre of urban population in 1971 falls slightly towards west, indicating the high urban population towards west where Guwahati has the highest urban population in the state Assam. In 1991, the mean centre of urban population both the weighted and unweighted falls in the district of Marigaon. From the above Figures, the temporal variation in the Mean centre of urban population can be seen shifting towards west, indicating the high concentration of urban population which became the centre of gravity.

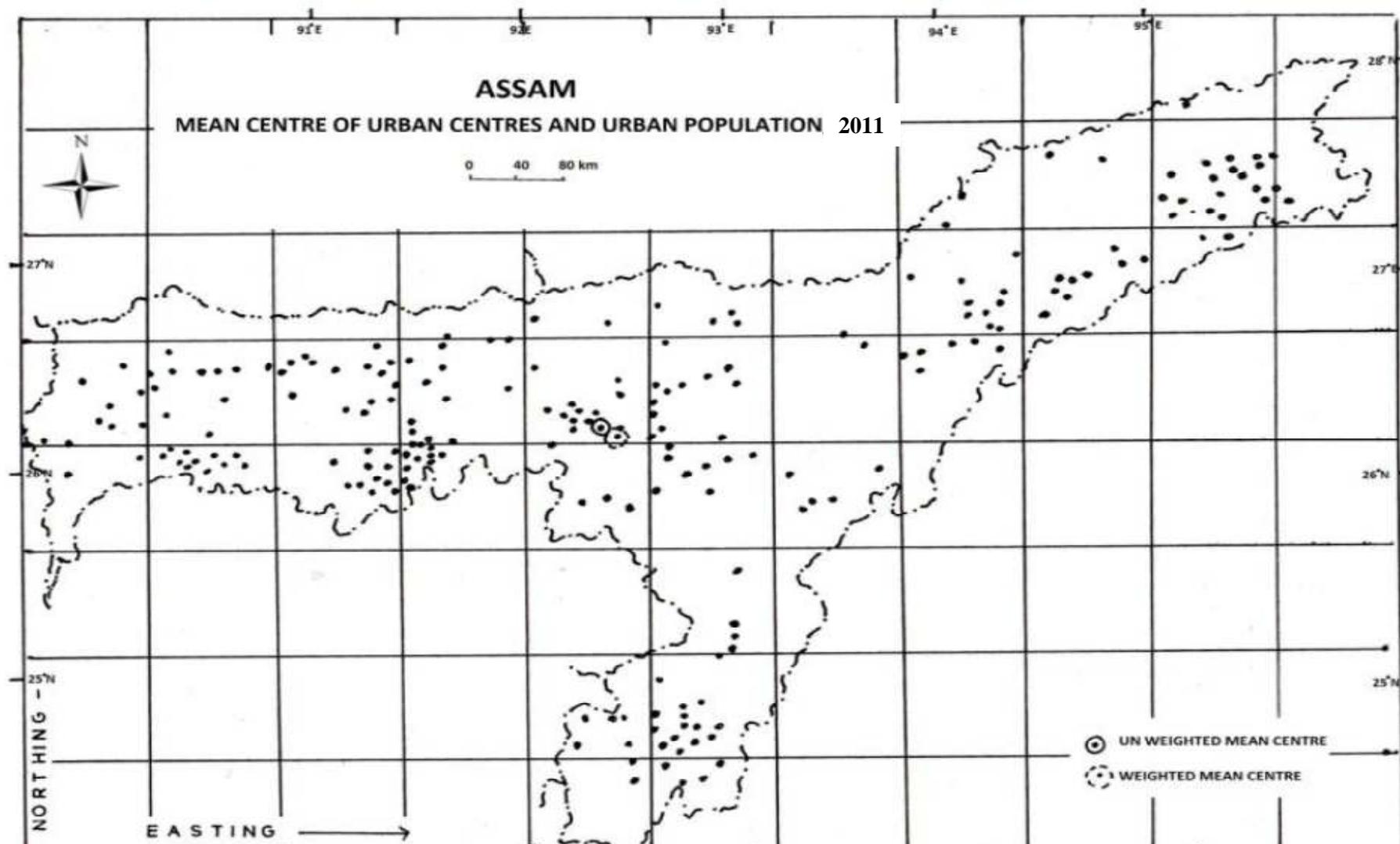
# SPATIAL MEAN CENTRE OF URBAN POPULATION, 1971



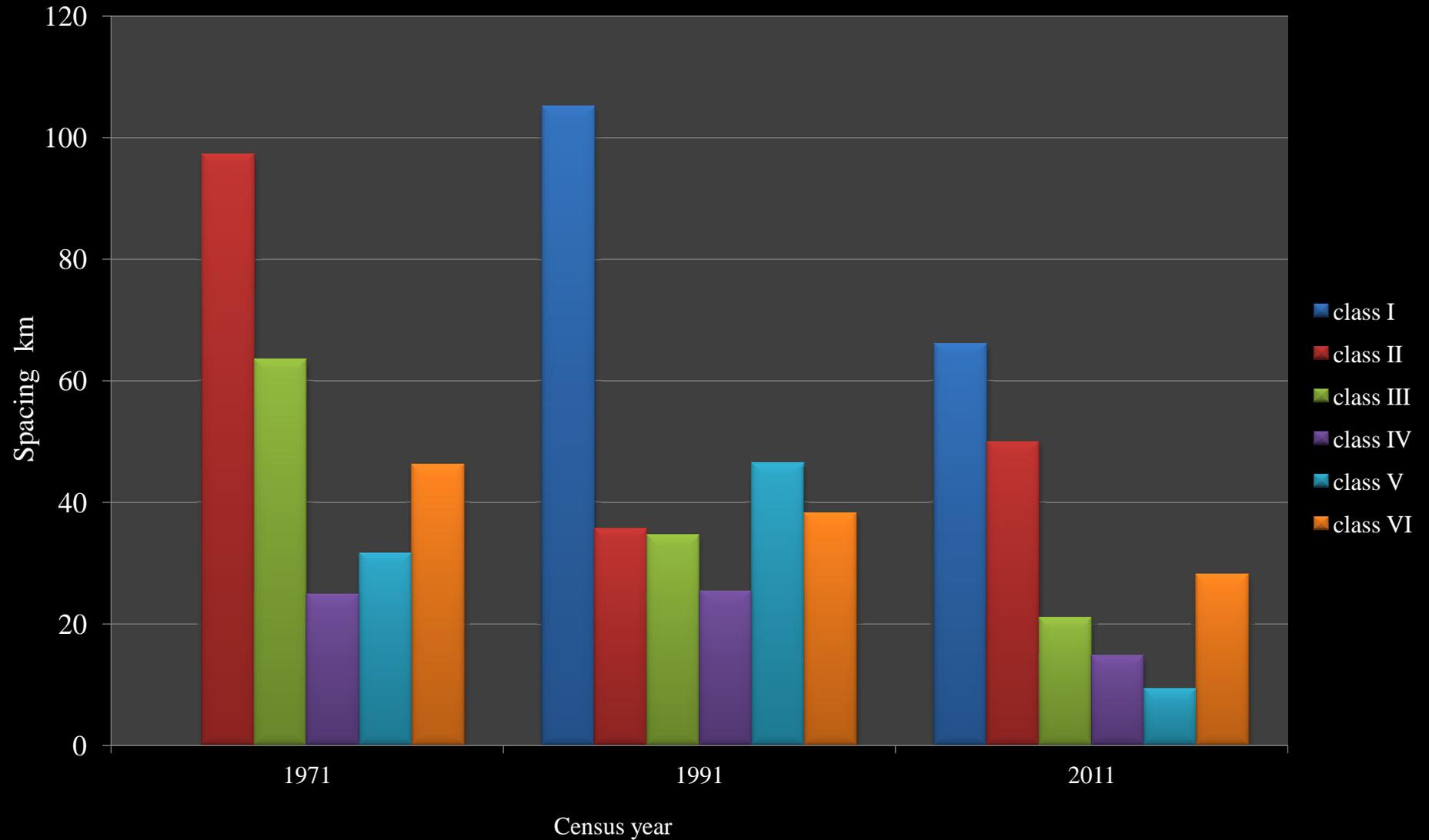
# SPATIAL MEAN CENTRE OF URBAN POPULATION, 1991



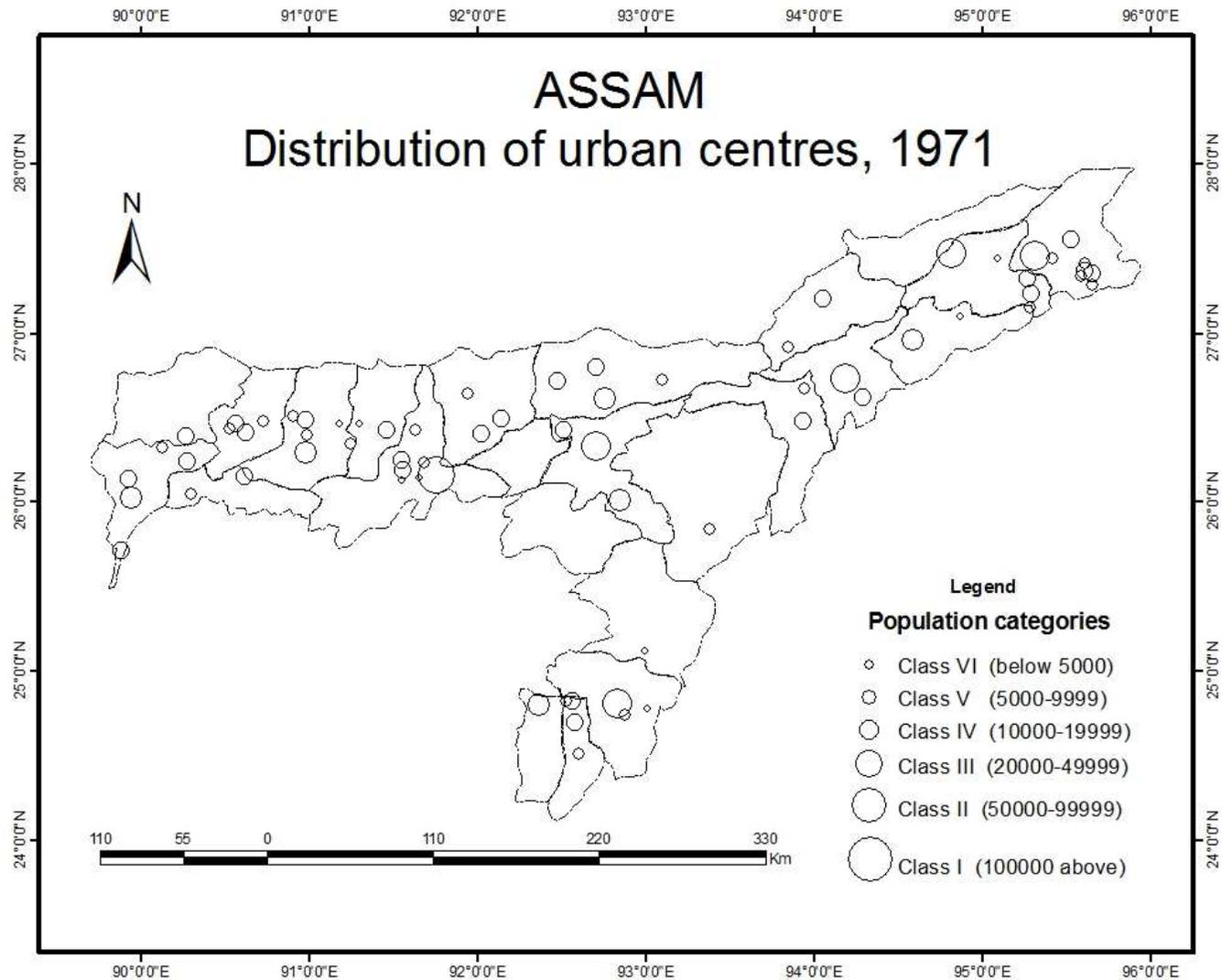
# SPATIAL MEAN CENTRE OF URBAN POPULATION, 2011



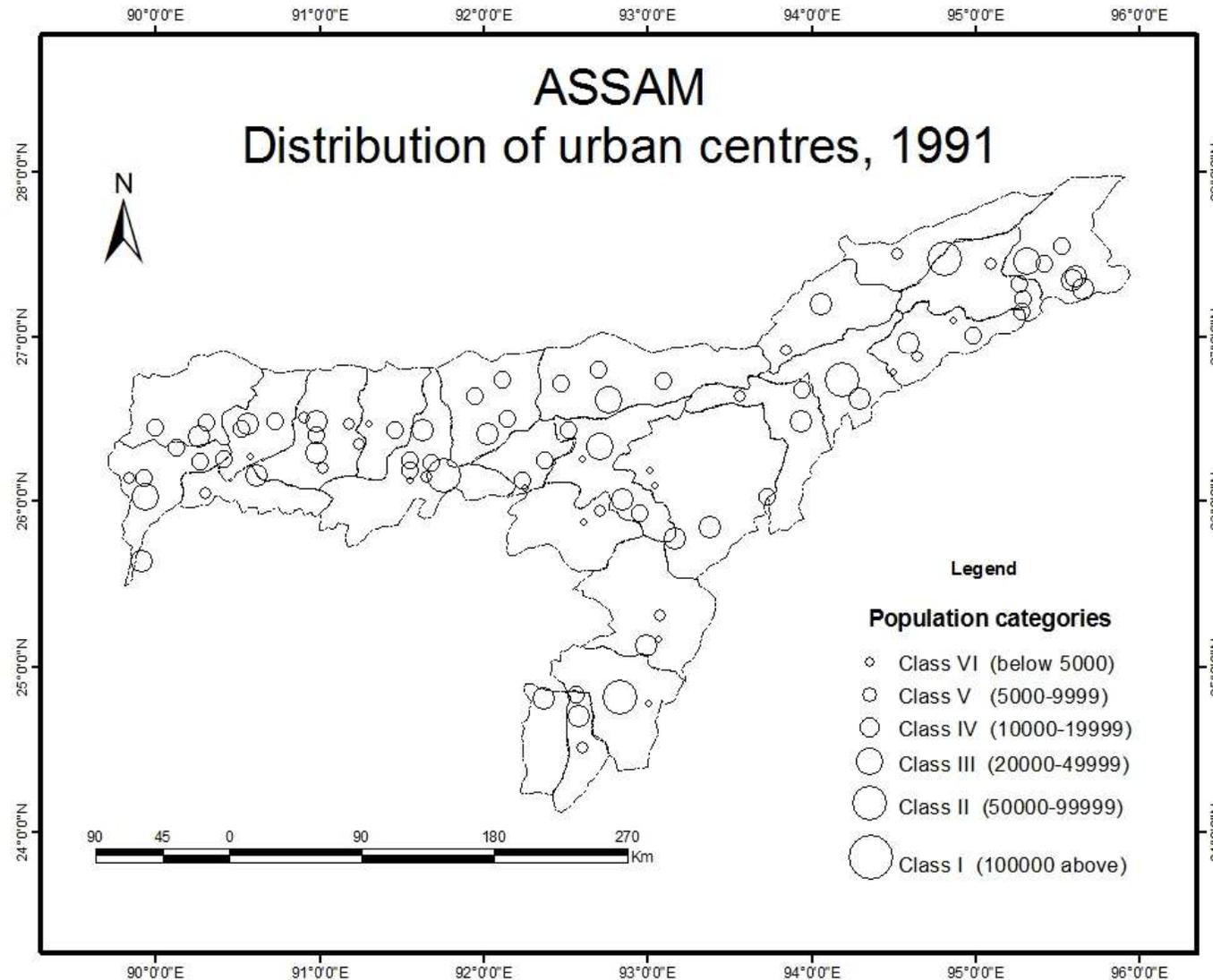
# Class-Wise Spacing of Urban Centres in Assam, 1971-2011



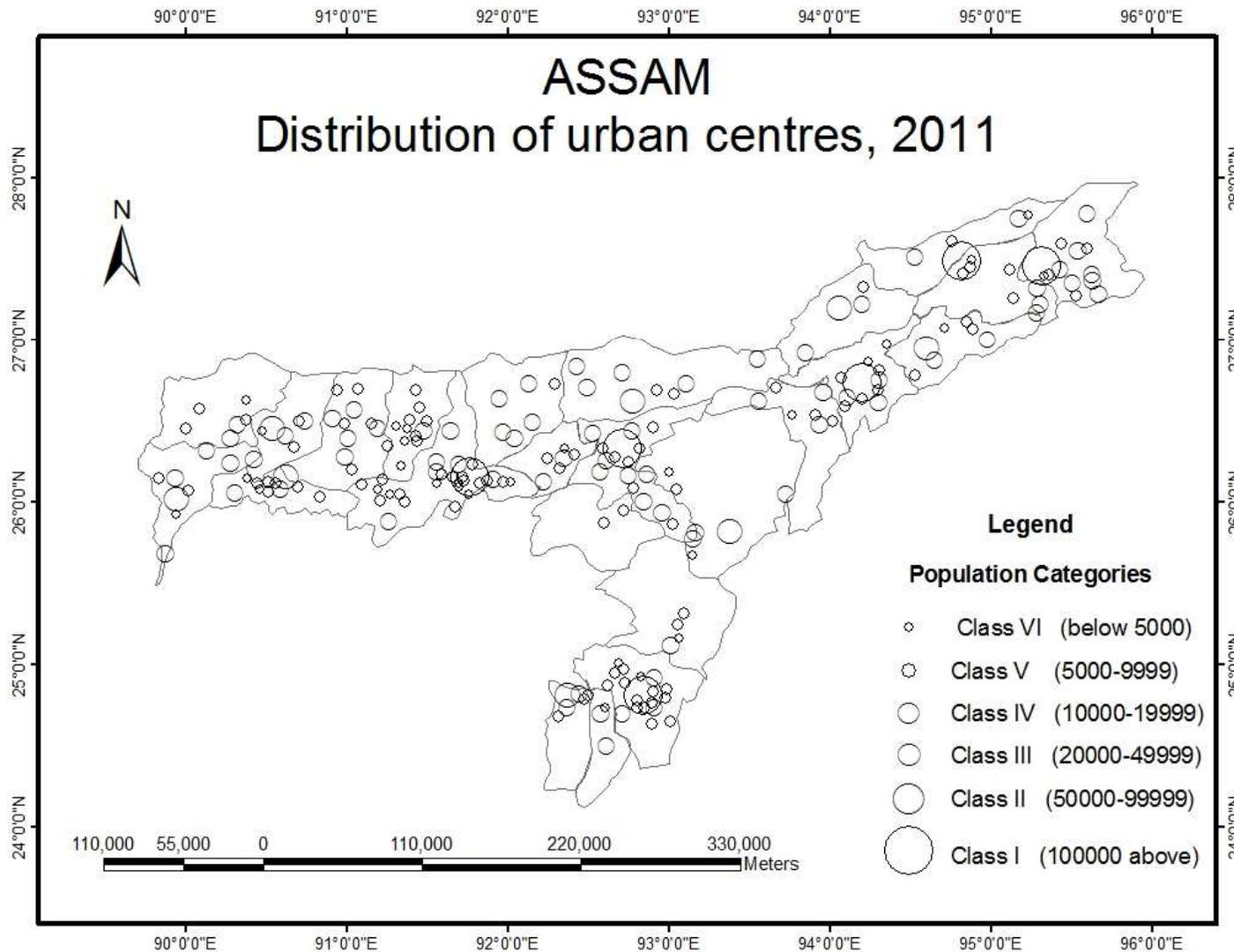
# DISTRIBUTION PATTERN OF DIFFERENT CATEGORIES OF URBAN CENTRES, 1971



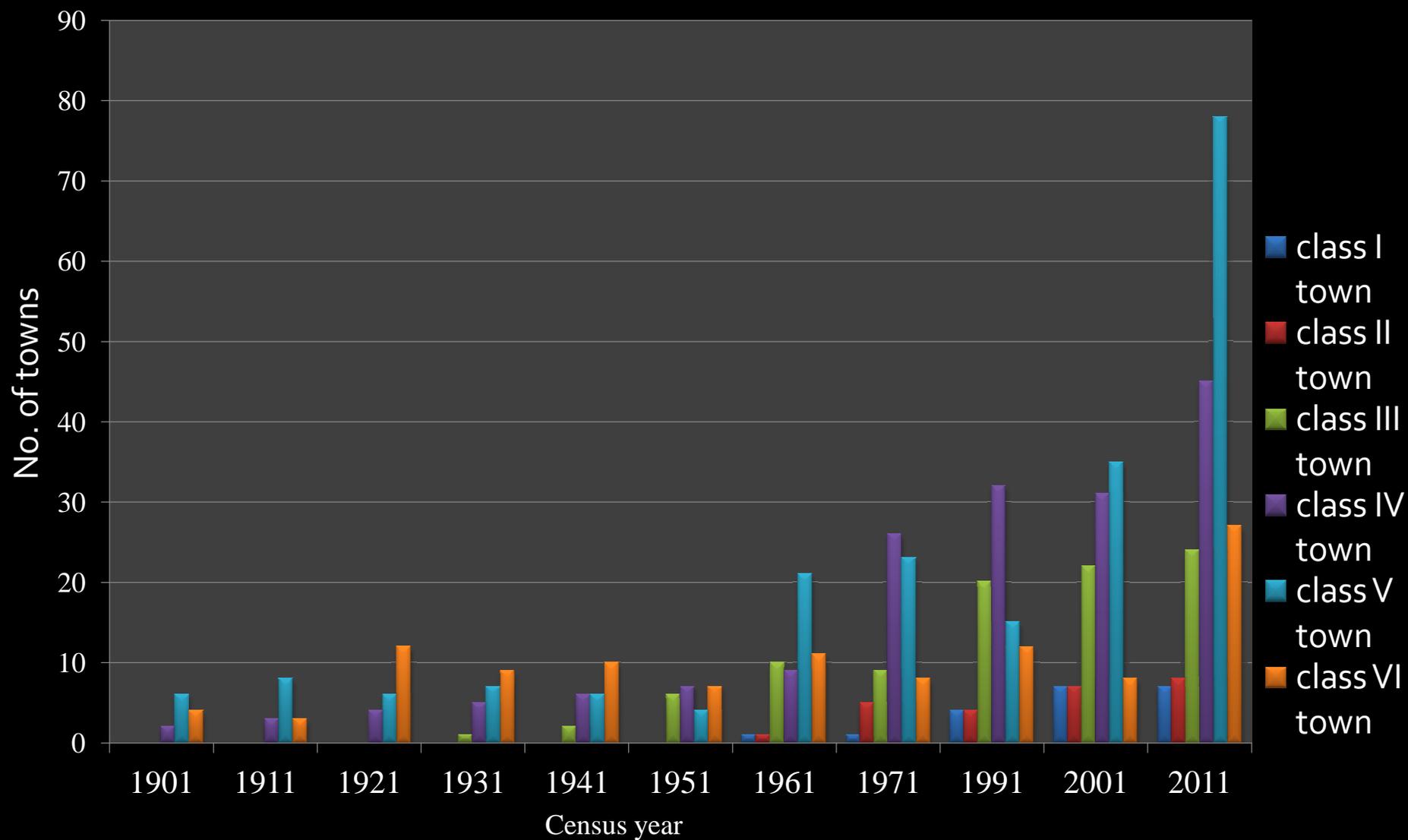
# DISTRIBUTION PATTERN OF DIFFERENT CATEGORIES OF URBAN CENTRES, 1991



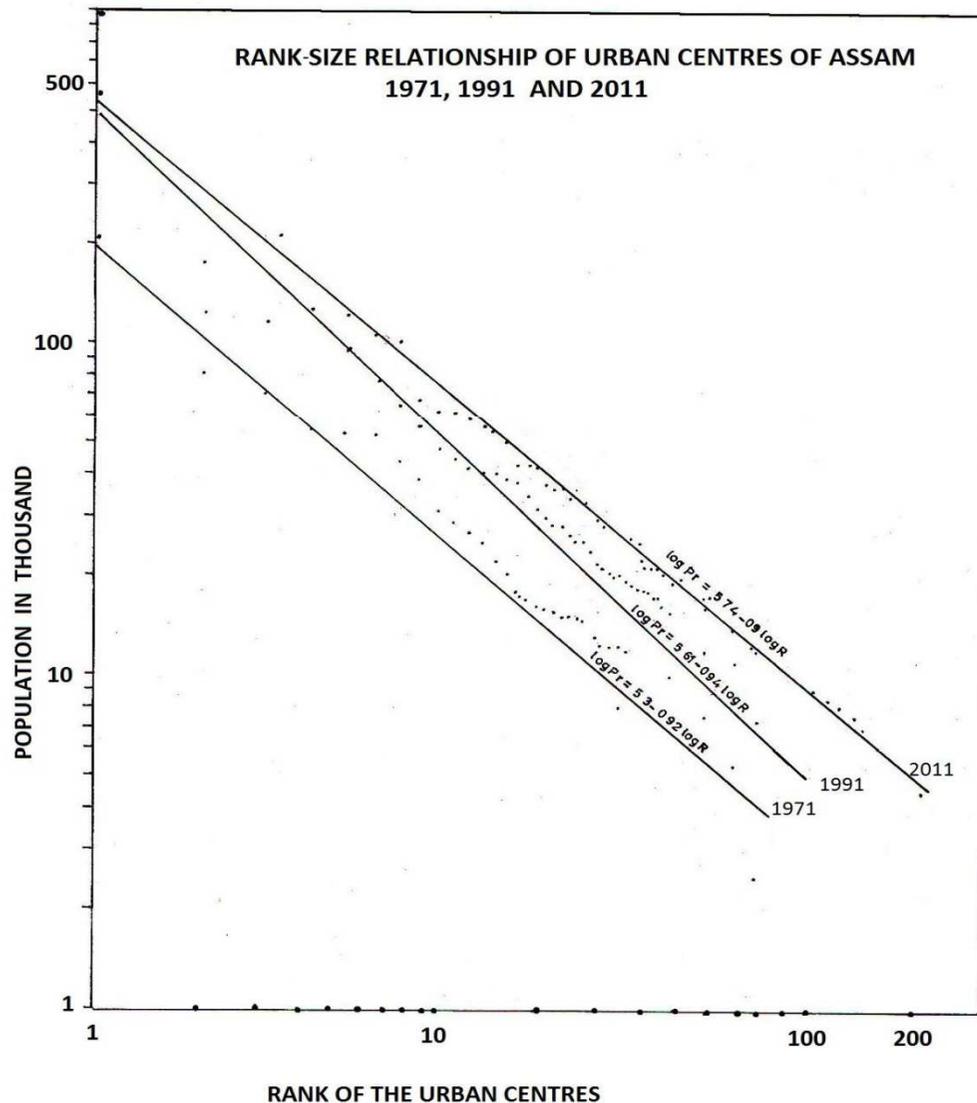
# DISTRIBUTION PATTERN OF DIFFERENT CATEGORIES OF URBAN CENTRES, 2011



## CATEGORY-WISE GROWTH OF TOWNS IN ASSAM, 1901 -2011



# PATTERNS OF RELATIONSHIP AND DEVELOPMENT OF URBAN CENTRES



- The regression coefficient of this line reflects the degree of Primacy in the entire urban system and the coefficient of determination may be taken as a measurement of its goodness of fit to the system of rank size regularity (Mahmood, 2008).
- Here it shows that the pattern of urban development has not been balanced in the entire three decades . Guwahati, the state primate city witnessed very high growth of population at the cost of other smaller urban centres.

# CONCLUSION

The striking feature is the wide inequalities observed in urbanization in terms of share of urban population in the district of Assam. Guwahati has maintained its dominance and lead as the prominent town with both high urbanization and high population growth rate. The inequalities of urbanization among the districts of Assam may be addressed by giving impetus for a balanced infrastructural development in small and medium towns of Assam. Spatial distribution of urban centres in the study region reveals uneven pattern and high concentration around the primate city and industrial town.

THANK YOU