

**URBAN INFRASTRUCTURE AND SLUM
POPULATION: A STUDY OF MAHARASHTRA,
WEST BENGAL AND TAMIL NADU**

*Dissertation submitted to Jawaharlal Nehru University in partial fulfilment
of the requirement for the award of the degree of*

MASTERS OF PHILOSOPHY

SAKREEN HASAN

**Centre for the Study of
School of Social Sciences
Jawaharlal Nehru
New Delhi – 110067**



**Regional Development
University**

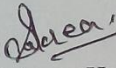
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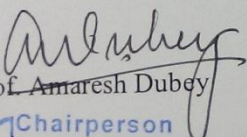

जवाहरलाल नेहरू विश्वविद्यालय
JAWAHARLAL NEHRU UNIVERSITY
Centre for the Study of Regional Development
School of Social Sciences
New Delhi-110067

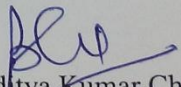

DECLARATION

I do hereby declare that the dissertation entitled "**Urban Infrastructure and Slum Population: A Study of Maharashtra, West Bengal and Tamil Nadu**" submitted by me for the award of the degree of Master of Philosophy of Jawaharlal Nehru University is my bonafide work. The dissertation has not been submitted for any other degree of this university or any other university.


Sakreen Hasan
Date: 24.07.15

We recommend that this dissertation may be placed before the examiners for evaluation.


Prof. Amaresh Dubey
 Chairperson
the Study of Reg. Dev.
School of Social Sciences
Jawaharlal Nehru University
New Delhi-110067


Dr. Bikramaditya Kumar Choudhary
Supervisor
 Centre for the Study of Reg. Dev.
School of Social Sciences
Jawaharlal Nehru University
New Delhi-110067

Tel: +91-11-26704466 / 4463 / 4103 Fax: 91-11-26742586, 26741504 Email:
chair_csrdd@mail.jnu.ac.in

*Dedicated to my Mother and
my loving brother and sisters*

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
GIS	Geographic Information System
NSSO	National Sample Survey Organization
P_B	Percentage of Households Availing Banking Services
P_B.f	Percentage of Households having Bathing Facility within the Premises
P_C.d	Percentage of Households having Closed drainage
P_E	Percentage of Households having Electricity

P_G	Percentage of Houses in Good Condition
P_L.f	Percentage of Households having Latrine Facility within the Premises
P_S	Percentage of Slum Population
P_T.W	Percentage of Households using Tap Water from Treated source
R_G	Rural Population Growth
R_P	Rural Population
T_P	Total Population
TFR	Total Fertility Rate
U_G	Urban Population Growth
U_P	Urban Population
UA	Urban Agglomeration

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Chapter-1

Urbanization and Slum: Study of West Bengal, Tamil Nadu and Maharashtra

1.1 Introduction

Urbanization is a worldwide phenomenon. About half of the total population (51.6 percent) of the whole world is living in urban areas urban which would increase to 66.5 percent by 2050.¹ Of this urban population 77.1 percent population (2010) residing in developed countries that will increase up to 85.4 percent by 2050, while in less developed countries this estimate is about 46 percent in 2010 and about 63 percent would be in 2050.²

The world urban population is growing at the rate of 2.2 percent annually. The urban population increasing at a greater pace in developing country that is of 2.27 percent while in developed region it is only 0.77 percent.³ About 60% of the urban population growth in developing countries is due to natural increase. As the Total Fertility Rate (TFR)⁴ of less developed countries is far more (4 to 7) than the more developed countries that is below replacement level (2), somewhere it is below 1 also say for example in Macau (0.93) and in Singapore TFR is least in the world that is 0.80. The remaining 40% is attributable to net rural-urban migration and reclassification of rural areas into urban sites.⁵ This rapid increase of urban population is also associated with problems like unemployment, growth of slum, and lack of basic facilities. The study is focused on the relationship between increases in urbanization, shortage of basic amenities and consequent growth of slum population in India.

¹ United Nations, Population Division, Department of Economic and Social Affairs, World Urbanization Prospects: The 2014 Revision

² World urbanization prospects: The 2014 revision, Department of Economic and social Affairs, United Nations.

³ United Nations, Population Division, Department of Economic and Social Affairs, World Urbanization Prospects: The 2014 Revision

⁴ Total Fertility Rate (TFR) = (sum of the Age Specific Fertility Rates * number of years in each age group)/ 1000

⁵ Baqui, A. (2009). Global Urbanization : Trends , Patterns , Determinants , and Impacts- working paper, *Johns Hopkins Bloomberg School of Public Health*, John Hopkins University, 1–42.

There is correlation between development and urbanization which attracts the people from the vicinity and lead to the influx of migrants in the existing urban areas. It happens, because economic growth brings about a relative shift in the distribution of work- force away from agriculture to industry and services and provides better opportunities in the urban areas relative to the rural counterparts.

The urbanization process involves not only an increase in concentration at a point but also multiplication of points of concentration of urban settlements. There is wide variation in urbanization among the cities of the world; there is concentration of urban population in million plus cities. In 2010 nearly 39 percent of the world urban population was living in million plus cities. In 1950, about 24 percent of urban population lived in million plus cities of the world. This would be near doubled (45%) by 2030.⁶ The same condition prevails in India. Here, Population of million plus cities rose from 18 percent to 39 percent during 2001 to 2011 and it is being estimated that it would rise up to 49 percent by 2030.⁷ This shows the concentration of population in big and mega cities of the world as there is perception behind this is that large cities provide better facilities.

Urbanization is said to be the product of rural-urban migration, industrialization and modernization and a shift from rural economy to urban economy.⁸ The share of employment of labour force is shifting from agricultural sector to manufacturing sector and tertiary sector in towns and cities. This led to increase in urban population in the country from 10.8 percent (1901) to 31.2 percent in 2011.⁹

The population of the country used to settle in those areas which provide better opportunities especially economic benefits and social infrastructure. In urban areas about 69 percent of the households live in good housing condition as compared to 45.9 percent of their rural counterparts. 70.6 percent of urban population has the access to the treated tap water with 81 percent having bathroom facility while it is only about 31 percent of the rural population with access the tap water and 25.4 percent have bathroom facility within

⁶ United Nations, Population Division, Department of Economic and Social Affairs, World Urbanization Prospects: The 2014 Revision

⁷United Nations, Population Division, Department of Economic and Social Affairs, World Urbanization Prospects: The 2014 Revision

⁸ Datta, P. (2006). Urbanisation in India. *Population Studies Unit Indian Statistical Institute*, Vol.75(June), 1–16.

⁹ Census of India, 2011

the premises. There is about universal electrification in urban areas while it is only about 55 percent in rural area.¹⁰

The migrants in the city, non-affordability to attain the better civic amenity and poor infrastructure facilities provided by the government could not assimilate the immigrants in the city leads to the slum formation. More than half the world's people live in cities: 54 percent in 2014, a proportion that is expected to increase to 66 percent by 2050, approximately a quarter of the world's urban population lives in slums.¹¹ In India, 17.4 percent of its population lives in slum which is growing at the rate of 25 percent (decadal growth rate).¹²

The slums in Indian cities predominantly created when large numbers of individuals or families move to the urban centers of their dreams, usually in search of better economic opportunities. However poor the quality of life of the urban areas may seem, from migrant slum-dwellers' perspective, living there is an entirely rational decision based on three basic factors;(1.) The productive employment opportunity in the urban centre will likely generate a higher and more consistent personal disposable income (2.) Cities offer a wider choice of education and employment opportunities, and (3.) While no parent wishes their child to grow up in a slum, the chances that the child could raise to a middle class life provides a strong incentive to migrate to one from the countryside. Unfortunately, slums are the only available way to inhabit the city for the vast majority of migrants. As of total migrants in the country about 71 percent are rural migrants who move from one area to another within the country.¹³ The coalescing of this process over decades, with successive waves of migrants and no exodus of the previous waves leads to slums growing in scale and scope. This analysis is based on the study of urbanization, basics amenities, assets and proportion of slum population in class I towns of the state of Maharashtra, West Bengal and Tamil Nadu.

¹⁰ Census of India, 2011

¹¹ United Habitat,2014

¹² Primary Census Abstract, Census of India,2011

¹³ Census of India,2001

1.2 Study Area

In India urbanization is taking place at a rapid pace. In the country, urbanization is flourishing along with several challenges with them. Some of them are being taken into account for the analysis like concentration of population in several metropolitan regions of the country, lack of basic amenities, growth of slum population etc. Three states of the country are being taken for this study namely, Maharashtra, Tamil Nadu and West Bengal. These states are the home of large part of urban as well as slum population of the country. About 37 percent of the total slum population of the country resides in these 3 states. All the three states are coastal states and having long colonial past. They also have the three Princely towns of colonial period namely: Bombay, Madras and Calcutta. Bombay and Calcutta were the important trading ports during the colonial period when industrialization takes place in India.¹⁴ These cities have give rise to primacy which is being accentuated over period of time. Even the first local urban body called a Municipal Corporation was set up in Madras in 1688 and was followed by the establishment of similar corporations in Bombay and Calcutta in 1762.¹⁵

How they act in different situation is being tried to capture here.

1.2.1 Maharashtra is a state in the western region of India and is the nations and also the world's second most populous sub-national entity with over 110 million inhabitants and its capital, Mumbai, has a population of approximately 18 million. Maharashtra is one of the wealthiest states in India, contributing 25% of the country's industrial output and 23.2% of its GDP (2010–11).¹⁶

According to the census of India, 2011, Maharashtra is the second most populous state in India with 9.28 percent population of India. The total population growth in 2011 was 15.99 percent while in the previous decade it was 22.57 percent. For the first time, in the year 2011, it was found to be lower than the national average. 55 percent of the state's population to be rural with 45 percent is being urban with 10.36 percent rural population growth while urban population growth is much higher that is about 24 percent. This indicates that the rural populations of the state will soon over ruled by the urban

¹⁴ NCERT(2005), India and the Contemporary World-II, Chapter-5- The Age of Industrailisation, 103-126.

¹⁵ Savage, D.and Dasgupta S., (2006). *Governance Framework for Delivery of Urban* , India Infrastructure Report, 1-17

¹⁶ Reserve bank of India

population. And of this urban population 77 percent urban population have shelters in class I towns of the state which is the home of about 35 percent of total population of the state.

Maharashtra is the home of one of the largest slum population of the world. Dharavi in Mumbai is quoted as the Asia's largest slum.¹⁷ About 18 percent of India's slum population have shelter in Maharashtra. So this state has been chosen to see the causes of the slum formation and what could be the policy implications to reduce the slum in the state.

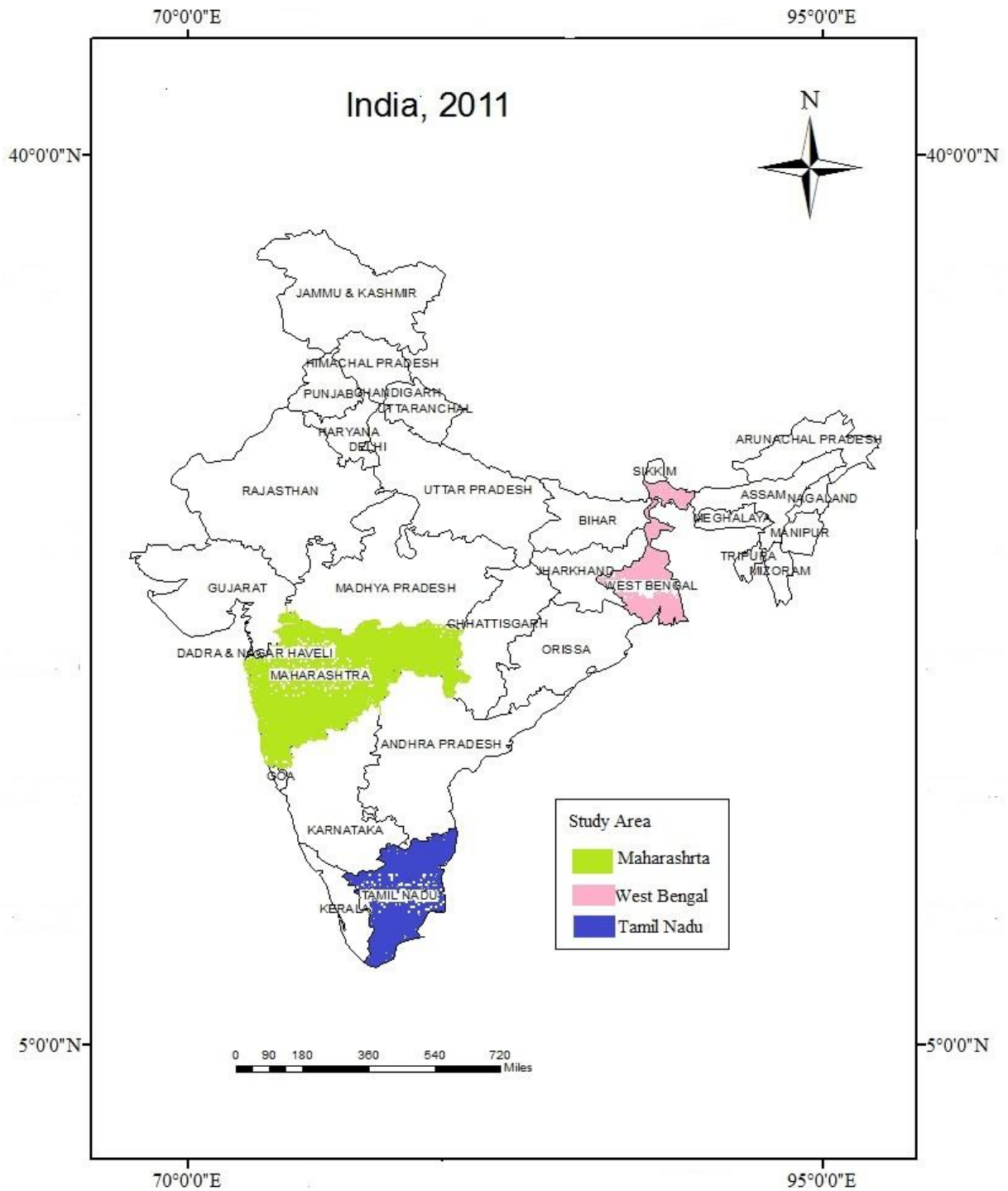
1.2.2 West Bengal is a state in eastern India and is the nation's fourth most populous state, with over 91 million inhabitants, spread over 88,750 km². According to the provisional results of the 2011 census, West Bengal is the fourth most populous state in India with a 7.55% of India's population. This state remains a predominant rural society as its 68 percent population lives in rural area. About 60 percent of state's urban population lives in class I towns and of this urban population about 26 percent population lives only in Kolkata.¹⁸ The state's 2001–2011 decennial growth rates was 13.93%, lower than the national growth rate of 17.64% but there is wide variation in the growth rate of urban (approx.30%) and rural population (approx.8%). In West Bengal about 9.8 percent of slum population of the country lives which is the third largest share of slum population of India.

1.2.3 Tamil Nadu lies in the southernmost part of the Indian Peninsula and is bordered by the union territory of Puducherry and the south Indian states of Kerala, Karnataka, and Andhra Pradesh. Tamil Nadu is the eleventh largest state in India by area and the sixth most populous state. 48 percent of the state's population lives in urban areas with the decennial growth of 27 percent. In this state, about 49 percent of urban population lives in class I towns of the state which is lower than the other two states, this signifies that in this state, concentration of population in class I towns is less than the other two state but the element of the primacy is also there.

¹⁷ Marx, B., Stoker, T., and Suri, T. (2013). The Economics of Slums in the Developing World The Economics of Slums in the Developing World +. *Journal of Economic Perspectives*, Vol. 27(4), 187–210.

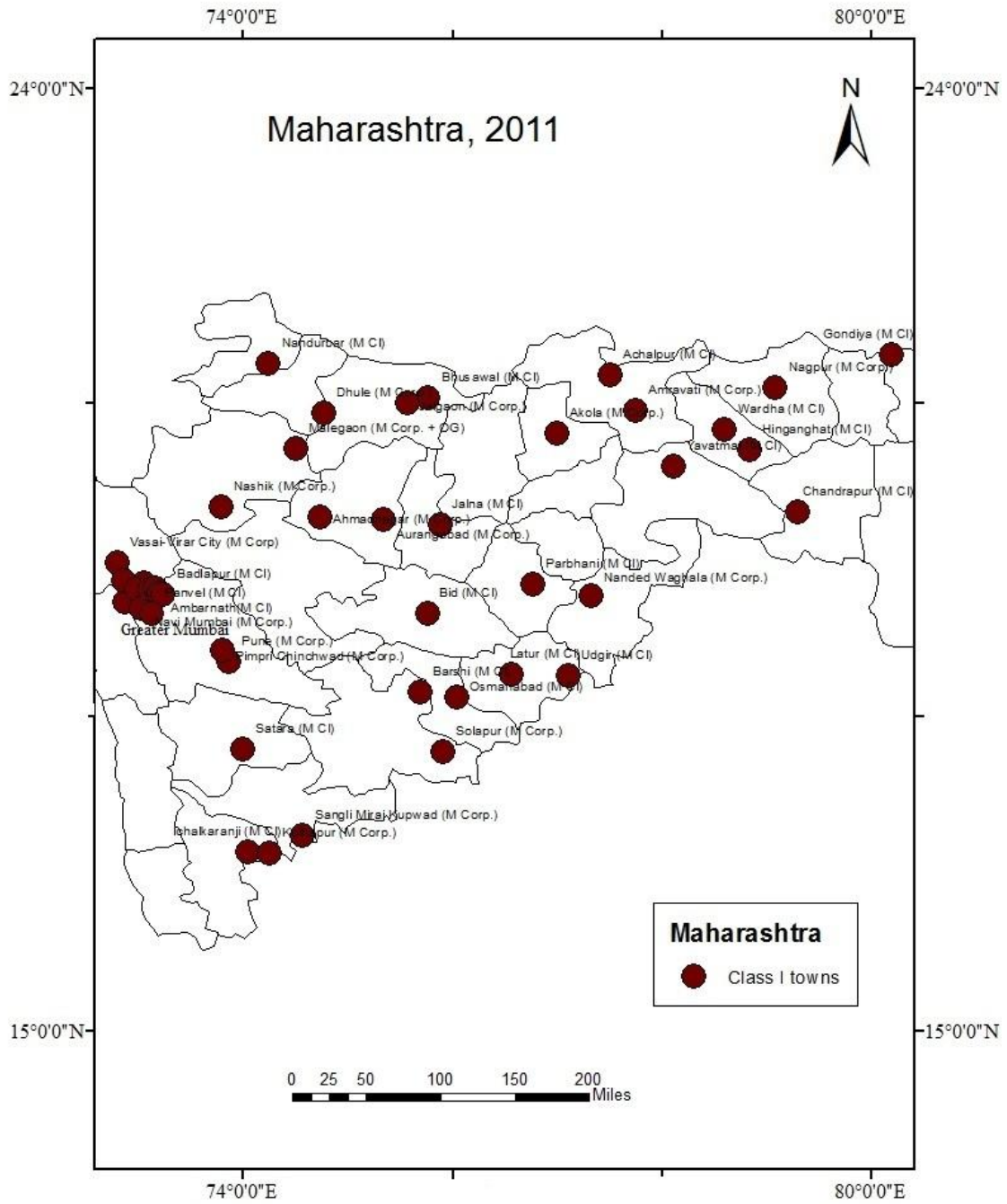
¹⁸ Census of India, 2011

Map 1.1 Location of Study Area in India



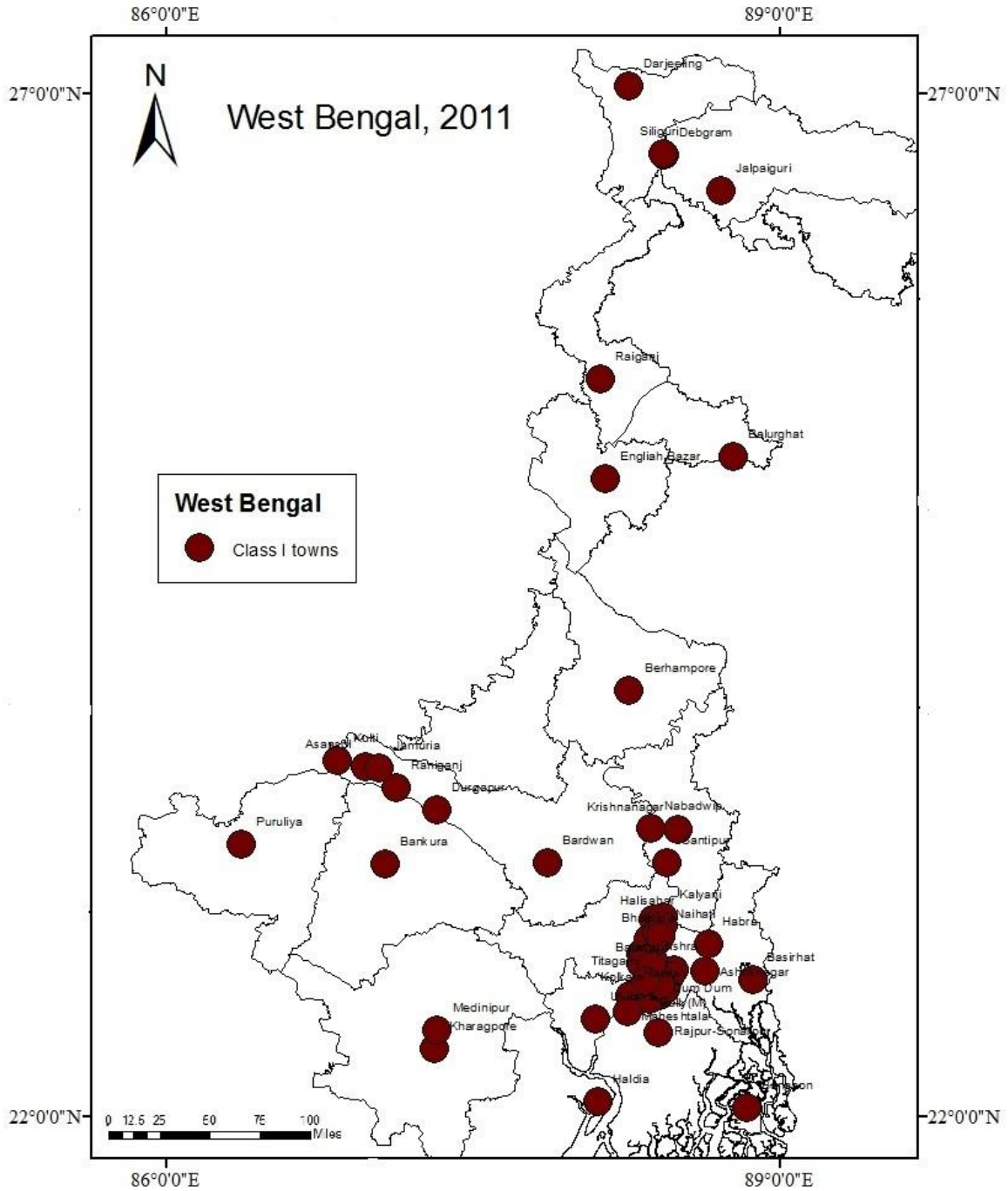
Source; Census of India, 2011

Map 1.2 Location of class I towns of Maharashtra



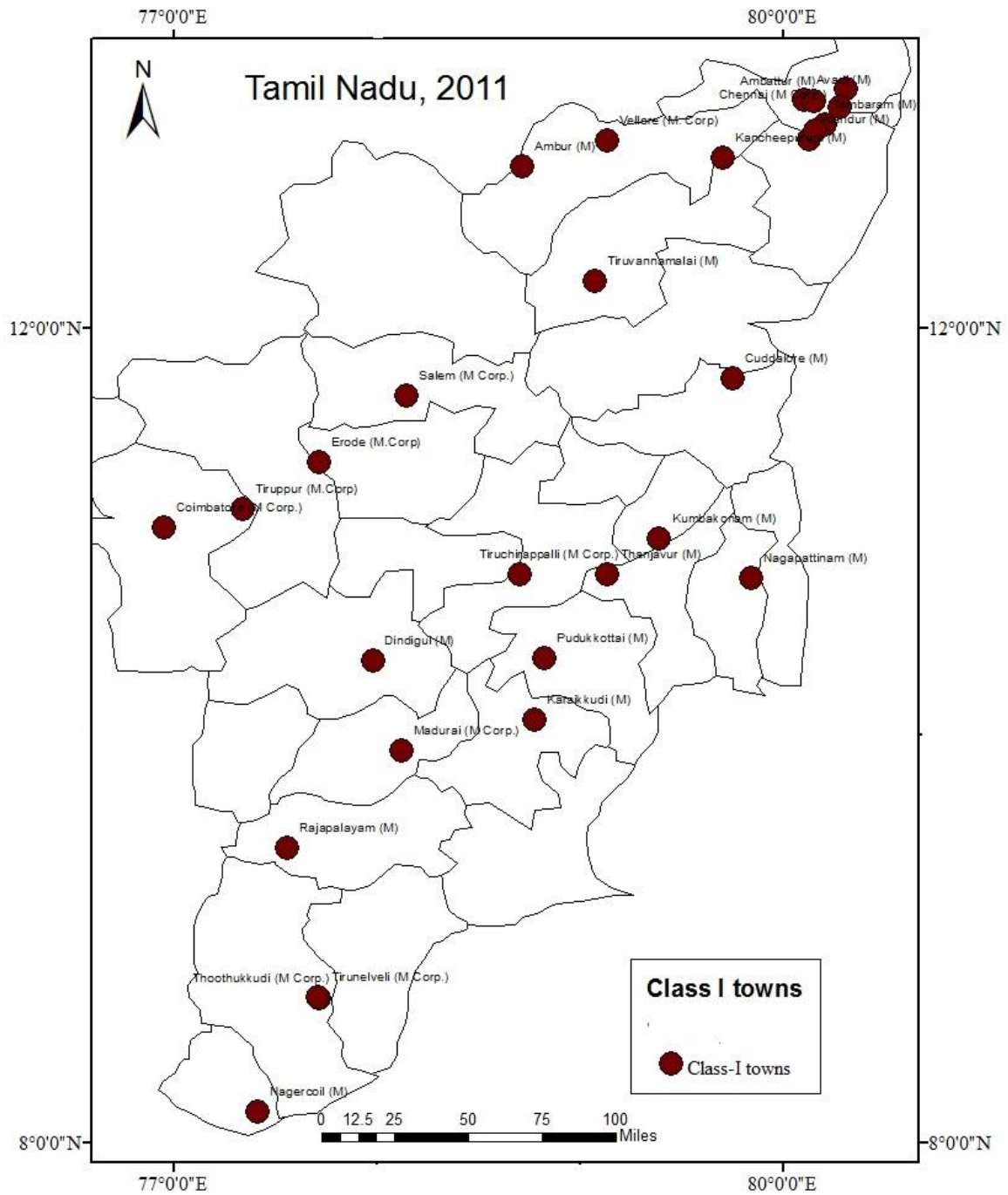
Source; Census of India, 2011

Map 1.3 Location of class I towns of West Bengal



Source: Census of India, 2011

Map 1.4 Location of class I towns of Tamil Nadu



Source; Census of India, 2011

1.3 Review of Literature:

There is abundance of literature available to analyze the urbanization, growth of urban centers, concentration of population in some big and mega cities, problems in urban areas; migration, reasons for migration, problem associated with the migration; slum, slum formation, effects of slums, how slum and urbanization is interrelated; migration to the urban areas, the problem of slum in urban areas and many related issues. Here the process of urbanization and slum is being discussed with the help of the available literature.

The early works were mainly focused on the process of urbanization and economic development. It became pass formation that was placed as the main cause of urbanization along with process like rural-urban shift of the population, occupational shift from agricultural to non agricultural and land use shift from agricultural to non agricultural. With time literature addressing the challenges those emerge due to urbanization and associated problems with the urban growth like; lack of basic facilities to the households of the urban areas, increasing crimes in the urbanization, unemployment, squatter, slum, etc.

1.3.1 Urbanization

Geographers use the term urbanization more commonly to refer to a process of transformation while urban is refer to the area where people engaged in non-farm activities. Urban area includes Statuary towns, Census towns and out growths. Census of India recognizes all those places as urban with municipality, corporation or cantonment or Notified Town area. And all those place which have population above 5000 with the density of over 400 square kilometer where about three fourth of the population engaged in non-agricultural activities. It has been suggested that there is structural and demographic change in the society. The structural aspect of the process refers to the change in economic structure of the economic activities of the population as a product of increasing specialization and advancing technology. The demographic aspect refers to the process of population concentration.

Urbanization is the process of change and its consequences, when a society gets transformed from an agrarian economy to an industrial economy and from a small

homogeneous society to a large heterogeneous society. This process of urbanization includes two components: one is increase in the number of people residing in urban areas or we can say contributing to form the urban areas and other is the shift in employment sector from agricultural to nonfarm activities.¹⁹ Urbanization, a process of city establishment and growth, is fast becoming the defining process in shaping the course of demographic, economic and social transformation of a nation.²⁰ As urbanization is a process even we can say a continuous process, where population dynamics changes. Most of the literature emphasis the process of urbanization is change in the demography and economy and there is relationship between economic growth and urbanization.²¹

The world is undergoing the largest wave of urban growth in history. Most of the new growth will occur in smaller towns and cities, which have fewer resources to respond to the magnitude of the change. In the early phase of urbanization, industrialization played an important role. There is interrelationship between industrialization and urbanization.²² As the rural economy develops, improvement in agriculture productivity which enhances the production and surplus of labour occur. This release of surplus labour induced in the other sector (manufacturing and service sector) of the economy²³ which is more remunerative and provides better economic opportunities.

The other argument would be that agricultural activity would be less remunerative and people wants to earn better living and shift from agriculture to other activity which lead to shift of mob from rural areas to urban centers.²⁴ As the urban centers provide better living condition like better facility of transportation, the efficiency of the city is not limited to the economic sphere and also makes possible a greater accumulation of capital

¹⁹ Khan, A. (1982). Rural-Urban Migration and Urbanization in Bangladesh. *Geographical Review*, Vol.34(2), 175–195

²⁰ Firdaus G. (2012). Urbanisation, emerging slums and increasing health problems: a challenge before the nation: an empirical study with reference to state of uttar Pradesh in Nigeria. *Environmental Research and Management*, Vol.3(9), 0146–0152

²¹ Stockwell, E. G., Laidlaw, K. A., (1980). A Note on the Association between Urbanization and Development in the Third World. *International Review of Modern Sociology*, Vol.10(1), 1–13

²² Golden, K. D. and H. H. (1954). Urbanization and the Development of Pre-Industrial Areas. *Economic Development and Cultural Change*, Vol.3(1), 6–26.

²³ Reiss, A. J. (1954). Economic Growth and the Rate of Urbanization : A Comment on the Paper by Davis and Golden Source : Economic Development and Cultural Change , *Economic Development and Cultural Change*, Vol. 3(1), 27–29.

²⁴ Davis, K. (1975). Asia ' s Cities : Problems and Options. *Population and Development Review*, Vol.1(1), 71–86.

and personnel for purpose of formal education, public health, science, art, etc.²⁵ In the initial years of urbanization migration was a major contributing factor to the urban growth. Settlement is a kind of evolving process began with the shift from nomadic life to sedentary lifestyle with the advent of agriculture. Then surplus from agriculture start the advent of trade and gradually urban settlement came up with better facilities.

Economic development is the most important determinant of urbanization and urban growth in the world, whether for developed nation or developing countries.²⁶ In developing countries, the process of urbanization is different from the industrial countries on two counts: one, the process of urbanization in these countries had a late start as most of the countries of the third world were the colonies of the western world and development process in these countries depends on the adopted policies and strategies of colonial masters. Urbanization in less developed regions is at rapid pace; higher annual average rate of increase than one experienced by the developed countries.²⁷

The technological advancement is at higher level in the current scenario. To compete in the international market and to catch up the world's level of urbanization, the cities have to develop at a greater rate. The rapid urbanization in many of the developing countries is accompanied by the concentration of urban population in very large cities. As the development is related with the industrialization and industrial development was localized because of the infrastructure availability at those centers.²⁸ Industries established in those areas where raw material and cheap labour were easily available. Industries flourish in urban centers along with the improvement in transportation, appropriate institutions like banking facilities, pool of skilled technocrats. Agglomeration economies are conditional on the existence of a pooled labour market, backward and forward linkages among firms, and knowledge spillovers.²⁹ Given

²⁵ Golden, K. D. and H. H. (1954). Urbanization and the Development of Pre-Industrial Areas. *Economic Development and Cultural Change*, Vol.3(1), 6–26.

²⁶ Firebaugh, G. (1979). Structural Determinants of Urbanization in Asia and Latin America, 1950- 1970. *American Sociological Review*, Vol.44(2), 199–215.

²⁷ Cohen, B. (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society*, Vol.28(1-2), 63–80.

²⁸ Henderson, V. (2002). Urbanization in Developing Countries. *The World Bank Research Observer*, Vol.17(1), 89–112.

²⁹ Organisation for Economic Co-operation and Development, (2009). *Trends in Urbanisation and Urban Policies in OECD Countries: What Lessons for China*, Report by China development Research Foundation, 1-219.

proximity, access to information, and economies of scale, investments in institutions, governance, citizen engagement, and infrastructure are mutually reinforcing in cities.³⁰

1.3.1.1 Urbanization in India:

As the criteria of Census of India to declare a region rural or urban is the settlement having population above 5000 person with 75 percent of male workers engaged in non agricultural activities and population density should be of 400 square kilometers.

The history of urbanization in India is quite old as towns and urban places flourished even in the Indus Valley around 2800 B.C. Urbanization in India during the ancient and medieval periods was associated with the seats of administrations, religious and trading centers. After the arrival of the Europeans in India, rate of urbanization was accelerated mainly because of commercial activities and also the location and establishment of modern factories and industries. The natural increase of the urban population along with the migrants intensifies the urban growth in India.³¹ In most of the third world countries, rural to urban migration is the principal component of rapid growth of urban population.³²

There is inter-relationship between migration, urbanization and development.

The Indian urbanization is of subsistence nature. It implies that the migrants from rural areas are attracted to the urban centers not for urban environment but for employment.³³

In general perception, cities offer a more favourable setting for the resolution of social and environmental problems than rural areas. Cities generate jobs and income. After independence, the policy makers emphasis on the industrial development of the country to move on the higher ladder of the economy. Some heavy industries were set up in those areas where raw material and cheap labour was available, with the advent of better transport linkages it's not a hurdle as a factor of production.³⁴ These industries (like iron and steel industry, engineering industry, fertilizer and chemical industry) were set up to reduced the cost of production and along with these industries many ancillary industry (like packaging industries, processing and finishing industries, etc.) established which

³⁰ United States Agency International Development, (2013) *Sustainable Service Delivery in an Increasingly Urbanized World*, Washington D.C. 1-48

³¹ Turner, R. (1961). The Future of Indian Cities. *Asian Survey*, Vol.1(1), 29–37.

³² Khan, A. A.-M. (1982). Rural-Urban Migration and Urbanization in Bangladesh. *Geographical Review*, Vol.34(2), 175–195.

³³ Census of India, 2001, also marriage or joining family as cause of migration

³⁴ Major factor of production- land, labour, capital and Transportation cost was added by the Max Weber

provided employment to the labour of the origin place as well as invited the influx of the nearby population and act as growth pole.³⁵ There would be localization of business within the growth poles which led to the rise of concentration of population in some centers which attracts more and more job hunger commuters.³⁶ Many towns and cities emerged in India as a result of industrialization for example Jamshedpur urban agglomeration in the state of Jharkhand emerged because of the Tata Iron and Steel industry established there. Growth of urbanization is mainly due to rural- urban migration.³⁷

With good governance, they can deliver education, health care and other services more efficiently than less densely settled areas simply because of their advantages of scale and proximity. Cities also present opportunities for social mobilization and higher work participation of women in tertiary sector. The challenge for the next few decades is learning how to exploit the possibilities urbanization offers. Urbanization comes up with its own shortcomings and several challenges.³⁸

The Indian urbanization has poly-metropolitan apex in which cities dominate the entire urban scheme accounting for one-third of the India's total urban population. The big cities of India are exploding their population while the small towns are stagnating (appendix-1); there is trend towards metropolitan pattern of urban population growth.³⁹ In 1901, about 78 percent of the country's urban population was living in towns, having a population of less than 1 lakh while in 2011; about 39 percent of the country's urban population lived in such towns.

Large cities are usually dynamic, growing centers for modern production and industry, financial services, internal commerce and foreign trade, education and government. That is why cities are more efficient than smaller places in production, economic growth and contributing to higher incomes. Therefore, there is rapid growth of large cities in the

³⁵ Growth Pole concept given by Francois Perroux in 1949

³⁶ Bondaruk, V. komarovskiy and V. (2013). The Role of the Concept of “ Growth Poles ” for Regional Development. *Public Administration, Finance and Law*, (4), 31–42.

³⁷ Souza, V. S. D. (1984). Urbanization as A Perspective for Social and Historical Analysis in Developing Societies. *Sociological Bulletin*, Vol.33(1), 91–98.

³⁸ Breese, G. (1963). Urban Development Problems in India. *Annals of the Association of American Geographers*, Vol.53(3), 253–265.

³⁹ Sharma, M. S. (1975). City Size and Costs. *India International Centre Quarterly*, Vol.2(2), 101–110

country.⁴⁰ In India towns have been classified into six categories that is class I towns having population more than 1 lakh, class II towns with the population in between 50,000 to 1,00,000, class III towns- 20,000 to 50,000, class IV towns-10,000 to 20,000, class- V towns- 5000 to 10000 and class- VI towns of the below 5000 population.⁴¹ This means that the regions having population above five thousand is considered to be a town or we can say urban area with other cities. But there is huge variation across the various classes of towns. In India, there is concentration of population in class I towns of the country,⁴² class I towns are expanding at the cost of small cities.⁴³ As in 1901, there was 21.68 percent population living in class I towns which had increased to 60.79 percent in 2011.⁴⁴ We can see that class I towns are expanding while smaller towns are converging in terms of population counts.

As the economy develops, there is an increase in the per capita income and also in demand for non-farm goods in the economy. These goods are not heavily land-dependent and use more of other factors of production, especially labour and capital. They are cheaper if produced in the urban sector of the economy, since urban settlements enjoy economies of agglomeration in manufacturing, services and provision of infrastructure. The urban centers utilize the surplus of the produce of countryside and rural sector consume the services and finished products provided by the urban settings.⁴⁵ Economic growth influences the rate of urbanization, while urbanization in turn, affects the rate at which the economy grows. As the country urbanizes, the share of national income that originates in the urban sector also increases.

Urbanization brings in the wake of number of challenges such as rapid population growth in urban settlements, which is cited as the biggest challenge in most literature on this

⁴⁰ Stockwell, E. G., Laidlaw, K. A., Stockwell, E. G., & Laidlaw, K. A. (1980). A Note on the Association between Urbanization and Development in the Third World. *International Review of Modern Sociology*, Vol.10(1), 1–13

⁴¹ Census of India, 2011

⁴² Chaudhuri, S. (1999). Urbanization and Identity : Emerging Situation in Indian Metropolises. *Indian Anthropological Association*, Vol.29(2), 37–66.

⁴³ Chatterjee, M. (2012). Regional Variation in Urbanisation in India and the Emergence of New Towns- working paper- Centre for Urban Economic Studies Department of Economics, University of Calcutta, 1-19

⁴⁴ Census of India

⁴⁵ Souza, V. S. D. (1984). *Urbanization as a Perspective for Social and Historical Analysis in Developing Societies*, Sociological Bulletin, Vol.33 (1), 91–98

subject.⁴⁶ This is a consequence of births exceeding deaths, migration of rural population to urban centre and also the classification of rural settlements as towns. Apart from growing population, there are other challenges too. The first set of challenges relates to the inadequate growth of formal employment, resulting in the growth of the urban informal sector, open urban unemployment and underemployment. The second set of challenges arises out of the inability of the urban physical and social infrastructure to grow in step with population, resulting in the deterioration of the quality of urban life and this leads to the formation of slum in urban areas. Urbanization along with the problems sometime is called as pseudo urbanization as in cities urban infrastructure lagged behind the economic development and there is prevalence of poverty, inadequate supply of housing, treated water facility, transportation, etc.⁴⁷ Improvement in sanitation is a major challenge in the developing world simultaneously garbage collection, waste management, recycling policies are becoming a hurdle in the growth of urban setting with the deteriorating environment.⁴⁸

Urbanization and industrialization acts as the suction pumps which attract the people from deprive areas to develop areas or we can say that from less develop to more develop region.⁴⁹ Urbanization in developing world is unprecedented, and in coming few years

⁴⁶ Breese, G. (1963). Urban Development Problems in India. *Annals of the Association of American Geographers*, Vol.53(3), 253–265

Cohen, B. (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society*, Vol.28(1-2), 63–80

Davis, K. (1975). Asia ' s Cities : Problems and Options. *Population and Development Review*, Vol.1(1), 71–86

Hansen, N. M. (1973). Urbanism and Regional Disparities in Developed. *Review of Social Economy*, Vol.31(1), 54–65

Reiss, A. J. (1954). Economic Growth and the Rate of Urbanization : A Comment on the Paper by Davis and Golden Source : Economic Development and Cultural Change , *Economic Development and Cultural Change*, Vol. 3(1), 27–29

Wheaton, W. C., & Shishido, H. (1981). Urban Concentration, Agglomeration Economies, and the Level of Economic Development. *Economic Development and Cultural Change*, Vol.30(1), 17

Yungang Liu, Z. L. and J. J. (2014). Pseudo-urbanization Mergence or Real China ' s Regions Province City , Guangdong and Its Effects : A Case Study of. *China Review*, Vol.14(1), 37–59

⁴⁷ Yungang Liu, Z. L. and J. J. (2014). Pseudo-urbanization Mergence or Real China ' s Regions Province City , Guangdong and Its Effects : A Case Study of. *China Review*, Vol.14(1), 37–59

⁴⁸ Cohen, B. (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society*, Vol.28(1-2), 63–80

⁴⁹ Tacoli, C. (2015). Rural-urban migration and urban poverty, UK All-Party Parliamentary Group (APPG) on Population , Development and Reproductive Health on population dynamics in the post-2015 development agenda, 1–7

the number of urban dwellers is expected to exceed rural dwellers.⁵⁰ This population in urban centers brings in several challenges along with them. One would be that, there is trend of increasing concentration of population in class I towns of the country.⁵¹

In India, due to unprecedented and unplanned urbanization the slum areas in urban society are rapidly increasing posing serious threat to sustainable development of the country.⁵²

1.3.2 Amenities and Assets in urban areas

Amenities are the things and conditions of living to lead the life comfortably.⁵³ Amenity could be classified in two categories; natural amenity and human made amenity. Natural Amenity is the natural environment conditions provided to enhance the location of the settlement of population.⁵⁴ These are the physical attributes of the nature like resources available in the nature. The history convey us that the civilizations flourished in those areas which provide favourable natural settings to settle down and start the development activities. People have to confine near hilly regions, they were dependent on the weapons and tools made of stones.⁵⁵ Agriculture started near the river valleys as the basic need of agriculture was fertile soil and water. Industries settled and get concentrated near the raw material availability and then near markets. Natural amenity provide resources to develop the human amenity, humans have the skills to make the resources useful for them.

Human amenities includes social and physical infrastructure. Health care, education, social security, recreation, innovation, etc. constitutes the social infrastructure while physical infrastructure includes housing, transportation, sanitation, waste management, water facility, financial institutions etc. Human amenity is the driving force of the

⁵⁰ Puga, D. (1996). Urbanisation patterns : European vs . less developed countries, *Centre for Economic Performance*, 1–29

⁵¹ Dyson, N. C. (1982). Urbanization in India: Results of the 1981 Census. *Population and Development Review*, Vol.8 (1), 145-155

⁵² Firdaus G. (2012). Urbanisation, emerging slums and increasing health problems: a challenge before the nation: an empirical study with reference to state of uttar Pradesh in Nigeria. *Environmental Research and Management*, Vol.3(9), 0146–0152

⁵³ Cambridge Dictionary

⁵⁴ Henderson, J. R., and Mcdaniel, K. (2005). Natural Amenities and Rural Employment Growth : A Sector Analysis. *The Review of Regional Studies*, Vol.35(1), 80–96.

⁵⁵ Ram, S.S.(2004), Ancient India, NCERT, 11-224

community.⁵⁶ Availability of amenities in the urban areas have the impact on business location decisions of the entrepreneur which influence the migration pattern of the country and growth and development of urban areas. This apparently influence the household decision to move from one place to another which provide better facility⁵⁷ and are of more promising of economic gains.

The development of amenities in the urban areas has great disparity in distribution⁵⁸ which has great implications on the concentration of urban population. Infrastructure (social as well as physical) effect the level of income, employment, housing prices, land development.⁵⁹ Better infrastructure leads to more jobs, higher income, and more developments which attract more and more people in the vicinity of the area. As it has been quoted by Dr. V. K. R. V. Rao (1980s)-

*“The link between infrastructure and economic development is not a once and for all affair. It is a continuous process; and progress in development has to be preceded, accompanied, and followed by progress in infrastructure, if we are to fulfill our declared objectives of generating a self-accelerating process of economic development.”*⁶⁰

India is one of the most prominent developing countries of the world and is one of the fastest growing economies in the world. It could unleash its full potentials, provided it improves the infrastructure facilities, which are at present not sufficient to meet the growing demand of the economy.⁶¹ Indian economy had placed the importance on the transport facility which was the backbone of the industrial development. Then shift was there to housing condition, electricity, irrigation, urban and rural water supply, and

⁵⁶ Regional Asset Indicators: Human Amenities (2006), Report-Center for the Study of Rural America Federal Reserve Bank of Kansas City, 1-57

⁵⁷ Vicente R., Rosina M. and Esther V. (2007) Is the influence of quality of life on urban growth non-stationary in space? A case study of Barcelona- working paper, Institute de Recerca en Economia Aplicada,1-15

⁵⁸ Kundu, A., Bagchi, S., & Kundu, D. (1999). Regional Distribution Amenities of in Infrastructure and Urban Basic Issues Concerning Empowerment of Local Bodies. *Economic and Political Weekly*, Vol.34(28), 1893–1906.

⁵⁹ Gopinath, Wu, J. and M. (2006). *Amenities , Infrastructure , and Spatial Variations in Economic Development in the United States*,1-37

⁶⁰ Montgomery, E. (2008), Infrastructure in India: A vast land of construction opportunity- working paper- PricewaterhouseCoopers, 1-24

⁶¹ De, P. (2008), ‘Infrastructure Development in India’, in Kumar, N. (ed.), International Infrastructure Development in East Asia – Towards Balanced Regional Development and Integration, ERIA Research Project Report 2007-2, Chiba,105-130

sanitation.⁶² Lack of these facilities results in the poor quality of living, and act as a breeding ground for the growth of slum. The access to basic amenities like electricity, drinking water, toilet facility, wastewater outlet and clean fuel are critical determinants of quality of urbanization.⁶³ Quality of life has suffered in urban centers not only due to migration but more so due to expanding gap between the demands and supply of necessary services and other infrastructure facilities.⁶⁴ In spite of faster growth rate of economic development in the country full coverage of the urban population in terms of access to good housing condition, safe drinking water, toilet facility, sewerage, waste management, and electricity connection remains a major challenge in India.⁶⁵ It has been observed that the bigger towns/cities enjoyed better infrastructure facilities than that of small and medium towns.⁶⁶ This may be one of the reasons for the concentration of population in metro and mega cities.

While assets are identified as the stock of financial, human, natural or social resources that can be acquired, developed, improved and transferred across generations.⁶⁷ On these assets there is control of community to lead a comfortable and smooth life.⁶⁸ To analyze the effect of assets availability on the quality of life, asset index have been used by different scholars. An asset index is any composite indicator such that the underlying indicators on which it is based reflect an individual's, or more often a household's, ownership (or lack thereof) of a range of assets, with the latter understood in a broad sense. Asset Index is also known as wealth index as the assets available to the households and are their personal belonging and their part of their property. So assets are the wealth of the households. These assets have the implication on the living standard of the people.

⁶² Nataraj, G. (2012), Infrastructure Challenges in India: The Role of Public-Private Partnerships-draft paper, Research Foundation, New Delhi, 1-22

⁶³ Bhagat, R. B. (2011). Emmerging Pattern of Urbanisation in India. *Economic and Political Weekly*, Vol. 46(34), 10–12.

⁶⁴ Mundu, G. B., & Bhagat, R. B. (2009). Slum Conditions in Mumbai with Reference to the Access of Civic Amenities, Vol.5(October), 1–18.

⁶⁵ Shaw, A. (2007). Basic Amenities in Urban India: Analysis at State and Town Level. *Indian Institute of Management Calcutta Working Paper Series*, (692), 1–33.

⁶⁶ Bhagat, R. B. (2011). Emmerging Pattern of Urbanisation in India. *Economic and Political Weekly*, Vol. 46(34), 10–12.

⁶⁷ Moser, C. O. N. (2006). Asset-based Approaches to Poverty Reduction in a Globalized Context, *Program*, 1-40

⁶⁸ Anonymous, Building Assets To Reduce Poverty and Injustice(2002), Report, Ford Foundation, 1-29

It has been observed that there is lack of assets in the urban areas and growing slum population.

1.3.3 Slums

Increasing urbanization is emerging as most pervasive and dominant challenge facing our country. The majority of the low income community lives in slum and squatter settlements, in inhuman conditions in the absence of basic civic amenities.⁶⁹ Rural migrants first move from the province to the city center - location at any price - to find jobs; then, with employment security, they move to the periphery, where ownership is attainable.⁷⁰ There are multiple linkages between urbanization, migration, poverty and slum formation; each can act to drive or prevent the others, and each can influence the outcomes of the others.

Migration can be a reaction to severe poverty, or a chosen livelihood strategy to improve upon household wealth and used to move to the urban areas but could not afford to have the proper housing and facility and could not attain better living condition as they have no choice and ultimately leads to the slum formation.⁷¹ They mingle with the slum population as there they could get affordable house and have to live in poor living condition, to survive they have to acclimatize in these condition as they profound that their previous condition is much worse than that of the present, living in slum. Slum is of with two types of notions: slum of hope and slum despair. Slum of hope is the place of more and more in-migrants where people come with the hope to attain the job and try to escalate on the development grounds. While slum of despair are those regions where most of the people live with poor living conditions with poor earnings but with no other option.⁷² The formation of slum is the inevitable part of rapid urbanization.

⁶⁹ Pronab Sen, P.K.Mohanty, J.Dash, C. C. (2010). Report of the Committee on Slum Statistics / Census, NBO,MoHUPA, Government of India New Delhi, 1-74

⁷⁰ Turner J. (1968), Housing Priorities, Settlement Patterns and Urban Development in Modernizing Countries, *Journal of the American Institute of Planners*, Vol.34, 354-363
Turner J. (1976), *Ecological Building: Housing by People towards Autonomy in Building Environments*, Pantheon Books, New York, 1-177.

⁷¹ Awumbila, M., Owusu, G., & Teye, J. K. (2014). Can Rural-Urban Migration into Slums Reduce Poverty? Evidence from Ghana-working paper, Centre for Migration Studies (CMS) at the University of Ghana, (April), 1-41

⁷² Stokes, C. J. (1962). A Theory of Slums. *Land Economics*, Vol.38(3), 187-197

1.3.3.1 Definitions of Slum

Defining slums raises several conceptual issues, making it difficult to precisely estimate the poor and slum population living in urban areas. Concepts and definitions of slums vary from country to country. Even in the same country, slum settlements may be known by different names.

In 2002, the United Nations operationally defined slums as communities characterized by insecure residential status, poor structural quality of housing, overcrowding, and inadequate access to safe water, sanitation, and other infrastructure.⁷³ There are different definitions of slum, some are as follows:

Census 2001

- For the first time in Census 2001, slum areas were earmarked across the country, particularly, in cities and towns having population of 50,000 or above in 1991 Census.
- Subsequently, the slum data was culled out also for towns with 20,000 to 49,999 population in 2001 and statutory towns having population less than 50,000 in 1991 but reported a more than 50,000 populations in 2001 and were not considered for carving slum EBs earlier.

Census 2011

- Slums have been earmarked in all the statutory towns irrespective of their population size based on the same definition as in 2001.
- Three types of slums have been defined in Census, namely, **Notified, Recognized and Identified**, are defined as follows:-
 - i. All notified areas in a town or city notified as “Slum” by State, Union territories Administration or Local Government under any Act including a ”Slums Act” may be considered as ***Notified Slums***
 - ii. All areas recognized as “Slum” by State, Union territories Administration or Local Government, Housing and slum Boards, which may have not been formally notified as slum under an act may be considered as ***Recognized Slums***.

⁷³ United Nations Human Settlements Program, 2003

A compact area of at least 300 population or about 60-70 households or poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities. Such areas should be identified personally by the Charge Officer and also inspected by an officer nominated by Directorate of Census Operations. This fact must be duly recorded in the charge register. Such areas may be considered as ***Identified Slums***.

The NSSO, in 1976-77 defined **slum** as declared and undeclared slums. The declared slums were areas which have been formally declared as slum by the respective municipalities, corporations, local bodies or the development authorities. The undeclared slums were defined as “an aerial unit having twenty five or more Katcha structures mostly of temporary nature, or inhabited by persons with practically no private latrine and inadequate public latrine and water. **In 1993 and 2002, NSSO** adopted the definition of slums as “A slum is a compact settlement with a collection of poorly built tenements, mostly of temporary nature, crowded together usually with inadequate sanitary and drinking water facilities in unhygienic conditions. Such an area, for the purpose of this survey, was considered as “*non notified slum*” if at least 20 households lived in that area. Areas notified as slums by the respective municipalities, corporations, local bodies or development authorities are treated as “*notified slums*”.

Registrar of India recognizes the slum areas with 60 to 70 households while NSSO takes into account 20 households with dilapidated conditions. This shows that Census of India covers a large population within the ambit of slum population.

UN-HABITAT defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following:

- Durable housing of a permanent nature that protects against extreme climate conditions.
- Sufficient living space which means not more than three people sharing the same room.
- Easy access to safe water in sufficient amounts at an affordable price.
- Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people.
- Security of tenure that prevents forced evictions.

Sociologist takes into account the conditions of the living standard of the people living in the urban areas. Poor living conditions with lack of basic facilities in houses and poor health conditions prevails in slum.⁷⁴ There is absence of or we can say lack of facilities like bathroom facility, latrine facility, drainage system, and lightning facility. There is prevalence of congestion and over-crowding.

All these definitions suggest that slum is all about the living conditions (including housing conditions, access of amenities, social security, institutions, etc.) of the urban population that is dynamic and ever changing. Slums are characterized by high concentrations of population, heterogeneous and ethnically multiracial population, largely inhabited by poor and socially weaker.⁷⁵ People move from one condition to other, when people move from low income to high income, they also shifts from poor condition to better conditions. Not all slums are homogeneous and not all slum dwellers suffer from the same degree of deprivation. The degree of deprivation depends on how many of the five conditions that define slums are prevalent within a slum household.

The legal definition of slums in India, however, differs from state to state according to the socio-economic culture of the slum that is dilapidated condition and low standard of living.⁷⁶ All notified slums are considered to be legal slums, which tend to be of a permanent nature. The municipal body is expected to provide all civic services to such areas. However, the slums included under category (iii) of the census are mostly non-notified slums and are inhabited by mainly temporary migrants, such as construction workers or other temporary workers, or new rural migrants who find it extremely difficult to get any formal housing within their paying capacity. These are called non-notified

⁷⁴ Desai A. R, 1972, Profile of an Indian slum, *Mittal Publication*, New Delhi, 1-19

Doshi Harish, 1990, Nagar Samajshastra, *University Granth Nirman Board*, Ahmedabad

Fairchild H. P, 1958, Dictionary of Sociology, *Philosophy of Michigan*, U.S.A.

http://books.google.co.in/books/about/Dictionary_of_Sociology_Edited_by_H_P_Fa.html?id=8x8cMwEACAAJ&redir_esc=y access on June – July, 2011

Macionis. J. J, 2006, Sociology – Tenth Edition, *Pearson Education*, Dorling Kindersley, New Jersey, 559-560.

⁷⁵ Mundu, G. B., & Bhagat, R. B. (2009). *Slum Conditions in Mumbai with Reference to the Access of Civic Amenities*-working paper, *IIPS Mumbai*, ENVIS center, 1–18

⁷⁶ Chandramouli, C. (2003). Slums in Chennai : A Profile, Method of Collection of Data Slum Population in Tamil Nadu Slum Population and Sex Ratio in Chennai. *Environment*, (i), 82–88

slums. These non-notified slums or poverty clusters generally have low reach of services and civic facilities.⁷⁷

In India, slums are declared legally and are to be notified by a competent administrative authority. The objective of declaring an area as a slum is basically to be able to allocate funding to extend or improve upon civic services. The Central Government enacted legislation in 1956 to tackle the problem of rising slums, particularly in the Union Territories.⁷⁸ As per this act, if the competent authority upon report from any of its officers or other information in its possession is satisfied as respect to any area that the buildings in that area: a) are in any respect unfit for human habitation; or b) are by reason of dilapidation, overcrowding, faulty arrangement and design of such buildings, narrowness or faulty arrangement of streets, lack of ventilation, light, sanitation facilities or any combination of these factors which are detrimental to safety, health and morals, it may, by notification in the official Gazette, declare such area to be a slum area.

Slums are a worldwide phenomenon which tends to deteriorate the urban environment. They are the shadow zones of urban existence where poverty, crime, aesthetic pollution apart from other type's pollution, disease and deprivation co-exist.⁷⁹ Physically they display a dense packing of houses and a further dense clustering of pollution within the houses. This in turn is associated with various physical and social problems. Migration from different parts of the area to slums makes the condition still unfavorable for survival.

The concept of a slum is an evaluative one rather than an analytical one and hence what is considered a slum in one cultural setting is an adequate housing facility in another. A slum can be conceptualized on the bases of:

1. Physical conditions of the area's individual housing conditions, crowding, sanitary conditions and lack of access to facilities which make possible the physical and mental well-being of the residence of the area.
2. Lack of effective social organization and
3. The social image of the area held laid the community at large as the slum-dwellers.

⁷⁷ National Family Health Survey -3, India, 2005-06

⁷⁸ Section 3 of the Slum Areas (Improvement and Clearance) Act, 1956 (Act No. 96, 1956)

⁷⁹ Ali M.A. and Toran K.T. (2004) Migration, Slums and Urban Squalor -A case study of Gandhinagar Slum, Proceedings of the Third International Conference on Environment and Health, Chennai, India. 1-11

Slum Population simply refers to people living in slum areas with low income.⁸⁰ As India is still on the path of development, there is large number of people living below the poverty line. These people usually live in slum areas connected to the city. Increase in Indian Population over a period of time has also resulted in slum population growth. Despite of Government efforts to build new houses and other basic infrastructure, most of the people living in slum areas do not have electricity, water supply and cooking gas. Slums sprout and continue to grow for a combination of demographic, social, economic, and political reasons.

1.3.3.2 Common causes that create and expand slums are as follows:-

Urbanization: The formation of slums is closely linked to urbanization. In most of the world's urban spheres, the phenomenon of slum is standing as a challenge that caused various problems. Gradually, the population of slum dwellers along with the number of the slums is increasing in almost all the countries⁸¹ the larger share of world urban population growth has been absorbed by slum communities on the periphery of Third World cities.⁸² The growth of urban centers in developing countries has been accompanied by high pace of social and economic development resulting into the phenomenal increase in city and town population with the growth of cities, the cost of housing and infrastructure is increasing on the one hand and lack of affordable housing facility on the other hand often forced the urban poor to rely on or create their own informal infrastructure, giving way to dramatic growth of slums in urban centers.⁸³

In some parts of the developing world, population growth has more than proportionately involved rural migration to informal settlements in and around cities, known more commonly as "slums"—densely populated urban areas characterized by poor-quality housing, a lack of adequate living space and public services, and accommodating large

⁸⁰ Stokes, C. J. (1962). A Theory of Slums. *Land Economics*, Vol.38(3), 187–197

⁸¹ Phukan, D. K. (2014). Levels of Some Basic Amenities in the Slums and Their Impacts on Ecology : A Case Study of Jorhat City , Assam. *Nternational Journal of Science and Research*, Vol.3(1), 71–73.

⁸² Davis M.(2006) *Planet of Slum*, Verso, U.S.A., 1-120

⁸³ Firdaus G. (2012). Urbanisation, emerging slums and increasing health problems: a challenge before the nation: an empirical study with reference to state of uttar Pradesh in Nigeria. *Environmental Research and Management*, Vol.3(9), 0146–0152.

numbers of informal residents with generally insecure tenure.⁸⁴ Some scholars suggest that urbanization creates slums because local governments are unable to manage urbanization, and migrant workers without an affordable place to live in, dwell in slums.

Rural-urban migration is one of the causes attributed to the formation and expansion of slums. World population has increased at a far greater rate than the total amount of arable land, even as agriculture contributes a much smaller percentage of the total economy. Many people move to urban areas primarily because cities promise more jobs, better schools for poor's children, and diverse income opportunities than subsistence farming in rural areas. However, some rural migrants may not find jobs immediately because of their lack of skills and the increasingly competitive job markets, which lead to their financial shortage.⁸⁵ Many cities, on the other hand, do not provide enough low-cost housing for a large number of rural-urban migrant workers. Some rural-urban migrant workers cannot afford housing in cities and eventually settle down in only affordable slums. Further, rural migrants, mainly lured by higher incomes, continue to flood into cities. They thus expand the existing urban slums. The migration of low-income population to the slum and squatter settlement is becoming a characteristic of the rapidly-growing intermediate-sized city.⁸⁶ The rural urban migration has often been considered the major factor for growth of slums in urban areas.⁸⁷

Poor housing planning: Lack of affordable low cost housing and poor planning encourages the supply side of slums.⁸⁸ An increasing pace of urbanization and the absence of affordable housing have resulted in growth of slums in urban India.⁸⁹ Insufficient financial resources and lack of coordination in government bureaucracy are

⁸⁴ Marx, B., Stoker, T., & Suri, T. (2013). The Economics of Slums in the Developing World The Economics of Slums in the Developing World +. *Journal of Economic Perspectives*, Vol. 27(4), 187–210.

⁸⁵ Leiwen, J. (2000). *Living condition of floating population in urban China*, -working paper- Watson Institute for International Studies, Brown University Institute of Population Research, Peking University, 1-24

⁸⁶ Mahapatro, S. R. (2012). The Changing Pattern of Internal Migration in India Issues and Challenges. *Research Scholar, Institute for Social and Economic Change(ISEC)*, Vol.3, 1–18

⁸⁷ Kundu, A.(2009). *Exclusionary Urbanisation in Asia: A Macro Overview*, Economic & Political Weekly, Vol.44, 48-58

⁸⁸ Clarke, J. J. (1931). Slums and the Housing Act , 1950 . *The Town Planning Review*, 14(3), 163–193.

⁸⁹ Sawhney, U. (2013). Slum population in India : Extent and policy response. *International Journal of Research in Business and Social Science*, Vol. 2(1), 47–56.

two main causes of poor housing planning.⁹⁰ The rapid growth combined with inadequate supply of low cost housing, was a major factor behind the rapid proliferation of the illegal settlements inside the city boundaries.

Social exclusion and poor infrastructure forces the poor to adapt to conditions beyond his or her control. Poor families that cannot afford transportation, or those who simply lack any form of affordable public transportation, generally end up in squat settlements within walking distance or close enough to the place of their formal or informal employment. One of the most enduring physical manifestations of social exclusion is the proliferation of slums and informal settlements. People living in these settlements experience the most deplorable living and environmental conditions. They are also excluded from participating in the economic social, political and cultural spheres of the city.⁹¹

Urban poverty encourages the formation and growth slums. In past, rural areas were typically thought of regions of poverty. With rapid shift from rural to urban life, poverty is migrating to urban areas.⁹² The urban poor arrives with hope, and very little of anything else.⁹³ He or she typically has no access to shelter, basic urban services and social amenities. Slums are often the only option for the urban poor.

1.3.4 Relationship between urbanization, availability of basic Amenities and assets to the households and slum

The higher economic vitality of cities and the possibilities of employment compared with the countryside pull the people to come and stay resulting into mushrooming of slums in

⁹⁰ Barnhardt, S., Field, E., & Pande, R. (2014). *Moving to Opportunity or Isolation ? Network Effects of a Slum Relocation Program in India*-working paper, Women and Public Policy Program at Harvard University, 1–47.

⁹¹ Arimah, B. C. (2001). Slums as expression of social exclusion: Explaining the prevalence of slums in African countries-working paper, United Nations Human Settlements Programme (UN-HABITAT) Nairobi, Kenya, 1–33.

⁹² Awumbila, M., Owusu, G., & Teye, J. K. (2014). Can Rural-Urban Migration into Slums Reduce Poverty ? Evidence from Ghana-working paper, Centre for Migration Studies (CMS) at the University of Ghana, (April), 1–41

⁹³ Arabindoo, P. (2011). City: analysis of urban trends, culture, theory, policy, action. *City*, 15(6), 635–646.

urban centers.⁹⁴ But it has been observed that the slum may be a poverty trap and neither temporary nor a short stop on the way to greater economic opportunities.⁹⁵ As cities continue to attract excess rural populations and people looking for economic opportunities, slums' share of the urban environment will surely continue to grow, particularly in fast developing and low income countries where the rate of urbanisation exceeds urban systems' ability to assimilate the rapid growing population. Although rural-urban migration is not a new phenomenon, the recent increase in numbers, and the resulting pressure on resources such as employment and housing, has led to the development of slums. Rural-urban migration is typically seen as creating pressure on urban infrastructure, environment and employment, and there is an underlying assumption that the phenomenon is linked to rising levels of urban poverty.⁹⁶ Rural urban migration has often been considered the major factor for growth of slums in urban areas. It is usually argued that overcrowding in cities due to natural growth of population and in-migration leads to the formation of slums because of rising land price and housing shortage. The major determinant of the origin as well as the persistence of the slum population is the nature and pattern of economic activity in which the bulk of the city population including the migrants manage to get absorbed. When demographic pressures create a shortage of land and housing in general, making it costlier for all the classes in the society, employment structure enables us to identify the particular groups which are likely to be affected most by such scarcity in the urban environment.⁹⁷

Existing literature in the context of urbanization and slum is vast and throws light on various challenging issues face by the slum dwellers. The over-urbanization⁹⁸ thesis- perhaps one of oldest theories - holds that with deterioration in the lands-man ratio in the

⁹⁴ Firdaus G. (2012). Urbanisation, emerging slums and increasing health problems: a challenge before the nation: an empirical study with reference to state of uttar Pradesh in Nigeria. *Environmental Research and Management*, Vol.3(9), 0146–0152.

⁹⁵ Marx, B., Stoker, T., & Suri, T. (2013). The Economics of Slums in the Developing World The Economics of Slums in the Developing World +. *Journal of Economic Perspectives*, Vol. 27(4), 187–210

⁹⁶ Awumbila, M., Owusu, G., & Teye, J. K. (2014). Can Rural-Urban Migration into Slums Reduce Poverty? Evidence from Ghana-working paper, Centre for Migration Studies (CMS) at the University of Ghana, (April), 1–41

⁹⁷ Mitra, A. (2006). *Urbanization in India : Evidence on Agglomeration Economies Urbanization in India : Evidence on Agglomeration Economies*-working paper, Institute of Economic Growth Delhi, 1–24.

⁹⁸ Sovani, N. V. (1964). The Analysis of “ Over-Urbanization.” *Economic Development and Cultural Change*, Vol.12(2), 113–122.

agricultural sector, the rural population in search of a livelihood migrates to urban areas. Subsequently, in the face of limited possibilities of labour absorption in the organized sector, particularly in industry, the rural migrant workers are believed to create a situation of unlimited supply of labour in the urban job market. This leads to a residual absorption of labour in the informal sector, generally said to be characterized by low productivity. Below-subsistence levels of incomes accruing to workers in this sector inflate the percentage of population below the poverty line, and compel them to reside in slums.⁹⁹ In this way slum start to flourish and continue to grow as this is the living condition as poor standard of life with the lack of basic amenities. There are many acts and policies for the slum clearance, then many talks were held for the slum resettlement and lastly it has been experienced that slum could not be cleared up but should be developed by providing better facilities. In the initial year of policy formulation for the slum, main emphasis was on housing solutions then shifts toward the slum up gradation to the slum redevelopment¹⁰⁰ by providing better facilities along with the peoples' participation. Programmes and policies implemented by ministry of housing and urban poverty alleviation¹⁰¹, which could be said policies for the slum up gradation. As if population of slum has better housing conditions with improved standard of living then there would be no longer slum provenance. Some of them are as follows:

- Jawaharlal Nehru National Urban Renewal Mission: Basic Services to the urban poor and Integrated Housing & Slum Development Programme
- Swarna Jayanti Shahari Rozgar Yojana
- Affordable Housing in Partnership
- Interest Subsidy Scheme for Housing the Urban Poor
- Integrated Low Cost Sanitation Scheme
- Projects/ Schemes for the Development of North Eastern States, including Sikkim
- Rajiv Awas Yojana

⁹⁹ Andavarapu, D., & Edelman, D. J. (2013). Evolution of Slum Redevelopment Policy. *Current Urban Studies*, Vol.1(4), 185–192

¹⁰⁰ Arabindoo, P. (2011). City: analysis of urban trends, culture, theory, policy, action. *City*, Vol.15(6), 635-646.

¹⁰¹ Government of India (2010). *Report of The Committee on Slum Statistics / Census*, 1-74

1.4 Objectives:-

The main aim of the present study is to see the growth and pattern of development of slum, the major causes of slum formation and expansion of slums. An attempt has been made to analyze the relationship between amenity in urban areas and the expansion of slum. Thus major objectives of the present study are as follows:-

- To analyze the growth of urban and slum population in class I towns of Maharashtra, West Bengal and Tamil Nadu in recent decade (2001-2011).
- To examine the concentration of urban population in some metro cities. (2001-2011).
- To evaluate the relationship of increasing urbanization and development (development in infrastructure) and growing slums in these regions. (2001-2011).
- To assess the relationship between Amenity and slum formation and expansion of slum in urban areas (2001-2011).
- To check the relationship between assets available to the households and proportion of slum population (2001-2011).

1.5 Research questions with methodology:-

1. Is there any impact of urban population growth on the growth of slum population in class I towns of the states of Maharashtra, West Bengal and Tamil Nadu?

Methodology:-

- Exponential growth rate of urban and slum population
 - ❖ Exponential growth rate (urban) = $1/n * [\ln (U_{t+n} / U_t)] * 100$
Where,
 \ln = natural log,
 U_t = urban population,
 t = census time,
 n = census interval=10

$$\text{❖ Exponential growth rate (slum)} = 1/n * [\ln (S_{t+n} / S_t)] * 100$$

Where,

\ln = natural log,

S_t = Slum population,

t = census time,

n = census interval=10

- Decadal growth rate of urban and slum population

$$\text{❖ } DGR = \left(\frac{P_n - P_o}{P_o} \right) * 100$$

Where,

DGR = Decadal Growth Rate in %

P_n = Present population

P_o = Past population

P_n and P_o are ten years apart

- Percentage share of slum population to the total urban population.
2. How the slum population expanded in class I towns in Maharashtra, West Bengal and Tamil Nadu, from 2001 to 2011?

Methodology:-

- Exponential growth rate of slum population.
 - Percentage increase of slum population in class I towns in Maharashtra, West Bengal and Tamil Nadu, from 2001 to 2011.
 - With the help of GIS software, maps to be prepared to show the slum population expansion from 2001 to 2011.
3. What is the spatial pattern of distribution of slum population in 2011 across the class I towns in Maharashtra, West Bengal and Tamil Nadu?

Methodology:-

- Maps are prepared using G.I.S. to show distribution of the slum population in Maharashtra, West Bengal and Tamil Nadu.

4. Is there any direct relationship between urbanization, amenity and slum formation in different urban areas?

Methodology:-

- Coefficient of correlation between different Amenities available to the households of the urban population and proportion of slum population.

$$r = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{n(\sum x^2) - (\sum x)^2} \sqrt{n(\sum y^2) - (\sum y)^2}}$$

Where,

r= linear correlation coefficient

n=number of variables

x=variable 1(value of Amenity)

y= variable 1(proportion of slum)

- Amenity index to be prepared to know the level of amenities in class I towns of Maharashtra, West Bengal and Tamil Nadu

❖ *Amenity Index* =

$$\frac{\left(\frac{x_1}{\bar{x}_1} * 100\right) + \left(\frac{x_2}{\bar{x}_2} * 100\right) + \left(\frac{x_3}{\bar{x}_3} * 100\right) + \left(\frac{x_4}{\bar{x}_4} * 100\right) + \left(\frac{x_5}{\bar{x}_5} * 100\right) + \left(\frac{x_6}{\bar{x}_6} * 100\right) + \left(\frac{x_7}{\bar{x}_7} * 100\right)}{n}$$

Where,

x1 =households living in Good housing condition,

x2 = households having Tap treated water,

x3 = households having electricity connection,

x4 = households having latrine facility,

x5 = households having bathroom facility,

x6 = households connected with closed drainage,

x7 = households availing banking facility,

\bar{x} = mean of the variables,

n = number of indicators (7)

- Asset index to be prepared to know the level of amenities in class I towns of Maharashtra, West Bengal and Tamil Nadu

❖ *Asset Index* =

$$\frac{\left(\frac{x_1}{p}\right) + \left(\frac{x_2}{p}\right) + \left(\frac{x_3}{p}\right) + \left(\frac{x_4}{p}\right) + \left(\frac{x_5}{p}\right) + \left(\frac{x_6}{p}\right) + \left(\frac{x_7}{p}\right)}{n}$$

Where,

- x1 = households having Radio,
- x2 = households having Television,
- x3 = households having Computer,
- x4 = households having Phone,
- x5 = households having bicycle,
- x6 = households having motorcycle,
- x7 = households having car,
- \bar{x} = mean of the variables,
- n = number of indicators (7)

5. Is there any relationship between Amenity index and proportion of slum population?

Methodology:-

- Correlation matrix of various amenities and proportion of slum to be prepared to check the correlation between various amenities and proportion of slum population.
- Scatter plot is being used to show the relationship between Amenity Index and proportion of slum

On “x” axis= amenity index is taken

“y” axis= proportion of slum population

- Simple Linear regression is used to show the magnitude of the relation between the two

❖ $y = b_0 + b_1x$

Where,

y =proportion of slum population

x =Amenity Index

6. Is any impact of concentration of population in some metro on the slum population?

Methodology:-

- Index of Primacy

❖ Index of Primacy= P_1/P_2

Where,

P_1 =Population of the largest city

P_2 =Population of the second largest city

- Reclassification of class I- towns, census 2011¹⁰². This classification is done to know the actual level of urbanization in class I towns and to know that which category has the highest value of towns and population in these towns. This would tell us about the concentration urban population in various categories, which could give us the insight of the charm of the large metros. Based on the classification done by Chaudhary (2010), class I towns have been classified into the following five categories:

- i) **Metro cities** or cities having a population of more than 10 lakh and percentage of slum in metro cities, and correlation between the two.
- ii) **Transitional metros**, cities having population between 8 to 10 lakh and percentage of slum in transitional metros, and correlation between the two.
- iii) **Regional metros**, cities having population between 5 to 8 lakh and percentage of slum in regional metros, and correlation between the two.
- iv) **Juvenile cities** having population between 3 to 5 lakh and percentage of slum in juvenile cities, and correlation between the two.

¹⁰² Choudhary, B. K. (2010). 'Urban Pattern in India: Some Reinterpretations', in R. N. Dubey (ed.) *Urbanization and Urban Planning in India: Vision and Reality*, Shree Natraj Prakashan, New Delhi

- v) **Incipient cities** having population between 1 to 3 lakh and percentages of slum in incipient cities. and correlation between the two.

1.6 Hypothesis:-

- i. There is inverse relationship between amenities and slum.
- ii. There is inverse relationship between asset index and slum.

1.7 Data Base:-

Present study will draw upon data from:

1. Census of India 2001 and 2011.
 - i.) Primary Census Abstract:-
 - a.) Slum population.
 - b.) Town wise urban population.
 - ii.) A-Series, General population Tables.
 - iii.) Household series – Amenity and asset data
 - iv.) Report of the committee on slum statistics/Census, Ministry of Housing and Urban Poverty Alleviation, Government of India.
2. NSS- 69th, report (2012)
3. NFHS-3 report (2005-06)
4. United Nations estimates,2014

1.8 Limitation of the Study

The study is related to the basic amenity and proportion of slum of class I towns of the state of Maharashtra, West Bengal and Tamil Nadu with the help of Census, 2011 data. Rest of the towns left over as the large chunk of urban and slum population resides in class I towns of the country. Selected amenities are taken for the analysis as the list of amenities in Census data is very large and each and every item could not be taken. So, that items have been selected which would be fit for the model to analyze the relationship

between amenities and proportion of slum population. Another limitation is related to the data used, as the town level data of amenity and slum population is only available in Census.

1.9 Chapterisation

In this thesis there is over all five chapters, every chapter is devoted to certain specific topics obtain the basic objective of the study. In chapter 2 Urbanization, growth of urban and slum population is being discussed with the comparative analysis of class one towns of Maharashtra, Tamil Nadu and West Bengal. In this chapter, class I towns clubbed to from the agglomerations and then reclassified to some hypothetical metros to see the concentration of urban and slum population in all the three states. Chapter 3 is about the relationship between availability of basic amenities in class I towns and proportion of Slum population in Maharashtra, West Bengal and Tamil Nadu and chapter 4 is to discuss the relationship between availability of Assets in class I towns and proportion of Slum population living in these towns in Maharashtra, West Bengal and Tamil Nadu and in chapter five the summary and conclusion of the study is discussed.

Chapter - 2

Urbanization and slum population: comparative analysis of class I towns of Maharashtra, Tamil Nadu and West Bengal

2.1 Introduction

Urbanization in India is neither unique nor exclusive but is similar to a world-wide phenomenon as the average Annual Rate of Change of the Percentage Urban population of the world is 1.00% in 2010 and in India, it is 1.13%.¹⁰³ Indian urbanization has proceeded as it has elsewhere in the world as a part and product of economic change. For instance, in 1950-51, the contribution of urban sector to India's GDP was only 29 percent, which has increased to 47 percent in 1980-81 and presently it contributes 62-63 percent and is likely to be 75 percent by 2021.¹⁰⁴ Urban settlements enjoy economies of agglomeration in manufacturing and services. As the share of Employment in manufacturing sector in urban India is 23.62 percent, in Service sector is 68.94 percent.¹⁰⁵ Economic growth influences the rate of urbanization, while urbanization in turn, affects the rate at which the economy grows.¹⁰⁶ As the GDP of the country grows at the rate of 5.92 percent in 1991-92 to 2001-02, this has increased to 7.57 percent 2002-03 to 2012-13.¹⁰⁷ According to Census of India, growth of urban population in 1991-2001 was 31.3 percent and during 2001-2011 is 31.8 percent. Both GDP and urban population growth have increasing trend.

The urbanization trends in India are a direct reflection of the structural changes that are taking place in the economy.¹⁰⁸ The contribution of industrial sector and service sector to

¹⁰³ United Nations, Population Division, Department of Economic and Social Affairs, World Urbanization Prospects: The 2014 Revision

¹⁰⁴ Report of the steering committee, Government of India on Urban Development on Urban Development for Eleventh five year plan.

¹⁰⁵ NSS, 68th Round; 2011-12

¹⁰⁶ Stockwell, E. G., Laidlaw, K. A., Stockwell, E. G., & Laidlaw, K. A. (1980). A Note on the Association between Urbanization and Development in the Third World. *International Review of Modern Sociology*, Vol.10(1), 1-13

¹⁰⁷ Reserve bank of India

¹⁰⁸ Das, S. (2013). Sectoral Transformation of Working Population and Status of Employment- A Case Study of Chanditala C . D Block – I , Hugli. *The International Journal Of Engineering And Science (IJES)*, Vol.2(4), 1-7

GDP is 15 and 70 percent respectively which is significantly higher than that of agriculture (13%).¹⁰⁹ Much of the growth of the economy comes from economic activities that are likely to be concentrated in and around existing cities and towns; particularly large cities.¹¹⁰ Mark Jefferson has propounded the primate city concept which is based on the agglomeration effect by which a city grows disproportionately to outstrip the others; this is what happens in the current scenario.

The numbers of metro cities¹¹¹ are continuously increasing from 12 in the year 1981 to 23 in 1991, 35 in 2001 and 54 in 2011.¹¹² Cities with transport (the share of public transport in mega cities is Mumbai 88 percent, Kolkata 79 percent, Chennai 67 percent and Delhi 62 percent).¹¹³ Telecom linkages (64.33 percent of households in urban areas have mobile phone as compared to 47.94 percent in rural India and landline connections are available to 5.93 percent households in urban India and 3.12 percent of households in rural areas of India)¹¹⁴ with global economy, are the preferred destinations for investments.

Urban population growth in the country has also witnessed an increase in the proportion of those living in appalling conditions in the slums¹¹⁵, shanty towns¹¹⁶ and squatters¹¹⁷. Here the main focus is on the slum and growth of slum population which has increased to about 54 percent during 2001-2011 in India and it is growing at the rate of 4 percent annually (computed from Census of India, 2001 and 2011).

It has been observed that slum is existed worldwide and its growth is worldwide phenomenon but it more aggrieved in developing and less developed nations. As about 32 percent of the world's total urban population live in slums; some 43 percent of the urban

¹⁰⁹ Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation, Government of India.

¹¹⁰ Wheaton, W. C., & Shishido, H. (1981). Urban Concentration, Agglomeration Economies, and the Level of Economic Development. *Economic Development and Cultural Change*, Vol.30(1), 17.

¹¹¹ Cities having population above ten lakhs.

¹¹² Census of India, 1981, 1991, 2001 and 2011.

¹¹³ Report of the steering committee, Government of India on Urban Development on Urban Development for Eleventh five year plan.

¹¹⁴ Census of India, 2011

¹¹⁵ A Slum, for the purpose of Census, has been defined as residential areas where dwellings are unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements and design of such buildings, narrowness or faulty arrangement of street, lack of ventilation, light, or sanitation facilities or any combination of these factors which are detrimental to the safety and health

¹¹⁶ A deprived area on the outskirts of a town consisting of large numbers of shanty dwellings (oxford dictionary)

¹¹⁷ A squatter settlement is the residential area which has developed without legal claims to the land.

population of all developing regions combined live in slums; and about 78 percent of the urban population in the least developed countries live in slums, while only 6 percent of the urban population in developed regions live in slum-like conditions.¹¹⁸ The formation of slums is closely linked to urbanization.¹¹⁹ The growth of urban centers in developing countries has been accompanied by high pace of social and economic development resulting into the phenomenal increase in city and town population with the growth of cities, the cost of housing and infrastructure is increasing on the one hand and lack of housing facility,¹²⁰ as 53 percent of houseless population lives in urban areas¹²¹ and other basic amenities, say for example source of drinking water within the premises(56%), closed drainage connectivity for waste water outlet (36.9%), latrine facility within the premises(66.0%) and households availing banking services(53%)¹²² are also lacking. Such scenario forced the urban poor to rely on or create their own informal infrastructure, giving way to dramatic growth of slums in urban centers.¹²³

In this chapter, the growth of slum population and the urban population growth in class I towns of the states of Maharashtra, Tamil Nadu and West Bengal in India is analyzed. In India these states reported large number of slum population. About 37 percent of the total slum population of the country resides only in these 3 states (in Maharashtra-18 percent of urban population lives in slum, in West Bengal about 9.8 percent and in Tamil Nadu-8.9 percent).¹²⁴

The present chapter is analyzed in following manner. This chapter is divided in three parts. There is analysis of three selected states of the country India. Initial part of this chapter deals with the urbanization and slum population of class I towns of Maharashtra and tries to find out that how metro cities of the states behaves differently. Every section of the chapter is further divided into three sub parts in which first part is about urban and

¹¹⁸ UN-HABITAT (2003)

¹¹⁹ Firdaus G. (2012). Urbanisation, emerging slums and increasing health problems: a challenge before the nation: an empirical study with reference to state of uttar Pradesh in Nigeria. *Environmental Research and Management*, Vol.3(9), 0146–0152

¹²⁰ Sawhney, U. (2013). Slum population in India : Extent and policy response. *International Journal of Research in Business and Social Science*, Vol. 2(1), 47–56.

¹²¹ Census of India,2011

¹²² Census of India, 2011

¹²³ Yungang Liu, Z. L. and J. J. (2014). Pseudo-urbanization Mergence or Real China ' s Regions Province City , Guangdong and Its Effects : A Case Study of. *China Review*, Vol.14(1), 37–59

¹²⁴ Census of India, 2011

slum population of the state, in second part urban and slum population in urban agglomerations and lastly class I towns are further divided to some hypothetical metros.¹²⁵

This analysis is all about class I towns but within these cities there is great variation as most of the people lives in and around large cities, mainly in million plus cities. The number of class I towns are more near to the start of the classification, may be because of new entries of towns into the class I category. Class I towns increased from 380 to 502 in India but there is prevalence of primacy in India cities and population remains concentrated in few metro cities of the country¹²⁶ (appendix-1). It is tried to reclassify the class I towns into several other categories as done by the Choudhary B.K. in 2010 to capture variation of social characteristics within the class I towns, like sex ratio, child sex ratio, literacy rate and female literacy rate. As computed by him, Sex ratio of metro cities was 882 and child sex ratio was 898 which explain that females are more in the child age group (0-6 age group) while males are more in adult age group. While in incipient cities sex ratio (917) is higher than that of child sex ratio (897). This indicates that there is more influx of migrants to the metros. This also contributes in the concentration of population in metro cities.

Here, this classification is done to know the actual level of urbanization in class I towns and to know that which category has the highest value of towns and population in these towns. This would tell us about the concentration urban population in various categories, which could give us the insight of the charm of the large metros. Based on the classification done by Choudhary (2010), class I towns have been classified into the following five categories:

- i) **Metro cities** or cities having a population of more than 10 lakh,
- ii) **Transitional metros**, cities having population between 8 to 10 lakh,
- iii) **Regional metros**, cities having population between 5 to 8 lakh,
- iv) **Juvenile cities** having population between 3 to 5 lakh, and
- v) **Incipient cities** having population between 1 to 3 lakh.

¹²⁵Choudhary, B. K. (2010). 'Urban Pattern in India: Some Reinterpretations', in R. N. Dubey (ed.) *Urbanization and Urban Planning in India: Vision and Reality*, Shree Natraj Prakashan, New Delhi

¹²⁶ Chaudhuri, S. (1999). Urbanization and Identity : Emerging Situation in Indian Metropolises. *Indian Anthropological Association*, Vol.29(2), 37–66.

The total number of class I towns in Maharashtra, Tamil Nadu and West Bengal, along with their population in various categories is shown in table 2.1.

Table 2.1: Distribution of cities in various states of India according to their percentage population size

States	Urban Agglomeration having Population 1 lakh and above									
	>10 lakh		10 to 8 lakh		8 to 5 lakh		5 to 3 lakh		3 to 1 lakh	
	2001	2011	2001	2011	2001	2011	2001	2011	2001	2011
Maharashtra	4(67)	10(70)	2(6)	2(7)	2(8)	6(9)	8(12)	8(7)	18(9)	18(7)
Tamil Nadu	3(37)	3(49)	1(16)	2(12)	2(12)	0	3(9)	4(13)	20(25)	23(25)
West Bengal	2(39)	2(32)	0	0	0	3(9)	2(17)	9(19)	22(43)	46(39)

Source: Census of India, 2001 and 2011

*Note: In bracket (), corresponding population of the category in percent.

The table 2.1 shows that class I towns in the three states (Maharashtra, West Bengal and Tamil Nadu) of India, has increased during 2001-2011. In Maharashtra number of towns increased from 34 to 44, in Tamil Nadu, towns increased from 29 to 32 and in West Bengal number of towns have increased to a significant level from 29 to 61. In all three states concentration of population is more in those metros that having population above 10 lakhs.

Population proportion (urban and slum population) in these metros of the three states will be discuss in further sections of the chapter.

2.2.1 Urbanization and slum population in Maharashtra

According to the Census of India, 2011, in Maharashtra proportion of urban population (45.22 %) is less than the rural population (54.78%). However this is higher than the national average of 31 percent. Urban population grows at the rate of 23.64% in this state which is much higher than rural population growth rate (10.36%). The Census data reveals that in this state above 50 % of population lives in rural areas that mean people are still dependent on the primary activities.¹²⁷ Here we can generalize that an increase in urbanization which boosts the secondary sector¹²⁸ and tertiary sector¹²⁹ and reduces the

¹²⁷Economic activities that includes agriculture, mining and quarrying activities, fishing, etc.

¹²⁸ Manufacturing activities.

¹²⁹ Service sector (transport, communication, banking, research and development etc.)

dependence on primary sector¹³⁰ is considered as a symbol of economic growth and development in the state. Distribution of population of the state can be seen in the table 2.2.

Table 2.2 Population distribution in the state of Maharashtra

Name of the State	U_P (%)	Population of class one towns (%)	
		T_P	U_P
MAHARASHTRA	45.22	35	77

Source: Census of India, 2001 and 2011

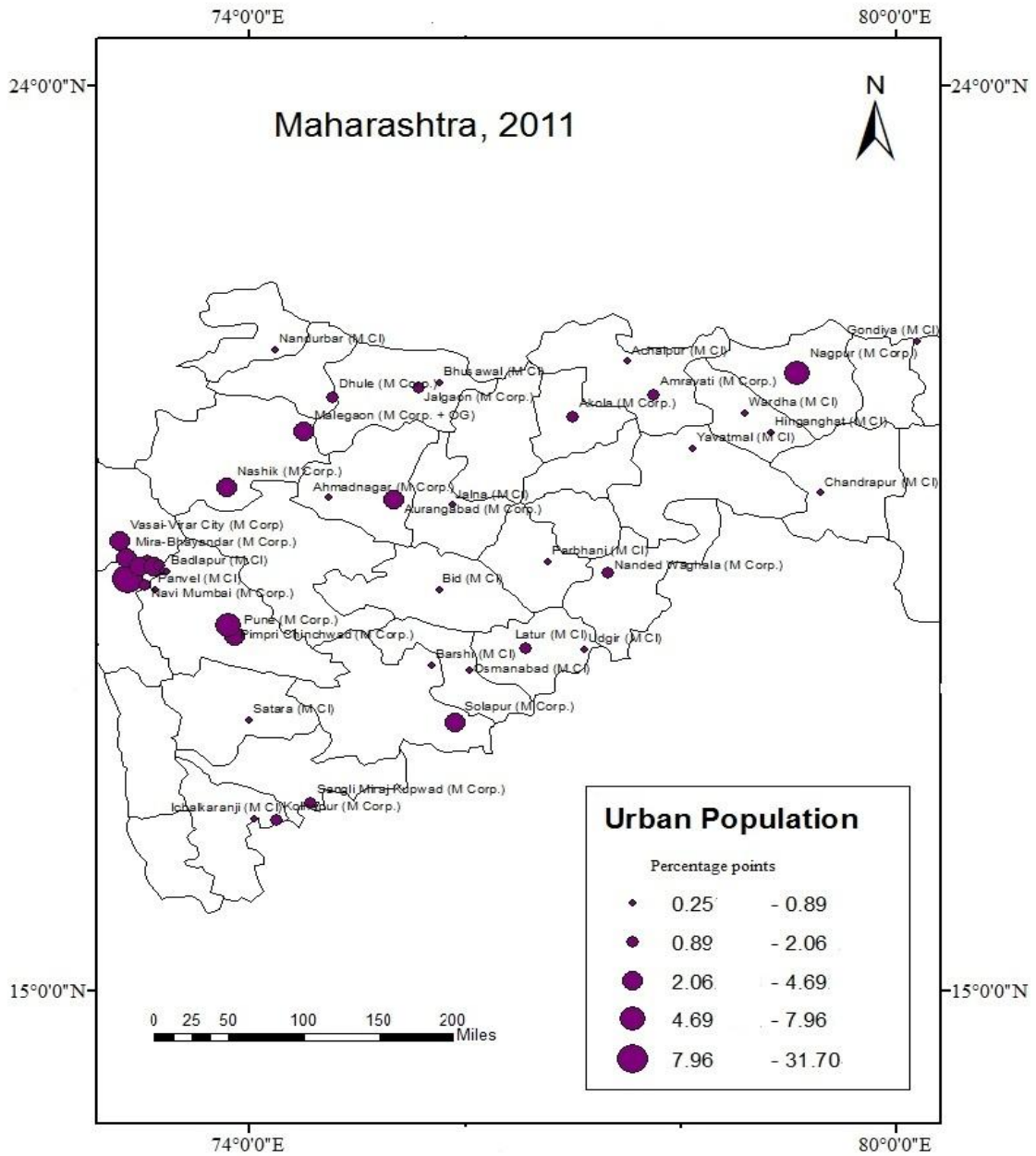
*Note: T_P= total population of the state, U_P= Urban population of the state

The table 1.2 tells us about the proportion of urban population of Maharashtra. The proportion of total population lives in class I towns is about 35 percent of total population of the state (Maharashtra) lives in class I towns of the state and about 77 percent of urban population lives in class one towns. A close analysis of the class I towns in Maharashtra is necessary to examine the growth pattern of urban and slum population in class one towns of the state.

According to the Census of India, 2011; slum population in Maharashtra is about 23.31percent of the total urban population of the state and of this 30 percent of slum population resides in the class I towns of the state. In Maharashtra growth of slum population increased at the rate of 5 percent during 2001-2011. The distribution of urban and slum population of class I towns of the state is being depicted in map 1.1 and 1.2 respectively.

¹³⁰ Includes primary activities

Map 2.1 Urban Population of Class I towns in Maharashtra

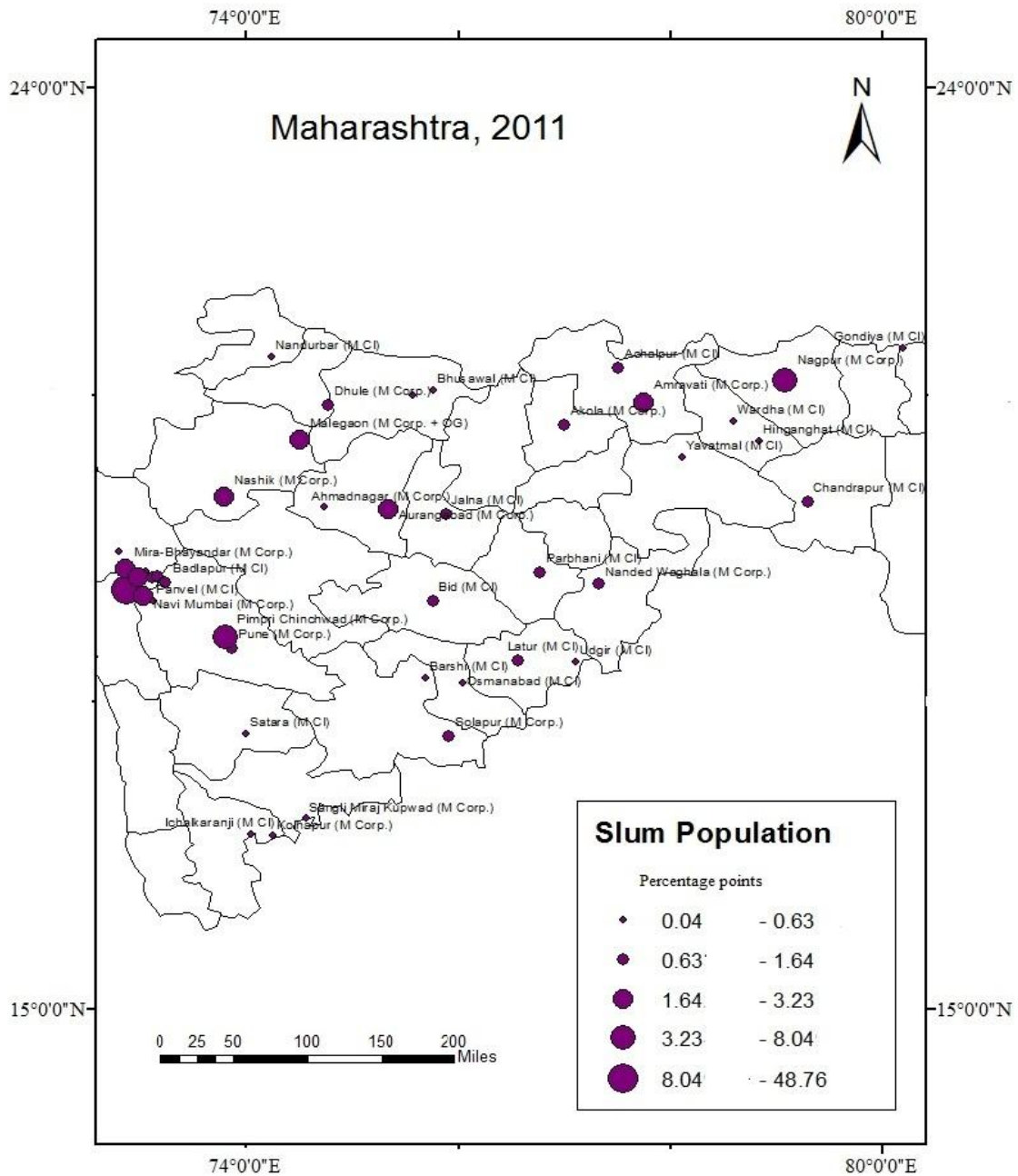


Source: Census of India, 2001

Map 2.1 indicates that most of the cities near to the Greater Mumbai have high urban population percentage share while this population percentage reduced as moved away from Mumbai. Nagpur is very far away from Mumbai but has large share of population

after Mumbai and Pune. Many of the class I towns are clustered around Greater Mumbai as pointed out in map 2.1. Share of slum population of class I towns is shown in map 2.2.

Map 2.2 Slum Population of Class I towns in Maharashtra



Source: Census of India, 2011

The Mumbai Metropolitan region comprises the Municipal Corporations of Greater Mumbai, Thane, Kalyan, Navi Mumbai, Ulhasnagar, Mira Bhayander and Vasai-Virar. That is why they all look like a cluster and forms one urban agglomeration. The same situation prevails with the slum population mainly concentration near Mumbai (Map 2.2) and have the greater share of population near Mumbai.

The distribution of growth rate of urban and slum population of all the class I towns of Maharashtra can be explained with the help of the appendix-2. In Maharashtra the highest urban population growth is in the Vasai-Virar city while slum population growth is highest in Kalyan-Dombivli. As both the cities are the part of Mumbai metropolitan region so distinction of any city from the region would be difficult. It may be possible that growth of one city could affect the other.

In this state, fluctuations in urban population growth rate along with the slum population growth rate are visible. The pattern of urban population growth of different class I towns of the state and is followed by the slum population growth. The analysis will be clearer if we take into account the urban agglomeration¹³¹ as most of the class one towns falls within the ambit of some urban agglomeration so the characteristics within the agglomeration may be similar therefore we cannot see these cities as two different entities. So these towns are clubbed to form the urban agglomerations. The analysis of agglomeration is being discussed in the following section.

¹³¹An urban agglomeration is a continuous urban spread constituting a town and its adjoining outgrowths (OGs), or two or more physically contiguous towns together with or without outgrowths of such towns. An Urban Agglomeration must consist of at least a statutory town and its total population (i.e. all the constituents put together) should not be less than 20,000 as per the 2001 Census.

2.2.2 Urban Agglomeration in Maharashtra

The table 2.3 gives the clear picture of the urban population growth and slum population of the urban agglomerations in Maharashtra.

Table 2.3 Population distribution in urban agglomeration of Maharashtra

Area Name	Total Population (%)	Slum Population (%)
Greater Mumbai UA	57.32	67.82
Pune UA	15.12	9.03
Nagpur UA	7.49	9.47
Nashik UA	4.63	2.09
Aurangabad UA	3.66	2.43
Malegaon UA	2.96	2.91
Bhiwandi UA	2.21	3.80
Kolhapur UA	1.71	0.74
Sangali UA	1.56	0.29
Ahmadnagar UA	1.09	0.41
Ichalkaranji UA	0.89	0.17
Bhusawal UA	0.58	0.19
Satara UA	0.37	0.05
Yavatmal UA	0.36	0.55

Source: Census of India

*Note: UA= Urban Agglomeration

The table 2.3 shows that more than half (57.3%) of urban population of class I town of Maharashtra have their shelter in Greater Mumbai Urban agglomeration and about 68 percent of slum population resides in this urban agglomeration. Pune is the second largest hub of the urban as well as slum population of the state, followed by Nagpur urban agglomeration, in map 2.1 and 2.2; it is evident that Nagpur has a large share of urban and slum population. Greater Mumbai, Pune, Nagpur, Thane, Nasik, etc. are the metro city of the state which have large chunk of the urban population of the state, more than three fourth of urban population of Maharashtra live in class I towns. But within class I towns there is a great diversity in the distribution of population. There is some kind of primacy¹³² prevails in the state. Index of primacy¹³³ indicates that Greater Mumbai have 4 times more population than Pune.

¹³²Primate city is that work as the financial, political and population centre of a country and has twice the population the next rank city (Mark Jefferson)

¹³³ Index of Primacy= P_1/P_2 .

P_1 = Population of the largest city

To have a better understanding of metro cities, it has been tried to reclassify the class I towns in some hypothetical towns, to check the concentration of urban and slum population of the state. And to evaluate the very basis of criteria of designating the class I towns in the country that is there any necessity to call the towns having population less than million as most of the population lives in million plus city. Reclassification towns in different categories, proportion of urban population and slum population can be explained as follows.

2.2.3 Reclassification of Class I towns of Maharashtra

According to Census of India, 2011 in Maharashtra there are 44 class I towns. The distribution of the urban and slum population in class I towns of the state of Maharashtra can be seen in the map no1.1 and 1.3. In Greater Mumbai metropolitan about 32 percent of urban population lives while 49 percent of slum of the Maharashtra resides in this metro. And some other major cities are Pune, Nagpur, Thane and Nasik where proportion of urban and slum population is higher than other cities of the state.

It can be observed that most of urban and slum population lives only in some towns, mainly in metro cities (appendix-1). That is why we have further classified the class I towns in some hypothetical metros to have an instance of the concentration of the urban and slum population in class I towns of the state of Maharashtra. The reclassification of towns is in the table 2.4

Table 2.4 Classification of Class I Towns of Maharashtra

Sr. No	Area Name	Reclassification of cities	proportion of Urban population	proportion of slum population
1	Greater Mumbai		31.7	48.76
2	Pune		7.96	6.46
3	Nagpur		6.13	8.04
4	Thane		4.69	3.06
5	PimpriChinchwad	Metro cities	4.4	1.2
6	Nashik		3.78	1.77
7	Kalyan-Dombivli		3.17	0.91
8	Vasai-Virar City		3.11	0.33
9	Aurangabad		2.99	2.07
10	Navi Mumbai		2.85	1.94
1	Malegaon	Transitional metros	2.42	2.48
2	Solapur		2.42	1.64
3	Mira-Bhayandar		2.06	0.57
1	BhiwandiNizampur	Regional metros	1.8	3.23
2	Amravati		1.64	2.23
3	NandedWaghala		1.4	1.18
4	Kolhapur		1.4	0.63
5	Ulhasnaga		1.29	0.79
6	SangliMirajKupwad		1.28	0.25
1	Jalgaon	juvenile cities	1.17	0.26
2	Akola		1.08	1.53
3	Latur		0.97	0.8
4	Dhule		0.95	0.84
5	Ahmadnagar		0.89	0.34
6	Chandrapur		0.81	0.75
7	Parbhani		0.78	0.7
1	Ichalkaranji	incipient cities	0.73	0.14
2	Jalna		0.72	0.98
3	Ambarnath		0.64	1.48
4	Bhusawal		0.47	0.16
5	Panvel		0.45	0.08
6	Badlapur		0.44	0.09
7	Bid		0.37	0.9
8	Gondiya		0.33	0.39
9	Satara		0.3	0.04
10	Barshi		0.3	0.42
11	Yavatmal		0.29	0.46
12	Achalpur		0.28	0.69
13	Osmanabad		0.28	0.33
14	Nandurbar		0.28	0.18
15	Wardha		0.27	0.25
16	Udgir		0.26	0.19
17	Hinganghat		0.25	0.23

Source : Census of India,2011

In the table 2.4 it can be seen that in this state out of 43 class one towns, there are 10 metro cities which have above ten lakh population where about 71% of urban population of class one towns lives in these 10 **Metro cities** and about 32 percent of urban population resides only in Greater Mumbai and about 74 percent of the total slum of class one towns of the state resides in this metro cities. In metro cities of Maharashtra sex ratio was 846 and child sex ratio 912 (computed by Chaudhary B.K., in 2010, based on 2001 Census data) indicates that there are more adult male migrants in metro cities in search of economic opportunities which reduces the sex ratio than to the child sex ratio, of the state. There are three **transitional metros**, having population between 8 to 10 lakhs, where 7 percent of urban population and about 5 percent of slum population lives in this state, here, a different kind of situation prevail in terms of sex ratio (932) and child sex ratio (906), this shows that females are more in adult age group than of 0 to 6 age group which is a clear indication of male out migrants from these cities. There are six **regional metros**, cities having population between 5 to 8 lakhs, in which 8.8 percent of urban population and 8 percent of slum population lives in these regional metros. There are seven **juvenile cities** having population between 3 to 5 lakhs where about 7 percent of urban population and 5 percent of slum population lives in these juvenile cities and in this state 17 **incipient cities** are there having population between 1 to 3 lakhs where 6.7 percent of urban population and 7.1 percent of slum population have their shelter. In the incipient cities also, sex ratio (925) is higher than of child sex ratio (912). This explains that metro cities are the hub of immigrants where as smaller cities are the homes of out-migrants, especially adult male migrants.

2.3.1 Urbanisation and slum population in West Bengal

According Census of India, 2011, in West Bengal 32 percent people lives in urban areas while 68 percent of the total population of the state still lives in rural areas. This depicts us that this state is still an agricultural predominant area where most of the people engaged in and dependent upon rural based primary activities. Growth of urban and rural population of the state is shown in table 2.5

Table 2.5 Population distribution in the state of West Bengal

Name of the State	Urban Population (%)	Rural population Growth rate(%)	Urban population Growth rate(%)
WEST BENGAL	31.87	7.68	29.72

Source: Census of India, 2001 and 2011

Table 2.5 shows that in West Bengal, urban population of the state grew by 29.7 percent which much higher than the rural population growth rate of about 7.68 percent. Here, we can say that yet the large proportion of population of West Bengal lives in rural area but urban population will outnumbered the rural population in near future. The distribution of population in class I towns in West Bengal could be seen in table no.2.6.

Table 2.6 Percent population growth in West Bengal

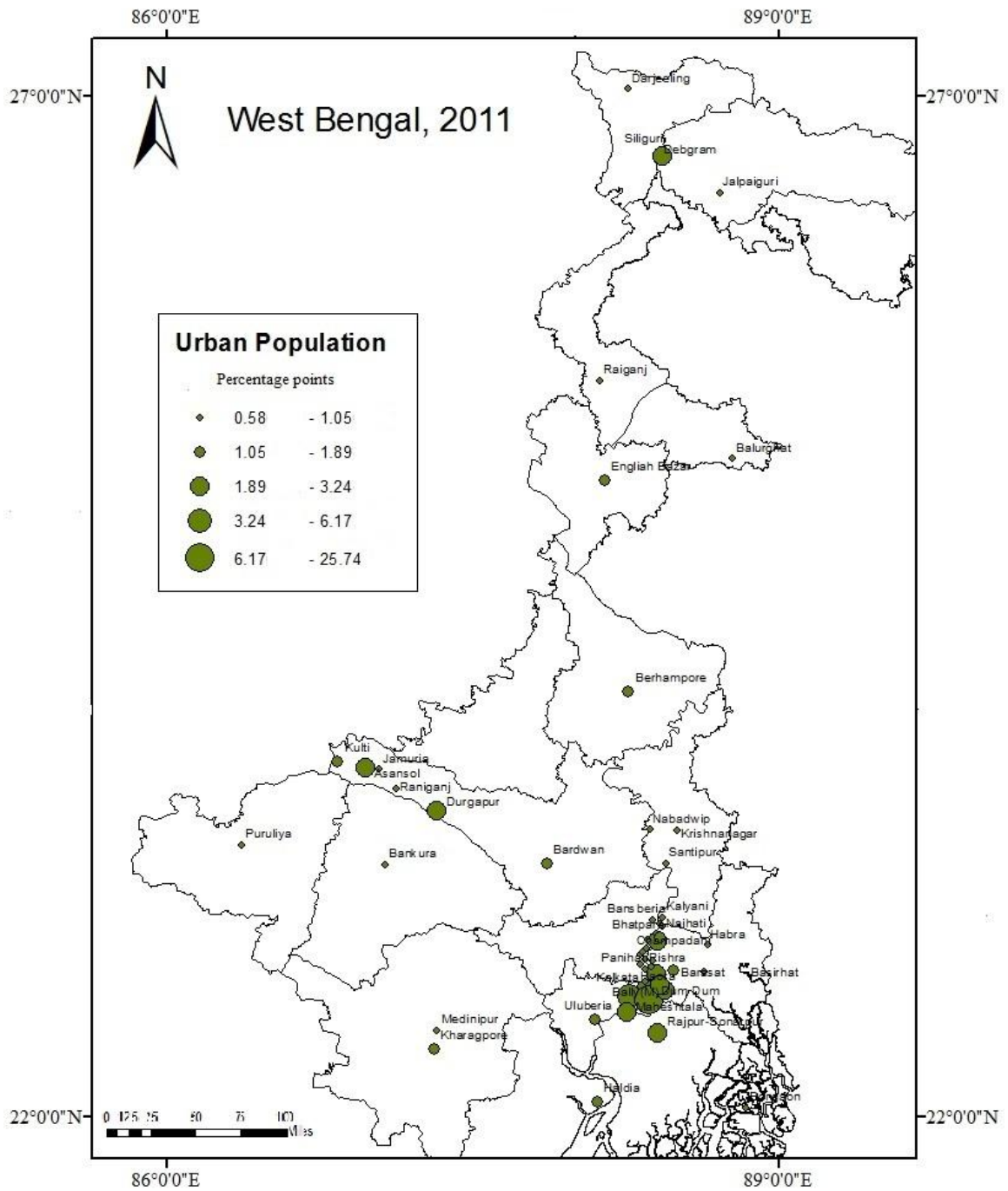
Name of the State	U_P (%)	Population of class one towns (%)	
		T_P	U_P
WEST BENGAL	31.87	19	60

Source: Census of India, 2011

*Note: T_P= total population, U_P = Urban population

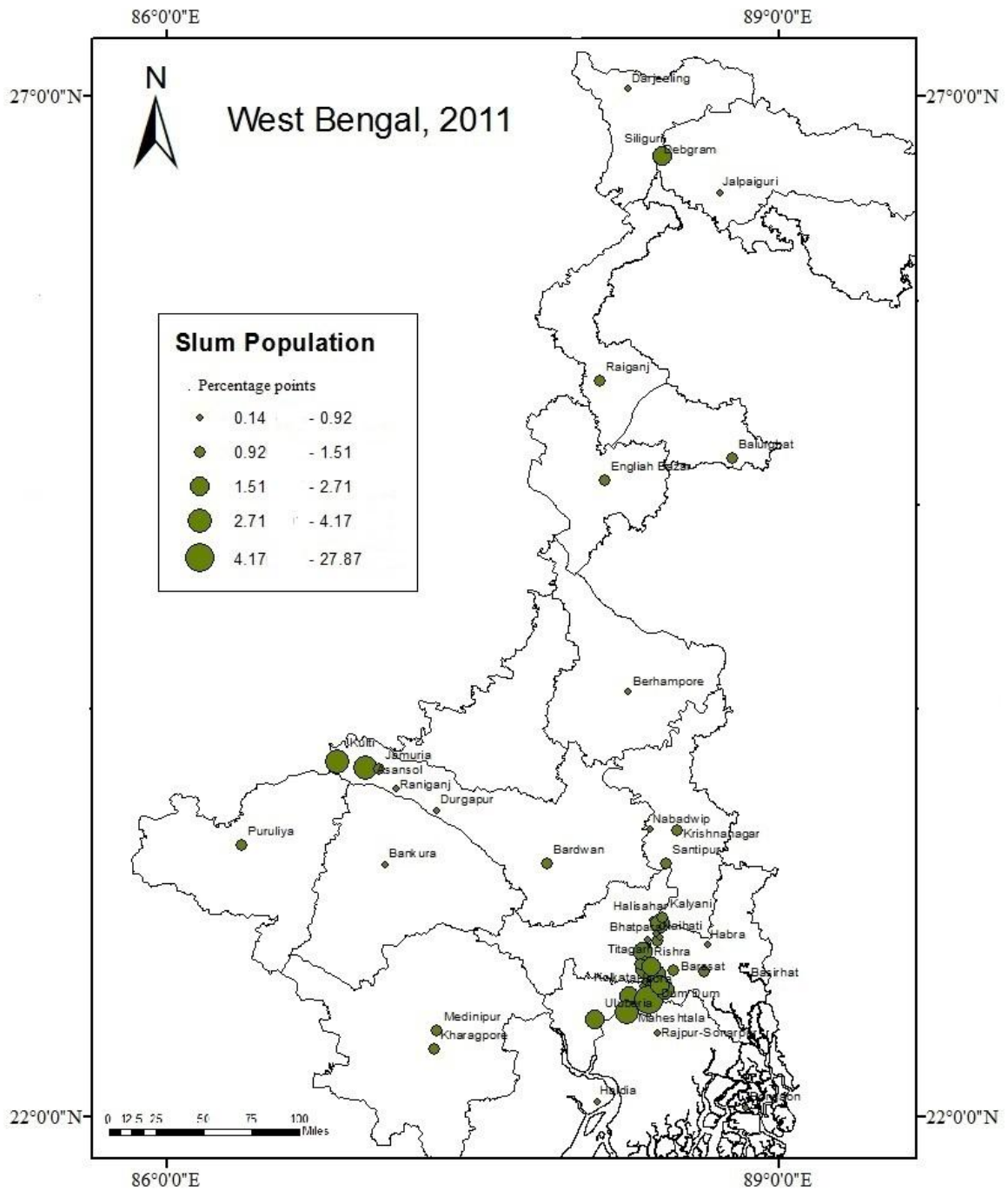
The table 2.6 depicts that in this state about 19 percent of the total population lives in the class I towns. And out of the total urban population about 60 percent resides in class I towns of the state. In this state slum population is increasing at a much faster rate during 2001-2011. In West Bengal, slum population grew by 55 percent which is much higher than the urban population growth rate of the state (appendix-3). It could be said that in coming decade slum population concentration is more in this state. The distribution of urban and slum population of this state can be shown with the help of map 2.4 and 2.5.

Map 2.4 Urban Population of Class I towns in West Bengal



Source: Census of India, 2011

Map 2.5 Slum Population of Class I towns in West Bengal



Source: Census of India, 2011

Map 2.4 shows the location of the class I towns in West Bengal. There is concentration of class I towns near Kolkata, many of the towns flourished near this city only. As it has

long history of development (Calcutta served for many years as the capital of British India. The early and prolonged exposure to British administration resulted in expansion of Western education, culminating in development in science, institutional education, and social reforms of the region) and forms a major urban agglomeration of the state. People used to migrate in and around Kolkata, to avail the economic benefits of the metro as this metro provides better infrastructure, better connectivity of transport and communication. State industries are localized in Kolkata region. It is becoming a hub of Information technology industry, software Technology Park developed in only in Kolkata in West Bengal. To see the effect of concentration of population on distribution of urban and slum population in the state, class I towns clubbed to form the urban agglomeration.

2.3.2 Urban Agglomeration in West Bengal

The table 2.7 shows the urban population and slum population of urban agglomeration of West Bengal:

Table 2.7 Population distribution in urban agglomeration in West Bengal

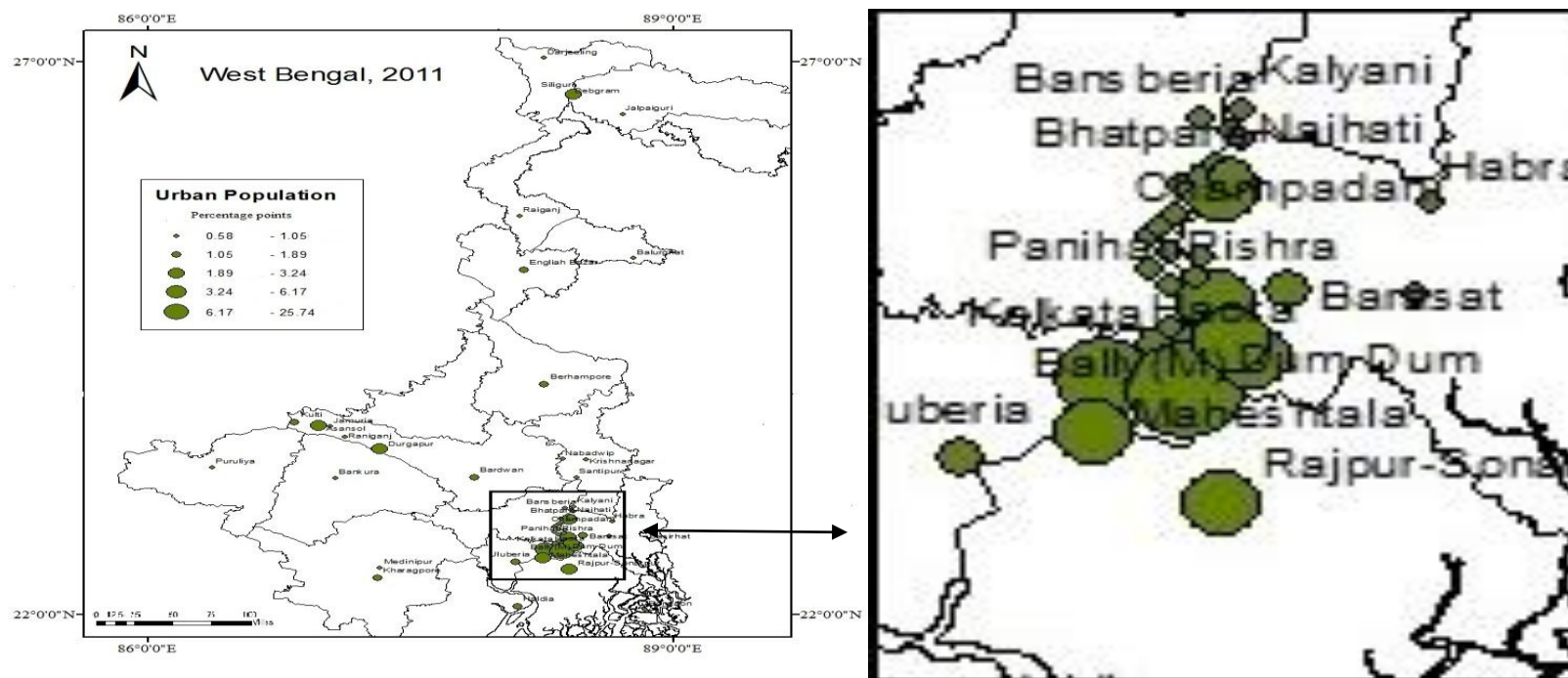
Area Name	Total Population (%)	Slum Population (%)
Kolkata UA	68.67	72.45
Asansol UA	6.62	9.15
Habra UA	6.86	2.96
Barddhaman UA	1.79	1.34
Durgapur UA	3.24	0.86
Siliguri UA	2.93	2.43
Kharagpur UA	1.18	1.04
English Bazar UA	1.17	1.20
Baharampur UA	1.11	0.81
Raiganj UA	1.05	1.43
Balurghat UA	0.87	1.29
Krishnanagar UA	0.87	0.97
Santipur UA	0.86	1.19
Nabadwip UA	0.71	0.87
Jangipur UA	0.69	0.99
Darjiling UA	0.68	0.49
Jalpaiguri UA	0.61	0.45

Source: Census of India, 2011

The table 2.7 shows that about 69 percent of the total class I towns' lives in Kolkata urban agglomeration and this percent would increase to 76 percent when Habra is also merged with the Kolkata agglomeration. As Habra city is not farther away from the

Kolkata urban agglomeration as shown in map 2.6. If the distance between the two does not vary much then how the basic characteristic of the agglomeration would be different. So, Habra could also be clubbed with Kolkata agglomeration to form an agglomeration. Index of primacy tells that Kolkata have ten times more population than that of Asansol which is the next largest urban agglomeration of the state.

Map 2.6 Location of Kolkata urban agglomeration in West Bengal



Source: Census of India, 2011

In West Bengal about 72 percent of slum population of class I towns of the state lives in Kolkata urban agglomeration and would be increase to 74 percent of slum population. This suggests that not only in Maharashtra but in West Bengal also there is the tendency of people to live in and around the metro cities.¹³⁴ As a result metro cities are expanding while the smaller towns have degenerated consequences. This could be further explained by the following reclassification of cities into some hypothetical metros which would give the glimpse of the concentration of population among the class I towns of West Bengal.

2.3.3 Reclassification of Class one towns of West Bengal

In West Bengal, there is sudden rise of census towns to 782 in 2011 which were 252 in 2001¹³⁵ there are 61 class I towns and approximately 60 percent of the urban population of the state lives in class I towns, according to the Census 2011. In Kolkata metro, about 25 percent of urban and 28 percent of slum population resides. To see the concentration of population in different regions within the ambit of class I towns is explained herewith. The analysis of West Bengal's hypothetical cities and the classification of Class I towns of West Bengal along with the urban and slum population is shown in the table 2.8.

Table 2.8: Classification of Class I Towns of West Bengal

Sr. No	Area Name	Reclassification of cities	proportion of Urban population	proportion of slum population
1	Kolkata	Metro cities	25.743	27.86
2	Haora		6.166	1.65
1	Durgapur	Regional metros	3.243	0.8
2	Asansol		3.228	3.96
3	Siliguri		2.938	2.41
1	Maheshtala	Juvenile cities	2.567	4.17
2	RajpurSonarpur		2.429	0.58
3	South DumDum		2.309	2.20
4	RajarhatGopalpur		2.306	1.64
5	Bhatpara		2.21	1.48
6	Panihati		2.16	1.80
7	Kamarhati		1.89	2.30
8	Barddhaman		1.799	1.34
9	Kulti		1.797	3.49

¹³⁴ Stockwell, E. G., Laidlaw, K. A., Stockwell, E. G., & Laidlaw, K. A. (1980). A Note on the Association between Urbanization and Development in the Third World. *International Review of Modern Sociology*, Vol.10(1), 1–13.

¹³⁵ Census of India, 2011

1	Bally		1.68	0.86
2	Barasat		1.594	1.4
3	North DumDum		1.426	1.41
4	Baranagar		1.404	1.07
5	Uluberia		1.347	2.71
6	Naihati		1.247	0.36
7	Bidhannagar		1.234	1.50
8	Kharagpur		1.189	1.04
9	English Bazar		1.177	1.20
10	Haldia		1.15	0.88
11	Berhampore		1.118	0.81
12	Raiganj		1.051	1.43
13	Serampore		1.041	1.09
14	Hugli-Chinsurah		1.015	0.48
15	Medinipur		0.969	1.10
16	Chandannagar		0.955	0.73
17	UttarparaKotrung		0.911	0.51
18	Balurghat		0.878	1.29
19	Krishnanagar		0.876	0.97
20	Barrackpore		0.875	0.42
21	Santipur		0.869	1.19
22	Jamuraia	Incipient cities	0.854	0.97
23	Habra		0.843	0.91
24	Bankura		0.787	0.91
25	North Barrackpore		0.76	0.14
26	Kanchrapara		0.742	0.66
27	Raniganj		0.741	0.77
28	Nabadwip		0.719	0.87
29	Halisahar		0.715	1.60
30	Rishra		0.713	1.76
31	AshokenagarKalyangarh		0.696	1.31
32	Baidyabati	0.693	0.52	
33	Puruliya	0.693	0.99	
34	Darjiling	0.68	0.49	
35	Titagarh	0.667	2.22	
36	Dum Dum	0.657	0.56	
37	Champdani	0.637	1.73	
38	Bongaon	0.623	0.79	
39	Khardah	0.621	0.78	
40	Jalpaiguri	0.615	0.45	
41	Bansberia	0.595	0.76	
42	Bhadreswar	0.581	1.21	
43	Kalyani	0.576	1.07	

Source: Census of India, 2011

The table 2.8 depicts that in West Bengal class I towns are more than Maharashtra. But, there are only two **Metro cities** in West Bengal which have above 10 Lakhs population and is the shelter of about 32 percent of urban population. There are no **transitional metros**, cities having population between 8 to 10 lakhs in this state. **Regional metros**,

cities having population between 5 to 8 lakhs are 3 in numbers where about percent of urban and 7 percent of slum population lives, there are nine **juvenile cities** having population between 3 to 5 lakhs, are the homes of 19 percent of urban and slum population of the state. It is quite amazing that out of total class I towns forty three towns falls in the category of **incipient cities** having population between 1 to 3 lakhs and about 39 percent of urban and 44 percent of slum population resides in these incipient cities. And of this 34 towns have population less than 2 lakhs; this indicates that in this state class I category is just like fictions as number of class I towns are high but proportion of population is high in metro cities which are very less in numbers. The similar condition prevails in the previous Census (2001) also, out of the total class I cities; thirty towns are at the incipient stage where about 43 percent of class I towns' population lives. Therefore we say that in this state class I towns are highest in counting but with incipient cities, and most of the incipient cities are the part of Kolkata urban agglomeration.

2.4.1 Urbanisation and slum population in Tamil Nadu

Tamil Nadu is at the forefront of the urbanization trend with 48.40 percent of the state's population lives in urban areas and about 17 percentage points higher than the national average of 31 percent of urban population. Urban population of the state of Tamil Nadu and population of class I towns of this state can be seen in the table 2.9.

Table 2.9 Population distribution in Tamil Nadu

Name of the State	U_P (%)	Population of class I towns (%)	
		T_P	U_P
TAMIL NADU	48.4	19	39

Source: Census of India, 2001 and 2011

*Note: T_P= total population, R_P = rural population, U_P = Urban population,

Table 2.9 tells us that out of the total urban population 39 percent urban population of the state lives in class I towns. This is a large proportion of urban population. Growth of population of the state is depicted in table 2.10.

Table 2.10 Population growth in Tamil Nadu

Name of the State	Urban Population (%)	Rural growth (%)	Urban growth (%)
TAMIL NADU	48.4	6.61	27.05

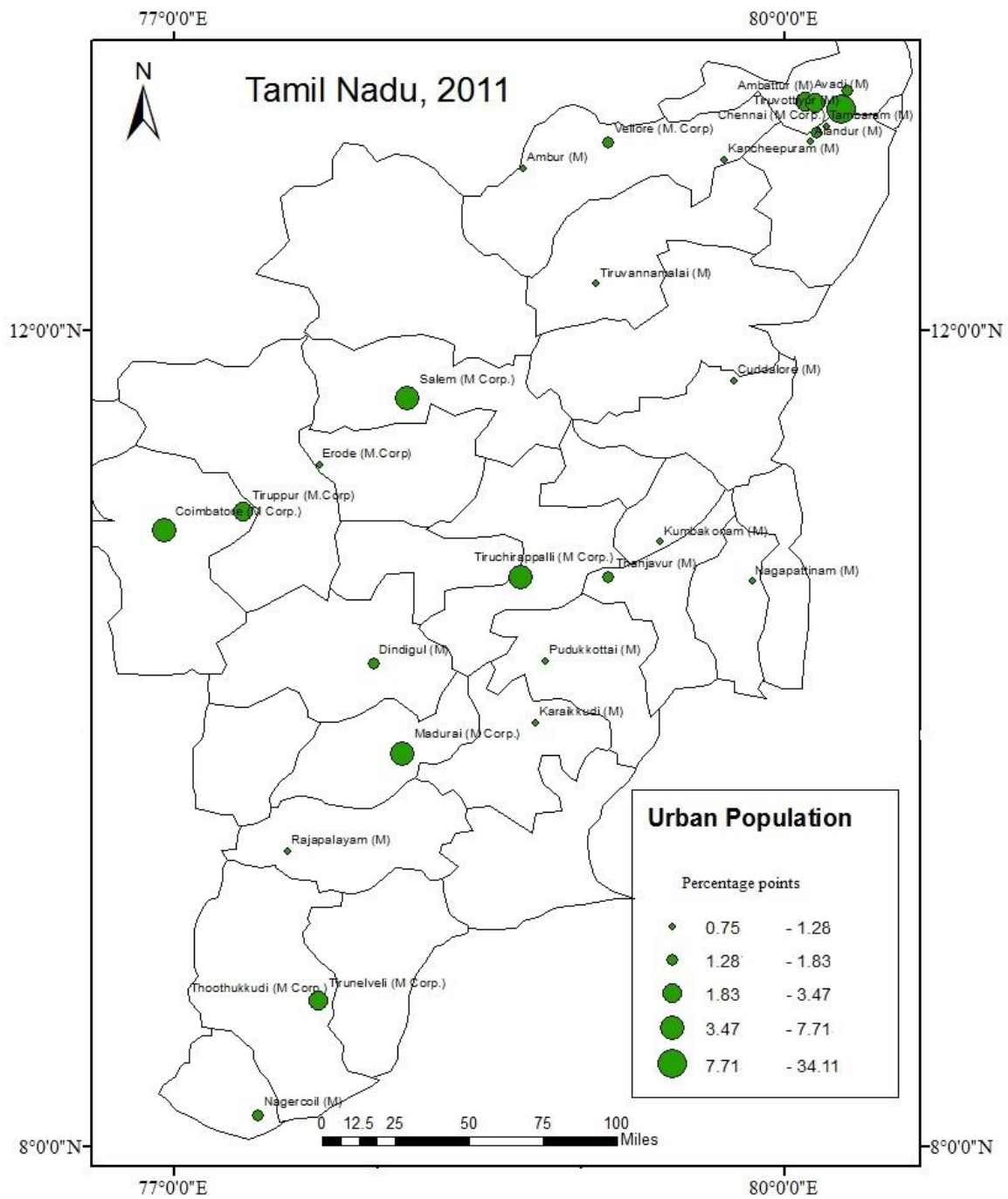
Source: Census of India, 2001 and 2011

Note : R_G = Rural population growth (2001-2011), U_G= Urban population growth (2001-2011).

In Tamil Nadu, Urban population growing at 27 percent during 2001-11 outpaced rural population growth (6 percent) in the state. This indicates that urban population will outnumber their rural counterpart with the same population growth which is expected to increase in the near future.

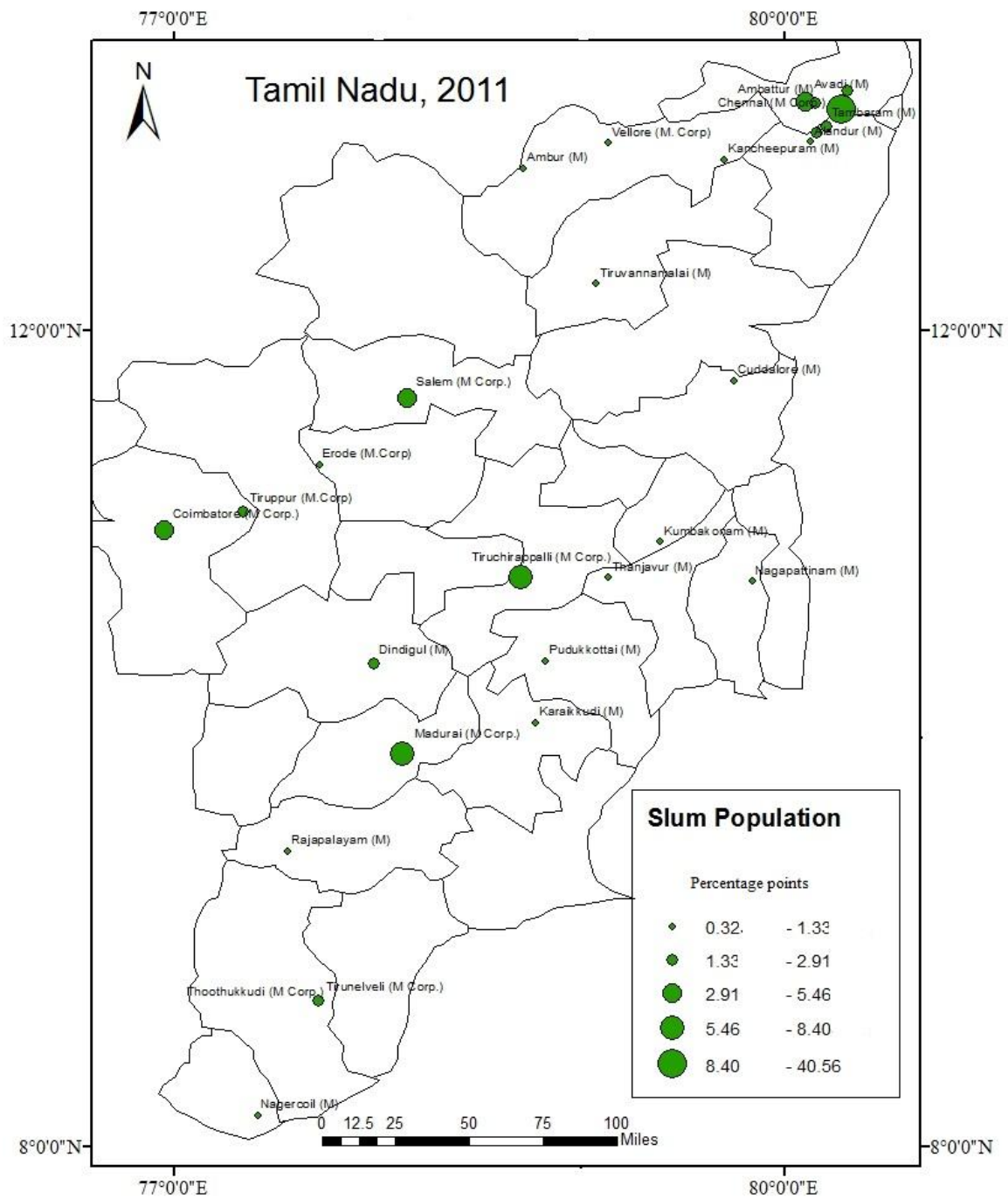
As the urban population grows in the state, the slum population is also increasing day by day. According to Census 2011, 16.6 percent of the total urban population of Tamil Nadu lives in slum which is almost doubled from the last Census (2001) and out of this proportion about 42.6 percent slum population lives in class I towns. Map 2.7 and 2.8 shows the distribution of urban and slum population respectively.

Map 2.7 Urban Population of Class I towns in Tamil Nadu



Source: Census of India, 2011

Map 2.8 Slum Population of Class I towns in Tamil Nadu



Source: Census of India, 2011

In Tamil Nadu, concentration of urban population and class I towns are more in and around Chennai (Map 2.7). While proportion of slum population is more evenly distributed all over the state, in every class I towns of the state (Map 2.8).

In Tamil Nadu slum population increased by 102 percent during 2001-2011. Appendix-4 depicts that the highest urban in three towns viz., Chennai, Coimbatore and Madurai but the growth of urban population in these three towns is less than other smaller towns like in Ambattur, Avadi and Pallavaram towns. The slum population growth is more than the urban growth in these towns. The proportion of slum population is largest in Chennai followed by Madurai and Coimbatore but growth of slum is highest in Tiruppur followed by Alandur. A general pattern could be observed that slum growth rate is more than the urban growth rate in Tamil Nadu. The analysis of urban and slum population in urban agglomeration of Tamil Nadu is discussed in the following section.

2.4.2 Urban Agglomeration in Tamil Nadu

The following table shows the urban population and slum population of urban agglomeration of Tamil Nadu:

Table 2.11 Population distribution in urban agglomeration of West Bengal

Area Name	Total Population %	Slum Population %
Chennai UA	48.205	54.547
Coimbatore UA	8.623	4.162
Madurai UA	7.474	8.405
Tiruchirappalli UA	6.222	6.905
Tiruppur UA	3.263	2.171
Salem UA	6.089	5.468
Erode UA	1.154	0.833
Tirunelveli UA	3.478	2.061
Vellore UA	0.842	1.000
Thoothukkudi UA	1.746	1.181
Dindigul UA	1.522	2.918
Kancheepuram UA	1.364	1.299
Karaikkudi UA	0.784	1.330
Neyveli UA	0.756	1.084
Kumbakonam UA	1.029	1.140
Thanjavur UA	1.637	1.315

Source: Census of India, 2011

*Note: UA= Urban Agglomeration

Here the situation is little bit different as in the above two states more than half of the total urban population lives only in one agglomeration. In this state also the proportion of

urban and slum population is highest in one agglomeration that is Chennai urban agglomeration, about 34 percent and 41 percent of urban and slum population respectively live in Chennai metropolitan. Reclassification of class one towns will give clearer image of the situation which is as follows:

2.4.3 Reclassification of Class I towns of Tamil Nadu

According to 2011 Census, there are about 30 Class I towns in Tamil Nadu, and 19 percent of total population and 39 percent of urban population of Tamil Nadu resides in these 30 class I towns which have population above one lakhs. So there is a need to speculate minutely over these towns that where the concentration of urban population is more. The analysis of Tamil Nadu's hypothetical cities and the classification of Class I towns of the state of Tamil Nadu are shown in table 2.11

Table 2.11: Classification of Class I Towns of Tamil Nadu

Sr. No.	Area Name	Reclassification of cities	proportion of Urban population	proportion of Urban population
1	Chennai		34.119	40.563
2	Coimbatore	Metro cities	7.715	3.904
3	Madurai		7.474	8.405
1	Tiruchirappalli	transitional metros	6.222	6.905
2	Salem		6.089	5.468
1	Tirunelveli		3.478	2.061
2	Ambattur	juvenile cities	3.423	1.665
3	Tiruppur		3.263	2.171
4	Avadi		2.541	3.496
1	Tiruvottiyur		1.832	2.532
2	Thoothukkudi		1.746	1.181
3	Pallavaram		1.718	1.739
4	Nagercoil		1.651	0.323
5	Thanjavur		1.637	1.315
6	Dindigul		1.522	2.918
7	Vellore		1.364	1.299
8	Tambaram		1.283	2.229
9	Cuddalore		1.275	0.927
10	Alandur		1.207	0.91
11	Kancheepuram	incipient cities	1.207	1.082
12	Erode		1.154	0.833
13	Tiruvannamalai		1.067	1.036
14	Kumbakonam		1.029	1.14
15	Rajapalayam		0.958	0.784
16	Kurichi		0.908	0.258
17	Madavaram		0.875	0.331
18	Pudukkottai		0.864	1.112
19	Ambur		0.842	1
20	Karaikkudi		0.784	1.33
21	Nagapattinam		0.756	1.084

Source: Census of India, 2011

The table 2.11 depicts that there are only three **Metro cities** in Tamil Nadu which have above 10 Lakhs population about 49 percent of urban population lives in these Metro cities. About 34 percent of urban population resides only in Chennai. There are only two **transitional metros**, cities having population between 8 to 10 lakhs while there is no **regional metros** (cities having population between 5 to 8 lakhs) in Tamil Nadu. There are four **juvenile cities** having population between 3 to 5 lakhs and twenty one **incipient cities** having population between 1 to 3 lakhs and about 26 percent of urban population resides in these incipient cities. This shows that in Tamil Nadu most of the cities are at their incipient stage that means most of the cities have just entered into the class I town category.

The similar situation is seen in terms of slum population, about 52 percent of slum population lives in metro cities and within this 40 percent of the slum population lives in Chennai. And about 25 percent of slum population lives in incipient cities. It can be said that there is concentration of population whether urban or slum in large metro cities.

2.5 Conclusion

It can be concluded that the situation of the all three state is different from each other. In Tamil Nadu and West Bengal, there is less number of metro cities as compared to Maharashtra. But many things are common in all the three state that is population concentration in and around metro cities. There is prevalence of primacy in Maharashtra, West Bengal and Tamil Nadu as well. In all the three states urban population is growing at much faster rate than their rural counter parts. And slum population growth is higher than that of urban population.

Chapter 3

Basic amenities and proportion of Slum population

3.1 Introduction

Urbanization is a population shift from rural to urban areas, "the gradual increase in the proportion of people living in urban areas", and the ways in which each society adapts to the change. According to United Nation's estimates, in 2010 about 55.1 percent of the world population is urban while there is great gap between developed and less developed nations. About 77.1 percentage point urban population lives in developed countries and in less developed countries the proportion of urban population is approx 44 percent.¹³⁶ Although India is one of the less urbanized countries of the world with only 31 per cent of her population living in urban agglomerations/towns, this country is facing a serious crisis of urban growth at the present time. The sheer magnitude of the urban population, haphazard and unplanned growth of urban areas, and a desperate lack of infrastructure are the main causes of such a situation. The rapid growth of urban population (decadal growth of total population in India is about 17.7 percentage points during 2001-2011 while urban population growth is about 31.8 percentage points)¹³⁷ both natural and through migration, has put heavy pressure on public utilities like housing, sanitation, transport, water, electricity, health, education and so on.

The urban centers offering diverse employment opportunities and means of livelihood are the main centers of attraction for migration; growth of migrants was about 21.5% (1999-2001). But the availability of infrastructure is low as per the Census of India, 2011, about 68.4 % of households living in good housing condition in the country, 70.6 % of households having the access of tap treated water as the main source of drinking water, 92.7% having main source of electricity as main source of lightning, 81.4% households having latrine facility, 77.5 % houses have bathrooms while only 44.5% households having closed drainage connectivity for waste water outlet and 67.8 % of households availing banking facilities.

¹³⁶ World urbanization prospects: The 2014 revision, Department of Economic and social Affairs, United Nations.

¹³⁷ Census of India, 2011

The access to basic amenities like electricity, drinking water, toilet facility, wastewater outlet and clean fuel are critical determinants of quality of urbanization. As per the definition, a slum is characterized by lack of durable housing, insufficient living area, lack of access to clean water, inadequate sanitation and insecure tenure¹³⁸ indicates that as the urban population grows without the proper growth of infrastructure provided by the government led to the increase in slum population. Here, we can say that there is interdependent relationship between basic amenities¹³⁹ or physical infrastructure¹⁴⁰ and slum population.

According to the World Bank's 2011 estimates, over 90% of urban growth is occurring in the developing world. About a quarter of the world's urban population lives in slums.¹⁴¹ When we see at regional level of slum population distribution, wide variation is being found like in Africa; over half of the urban population (61.7%) lives in slums.¹⁴² In Asia, 30% of the urban population resides in slums, and this continent is currently home to half of the urban population of the world.¹⁴³ In the Latin America and Caribbean region, about 24% of urban slum-dwellers are there.¹⁴⁴

Slum population in India is increasing day by day, as per Census of India, 2011; decadal growth of slum population is about 31.8% (2001-2011). Slums have become an integral part of urbanization as the pace of urbanization is increasing in developing countries in the absence of affordable housing and are in a way manifestation of overall socioeconomic policies and planning. A slum means an area where poor people are living in a substandard condition with the lacks of infrastructure facilities and some time social disorganization is originated and inadequate of basic amenities and infrastructural resources.

In this chapter it has been tried to capture the scenario of the relationship (with the help of correlation coefficient method, scattered plot and regression analysis) between availability of basic amenities and proportion of slum population residing in class I towns

¹³⁸ UN Habitat, 2013

¹³⁹ Things considered to be necessary to live comfortably- Cambridge Dictionary

¹⁴⁰ Physical infrastructure refers to the basic physical structures required for an economy to function and survive, such as transportation networks, a power grid and sewerage and waste disposal systems

¹⁴¹ UN-Habitat, 2013

¹⁴² UN-Habitat, 2013

¹⁴³ State of the World Cities Report, 2012/13

¹⁴⁴ UN-Habitat, 2013

of the states of Maharashtra, West Bengal and Tamil Nadu. As the slum is all about the situation or condition in which the people of medium and lower strata are living. To control the growth of slum population and to combat the formation of slum, we have to analyze the situation of basic infrastructure provided in these towns.

This chapter is divided in three sections that is (1) Maharashtra, (2) West Bengal, and (3) Tamil Nadu and these sections are further classified in sub sections to have the idea of the similar situation from different angles. In the initial section, class I towns are taken for the study then these towns are clubbed to form the urban agglomeration and then class I towns are further classified into some hypothetical metros as the major concentration of population is only few large cities in all the three states but number of class I towns are increasing with great pace only because the population count touch the demarcation criteria of class I and to get the clear picture within the class I towns.

3.2.1 Basic amenities and proportion of Slum in Maharashtra

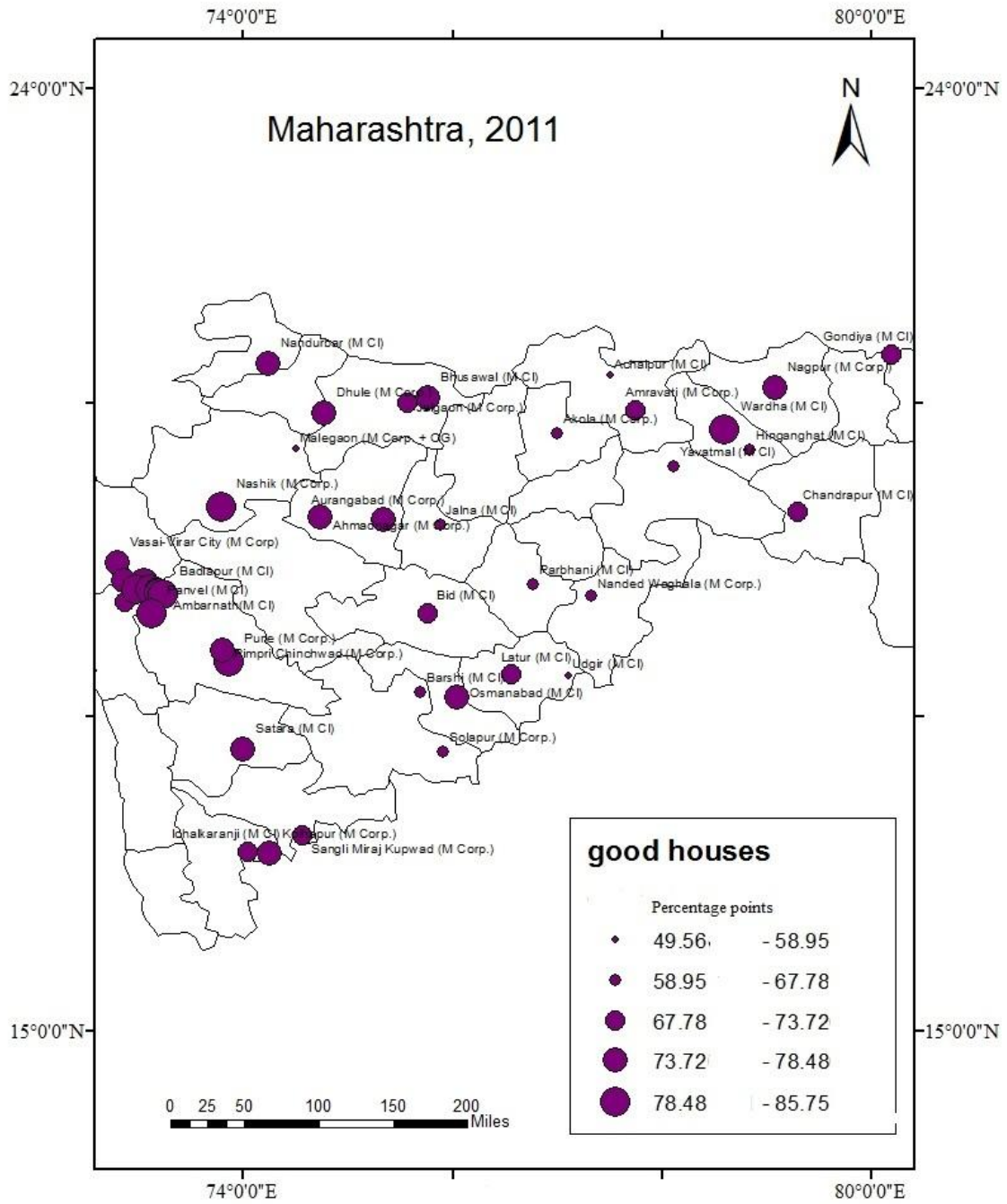
This study is related to the availability of basic amenities/physical infrastructure and slum population in class I towns of the state of Maharashtra in India. The state of Maharashtra has the highest share of slum population to the total slum population of India (as per the Census of India, 2011, 18.1% of total slum population of India lives in Maharashtra). And of the state's urban population 23.31 percentage point population residing in slum. Full coverage of the urban population in terms of access to safe water supply, toilet facilities, sewerage and electricity remains a major challenge in India.

There is lack of basic amenities available in this state as it is revealed by the Census data. As per the Census, 2011, at the National level, 43.5% of households uses treated tap water as a source of drinking water, 67.3% having electricity connection, 46.9% having the latrine facility, 42% having bathing facility while only 18.1% of households having closed drainage connectivity and 58.7% availing banking facility while in Maharashtra, 60.9% of households uses treated tap water as a source of drinking water, 83.9% having electricity connection, 53.1% having the latrine facility, 64.3% having bathing facility while only 33.2% of households having closed drainage connectivity and 68.9% availing banking facility.

According to the NFHS-3 Report (2005), 81.3% population having tap water as their main source of drinking, 97% having electricity connectivity and only 48 % population of Maharashtra having sanitation facility within their premises while the country's 71% population having tap water as their main source of drinking, 93% having electricity connectivity and only 52.8% population of Maharashtra having sanitation facility within their premises. As in the second chapter it has been discussed that in Maharashtra about 45.2 percent population lives in urban areas and of this urban population 77 percent of population lives in class I towns of Maharashtra. So for the present study, class I towns of Maharashtra is being taken.

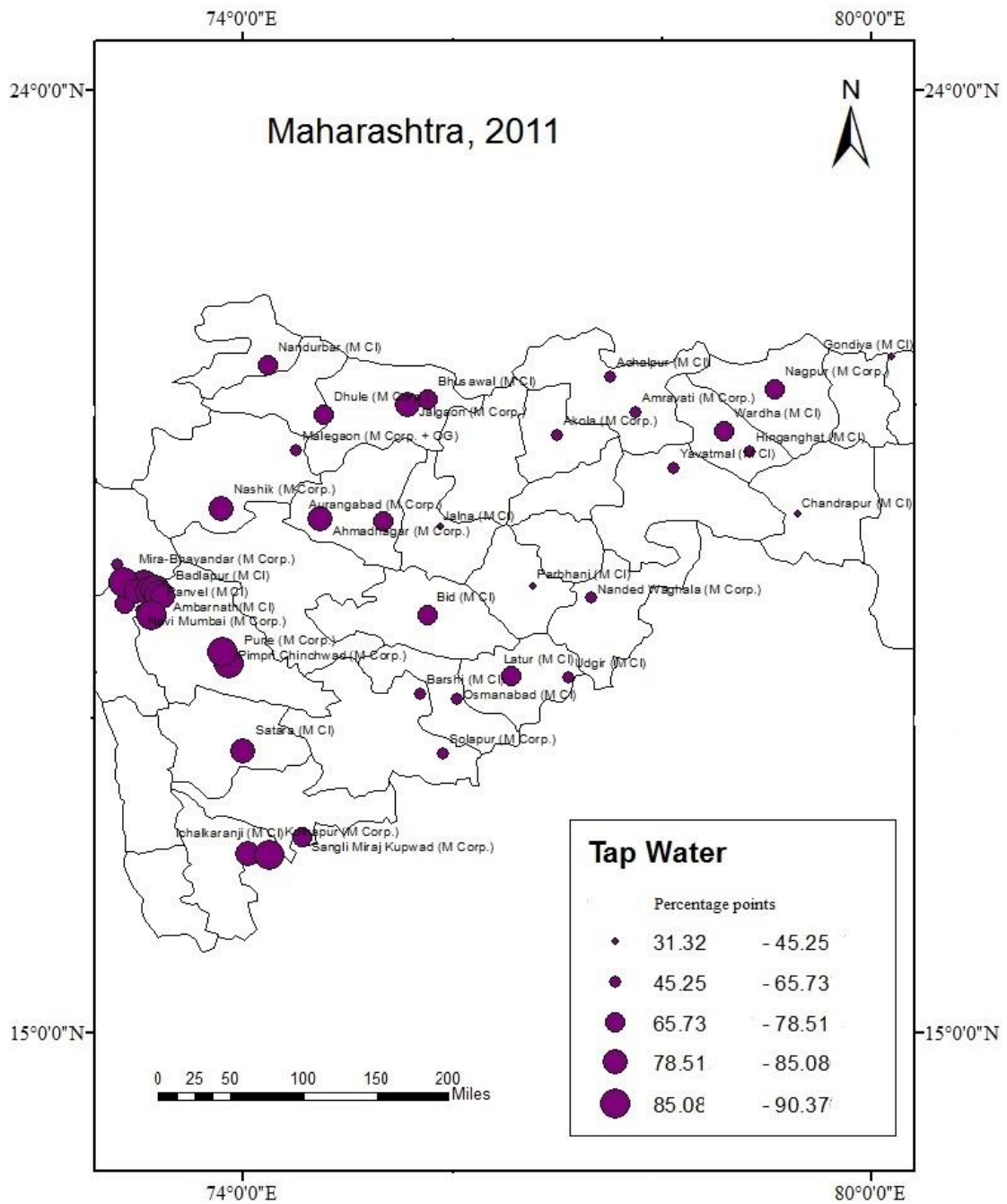
A detailed analysis of proportion of slum population and availability of amenities which includes good housing condition, treated tap water as the source of drinking water, electricity as the source of lightning, households having latrine and bathing facility within the premises, waste water outlet connected to closed drainage, and households availing the banking facilities. This may be a limitation of the study that only these indicators have been taken to assess the availability of amenities and to calculate the amenity index of class I towns of the state of Maharashtra. Map 3.1 to 3.7 shows the distribution of amenities in class I towns of Maharashtra.

Map 3.1 Households having good houses in Maharashtra



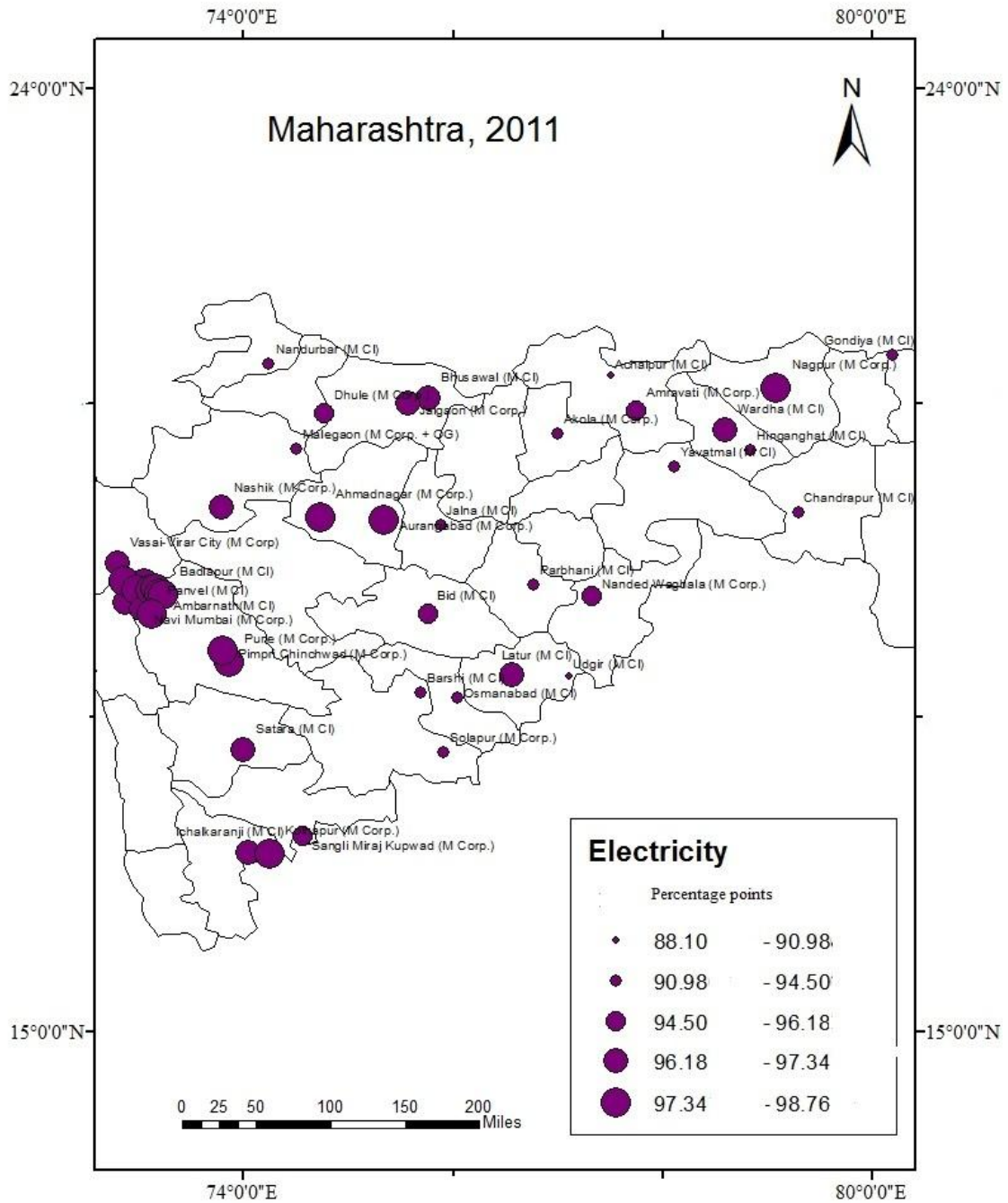
Source: Census of India, 2011

Map 3.2 Households having access to tap treated water in Maharashtra



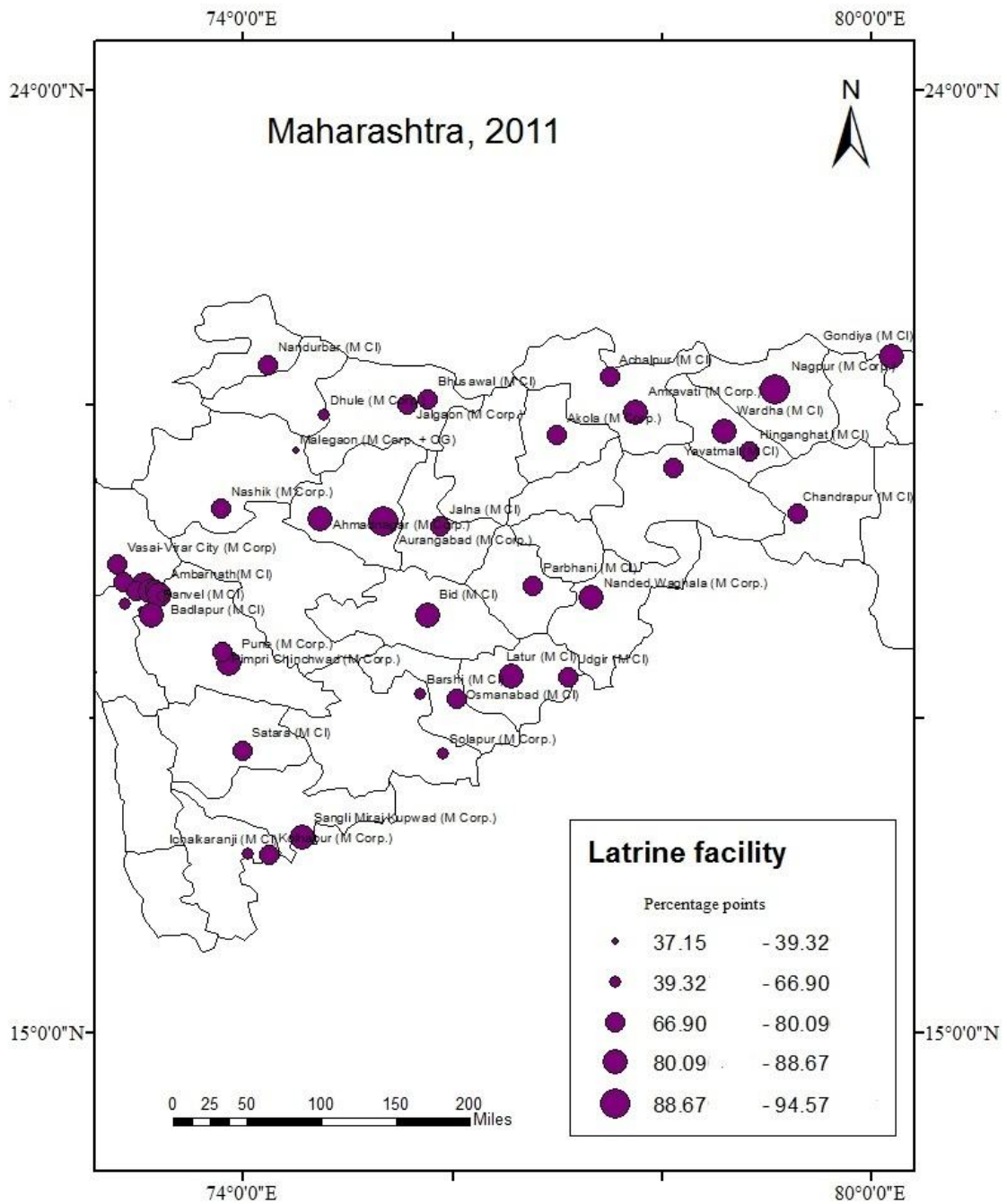
Source: Census of India, 2011

Map 3.3 Households having electricity connection in Maharashtra



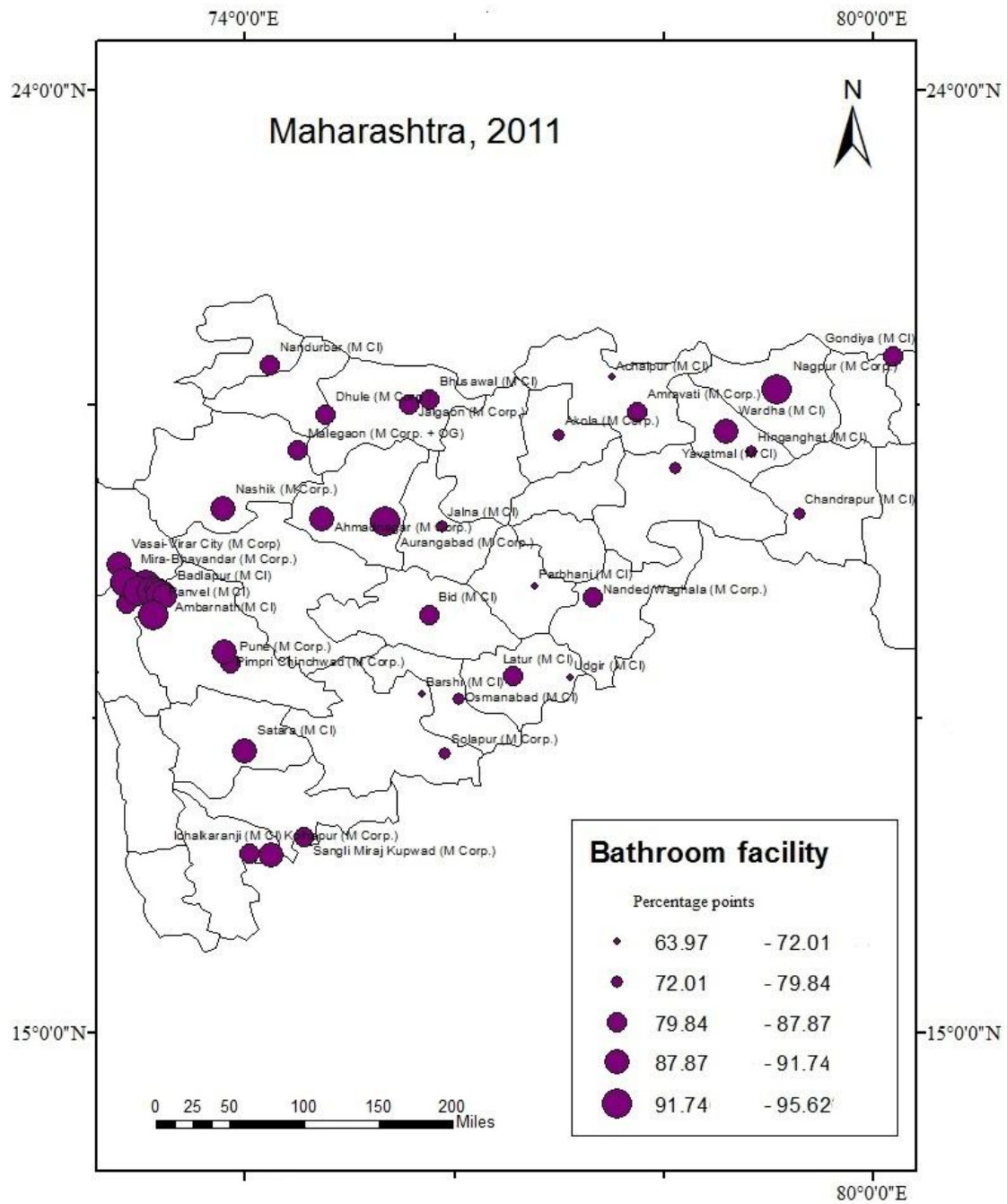
Source: Census of India, 2011

Map 3.4 Households having latrine Facility within the Premises in Maharashtra



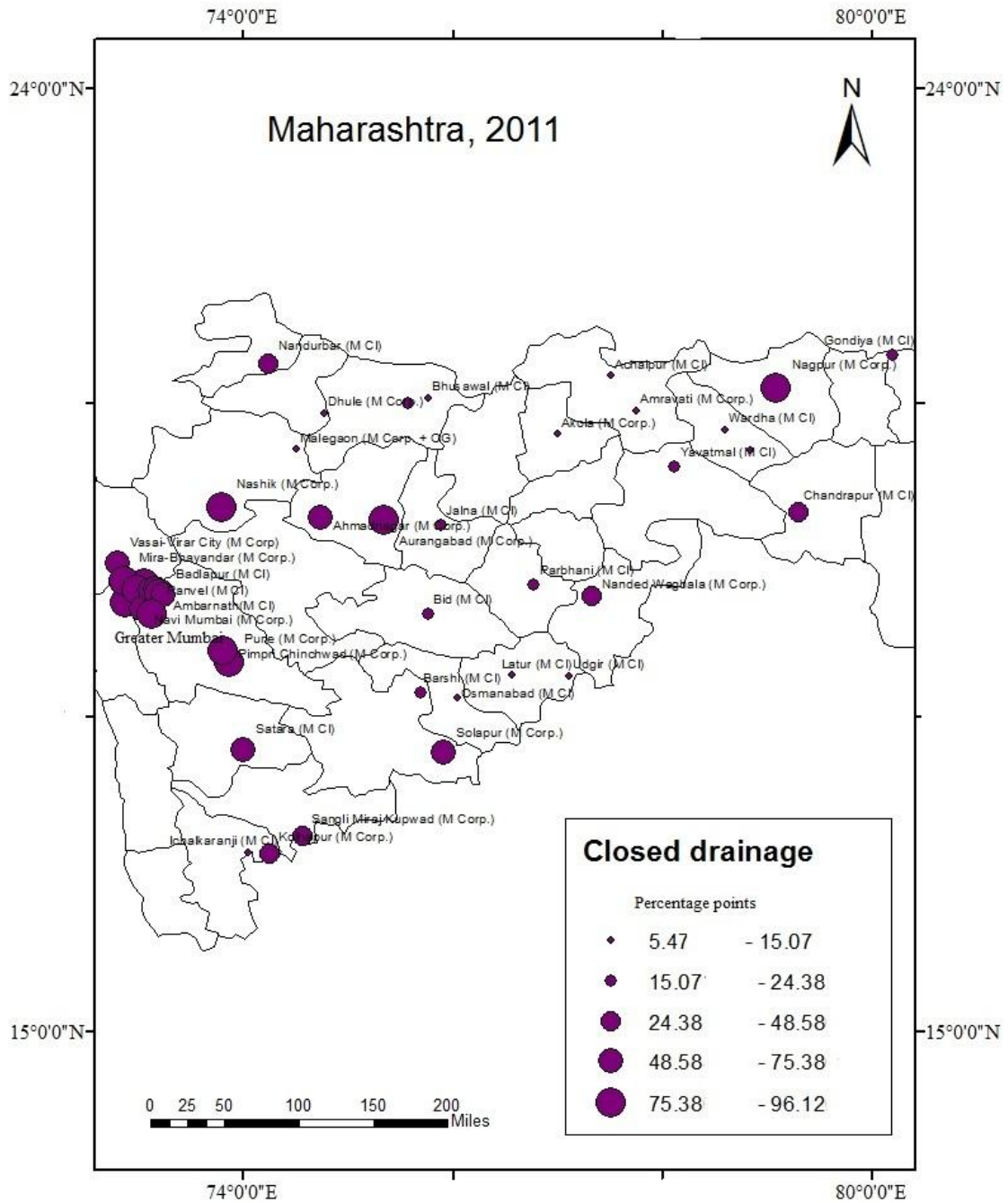
Source: Census of India, 2011

Map 3.5 Households having bathroom Facility within the Premises in Maharashtra



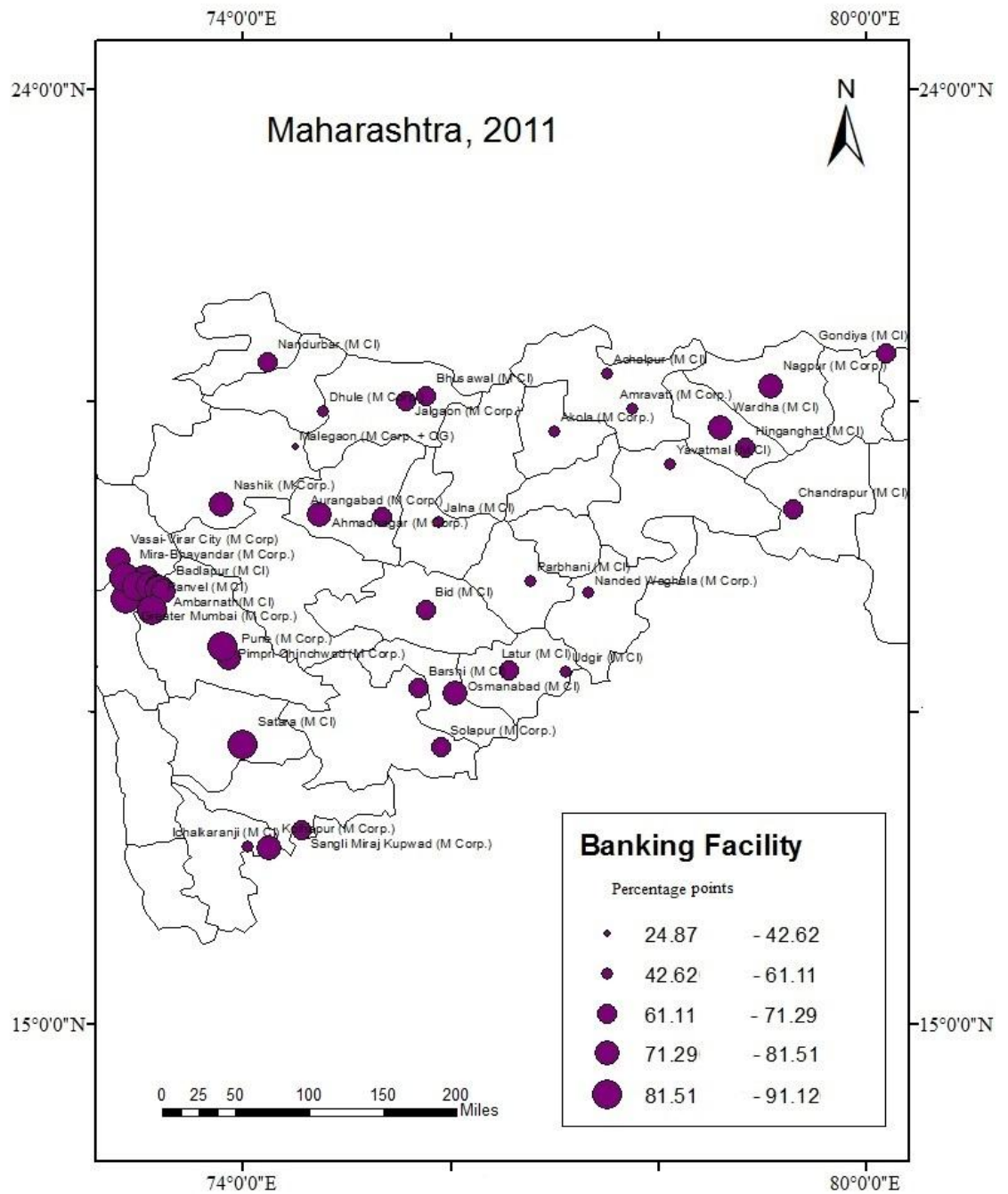
Source: Census of India, 2011

Map 3.6 Households connected to closed drainage outlet in Maharashtra



Source: Census of India, 2011

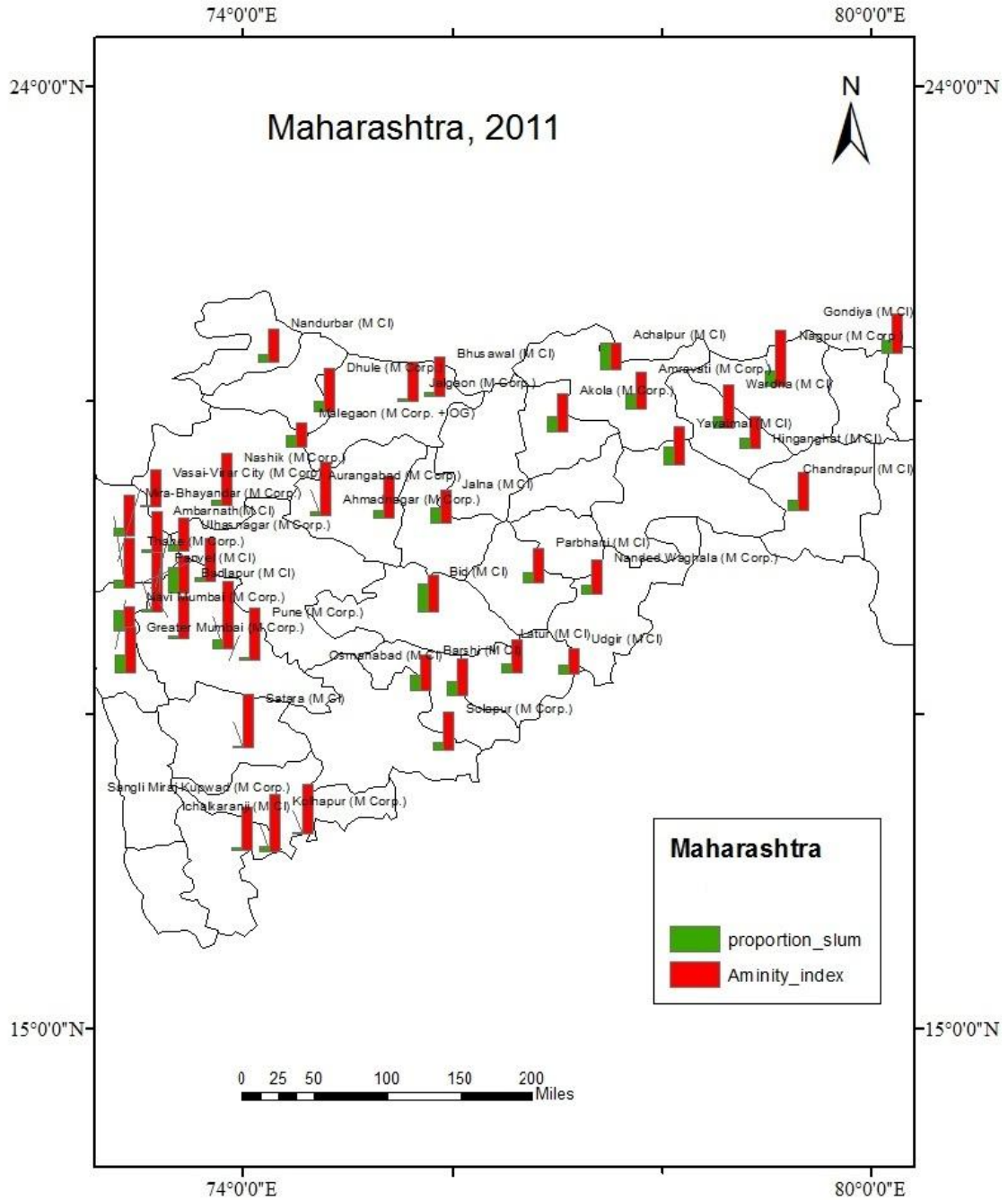
Map 3.7 Households availing Banking services in Maharashtra



Source: Census of India, 2011

As the class I towns are clustered around Greater Mumbai is shown in the maps, the basic facilities also conglomerates around the Greater Mumbai area. As we move interior to the state, away from Mumbai the amenity availability declining. It emphasizes the growth of certain big town which provides basic amenities to the households of the towns. This attracts the population of the hinterlands to lead a life in better living condition with a better standard of life. All the amenities available to the class I towns is above 50 percent. It has been observed that in big cities, share of amenity is more. The distribution of amenity is more distorted. Somewhere it is as high as above 80 percent while in some region it is yet below 50 percent. This has implications on the living condition of the urban population. Basic amenity like sanitary facility, tap treated water, waste water outlet connected to closed drainage are the basic need of public life. When these are provided, the environment conditions become difficult to live in filthy condition. But the low income group people have no choice as to settle down in these areas. This ultimately led to the slum formation. The proportion of slum population of class I towns of Maharashtra and Amenity index (calculated with the help of selected amenity) is shown in the map 3.8

Map 3.8 Amenity Index and proportion of slum population in class I towns of Maharashtra



Source: Census of India, 2011

The map 3.8 shows that where ever amenity index has the higher value, the proportion of slum population is less over there, except in Greater Mumbai and nearby areas of Mumbai. As the nearby or neighbouring regions shows more or less similar characteristics. So the class I towns of the state is being clubbed into the following urban agglomerations which gives the information about the amenity index and proportion of slum of urban agglomeration of the state.

3.2.2 Availability of basic amenities in urban agglomeration and proportion of Slum population residing in these urban agglomerations in the state of Maharashtra

The table 3.1 tells us about the amenity indices and proportion of slum living in these urban agglomerations.¹⁴⁵

Table 3.1 Amenity index and proportion of slum population in urban agglomeration of Maharashtra

Name of UA#	2001		2011	
	Amenity index	prop_slum*	Amenity Index	prop_slum*
Ahmadnagar UA	1.11	7.10	1.16	10.62
Aurangabad UA	1.24	16.92	1.19	18.81
Bhiwandi Nizampur UA	0.84	19.37	0.87	28.67
Bhusawal UA	0.96	11.67	0.90	9.24
Greater Mumbai UA	0.94	43.74	0.97	33.46
Ichalkaranji UA	0.79	7.03	0.87	5.48
Kolhapur UA	1.09	12.55	1.06	12.32
Malegaon UA	0.63	50.86	0.64	27.81
Nagpur UA	1.25	35.93	1.22	32.73
Nashik UA	1.24	12.89	1.22	12.77
Pune UA	1.02	17.35	1.01	16.89
Sangli Miraj Kupwad UA	0.99	6.19	1.00	5.39
Satara UA	1.09	5.40	1.17	3.80
Yavatmal UA	0.86	35.83	0.83	43.00

Source: Census of India, 2001 and 2011

Note: * proportion of slum, # Urban Agglomeration

In the table 3.1, this is being quite clear that in general, where amenity index is low, there proportion of slum is high; that means there is inverse relationship between availability of amenity and proportion of slum population. When amenity index is compared with 2001, Census data to 2011 Census data, it comes to in light that amenity of most of the urban agglomeration is improving. While somewhere amenity index reduced also. Proportion of slum population increases as amenity index reduced in most of the agglomeration during

¹⁴⁵ These urban agglomerations includes class I towns of the state

2001-2011. In these urban agglomerations few towns are being clubbed to form the agglomeration to have a better understanding of the relationship between availability of amenity and slum population town level analysis is being done. And these towns are classified into some hypothetical metros as in some towns major chunk of the population lives only in some cities. According to census of India, 2011, there are about 32% of urban population and 49% of slum population of class I towns of the state lives in Greater Mumbai only. This can be explained in the following section of the chapter.

3.2.3 Basic amenities and proportion of Slum population across Reclassified class I towns of the state of Maharashtra

There is wide variation within the class I towns of the state, whether in terms of availability of amenities or proportion of slum residing in these towns. It has been discussed in the second chapter that the major portion of urban as well as slum population lives in metros having population more than 10 lakhs (about 32% of urban population and 49% of slum population).¹⁴⁶ In all the metro cities the amenity index is above 1 except Greater Mumbai which have amenity index lesser than unit, this indicates that there is lack of basic amenities provided by the Greater Mumbai but proportion of urban dwellers as well as slum population is largest in this metro (Appendix-5). As the value of amenity index increases proportion of slum population decreases in other metro cities while in metros it does not follow the suit. This indicates that there is positive relationship in metros between amenity index and proportion of slum population. And there is inverse correlation between the two in transitional metro, regional metro, juvenile and incipient cities. Correlation between proportion of slum population and amenity index is calculated as 0.02, 0.57, -0.99, -0.80, -0.66 and -0.46 for metro cities including Greater Mumbai, metro cities excluding Greater Mumbai, transitional metro, regional metro, juvenile and incipient cities respectively.¹⁴⁷

To have a better idea about the situation of these metro, the average of amenity index and proportion of slum population of every classification is being done. The table 3.2 throws

¹⁴⁶ According to census of India, 2011

¹⁴⁷ Census of India, 2011

light on the major issues related to availability of amenities and proportion of slum in the reclassified towns.

Table 3.2 Amenity index and proportion of slum population in reclassified class I towns of Maharashtra

Classification of Towns	2001		2011	
	Amenity Index	prop_slum [^]	Amenity Index	prop_slum [^]
Metro cities (Above 10 lakhs*)	0.957	0.395	0.981	0.287
Metro cities (Above 10 lakhs#)	1.004	0.205	1.006	0.180
Transitional metros (8 to 10 lakhs)	0.999	0.188	1.073	0.185
Regional metros (5 to 8 lakhs)	1.022	0.221	0.994	0.257
Juvenile metros (3 to 5 lakhs)	1.022	0.211	1.003	0.214
Incipient metros (1 to 3 lakhs)	0.976	0.251	1.023	0.287

Source: Census of India, 2001 and 2011

Note:* includes Greater Mumbai, # excludes Greater Mumbai, ^ proportion of slum

In the above table, it can be seen that in metro cities, there is highest proportion of slum but amenity index is low. While within the metros when Greater Mumbai is included amenity index is lower and proportion slum is higher and when Greater Mumbai is excluded amenity index goes up and proportion of slum goes down, and the largest concentration of slum population in Greater Mumbai itself. Here, it could be said Mumbai attract more people but could not provide the basic amenities to absorb growing population in metropolis, formal housing of the metro ultimately led to the growth of slum population.

In 2001 amenity index was lower than 2011 index, while proportion of slum reduces from about 40% to 29% during 2001-2011. This is evident that as amenity index increases proportion of slum decreases from 2001 to 2011. In 2011 census, the trend is not followed by incipient cities as amenity index is highest in incipient cities which are just entered into the class I category but it also have high proportion of slum.

3.2.4 Relationship between proportion of slum population and availability of basic amenities in the state of Maharashtra

Relationship between availability of amenities and proportion slum population living in class I towns can be traced with the help of correlation matrix, scatter plot diagram and

regression analysis between various assets and proportion of slum population. Here we start with the correlation matrix.

3.2.4.1 Correlation matrix: Correlation refers to any of a broad class of statistical relationships involving dependence; Correlations are useful because they can indicate a predictive relationship (whether it is positive or negative relation). Correlation matrix is a matrix giving the correlations between all pairs of data sets. Relationship between various selected basic amenities available to the households which have been taken for the analysis (to calculate amenity index) as well as proportion of slum population living in the class I towns of the state of Maharashtra, is being depicted in the table 3.4

Table 3.3 Correlation matrix of assets and proportion of slum population living class I towns of Maharashtra

<i>Amenity</i>	<i>P_G</i>	<i>P_T.W</i>	<i>P_E</i>	<i>P_L.f</i>	<i>P_B.f</i>	<i>P_C.d</i>	<i>P_B</i>	<i>P_S</i>
P_G	1							
P_T.W	0.710	1						
P_E	0.748	0.757	1					
P_L.f	0.576	0.234	0.325	1				
P_B.f	0.801	0.753	0.800	0.510	1			
P_C.d	0.553	0.563	0.683	0.217	0.609	1		
P_B	0.876	0.602	0.673	0.562	0.701	0.657	1	
P_S	-0.504	-0.464	-0.480	-0.309	-0.514	-0.319	-0.420	1

Source; Census of India, 2011

Note; P_G = Percentage of houses in good condition, P_T.W = Percentage of households using Tap water from treated source, P_E = Percentage of households having Electricity, P_L.f = Percentage of households having latrine facility within the premises, P_B.f = Percentage of households having bathing facility within the premises, P_C.d = Percentage of households having Closed drainage, P_B = Percentage of households availing banking services, P_S = Percentage of slum population

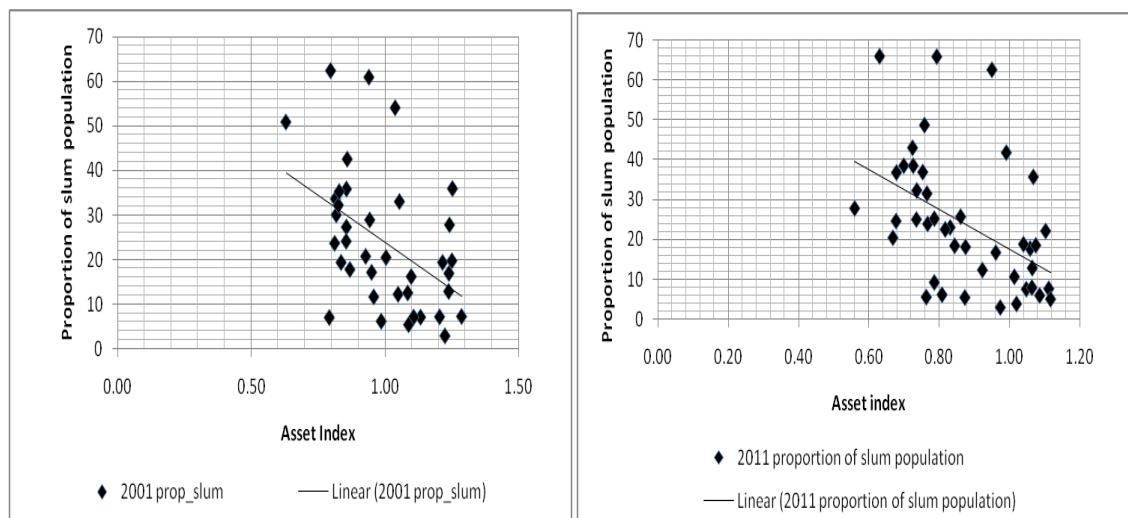
The correlation between various amenity and slum population has been explained in table 3.3. All the selected amenities show the positive relationship with each other as the availability of amenities is interrelated. If people living in good housing condition then it will have electricity connection with latrine and bathroom facility within the premises. Where latrine and bathroom facility is within the premise, there would be more possibility that waste water outlet would be connected to closed drainage. As it can be seen in the table 3.3 closed drainage is positively correlated with the entire (selected) amenity but more with the bathroom facility within the premises. When banking facility is taken for the consideration, it is highly (positive) correlated with good housing

condition. From the analysis it is being clear that availability of basic amenity is positively correlated as well as inter related with each other.

Proportion of slum population living in the class I towns of Maharashtra are negatively correlated with the availability of basic amenity availing the households. That means if amenity availability increases proportion of slum decreases. Therefore we can say to eradicate the problem of slum government have to provide the amenities or infrastructure to the households of the urban community. Slum is all about the condition of housing and environment where they are living. If conditions improve, slum automatically reduces.

3.2.4.2 Scatter diagram: A scatter diagram is a tool for analyzing relationships between two variables. One variable is plotted on the horizontal axis and the other is plotted on the vertical axis. The pattern of their intersecting points can graphically show relationship patterns. When line slope upward, then there is direct relationship or positive relationship between two variables (when one variable increases on the 'x' axis, the other variable at the 'y' axis also increases) and vice versa. Generally on vertical axis (y-axis) variables taken are known as response variable which shows the relationship of the variable taken on the horizontal axis (x-axis). In other words it can be explained that a unit change in the variable of the 'x'-axis of the graph have the impact on the change in the variable plotted on the 'y'-axis. The figure 3.2 shows the relationship between asset index and proportion of slum population.

Figure 3.1 Scatter diagram to show the relationship between proportion of slum population and amenity index in Maharashtra, 2001 and 2011



Source: Census of India, 2001 and 2011

In this graph, on ‘x’ axis, amenity index (dependent variable) is taken and on ‘y’ axis (response variable), proportion of slum population of the class I towns of the state of Maharashtra which shows that there is inverse relationship between proportion of slum and amenity index as the points of the plots which indicate the proportion of slum population are downward sloping. In both the Census year (2001 and 2011) some points are scattered while most of the points plotted on the graph more or less aligned along the line of fit and negatively sloped.

With both the methods discussed above describe the relationship between slum population and asset that there is inverse relationship between the two but how much increase or decrease in one variable could affect the other can be traced with the help of regression analysis as explained in the following section.

3.2.4.3 Regression analysis: Regression analysis is a statistical tool for the investigation of relationships between variables. It is used when two or more variables are thought to be systematically connected by a linear relationship. Regressions are of various type; simple linear regression, multiple linear regression, logistic regression, etc. For this analysis simple linear regression method is being used.

Simple linear regression is the most commonly used technique for determining how one variable; dependent variable (slum population) is affected by changes in another variable, independent variable (asset index). We suppose that they are related by an expression of the form; $y = b_0 + b_1x$ ¹⁴⁸, is the equation of a straight line; b_0 is the *intercept* (or *constant*) and b_1 is the *x coefficient*, which represents the slope of the straight line the equation describes. The table 3.4 tells the relationship between proportion of slum population and asset index.

Table 3.4 Regression coefficients of the state of Maharashtra

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.6742	5.1698	0.0000	0.4108	0.9376
Index	-0.4970	-3.3862	0.0015	-0.7934	-0.2006
R Square	0.22				
Adjusted R Square	0.20				

Source: Census of India, 2011

¹⁴⁸ y=proportion of slum population of Maharashtra, x=amenity index of Maharashtra

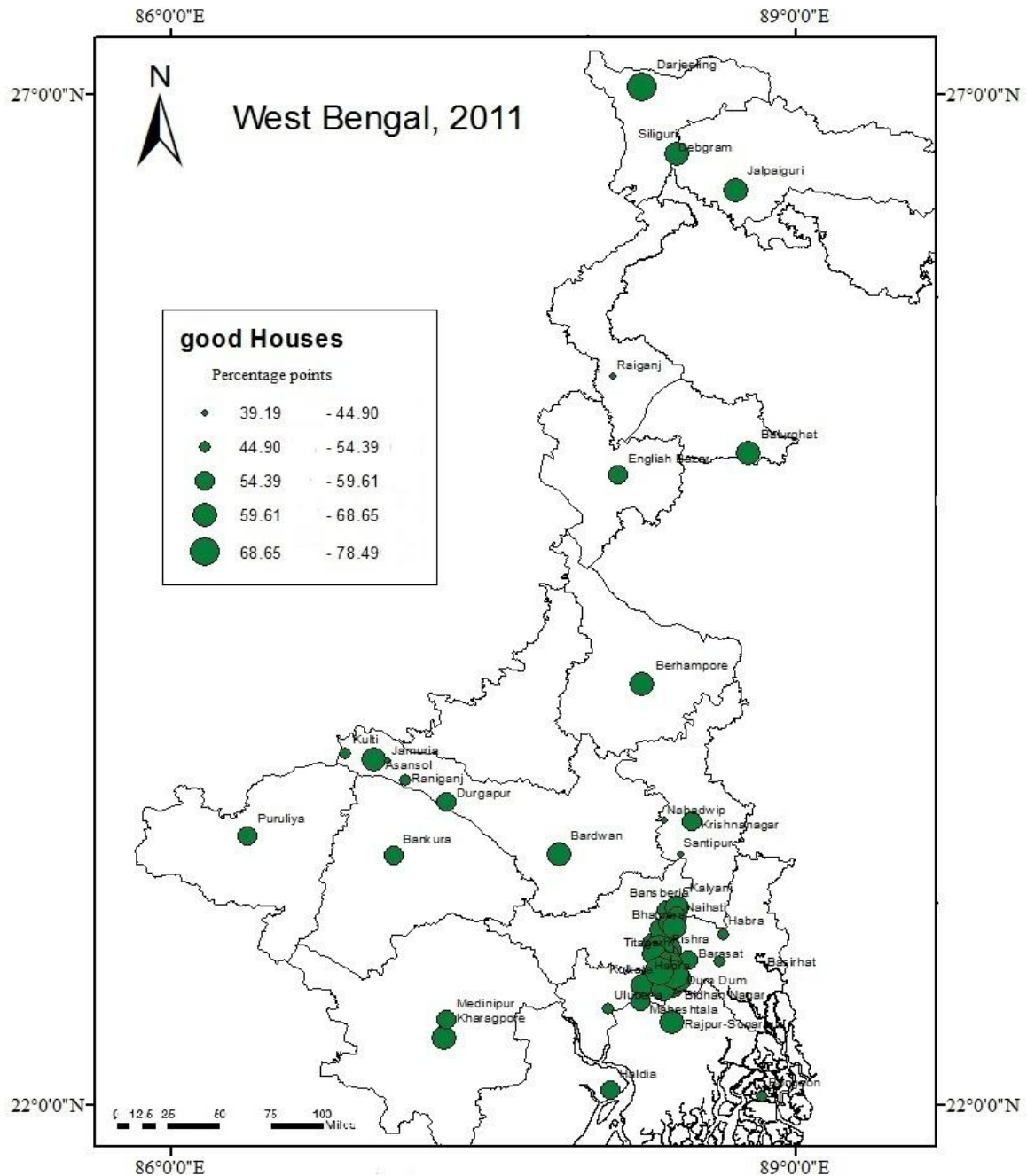
The Simple Linear Regression model explains for negative relationship among the dependent variable that is Slum Population and an independent variable Amenity Index. The p-values used for testing of null hypothesis against covariate explains for the possible rejection of the null hypothesis, accounted by the low p-value (< 0.01), that is 0.0000 for intercept term and 0.0015 for Amenity index. The negative coefficient of asset index very clearly indicates that there stands negative relationship between the two variables and if a unit change occurs in the amenity index the corresponding slum population will show a decline by 0.50 units. The value of R square indicates that around 22% of the variations in the dependent variable around the mean are explained by Amenity index, or one may explain it as 22% of the values fit the model. The model explains the causation between the slum population and amenity index. It could be explained that to address the issue of slum, to reduce to proportion of slum population and to improve the living condition of slum, the way is to provide better amenities to the urban households.

3.2.1 Availability of basic amenities in class I towns and proportion of Slum population residing in these towns in the state of West Bengal

There are 61 class I towns in West Bengal, where 14 new class I towns are adding during 2001-2011. The state has fourth largest slum population (9.8% slum population, as per Census of India, 2011) of total slum population of India. In West Bengal, availability of basic amenity further less than the Maharashtra. NFHS-3 report (2005) suggests that there is lack of basic amenities in the state of West Bengal. According to the NFHS-3 Report, 31.2% population having tap water as their main source of drinking, 89% having electricity connectivity and only 48.7% population of West Bengal having sanitation facility within their premises. The same situation is revealed by the Census 2011 data that 25.4% of households uses treated tap water as a source of drinking water, 54.5% having electricity connection, 58.1% having the latrine facility, 27% having bathing facility while only 9.2% of households having closed drainage connectivity. In this state also pattern of urban population is more or less similar to that of Maharashtra. Here, about 19% of the total population lives in the class-I towns. And out of the total

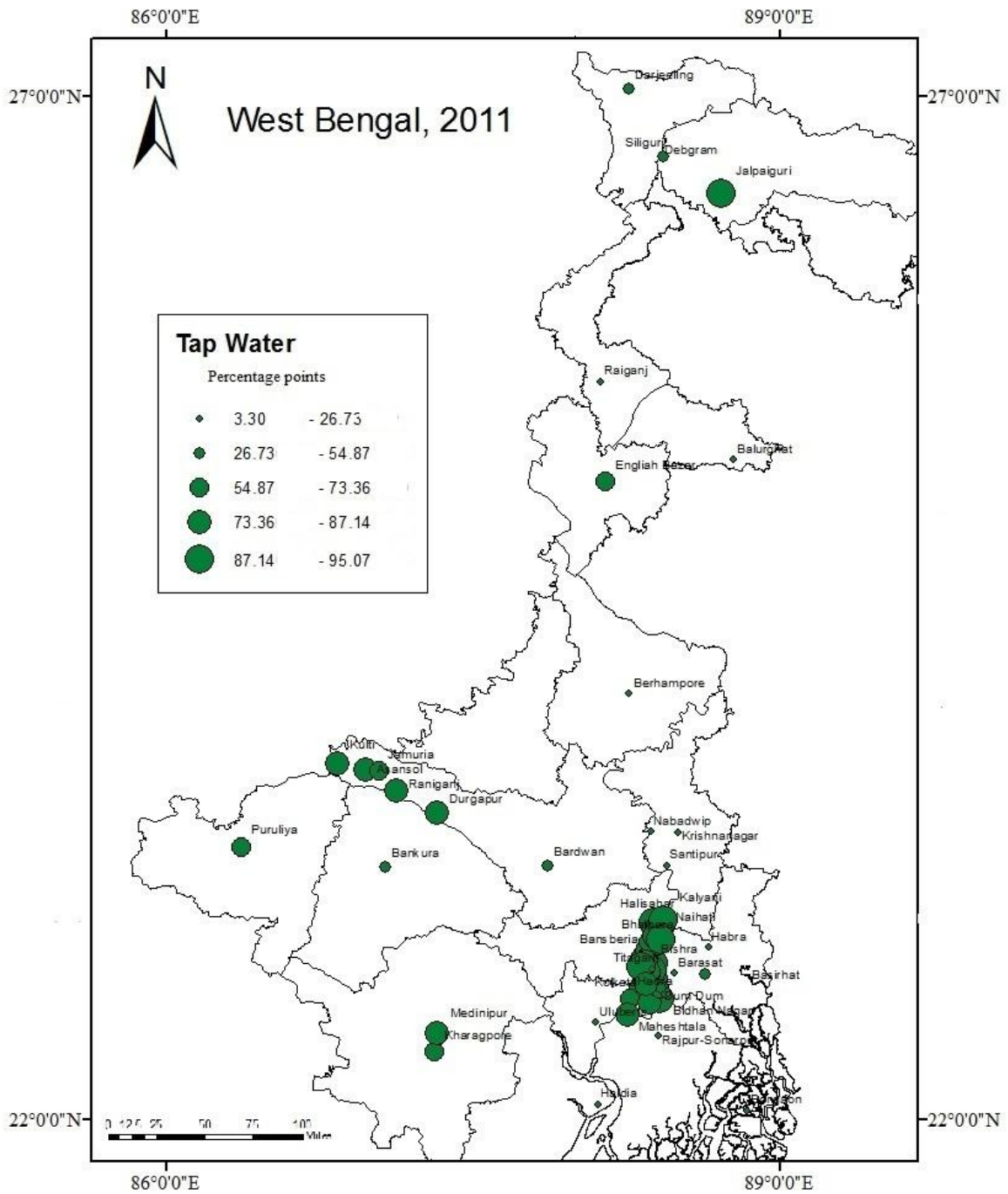
urban population about 60% population resides in these towns. The maps (map 9 to 3.14) explains the present status of availability of amenities in class I towns of the state and proportion slum population living in these towns.

Map 3.9 Households having good houses in West Bengal



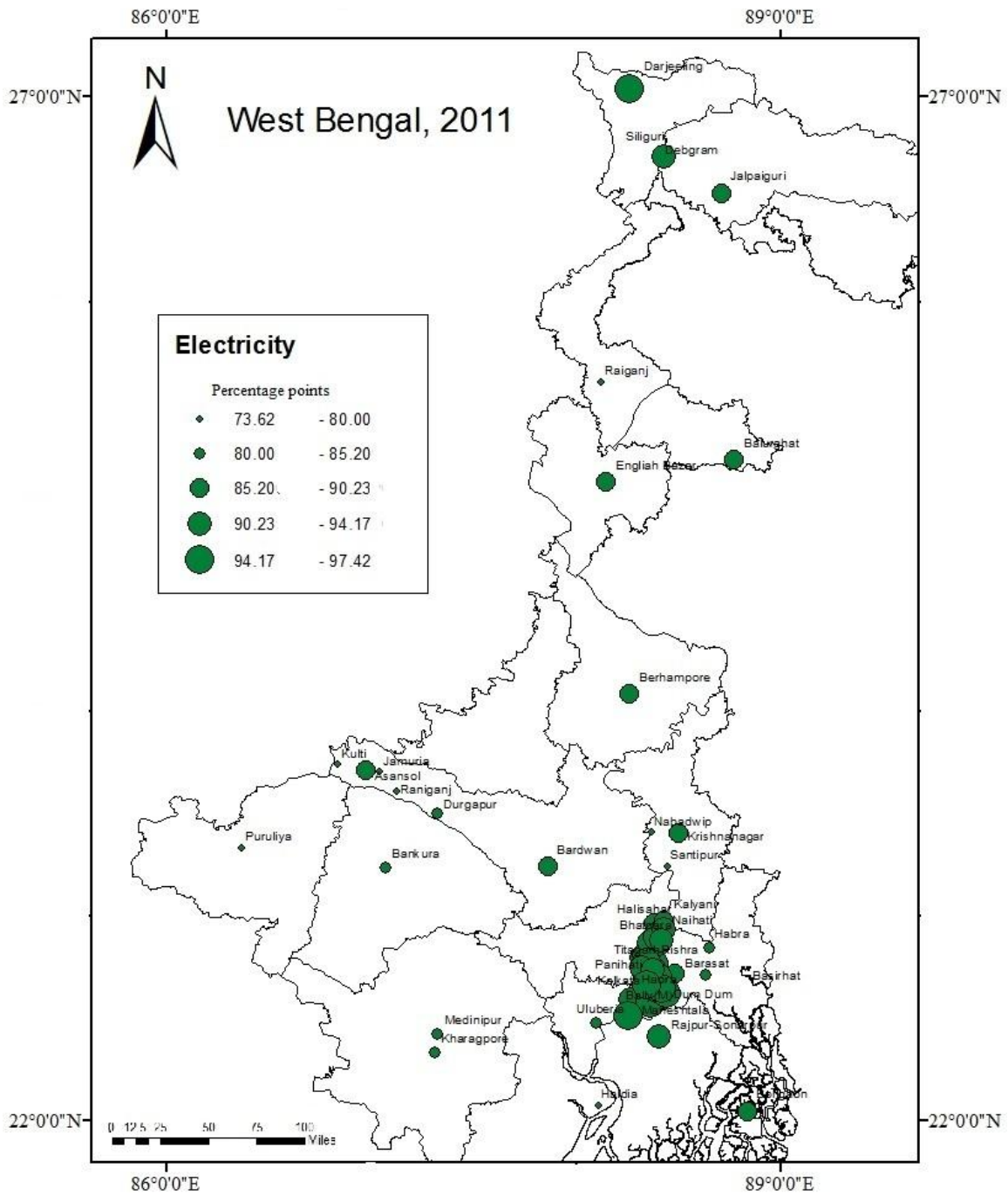
Source: Census of India, 2011

Map 3.10 Households having access to tap treated water in West Bengal, 2011



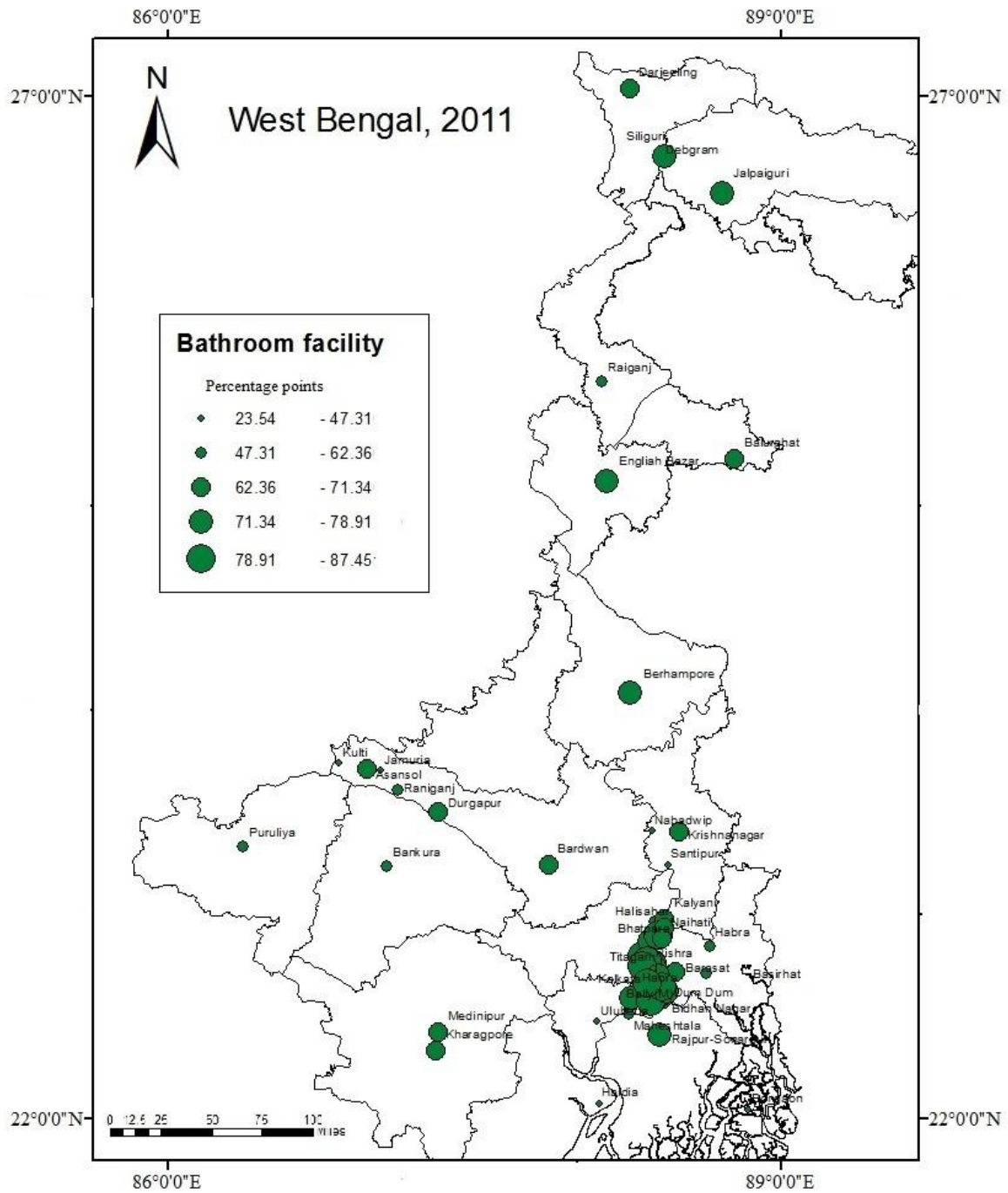
Source: Census of India, 2011

Map5 3.11 Households having electricity connection in West Bengal



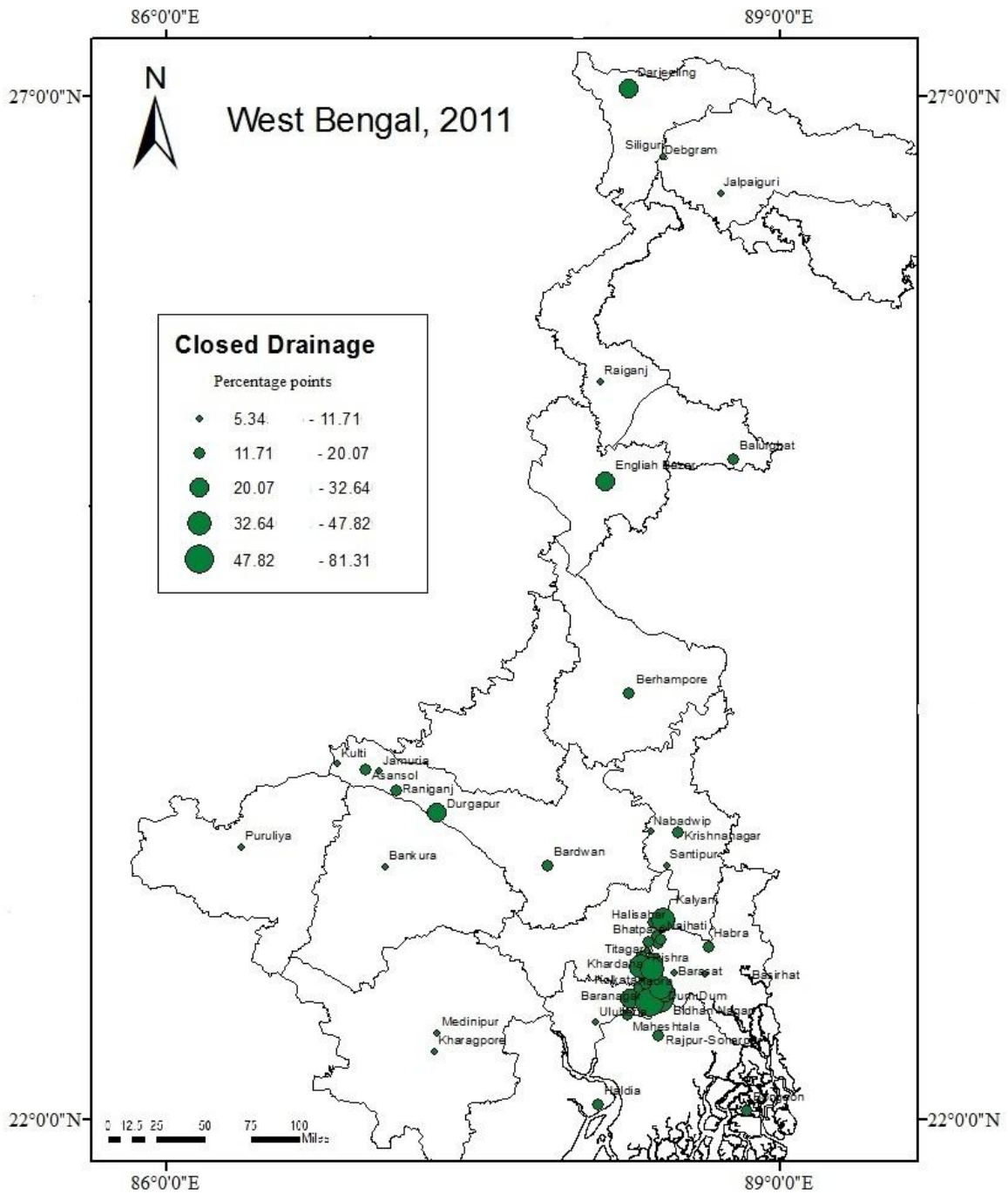
Source: Census of India, 2011

Map 3.13 Households having bathroom Facility within the Premises in West Bengal, 2011



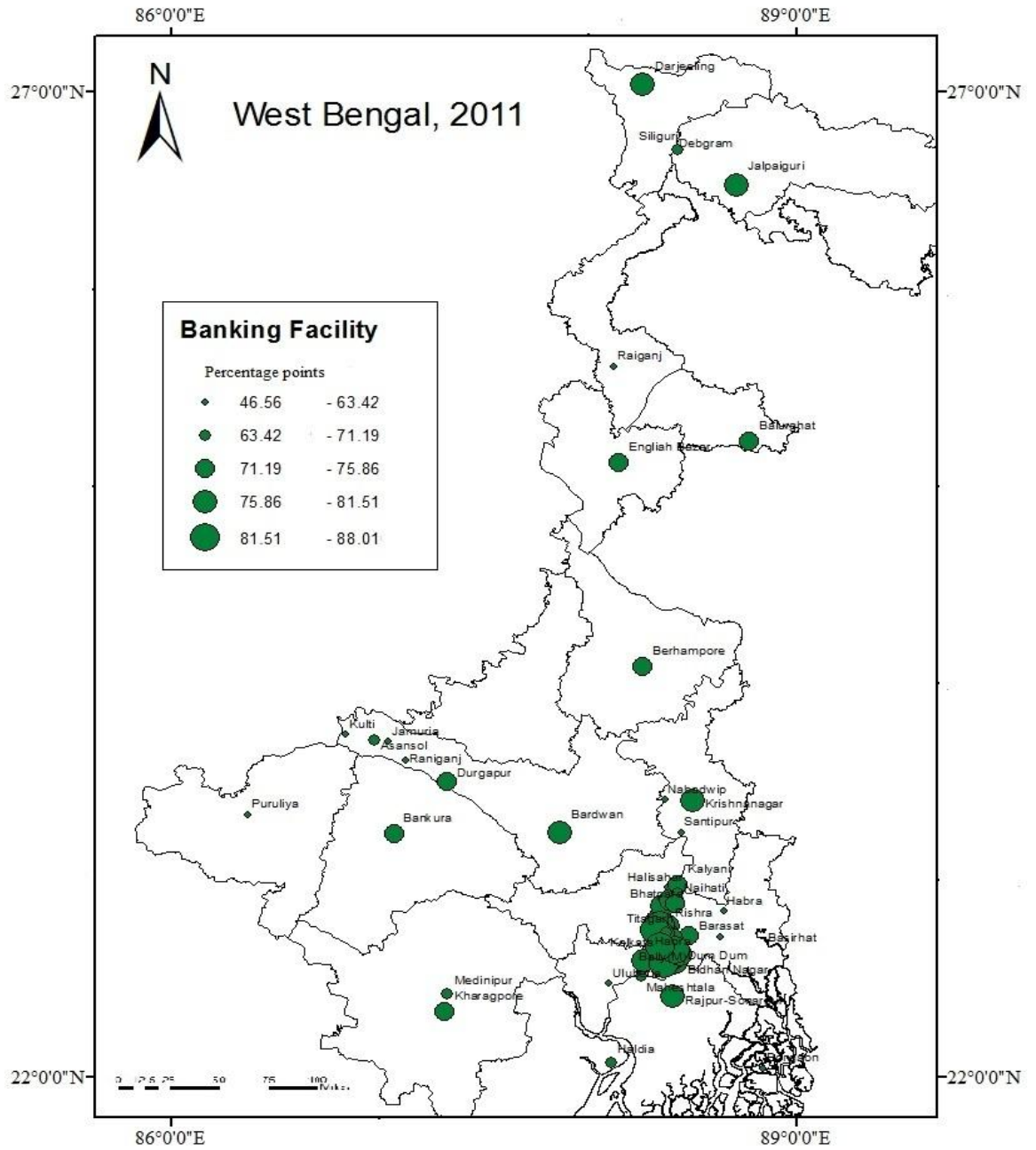
Source: Census of India, 2011

Map 3.14 Households connected to closed drainage outlet in West Bengal, 2011



Source: Census of India, 2011

Map 3.15 Households availing Banking facility in West Bengal

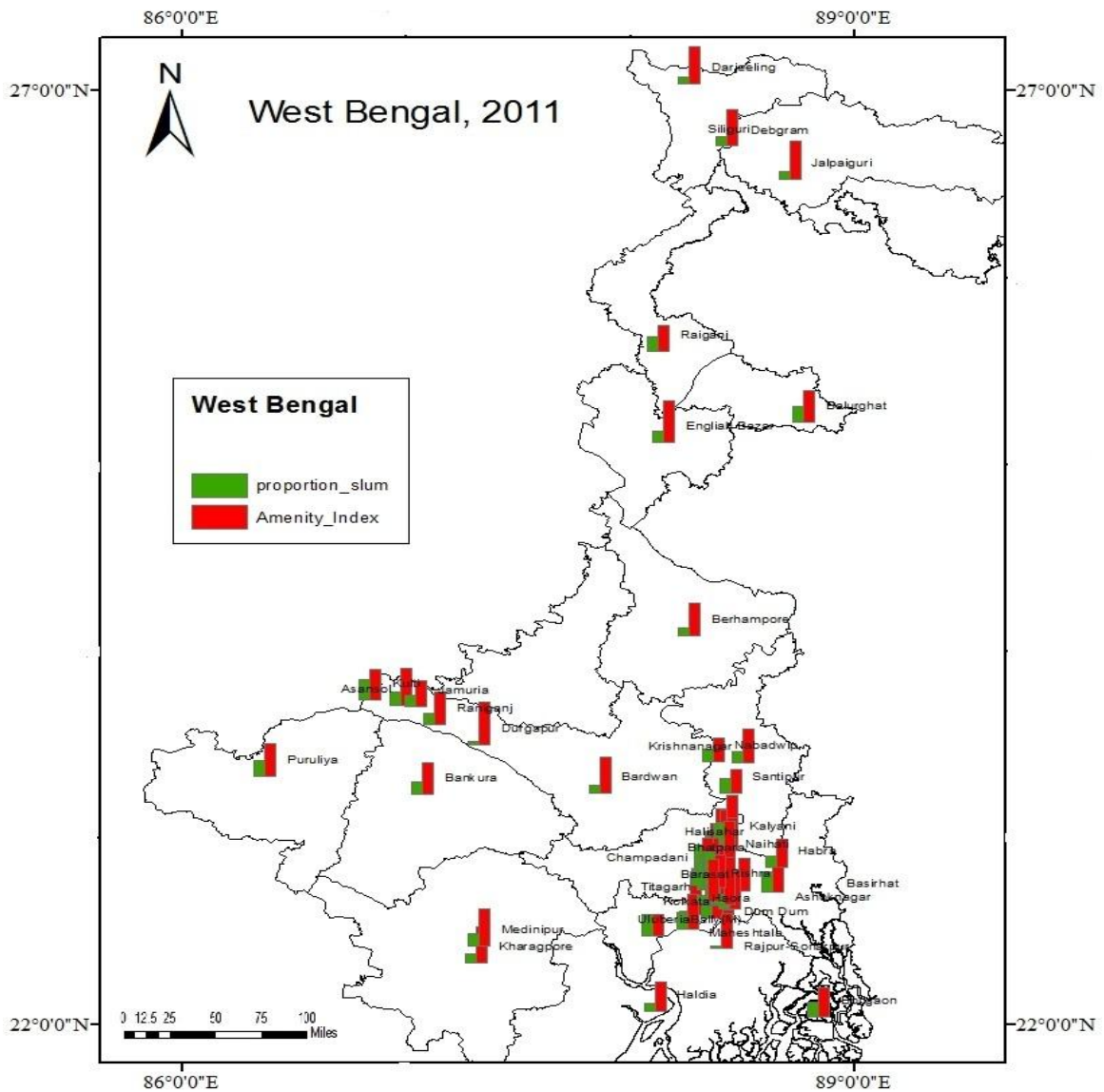


Source: Census of India, 2011

The Maps shows that nowhere in the class I towns of the state of West Bengal any basic facility is upto 100 percentage points which depicts that there is lack of basic amenities and it would be a breeding ground for the formation and growth of slum. In West Bengal,

concentration of amenities (good housing condition, tap treated water, electricity connection, latrine and bathroom facility with the waste water out let connected to closed drainage) is more visible in the maps. Class I towns along with their amenities is surrounded near Kolkata metropolitan region. What would be the impact of this on the slum population could be analyzed from the map 3.16

Map 3.16 Amenity Index and proportion of slum population of class I towns of West Bengal



Source: Census of India, 2011

In the map 3.16 it is being clear that amenity is more concentrated around Kolkata but slum population is of more diverse nature. Slum is concentrated around Kolkata region as well as found in those areas where availability of amenity is less. Here one could establish the relationship between Amenity Index and slum population is of inverse in nature (Appendix-12).

For the further analysis these towns are being clubbed to form the urban agglomeration as the characteristics of cities within the agglomeration is more or less similar.

3.2.2 Availability of basic amenities in urban agglomeration and proportion of Slum population residing in these urban agglomerations in the state of West Bengal

In West Bengal Kolkata Urban agglomeration is the only major agglomerations in the state where about 69 % of the urban population and 68 % of slum population of class I towns have their shelter. The table 3.5 shows the analysis of urban agglomeration in the state of West Bengal

Table 3.5 Amenity index and proportion of slum population in urban agglomeration of West Bengal

Name of UA#	2001		2011	
	Amenity Index	prop_slum*	Amenity Index	prop_slum*
Asansol UA	1.087	27.61	1.071	40.06
Balurghat UA	0.775	29.85	0.883	42.8
Barddhaman UA	0.954	21.85	1.002	21.7
Darjiling UA	1.051	7.77	1.033	21.1
Durgapur UA	1.227	29.79	1.157	7.7
English Bazar UA	1.152	35.99	1.128	29.7
Habra UA	1.001	19.3	1.001	41.87
Jalpaiguri UA	0.997	4.76	1.053	21.5
Kharagpur UA	0.985	19.11	0.976	25.3
Kolkata UA	1.216	27.12	1.157	28.7
Krishnanagar UA	0.976	15.22	0.929	32.3
Nabadwip UA	0.671	42.89	0.665	35.4
Raiganj UA	0.8	40.66	0.698	39.5
Santipur UA	1.086	18.29	1.061	31.3
Siliguri UA	0.888	37.05	0.978	24

Source: Census of India, 2001 and 2011

Note: * proportion of slum, # Urban Agglomeration

The table 3.5 shows that the in most of the urban agglomeration amenity index improves from 2001 to 2011 and slum population reduced. Amenity index is highest in the Kolkata urban agglomeration and proportion of slum is less as compare to the other urban agglomerations of the state. It is quite clear that during 2001- 2011 amenity index improved. Wherever amenity index raises proportion of slum goes down from 2001 to 2011. The class one towns are being classified into some hypothetical metros to obtain a clear picture.

3.3.3 Availability of basic amenities and proportion of Slum population in Reclassified class I towns of the state of West Bengal

As in the previous chapter we have seen that the a large chunk of population lives in the metro cities where population is more than 10 lakh and number of class I town is more in the initial stage that is incipient cities.¹⁴⁹ Appendix-6, tells us about the availability of amenities and proportion of slum population living in class I towns which are being reclassified into some hypothetical metros. It is being evident that proportion of slum population living in metros and the condition of amenities is better from the other category as the slum population and amenity index are positively correlated while all other categories of metros are negatively correlated that means in those metros amenity is high, proportion of slum of slum is low and vice versa. As the correlation between proportion of slum population and amenity index is 1, -0.99, -0.44 and -0.41 for metro cities, regional metro, juvenile and incipient cities respectively.¹⁵⁰

The table 3.6 tells us about the amenity index and proportion of slum living in these reclassified hypothetical metros.

¹⁴⁹ Towns having population in between 1 to 3 lakh

¹⁵⁰ Census of India,2011

Table 3.6 Amenity index and proportion of slum population in reclassified class I towns of West Bengal

Classification of Towns	2001		2011	
	Amenity Index	prop_slum [^]	Amenity Index	prop_slum [^]
Metro cities (Above 10 lakhs)	1.067	0.287	1.059	0.268
Regional metros (5 to 8 lakhs)	-	-	1.005	0.222
juvenile cities (3 to 5 lakhs)	1.018	0.274	1.009	0.283
incipient cities (1 to 3 lakhs)	1.095	0.245	1.004	0.327

Source: Census of India, 2001 and 2011

Note: ^ proportion of slum

From the table no.3.6 it has been evident that Amenity Index is highest in Metro cities (>10 lakh population) in both the Census¹⁵¹, and it is reducing in the lower categories of the towns in both the census year. In 2001, proportion of slum is decreasing in the lower categories that are juvenile and incipient metros. While in 2011 proportion of slum population is more in juvenile and incipient metros. It is evident from the table that there is inverse relationship between availability of amenity and proportion of slum as where amenity index is low, proportion of slum population is more and vice versa.

The table 2.1 of the second chapter shows that there are many new entries of towns in class I categories in the state of West Bengal. As they are just added, they are just in the category of incipient metro category and in juvenile metro category. Therefore we can say that this study is related to the metros or incipient towns having the population between 1 to 3 lakhs. The largest concentration of urban population is in metros¹⁵² where amenity index is also highest as compared to other categories of towns and number of towns is highest in the incipient category. It could be suggested to revisit to the definition and criteria for declaring the class I towns or we can say that reclassification of settlement is the need of hour in the study of urbanization.

¹⁵¹ Census of India, 2001 and 2011

¹⁵² Cities having population of above 10 lakhs.

3.3.4 Relationship between proportion of slum population and availability of basic amenities in the state of West Bengal

3.3.4.1 Correlation matrix: The table 3.7 is about the correlation matrix between different amenity and proportion of slum population of class I towns of the state of West Bengal.

Table 3.7 Correlation matrix of assets and proportion of slum population living in class I towns of West Bengal

<i>Amenities</i>	<i>P_G</i>	<i>P_T.W</i>	<i>P_E</i>	<i>P_L.f</i>	<i>P_B.f</i>	<i>P_C.d</i>	<i>P_B</i>	<i>P_S</i>
P_G	1							
P_T.W	0.336	1						
P_E	0.689	0.370	1					
P_L.f	0.455	-0.003	0.511	1				
P_B.f	0.812	0.427	0.656	0.631	1			
P_C.d	0.409	0.266	0.410	0.178	0.362	1		
P_B	0.846	0.397	0.752	0.462	0.842	0.519	1	
P_S	-0.458	-0.154	-0.171	-0.366	-0.567	-0.043	-0.346	1

Source; Census of India, 2011

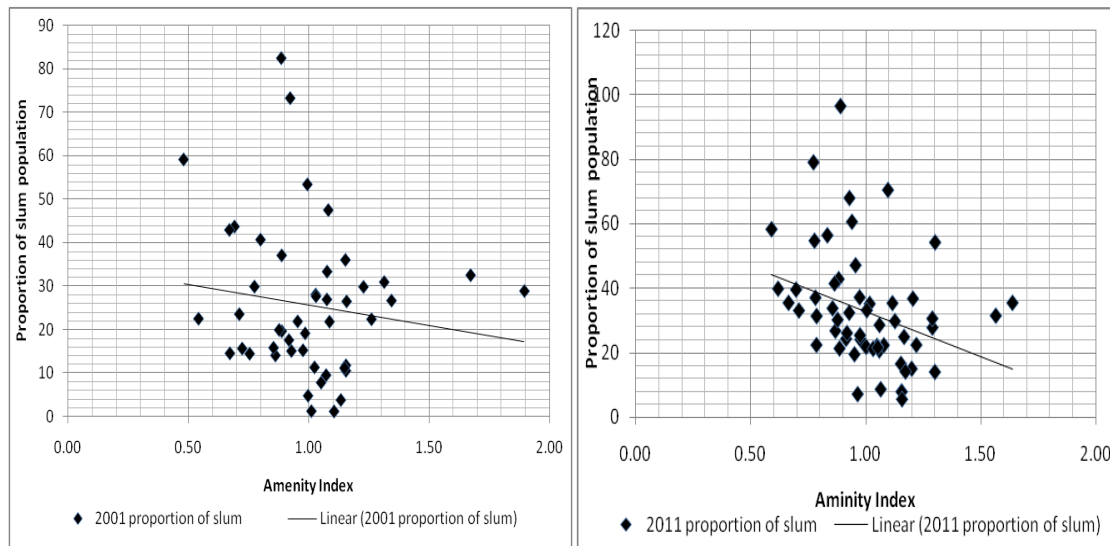
Note; P_G = Percentage of houses in good condition, P_T.W = Percentage of households using Tap water from treated source, P_E = Percentage of households having Electricity, P_L.f = Percentage of households having latrine facility within the premises, P_B.f = Percentage of households having bathing facility within the premises, P_C.d = Percentage of households having Closed drainage, P_B = Percentage of households availing banking services, P_S = Percentage of slum population

The correlation between various amenity and slum population of the state of West Bengal is being depicted in table 3.7. In this table also the relationship is more or less same as in Maharashtra except some exception. In West Bengal, selected amenities taken for the analysis show the positive relationship with each other. Those who are living in good housing condition, have electricity as the main source of lightning along with bathroom facility within the premises. Here latrine facility shows the negative relationship with tap water but it is negligible. The closed drainage is positively correlated with the entire (selected) amenity but more with the good housing condition, electricity connection and bathroom facility within the premises. The banking facility is highly (positive) correlated with good housing condition as the people living in good houses would have better living condition and more and more people availing the banking facility.

While proportion of slum population living in the class I towns of West Bengal are negatively correlated with the availability of basic amenity available to the households. That means if amenity availability increases proportion of slum decreases.

3.3.4.2 Scatter diagram: The figure 3.2 shows the relationship between asset index and proportion of slum population.

Figure 3.2 Scatter diagram to show the relationship between proportion of slum population and amenity index in West Bengal, 2001 and 2011



Source: Census of India, 2001 and 2011

In the graphs on 'x' axis, amenity index (dependent variable) is taken and on 'y' axis (response variable), proportion of slum population of the class I towns of the state of West Bengal which tells us about that there is inverse relationship between proportion of slum and amenity index as the points of the plots which indicate the proportion of slum population are downward sloping. In both the Census year (2001 and 2011) some points are scattered while most of the points plotted on the graph more or less aligned along the line of fit and negatively sloped. In 2001, the points on the graphs are more dispersed and line of fit is gently sloping downwards as compared to the other graphs (2011). From 2011 census the inverse relationship between proportion of slum and amenity index is more clear than 2001. It could be said that as the condition of amenity availability improving, proportion of slum population reduced. The causation relationship between the two (proportion of slum and amenity index) can be traced.

3.3.4.3 Regression analysis: The Simple Linear Regression model explains for negative relationship among the dependent variable that is Slum Population and an independent variable Amenity Index in West Bengal, depicted in table 3.8.

Table 3.8 Regression coefficients of the state of West Bengal

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.60974	5.3155	0.0000	0.3798	0.8396
Amenity Index	-0.2811	-2.5174	0.0147	-0.5050	-0.0573
R Square	0.10				
Adjusted R Square	0.09				

Source: Census of India, 2011

The p-values used for testing of null hypothesis against covariate explains for the possible rejection of the null hypothesis, accounted by the low p-value (< 0.05), that is 0.000 for intercept term and 0.014 for Amenity index. The negative coefficient of asset index very clearly indicates that there stands negative relationship between the two variables and if a unit change occurs in the amenity index the corresponding slum population will show a decline by 0.28 units. The value of R square indicates that around 10% of the variations in the dependent variable around the mean are explained by Amenity index, or one may explain it as 10% of the values fit the model. The model explains the causation between the slum population and amenity index.

3.4.1 Basic amenities in class I towns and proportion of Slum population in Tamil Nadu

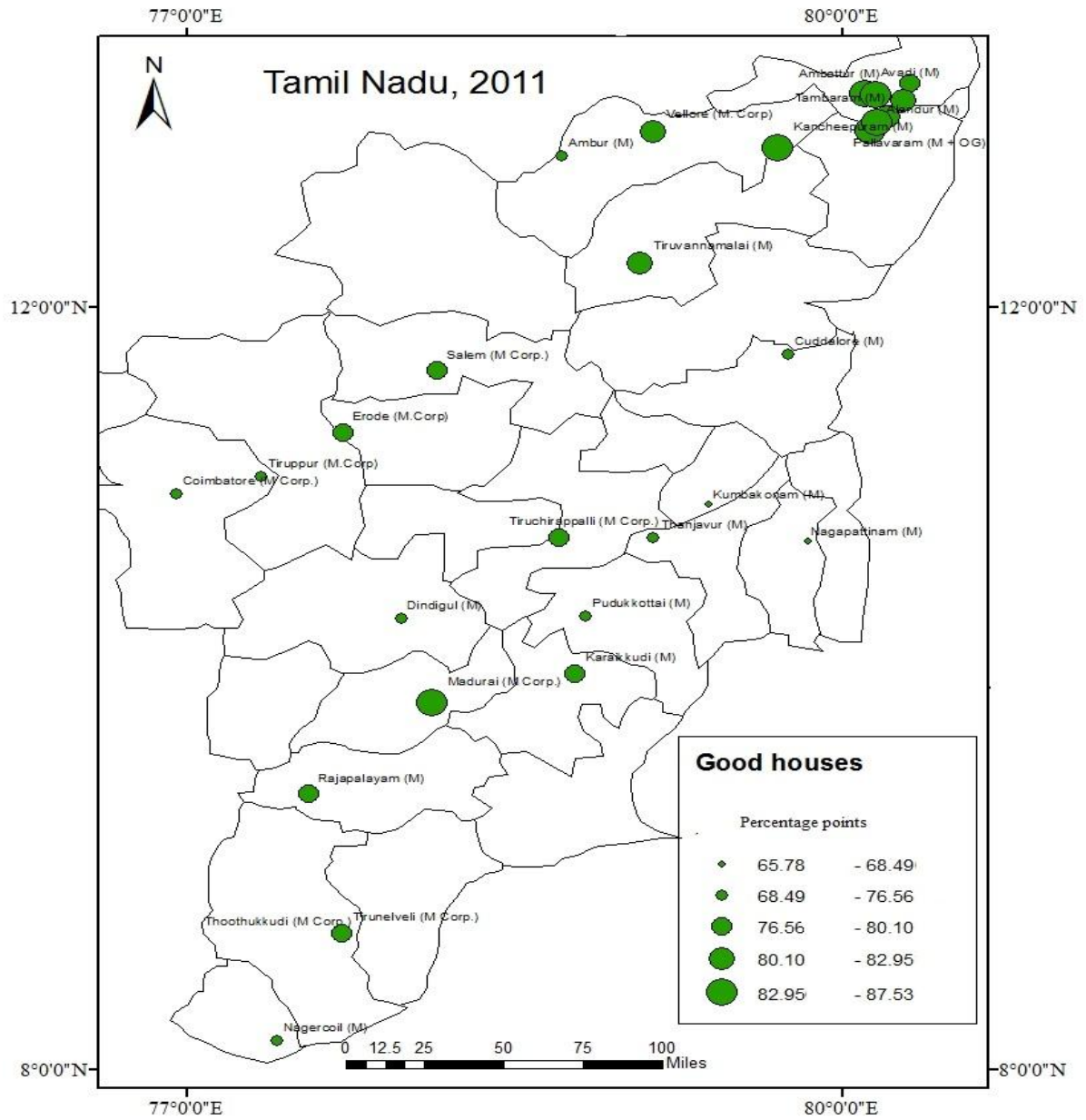
In this state as a whole the share of slum population was about 8.1% in 2001 and increased to 8.9 percent.¹⁵³ Amenities available in this state is also lacking it can be traced from the NFHS-3 report that about 37.5% population having tap water as their main source of drinking, 93% having electricity connectivity and only 33.7% population of Maharashtra having sanitation facility within their premises. And according the Census, 2011, in Tamil Nadu, 79.8% of households uses treated tap water as a source of drinking water, 93.4% having electricity connection, 48.3% having the latrine facility, 49.9% having bathing facility while only 25.4% of households having closed drainage connectivity.

The study is related to the class I towns, so the analysis of availability of amenities and proportion of slum in these towns can be in the appendix-7. In Tamil Nadu, number of

¹⁵³ Census of India, 2011

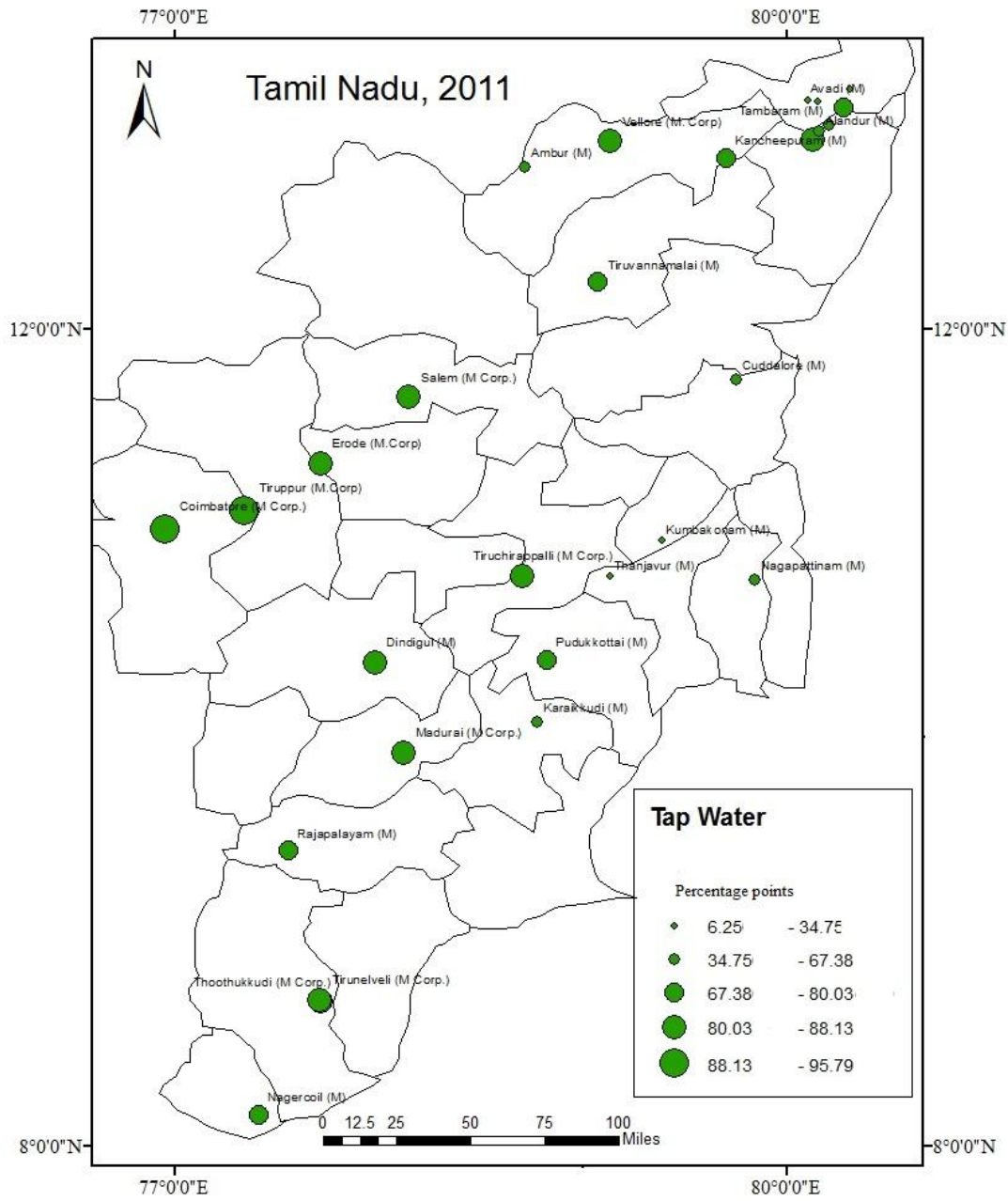
class I towns increased from 29 to 32 during 2001-2011. Map no. 3.17 to 3.23 shows the basic amenities of class I towns of Tamil Nadu.

Map 3.17 Households having good houses in Tamil Nadu



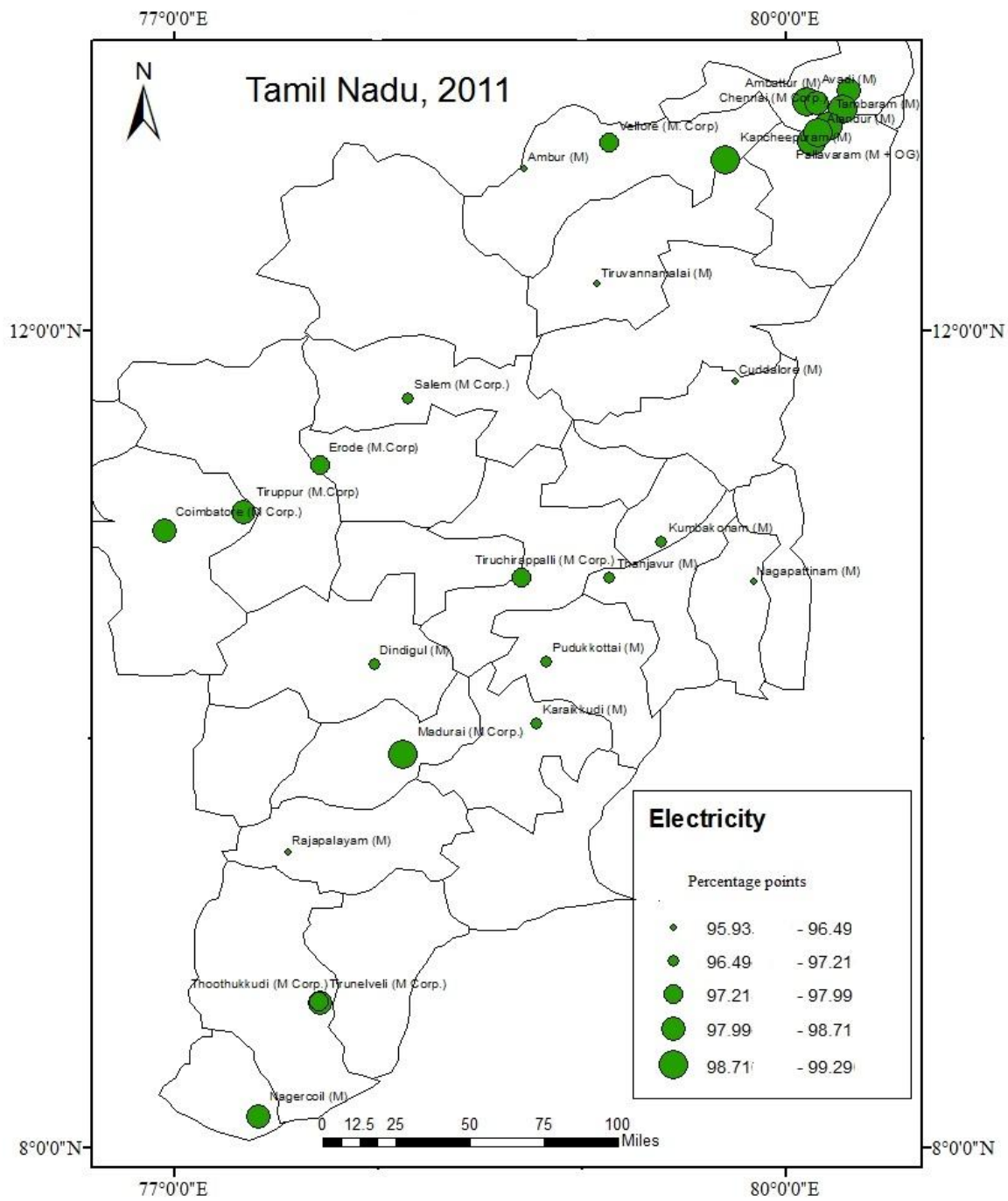
Source: Census of India, 2011

Map 3.18 Households having access to tap treated water in Tamil Nadu



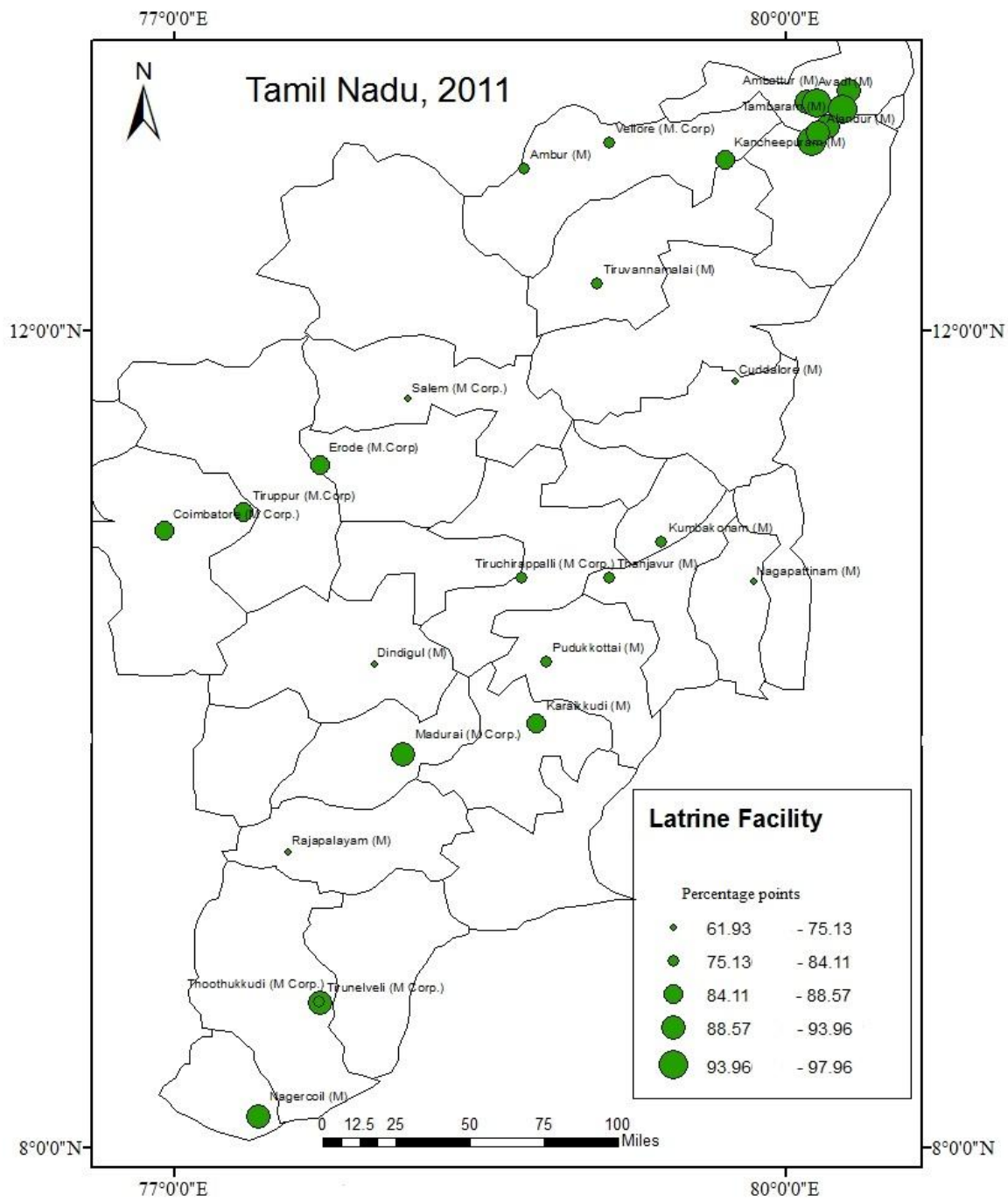
Source: Census of India, 2011

Map 3.19 Households having electricity connection in Tamil Nadu



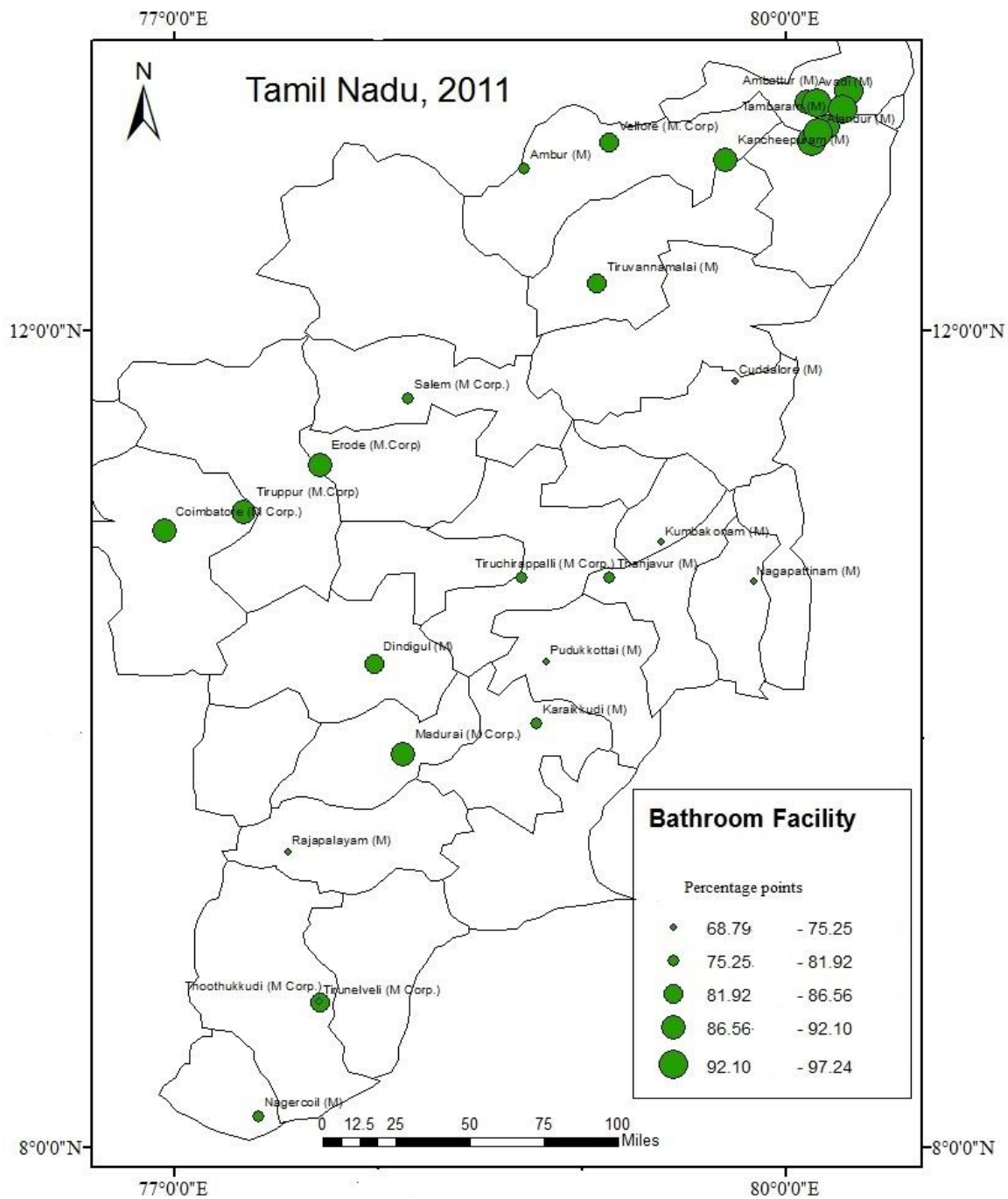
Source: Census of India, 2011

Map 3.20 Households having latrine Facility within the Premises in Tamil Nadu



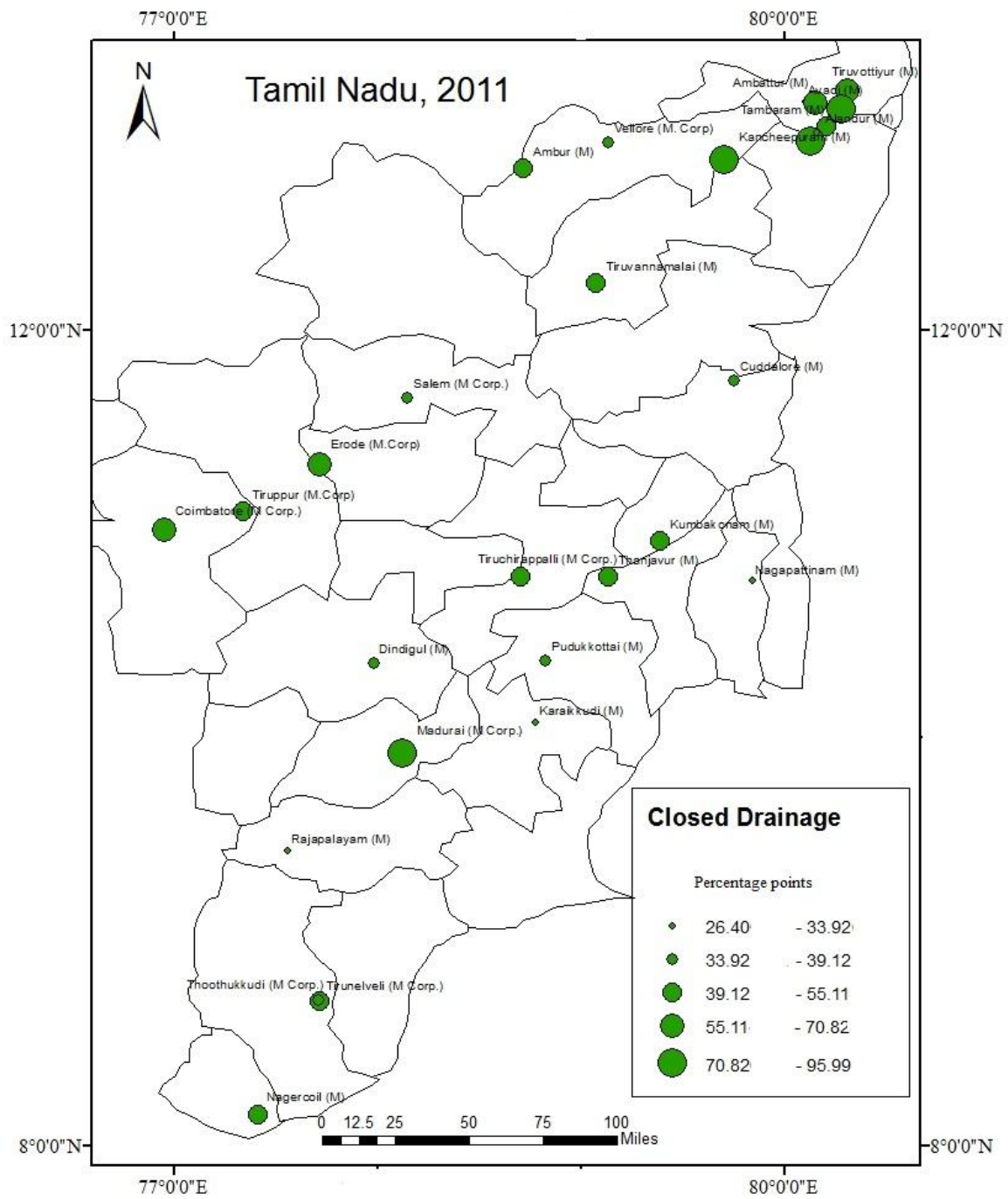
Source: Census of India, 2011

Map7 3.21 Households having bathroom Facility within the Premises in Tamil Nadu



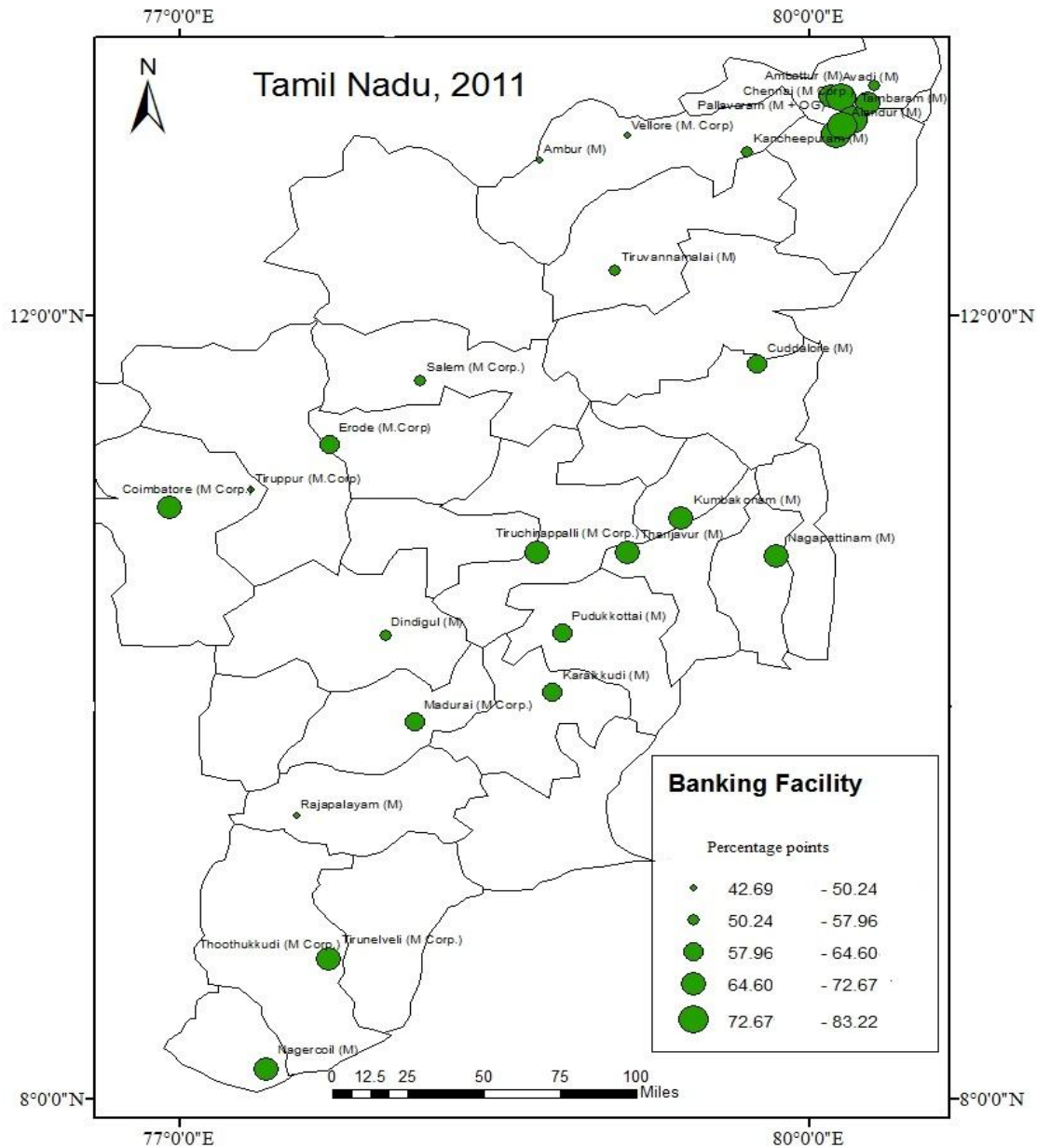
Source: Census of India, 2011

Map 3.22 Households connected to closed drainage outlet in Tamil Nadu



Source: Census of India, 2011

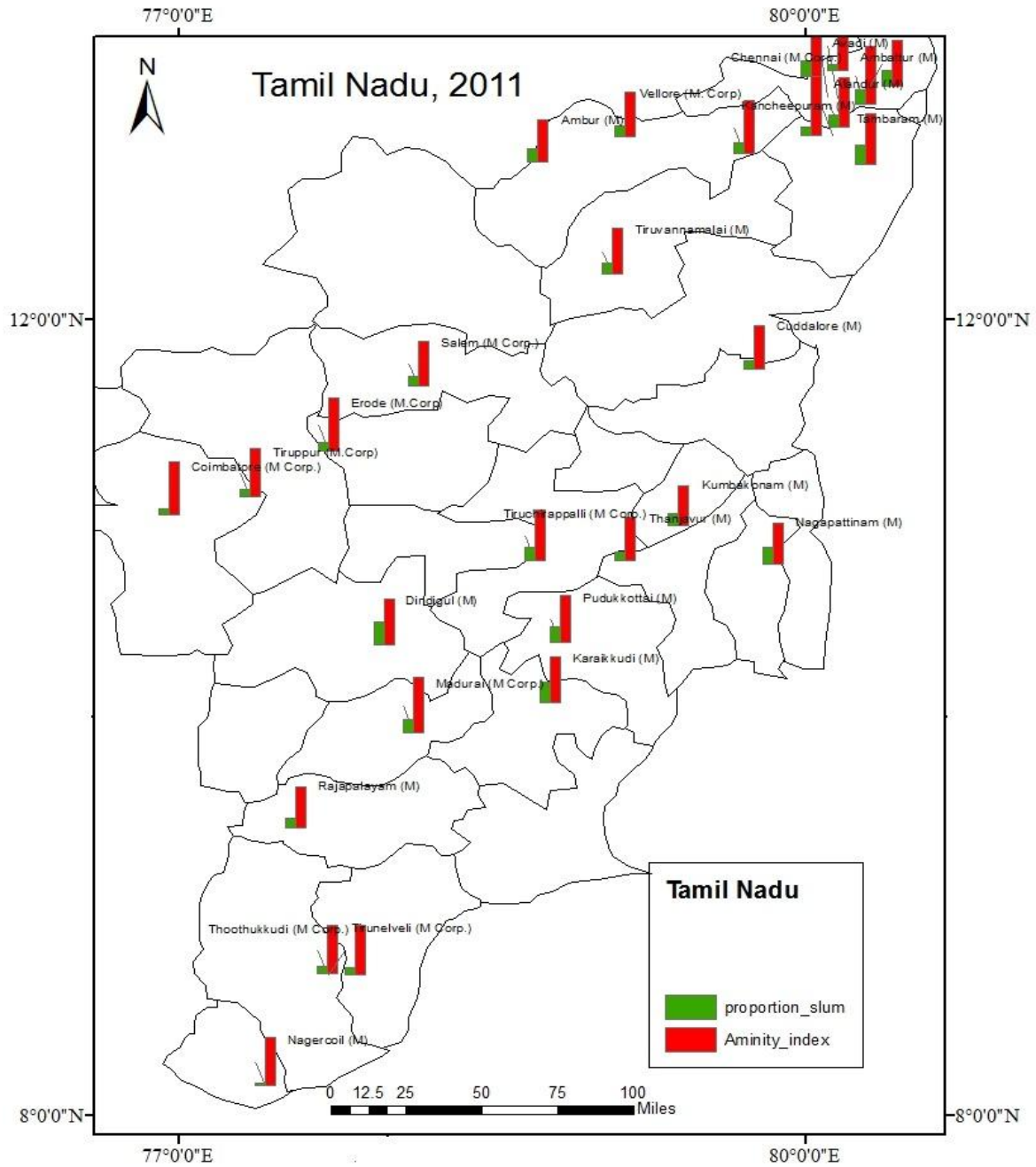
Map 3.23 Households availing banking facility in Tamil Nadu



Source: Census of India, 2011

The maps show that there is a kind of concentration is seen around Chennai. In and around Chennai all the amenities have the high value. More or less every town having the connectivity of electricity but most of the households are not connected to the closed drainage, as well as the households availing banking facility are also less. Amenity Index and proportion of slum population is being depicted in the map 3.24

Map 3.24 Amenity Index and proportion of slum population of class I towns in Tamil Nadu



Source: Census of India, 2011

Map 3.24 shows that there is concentration of slum population in and around Chennai. Tamil Nadu is variant than other two states that some where proportion of slum is more amenity index is less but not ubiquitously distributed. For better understanding of the analysis these class-I towns are being conglomerated to form the urban agglomeration as the characteristics of the agglomeration is similar within and towns of the agglomeration do not behave differently.

3.4.2 Basic amenities in urban agglomeration and proportion of Slum population in Tamil Nadu

In Tamil Nadu, class I towns are less in numbers as compared to the other two states (Maharashtra and Tamil Nadu). A large chunk of the urban population of the state resides only in the Chennai city (about 34% of urban population). And the concentration of urban and slum population is in this urban agglomeration as 48% of the urban population and 54% of slum population of the total population of class I towns are living in Chennai urban agglomeration.¹⁵⁴ The following table gives the glimpse of the availability of amenity and proportion of slum.

Table 3.9 Amenity index and proportion of slum population in urban agglomeration of West Bengal

Name of UA#	2001		2011	
	Amenity Index	prop_slum*	Amenity Index	prop_slum*
Chennai UA	1.139	0.209	1.129	0.277
Coimbatore UA	1.128	0.063	1.027	0.117
Dindigul UA	0.959	0.618	0.944	0.466
Erode UA	1.094	0.147	1.094	0.176
Kancheepuram UA	1.171	0.147	1.108	0.218
Kumbakonam UA	0.998	0.188	0.941	0.413
Madurai UA	1.076	0.238	1.145	0.273
Salem UA	0.918	0.218	0.944	0.218
Thanjavur UA	0.962	0.184	0.841	0.269
Thoothukkudi UA	0.882	0.115	1.04	0.164
Tiruchirappalli UA	1.047	0.237	1.045	0.27
Tirunelveli UA	0.929	0.145	0.988	0.144
Tiruppur UA	0.986	0.027	0.995	0.162
Vellore UA	1.117	0.179	0.942	0.231

Source: Census of India, 2001 and 2011

Note: * proportion of slum, # Urban Agglomeration

¹⁵⁴ As per the Census, 2011, 48% of the urban population and 54% of slum population of the total population of class I towns are living in Chennai urban agglomeration.

The table 3.9 shows that there is no clear cut relationship between amenity and slum population. Somewhere there is direct relationship while somewhere indirect. But it is evident that Amenity Index raised during 2001-2011 and proportion of slum also increased from 2001 census to 2011 census.

It is evident from the analysis that in the other two states (Maharashtra and West Bengal), major concentration of population is in the metro cities. The reclassified towns of the state of Tamil Nadu could give the glimpse of the situation that is it a common phenomenon in all the three state or something is different.

3.4.3 Basic amenities and proportion of Slum population in Reclassified class I towns of the state of Tamil Nadu

In Tamil Nadu, on an average, metro cities have the higher Amenity Index compared to the other class I towns of the state but proportion slum is more in the cities having population less than 3.5 lakhs (Appendix-7). There is increase in slum population along with the improvement in Amenity Index in the Transitional Metro while this is inverted when juvenile and incipient cities are being taken into account. In these cities the proportion of slum is higher where amenity index is low. The calculated correlation between proportion of slum population and amenity index is 1.39, 1.24, -0.34 and -0.28 of metro cities, transitional metro, juvenile and incipient cities respectively.

The following table tells us about the reclassified towns, their amenity index and proportion of slum residing in these towns

Table 3.10 Amenity index and proportion of slum population in reclassified class I towns of Tamil Nadu

Classification of Towns	2001		2011	
	Amenity Index	prop_slum [^]	Amenity Index	prop_slum [^]
Metro cities (Above 10 lakhs)	1.233	0.189	1.017	0.261
Transitional metros (8 to 10 lakhs)	1.000	0.157	1.000	0.244
Regional metros (5 to 8 lakhs)	1.001	0.228	-	-
Juvenile cities (3 to 5 lakhs)	0.996	0.121	1.010	0.180
Incipient cities (1 to 3 lakhs)	0.996	0.243	1.008	0.244

Source: Census of India, 2001 and 2011

Note: [^] proportion of slum

In Tamil Nadu, the situation is little bit different compared with the other two states. In 2001, in Tamil Nadu only one city was having population above 10 lakhs that was Chennai but the proportion of slum population living here high (19%) and still high (29%). In 2011, there is no regional metro in the state may be because the population of these metro rises and moved into the other category that is transitional metro (having population between 8 to 10 lakhs). Here, the inverse relationship between proportion of slum population and Amenity Index could not be established. As in every category of metros, proportion of slum increased during 2001- 2011 and apart from metro cities the condition of amenity also improved during this period. To check the relationship between the two the following section is devoted to the methods of statistics to recognize the relation.

3.4.4 Relationship between proportion of slum population and availability of basic amenities in the state of Tamil Nadu

3.4.4.1 Correlation matrix: The table 3.11 is about the correlation matrix between different assets and proportion of slum population of the urban agglomeration of the state of Tamil Nadu

Table 3.11 Correlation matrix of assets and proportion of slum population living in class I towns of Tamil Nadu

<i>Amenities</i>	<i>P_G</i>	<i>P_T.W</i>	<i>P_E</i>	<i>P_L.f</i>	<i>P_B.f</i>	<i>P_C.d</i>	<i>P_B</i>	<i>P_S</i>
P_G	1							
P_T.W	0.102	1						
P_E	0.538	-0.103	1					
P_L.f	0.500	-0.159	0.866	1				
P_B.f	0.720	0.035	0.743	0.742	1			
P_C.d	0.383	0.193	0.529	0.533	0.546	1		
P_B	0.180	-0.318	0.439	0.529	0.188	0.223	1	
P_S	-0.042	-0.212	-0.124	-0.191	-0.050	-0.065	-0.072	1

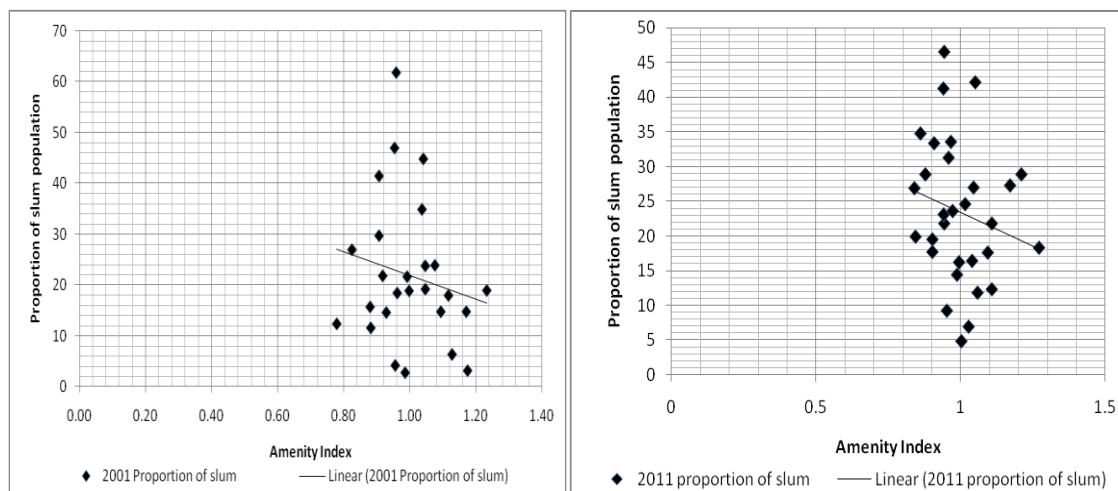
Source; Census of India, 2011

Note; P_G = Percentage of houses in good condition, P_T.W = Percentage of households using Tap water from treated source, P_E = Percentage of households having Electricity, P_L.f = Percentage of households having latrine facility within the premises, P_B.f = Percentage of households having bathing facility within the premises, P_C.d = Percentage of households having Closed drainage, P_B = Percentage of households availing banking services, P_S = Percentage of slum population

The correlation between various amenity and slum population of the state of Tamil Nadu is given in table 3.11. In Tamil Nadu situation is little bit different from the other two states as the selected amenities taken for the analysis show the positive relationship with each other except with tap treated water. Good housing condition shows positive relationship with all the attributes of amenity but strong correlation is with houses with bathroom and latrine facility within the premises and electricity as the main source of lightning. Here tap treated water shows the negative relationship with electricity, latrine facility and banking facility but a weak relationship is observed which can be overseen. The closed drainage is positively correlated with the entire (selected) amenity. The banking facility is positively correlated with all the variables except tap water. While proportion of slum population living in the class I towns of Tamil Nadu are negatively correlated with the availability of basic amenity available to the households. But relationship built in with the correlation matrix between proportion of slum and other amenities is weak which might not be the explanatory factor in between slum and amenity. So the other method is being used to establish the relationship between the two.

3.4.4.2 Scatter diagram: The figure 3.3 shows the relationship between amenity index and proportion of slum population.

Figure 3.3 Scatter diagram to show the relationship between proportion of slum population and amenity index in Tamil Nadu, 2001 and 2011



Source: Census of India, 2001 and 2011

Figure 3.3 is the scatter plot of slum population and amenity index of the state of Tamil Nadu. In 2001, points plotted on the graph are varies between 0.80 to 1.20 points. The points are dispersed as the points depicting the proportion slum population vary widely on the same points of amenity index. In 2011, most of the points of proportion of slum are around 1 amenity index. It is evident in both the census, that there is negative correlation between proportion f slum population and amenity index but the correlation is weak. To check the causation relationship between slum and amenity index, regression analysis is being used.

3.4.4.3 Regression analysis:

Table 3.12 Regression coefficients of the state of Tamil Nadu

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.42679	2.3283	0.0273	0.0513	0.8022
Amenity Index	-0.1930	-1.0571	0.2994	-0.5671	0.1810
R Square	0.04				
Adjusted R Square	0.004				

Source: Census of India, 2011

The Simple Linear Regression model explains for negative relationship among the dependent variable that is Slum Population and an independent variable Amenity Index. The p-values used for testing of null hypothesis against covariate explains for the possible rejection of the null hypothesis, accounted by the low p-value (< 0.05), that is 0.027 for intercept term and 0.299 for Amenity index. The negative coefficient of asset index very clearly indicates that there stands negative relationship between the two variables and if a unit change occurs in the amenity index the corresponding slum population will show a decline by 0.19 units. The value of R square indicates that around 04% of the variations in the dependent variable around the mean are explained by Amenity index, or one may explain it as 04% of the values fit the model. The model could not clearly explain the causation between the slum population and amenity index.

3.5 Conclusion

From above analysis it can be concluded that there is one common thing about all three states, there is great primacy is seen in the distribution of urban population, especially slum population in large metros (have population above 1 million). A large chunk of slum population of Maharashtra, West Bengal and Tamil Nadu lives in Greater Mumbai (49%), Kolkata (29%) and Chennai (41%), respectively. It comes in light that there is tendency of people to live in large cities as there is general perception that big cities provide better infrastructure. But data shows that amenities in Greater Mumbai are lesser than other towns of the state. While in other two states (West Bengal and Tamil Nadu), Kolkata and Chennai have highest value of Amenity Index along with the highest share of slum population.

In Maharashtra and West Bengal, most of the cities/metros or urban agglomerations have inverse relationship between Amenity Index and proportion of slum population.

While in Tamil Nadu, a clear cut relationship between the two could not be established. It might be possible because amenities available to the households of Tamil Nadu is more evenly distributed among the class I towns(Amenity Index is around 1), wide variation is not seen as compared to other two states (Maharashtra and West Bengal). The concentration of Amenity as well as proportion of slum is not seen in Tamil Nadu in some towns as in other two states but it is increasing, concentration of slum population is growing in Chennai which was 19 percent in 2001 and increased to 28 percent in 2011. This would lead to the similar condition as the other two states in coming decades.

This relation between Amenities and slum population has policy implications as to reduce the slum population, provide basic amenities to the households which will improve their standard of living and ultimately lead to reduction in growth of slum and check the future slum formation.

Chapter: 4

Assets and proportion of slum population

4.1 Introduction

Urbanization is the product of rural-urban migration, industrialization and modernization and a shift from rural economy to urban economy.¹⁵⁵ The mobile population of the country used to settle in those areas which provide better opportunities especially economic benefits and social and economic infrastructure. The indiscriminate growth of the immigrants in the city, non-affordability to attain the better civic amenity and poor infrastructure facilities provided by the government could not assimilate the immigrants in the city leads to the slum formation. People living in slums experience the most deplorable living and environmental conditions.¹⁵⁶ In chapter 3 it has been tried to correlate the availability of basic amenity to the households and proportion of slum population living in urban centers as per the various definitions of slum¹⁵⁷ (discussed in the chapter-1) explains the slum as the poor living conditions with poor infrastructure. This is all about the surroundings and neighboring conditions but the availability of assets in the households of the urban areas also have some implications on the proportion of slum population living in these states.

Assets are identified as the stock of financial, human, natural or social resources that can be acquired, developed, improved and transferred across generations.¹⁵⁸ So here, it is being tried to capture the availability of consumer durable goods¹⁵⁹ of the households in the class I towns of the state of Maharashtra, West Bengal and Tamil Nadu. These selected durable goods have been taken to calculate the asset Index as the use of asset

¹⁵⁵ Datta, P. (2006). Urbanisation in India. *Population Studies Unit Indian Statistical Institute*, Vol.75(June), 1–16.

¹⁵⁶ Arimah, B. C. (2001). Slums as expression of social exclusion: Explaining the prevalence of slums in African countries, 1–33.

¹⁵⁷ Given by Census of India,2001; UN-HABITAT; NSSO-69th round report; NFHS-3, report

¹⁵⁸ Moser, C. O. N. (2006). Asset-based Approaches to Poverty Reduction in a Globalized Context, *Program*, 1-40

¹⁵⁹ Here, Radio, Television, computer, phones, bicycle, Two wheelers, Car/Jeep/van are taken as consumer durable

indices as proxies for welfare, wealth, economic status and/or living standards has rapidly become very popular in social epidemiology and development.¹⁶⁰

In India, these assets are not entirely available to the households of the urban population, as according to Census of India, 19.9% of households having radio, 47.2% having Television, 63.3% having phones, only 9.5% having computers while the mode of transports used by the household are 44.8% of households uses bicycles, 21% uses motorcycles and only 4.7% having the ownership of cars. And as per the NFHS-3-report,2011, 38.9% of households having radio, 73.2% having Television, 36.3% having phones, only 8% having computers while the mode of transports used by the household are 50% of households uses bicycles, 30.5% uses motorcycles and only 6.1% having the ownership of cars. While the proportion of slum population in urban areas increasing at a rapid pace (at the decadal growth of 25.1).¹⁶¹ So it is being tried to see that is it any relation between availability of asset in the households of urban areas and proportion of slum population living in urban areas. And for the analysis class I towns is being taken as 70% of the total urban population of India, lives class I towns.

In this chapter it has been discuss that assets available in the class I towns of the state of Maharashtra, West Bengal and Tamil Nadu has direct bearing on the proportion of slum population living in these towns as the proportion of slum population and Asset Index are negatively correlated (-0.43, Maharashtra; -0.46, West Bengal; -0.16, Tamil Nadu)

This chapter is divided in three sections, each section in devoted to one state that is (1) Maharashtra, (2) West Bengal, and (3) Tamil Nadu and these sections are further classified in sub sections to have the idea of the similar situation from different angles. In the first section, class I towns are taken for the study then these towns are clubbed to form the urban agglomeration¹⁶² and then class I towns are further classified into some hypothetical metros as the major concentration of population is only few large cities.¹⁶³

¹⁶⁰Johnston D. and Abreu A. (2012), Asset Indices as a Proxy for Poverty Measurement in African Countries: A Reassessment- Draft Paper, 1-17

¹⁶¹ Census of India, 2011

¹⁶² An urban agglomeration is a continuous urban spread constituting a town and its adjoining outgrowths (OGs), or two or more physically contiguous towns together with or without outgrowths of such towns

¹⁶³ As per the Census of India, 2011, 70% of total urban population lives in class I towns while 42.6% urban population lives in million plus cities.

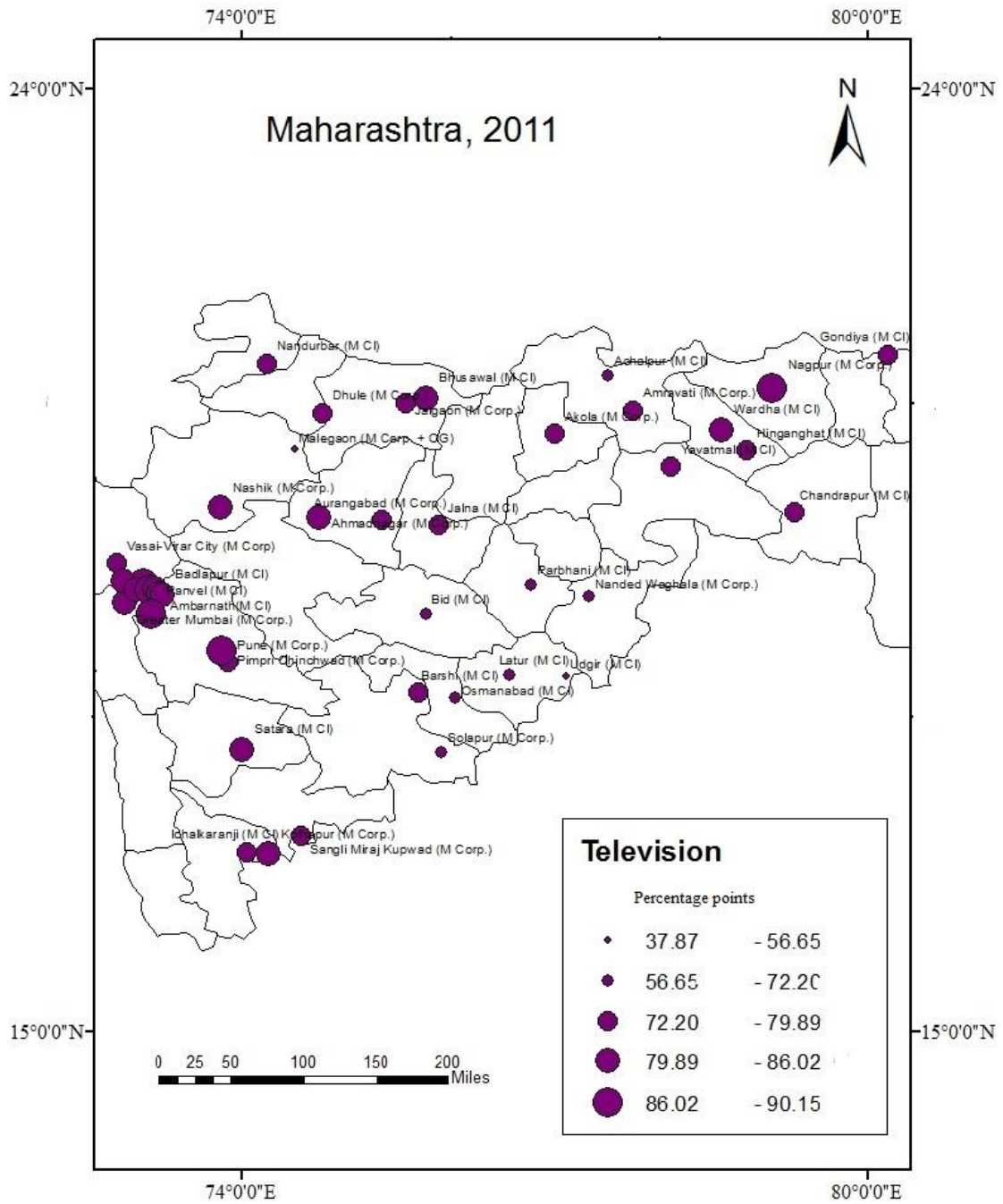
4.2.1 Availability of assets in class I towns of the state of Maharashtra

In the state of Maharashtra availability of assets to the households is slightly more than the national average that is, according to Census of India, 2011, 19.5% of households having radio, 56.8% having Television, 69.1% having phones, only 13.3% having computers while the mode of transports used by the household are 30.5% of households uses bicycles, 24.4% uses motorcycles and only 5.9% having the ownership of cars. As per the NFHS-3 report, 41.9% of households having radio, 79.7% having Television, 42.7% having phones, only 10.4% having computers while the mode of transports used by the household are 37.6% of households uses bicycles, 28.9% uses motorcycles and only 5.4% having the ownership of cars.

There is wide variation in the availability of the selected consumer goods, which have been taken for the analysis, within the class I towns of the states. Appendix-14 tells us about the assets available to the households of class I towns of the state of Maharashtra which explains the variability in the presence of assets in the class I towns of the state. It has been evident that the television and telephone are among the selected consumer durable goods for the analysis, most common asset available to the households while the least available assets are cars and computers. Computers are being surveyed for the first time in the Census of India, 2011; very few percentage of household owed the computers, some with internet connection facility while some without internet. Pune, Nagpur and Kolhapur have the largest proportion of assets whether it is Radio, Television, Computer, Telephone, Bicycle, Motorcycle, or Car (appendix-14). It can be seen in the urban agglomeration of the state along with the proportion of slum residing there.

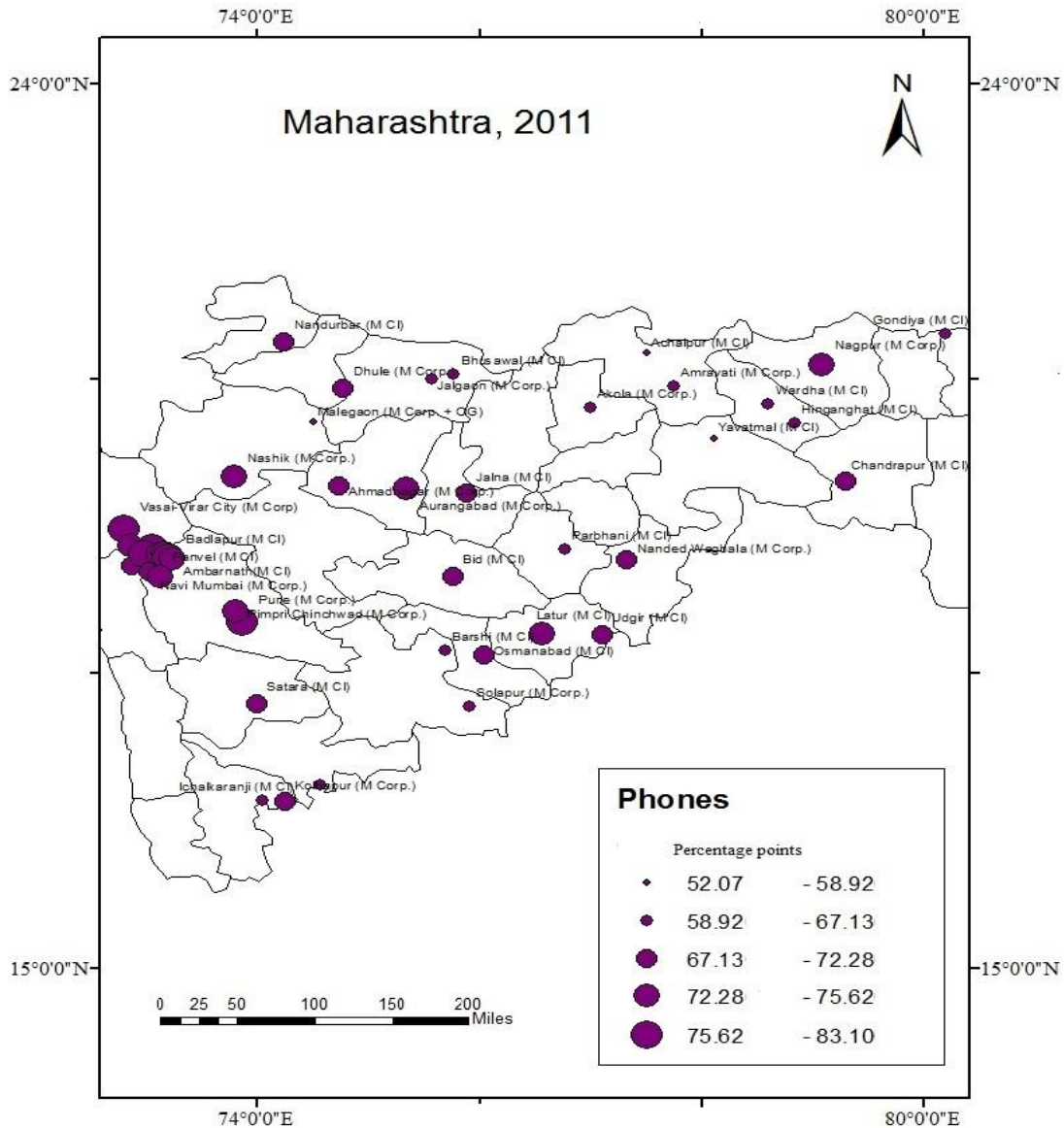
The map 4.1 to 4.6 shows the distribution of different Assets in class I towns of Maharashtra.

Map 4.1 Households having Television in Maharashtra



Source: Census of India, 2011

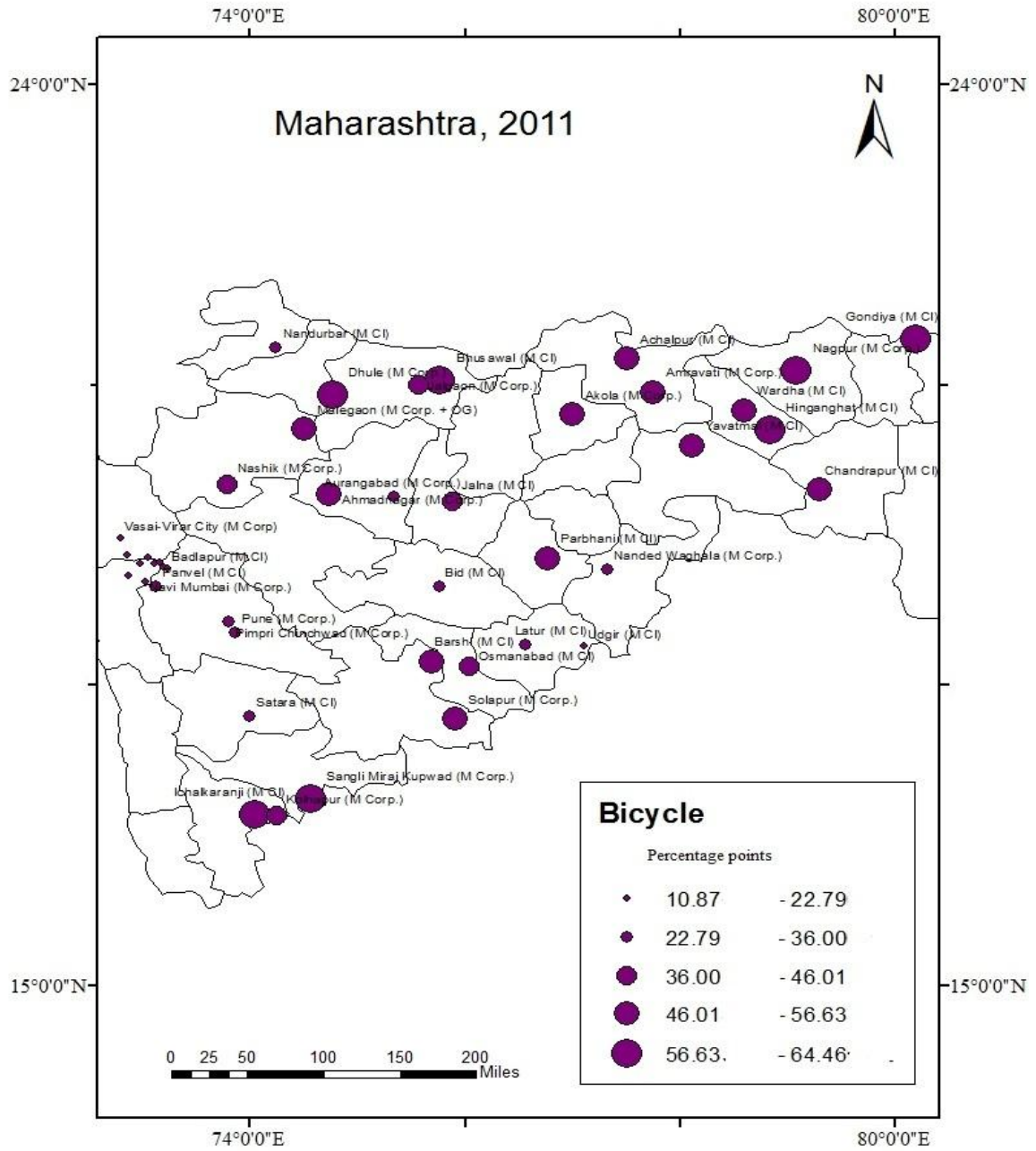
Map 4.2 Households having phones in Maharashtra



Source: Census of India, 2011

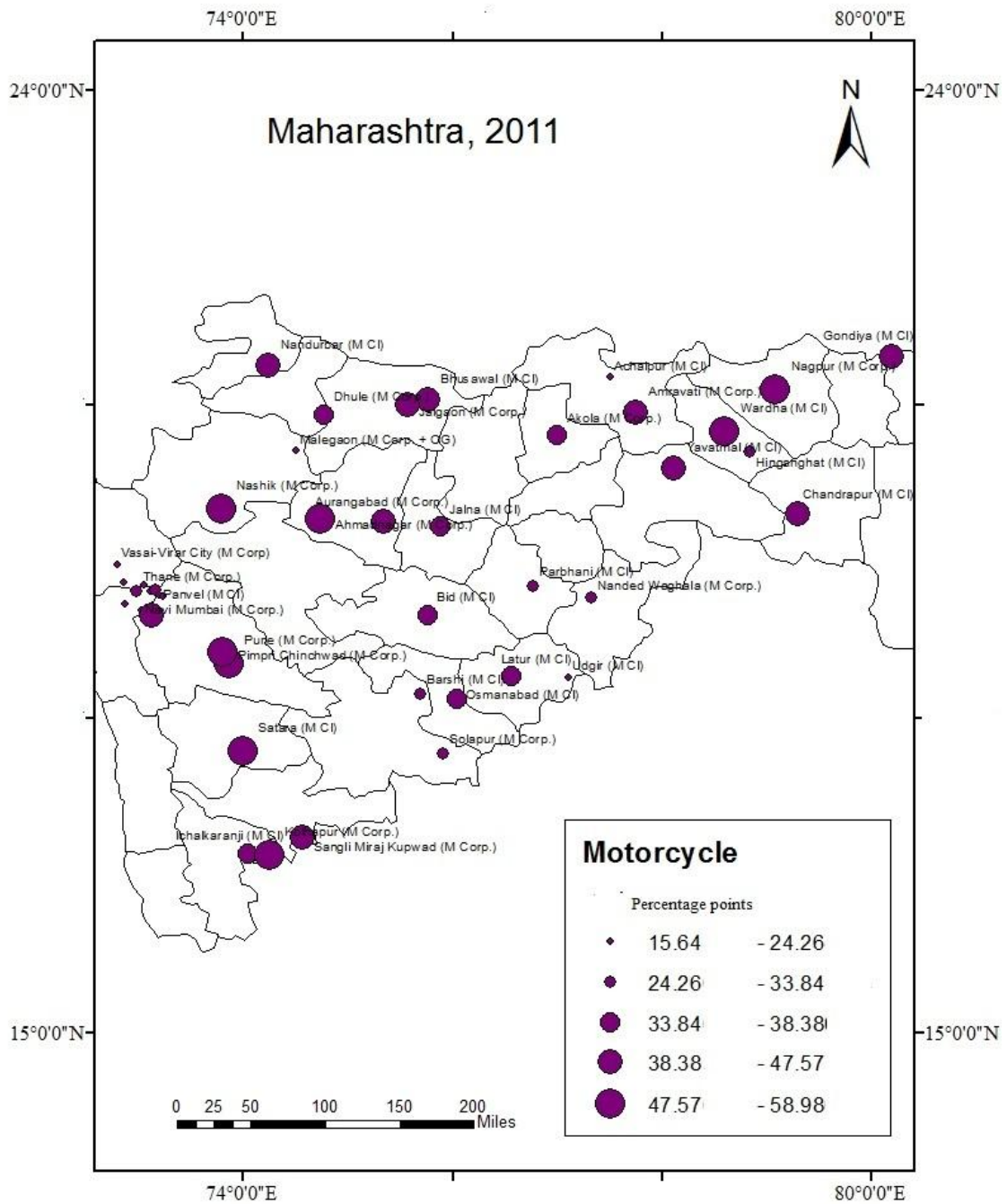
Map 4.1 and map 4.2 shows the distribution of Television and Phones respectively, there is one common thing in these two maps that most of the households having television and phones in class I towns. It could be said that television and phones are common goods for the common man of every region. That is why it is ubiquitously distributed. While the distribution of other assets are depicted in map 4.3, 4.4, 4.5 and 4.6.

Map 4.3 Households having Bicycles in Maharashtra



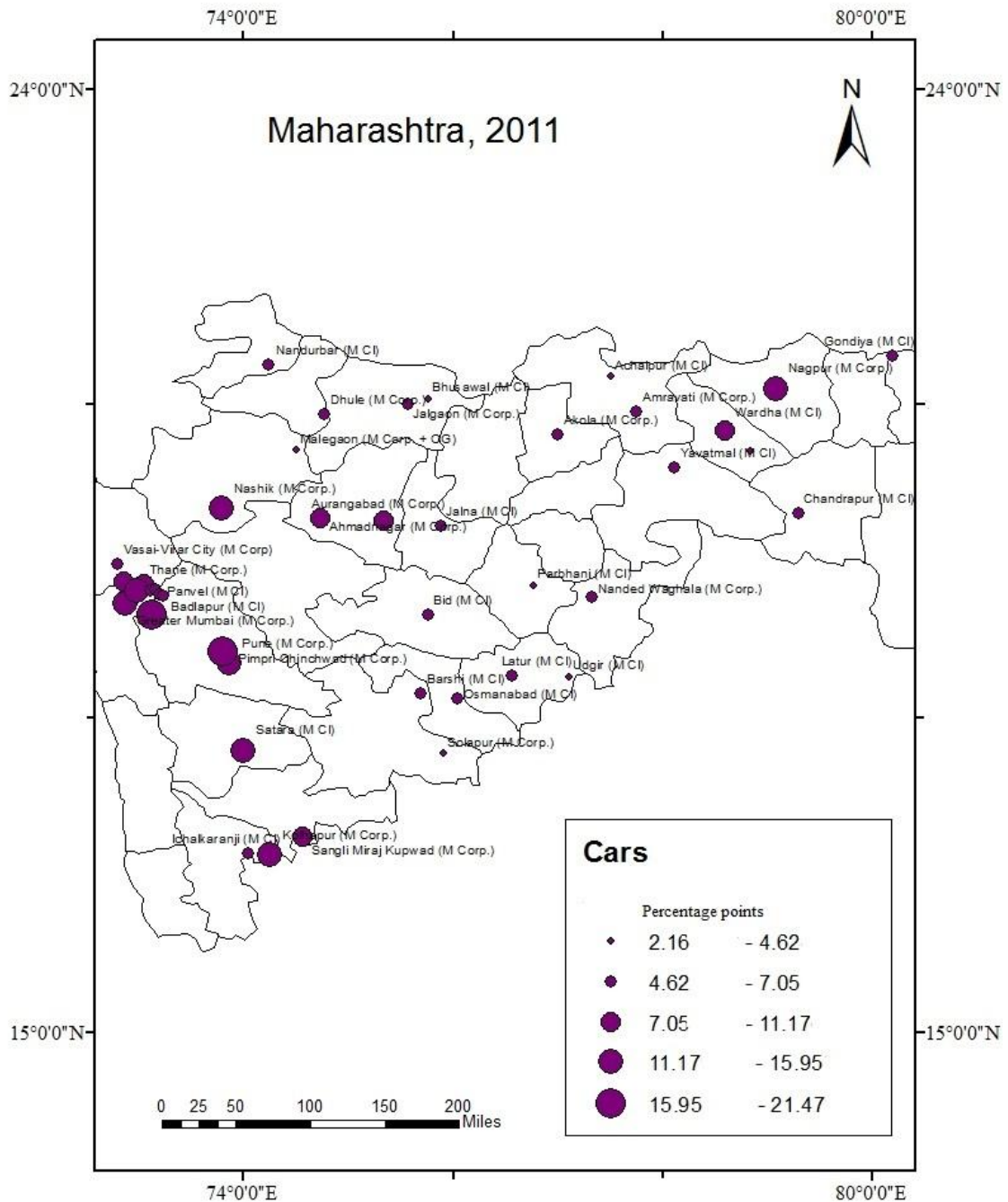
Source: Census of India, 2011

Map 4.4 Households having Motorcycles in Maharashtra



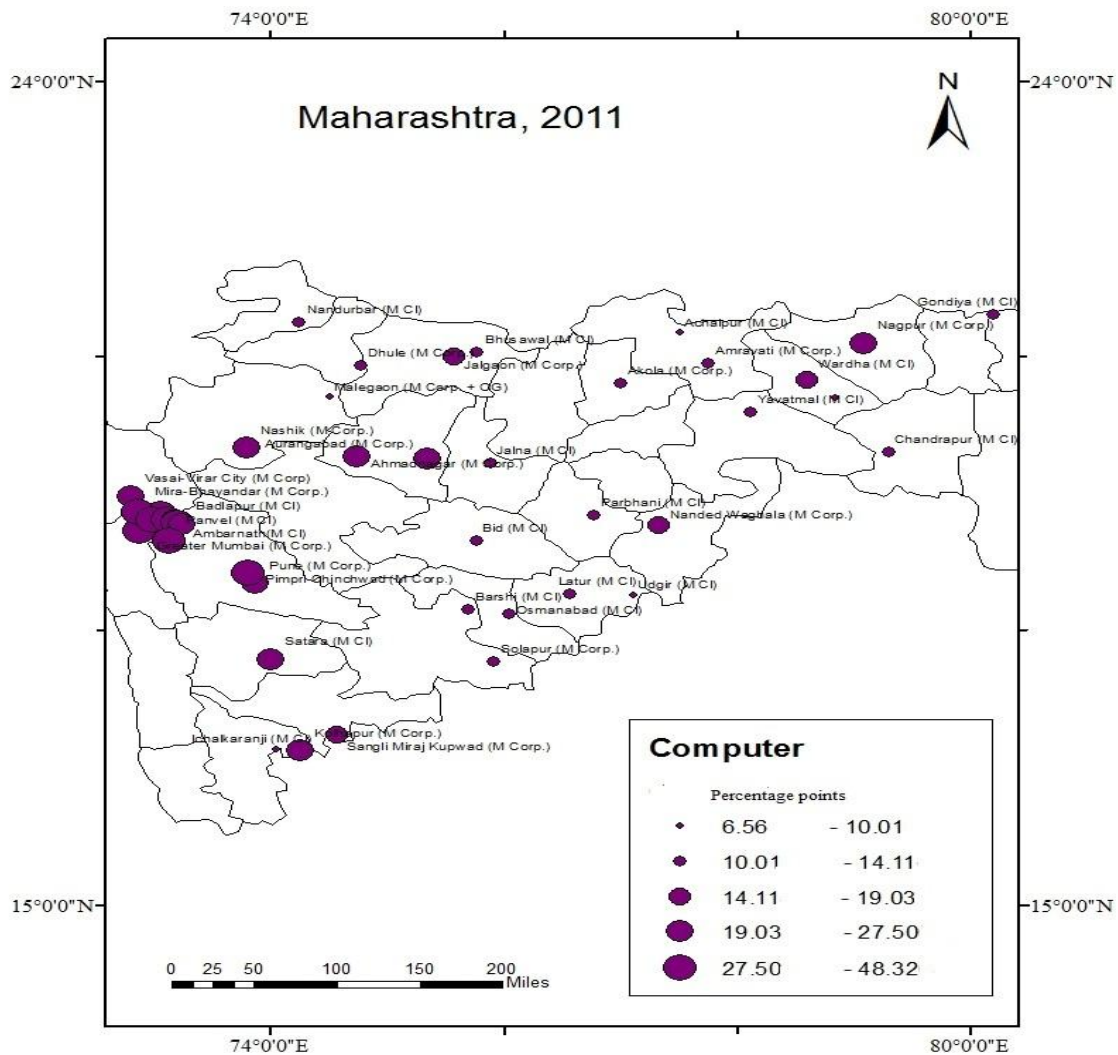
Source: Census of India, 2011

Map 4.5 Households having Cars in Maharashtra



Source: Census of India, 2011

Map 4.6 Households having Computers in Maharashtra



Source: Census of India, 2011

Bicycles and motorcycles have large share away from the Greater Mumbai or we can say in smaller towns (within the ambit of class-I) of the Maharashtra. In and around Mumbai region, Cars and computers have more shares as compared to other parts of the state. Here, it can be said that in metro cities of the state, ownership of Cars and computers is more common and reflects the higher income group of people residing there. The composite index of assets and proportion of slum population in class I towns of Maharashtra is shown in map 4.7

Map 4.7 shows that where ever the value of Asset Index high, proportion of slum population is low and vice versa which reflects the inverse relationship between the two.

4.2.2 Availability of assets in urban agglomeration and proportion of Slum population residing in these urban agglomerations in the state of Maharashtra

The table 4.1 tells us about the available assets to the households and proportion of slum population living in these urban agglomerations.

Table 4.1 Assets in the urban agglomerations of the state of Maharashtra and proportion of slum living in these agglomerations

Name of Urban Agglomeration	Radio	Television	Computer	Telephone	Bicycle	Motorcycle	Car	P_S*
Ahmadnagar	37.55	85.55	21.92	71.74	56.63	54.84	11.17	10.62
Aurangabad	19.51	78.22	20.17	75.62	29.78	47.57	9.60	18.81
Bhiwandi Nizampur	18.63	50.60	9.79	71.14	15.11	16.89	2.89	48.67
Bhusawal	18.71	82.06	13.48	66.17	59.46	42.01	4.16	9.24
Greater Mumbai	33.05	85.30	31.76	73.47	12.43	18.03	11.72	33.46
Ichalkaranji	34.31	75.35	9.83	66.43	58.40	38.03	6.97	5.48
Kolhapur	51.25	85.36	22.31	70.40	44.13	54.95	14.02	12.32
Malegaon	5.96	37.87	10.01	56.17	54.94	18.87	2.16	27.81
Nagpur	36.83	86.99	20.66	72.71	64.46	57.48	11.71	35.73
Nashik	31.14	83.18	25.92	74.95	42.60	50.61	13.62	12.77
Pune	43.30	85.07	34.62	77.29	33.05	56.03	18.39	16.89
Sangli Miraj Kupwad	40.26	75.63	16.54	67.07	63.28	42.76	9.12	5.39
Satara	39.25	86.02	24.14	70.99	34.55	50.28	13.24	3.80
Yavatmal	16.71	75.04	12.97	58.92	51.33	41.51	7.05	43.00

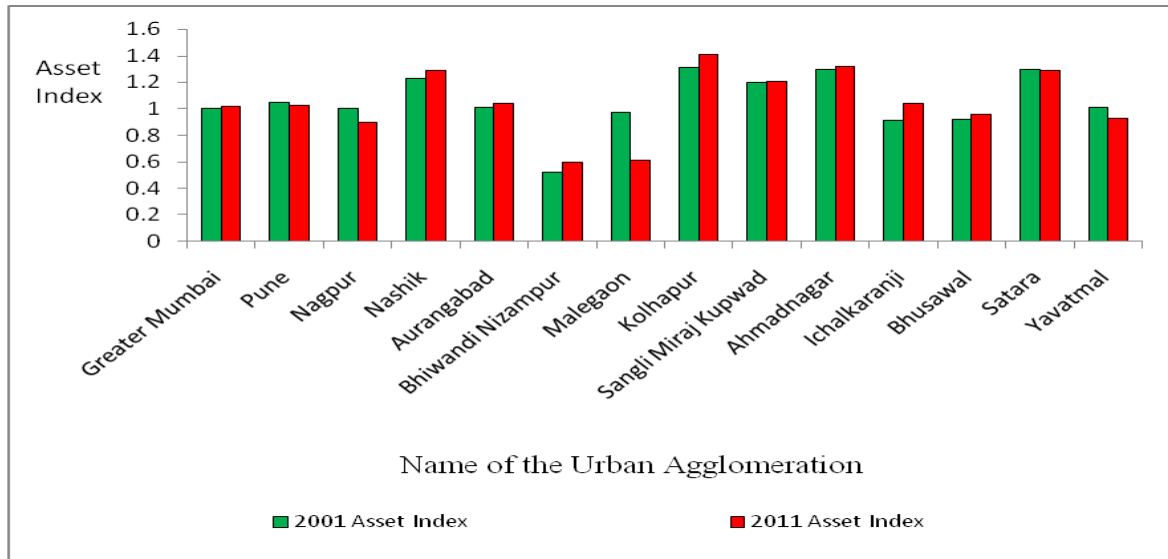
Source: Census of India, 2011

Note: * proportion of slum population

The table 4.1 tells us that Television and Phone occupies the largest portion of the available assets means these consumer durables covers the largest percentage of the available assets to the households of the urban agglomeration in the state of Maharashtra. Cars have the least share of proportion of the assets available to the households. But it is evident that proportion of slum population is more in those agglomerations where all assets in general and cars, computer in particular are less in percentage. Therefore it can be said that the luxurious goods like cars and computers are less found in those urban areas where proportion of slum is high.

Asset index¹⁶⁴ is being calculated with the help of these durable goods. The trend of change in asset index during 2001-2011 is depicted in figure 4.1

Figure 4.1 Asset index in urban agglomerations of Maharashtra



Source: Census of India, 2001 and 2011

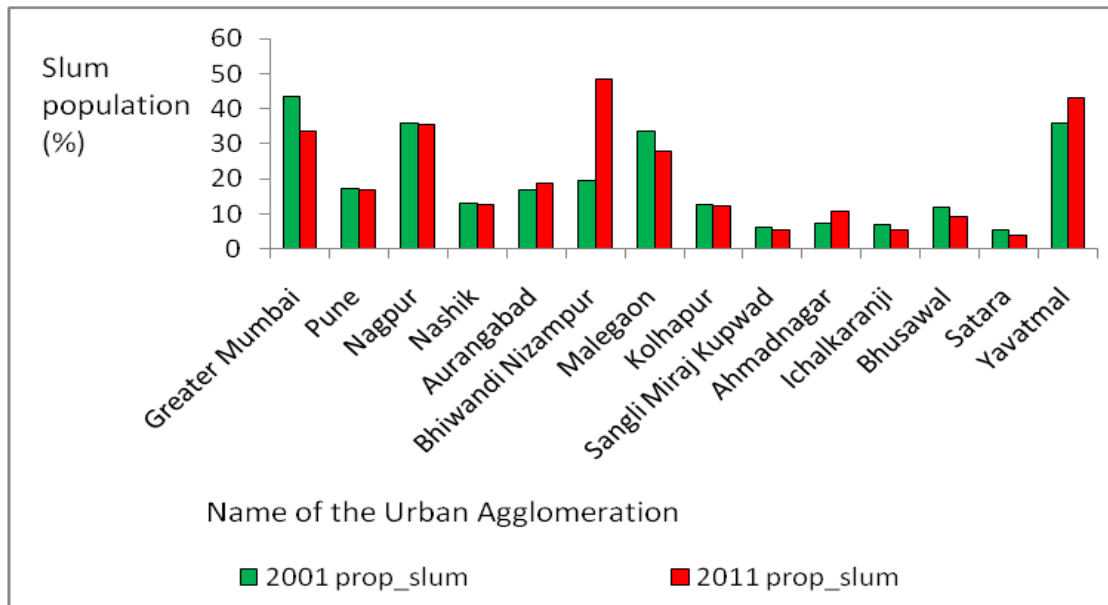
In the figure 4.1 changing pattern of Asset Index is shown. It is clear from the graph that most of the agglomerations have the value of Asset Index below 1 and a slow increase is being observed from 2001 to 2011. Its connection with proportion of slum population can be traced out with the help of the figure 4.2.

$$^{164}\text{Asset Index} = \frac{\left(\frac{x_1}{\bar{x}_1}\right) + \left(\frac{x_2}{\bar{x}_2}\right) + \left(\frac{x_3}{\bar{x}_3}\right) + \left(\frac{x_4}{\bar{x}_4}\right) + \left(\frac{x_5}{\bar{x}_5}\right) + \left(\frac{x_6}{\bar{x}_6}\right) + \left(\frac{x_7}{\bar{x}_7}\right)}{n}$$

Where,

- x1 = households having Radio,
- x2 = households having Television,
- x3 = households having Computer,
- x4 = households having Phone,
- x5 = households having bicycle,
- x6 = households having motorcycle,
- x7 = households having car,
- \bar{x} = mean of the variables,
- n = number of indicators (7)

Figure 4.2 Proportion of slum population in urban agglomerations of Maharashtra



Source: Census of India, 2001 and 2011

It is being evident in the figure 4.2 that the urban agglomeration having least value of asset index having the largest percentage points of the slum population and it is followed by others with some exceptions. Therefore we can say that these are inversely correlated; that is where asset index is low, proportion of slum is high and vice versa. It can be observe that there is not much difference prevails in the changing value of index and percentage of slum population living in these urban agglomerations from 2001 to 2011. Only in Greater Mumbai agglomeration there is phenomenal change in the proportion of slum population during 2001-2011 as it is being decreased from 44 percentage points to 33 percentage points (appendix-17).

As it has been discussed earlier that majority of the urban population living in the class I towns and of this about half of the urban population has shelter in the million plus cities. To analyze the concentration of slum population in class I towns along with their asset index these towns are being reclassified into some hypothetical metros.

4.2.3 Availability of assets and proportion of Slum population in Reclassified class I towns of the state of Maharashtra

Class I towns of Maharashtra have been reclassified into five categories; Metro cities, transitional metros, regional metros, juvenile cities and incipient cities. Urban as well as slum population is concentrated into metro cities only. Table 4.2 depicts the situation of asset index and proportion of slum living in these reclassified towns.

Table 4.2 Asset index and proportion of slum in reclassified class I towns of Maharashtra

Classification of Towns	2001		2011	
	Asset Index	prop_slum*	Asset index	prop_slum*
Above 10 lakhs [^]	0.963	0.396	0.983	0.287
Above 10 lakhs [#]	1.045	0.206	1.062	0.180
8 to 10 lakhs	0.999	0.188	1.073	0.185
5 to 8 lakhs	1.014	0.226	0.994	0.257
3 to 5 lakhs	1.022	0.210	1.004	0.214
1 to 3 lakhs	0.969	0.252	1.035	0.287

Source: Census of India, 2001 and 2011

Note: [^] includes Greater Mumbai, [#] excludes Greater Mumbai, * proportion of slum population

In the table 4.2, it can be seen that asset index is improving from 2001 to 2011 and as asset index improves proportion of slum goes down. One thing is noticeable here that in the category of metro cities, value of asset index is lower from the other categories in both the periods (Census-2001 and 2011), when Greater Mumbai excluded from the category asset index proportionately rises and slum population decreases. It may be because of the largest proportion of slum living in Greater Mumbai alone. It can be concluded here that Greater Mumbai which is the one of largest mega city of the country having the lower asset index compared the other cities.

There is positive correlation between asset indices of metro cities to the proportion of slum population mean is that as assets of the households increases, proportion of slum population increases and when Greater Mumbai is excluded the value of correlation further increases (appendix-18). It can be pointed out that asset availability in Mumbai is less than the other metros of the state. As the Greater Mumbai has the largest share of slum population it could be a cause to neutralize the availability of assets. Here, two way relationships could be established that if slum population is high, assets would be less and where assets are less, proportion of slum population would be more. But in any way there

is negative correlation between the two. It has been said that the slum is about the dilapidated condition and low standard of living.¹⁶⁵ To eradicate the problem of slum, availability of assets have to improve, assets have to be created.

4.2.4 Relationship between proportion of slum population and available assets in the state of Maharashtra

Relationship between assets and proportion slum population living in class I towns can be traced with the help of correlation matrix, scatter plot diagram and simple linear regression analysis between various assets and proportion of slum population. These methods tell about the relationship between the two variables. Correlation matrix tells the negative or positive relationship between any two variable, scatter plot show the relationship between ‘x’ and ‘y’ variables and unit change in x variable have impact on y variable while simple linear method explains the magnitude of the relationship. Here we start with the correlation matrix.

4.2.4.1 *Correlation*: Correlation refers to any of a broad class of statistical relationships involving dependence; Correlations are useful because they can indicate a predictive relationship. Correlation matrix shows the correlations between all pairs of data sets. Relationship between various selected durable goods which have been taken for the analysis (to calculate asset index) as well as proportion of slum population living in the class I towns of the state of Maharashtra, is being depicted in the table 4.3

Table 4.3 Correlation matrix of assets and proportion of slum population in urban agglomeration of Maharashtra

<i>Assets</i>	<i>Radio</i>	<i>Television</i>	<i>Computer</i>	<i>Telephone</i>	<i>Bicycle</i>	<i>Motorcycle</i>	<i>Car</i>	<i>prop_slum*</i>
Radio	1							
Television	0.716	1						
Computer	0.604	0.659	1					
Telephone	0.573	0.608	0.733	1				
Bicycle	0.038	0.062	-0.407	-0.472	1			
Motorcycle	0.616	0.732	0.405	0.422	0.418	1		
Car	0.807	0.760	0.899	0.710	-0.171	0.688	1	
<i>prop_slum*</i>	-0.488	-0.431	-0.186	-0.174	-0.376	-0.509	-0.344	1

Source: Census of India, 2011

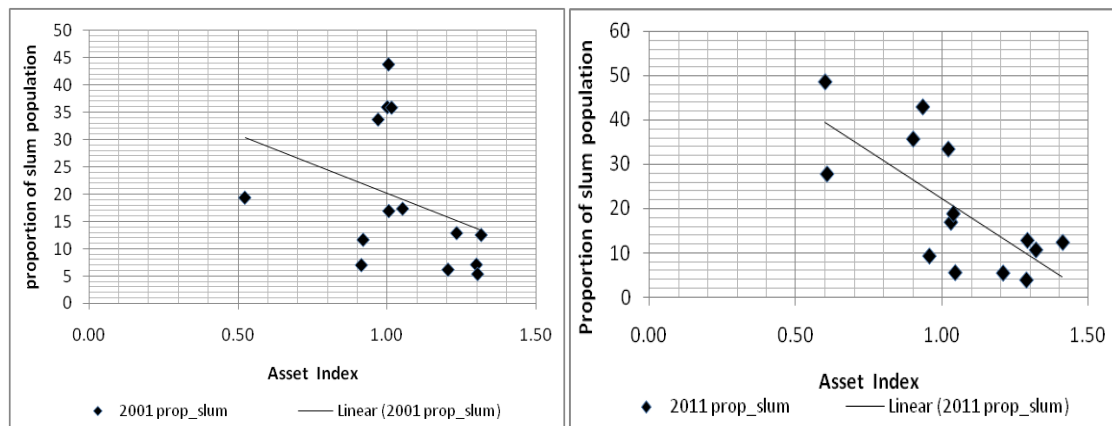
Note: * proportion of slum population

¹⁶⁵ Chandramouli, C. (2003). Slums in Chennai : A Profile, Method of Collection of Data Slum Population in Tamil Nadu Slum Population and Sex Ratio in Chennai. *Environment*, (i), 82–88.

The table no.4.3 shows the correlation matrix between asset available to the households and proportion of slum population in urban agglomeration of Maharashtra, which shows that every asset have the negative correlation with the proportion of slum population (Correlation could not prove causation). Here we can say that there may be two way relationships between availability of assets and proportion of slum population that the people of the slum living with poor standard of living condition as they are mostly of the lower income groups and could not afford better housing condition and having less number of durable goods.¹⁶⁶ This relationship can be seen with the help of scatter diagram.

4.2.4.2 *Scatter plot*: A scatter plot is a tool for analyzing relationships between two variables. One variable is plotted on the horizontal axis and the other is plotted on the vertical axis. The pattern of their intersecting points can graphically show relationship patterns. When line slope upward, then there is direct relationship or positive relationship between two variables (when one variable increases on the ‘x’ axis, the other variable at the ‘y’ axis also increases) and vice versa. The following graphs show the relationship between asset index and proportion of slum population.

Figure 4.3 Scatter diagram to show the relationship between proportion of slum population and asset index in Maharashtra, 2001 and 2011



Source: Census of India, 2001 and 2011

¹⁶⁶ Sawhney, U. (2013). Slum population in India : Extent and policy response. *International Journal of Research in Business and Social Science*, Vol. 2(1), 47–56.

In figure 4.3, on ‘x’ axis, asset index is taken and on ‘y’ axis, proportion of slum population of the urban agglomeration of the state of Maharashtra. As in scatter plot, any change on ‘x’ axis have the impact on ‘y’ axis, that is why asset index is being taken on ‘x’ axis to know the impact of asset index on slum population as the variable on ‘y’ axis is dependent on variable on ‘x’ axis. In 2001, points are more scattering but still it can be seen that there is downward slope of the points. While in 2011, the relationship is clearer in the diagram where points are steadily sloping downward. In both the cases there is inverse relationship between proportion of slum population and asset index.

With both the methods discussed above describe the relationship between slum population and asset that there is inverse relationship between the two but how much increase or decrease in one variable could affect the other can be traced with the help of regression analysis as explained as follows.

4.2.4.3 Regression analysis: Regression analysis is a statistical tool for the investigation of relationships between variables. It is used when two or more variables are thought to be systematically connected by a linear relationship. Regressions are of various type; simple linear regression, multiple linear regression, logistic regression, etc. For this analysis simple linear regression method is being used.

Simple linear regression is the most commonly used technique for determining how one variable; dependent variable (slum population) is affected by changes in another variable, independent variable (asset index). We suppose that they are related by an expression of the form, $y = b_0 + b_1x$ ¹⁶⁷, is the equation of a straight line; b_0 is the *intercept* (or *constant*) and b_1 is the *x coefficient*, which represents the slope of the straight line the equation describes. The table 4.5 tells the relationship between proportion of slum population and asset index.

Table 4.5 Regression coefficients of the state of Maharashtra

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.6512	4.988	0.0003	0.367	0.936
Asset index	-0.4288	-3.522	0.0042	-0.694	-0.164
R Square	0.51				
Adjusted R Square	0.47				

Source: Census of India, 2011

¹⁶⁷ y=proportion of slum population of Maharashtra, x=asset index of Maharashtra

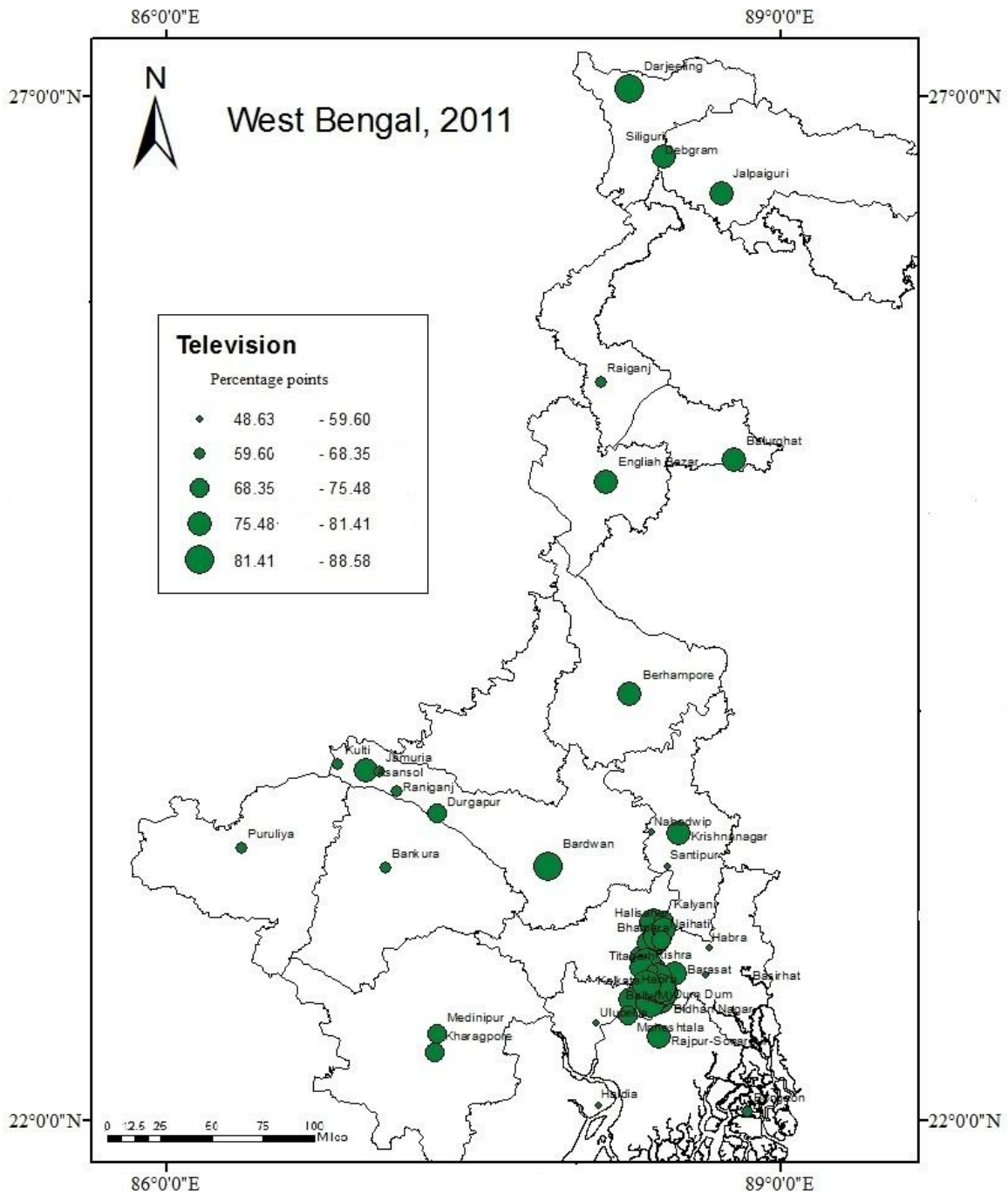
The Simple Linear Regression model explains for negative relationship among the dependent variable that is Slum Population and an independent variable is Asset Index of the state of Maharashtra. The p-values used for testing of null hypothesis against covariate explains for the possible rejection of the null hypothesis ($H_0: \beta=0$), accounted by the low p-value (< 0.01), that is 0.0003 for intercept term and 0.0042 for Asset index. The negative coefficient of asset index very clearly indicates that there stands negative relationship between the two variables and if a unit change occurs in the asset index the corresponding slum population will show a decline by 0.43 units. The value of R square indicates that around 51% of the variations in the dependent variable around the mean are explained by Asset index, or one may explain it as 51% of the values fit the model. So the model is fairly good to explain the causation between the slum population and asset index.

To know the relationship between asset index and slum population in other state of India, West Bengal and Tamil Nadu is being taken as there is wide variation among the states of the country in terms of urbanization, slum residents, and basic facilities available to the households or assets availing the households in different corners of the country. Here is the case of the state of West Bengal.

4.3.1 Availability of assets in class I towns in the state of West Bengal

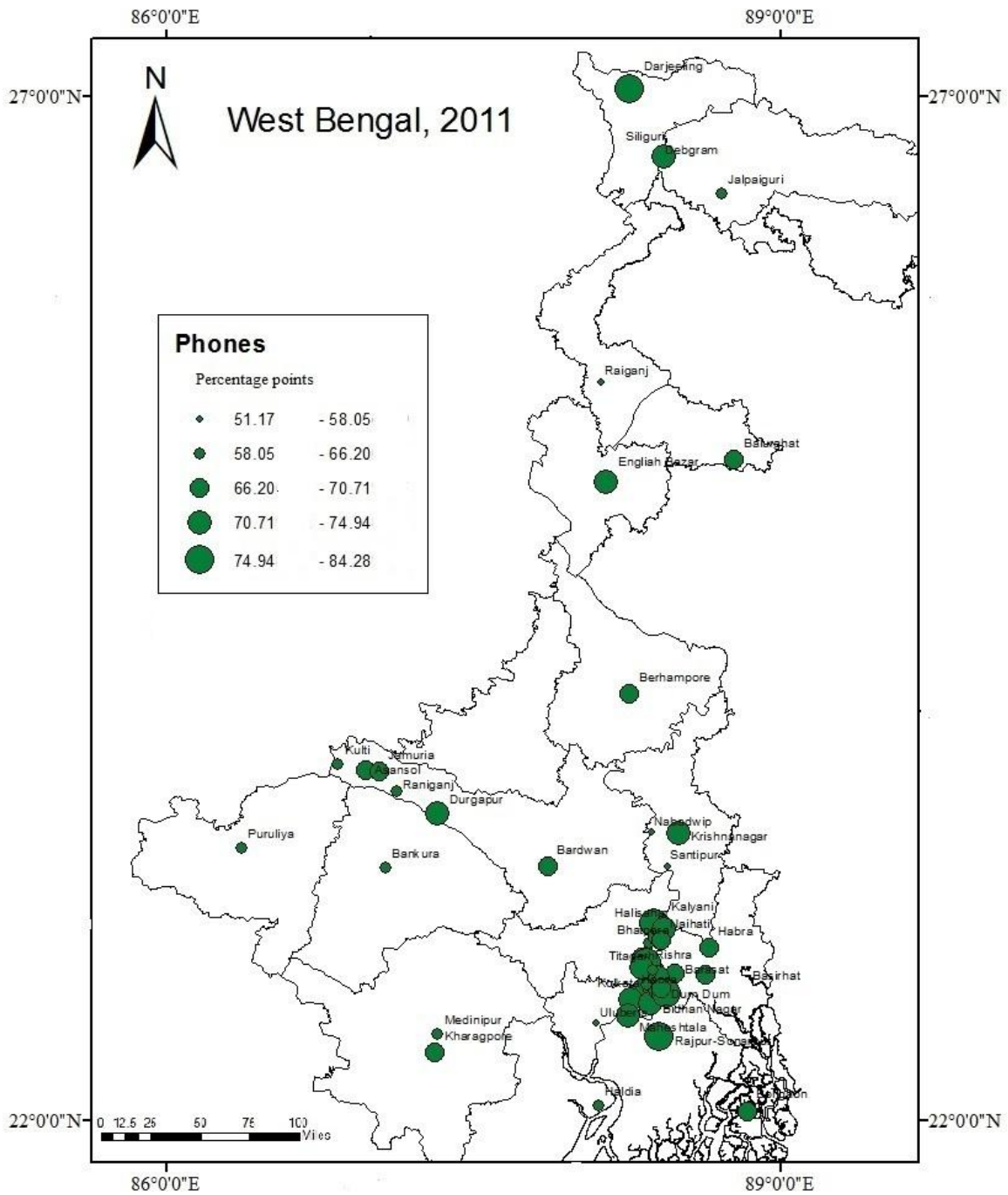
In West Bengal availability of assets can be traced with the help of data from NFHS-3 Report, 46.1% of households having radio, 68.9% having Television, 32.7% having phones, only 7.3% having computers while the mode of transports used by the household are 59.4% of households uses bicycles, 14.2% uses motorcycles and only 3.2% having the ownership of cars and According to Census of India, 2011, 18.3% of households having radio, 35.3% having Television, 49.1% having phones, only 8.3% having computers while the mode of transports used by the household are 57.2% of households uses bicycles, 8.5% uses motorcycles and only 2.2% having the ownership of cars (appendix-15). The map 4.8 to 4.13 shows the distribution of assets.

Map 4.8 Households having Television in West Bengal, 2011



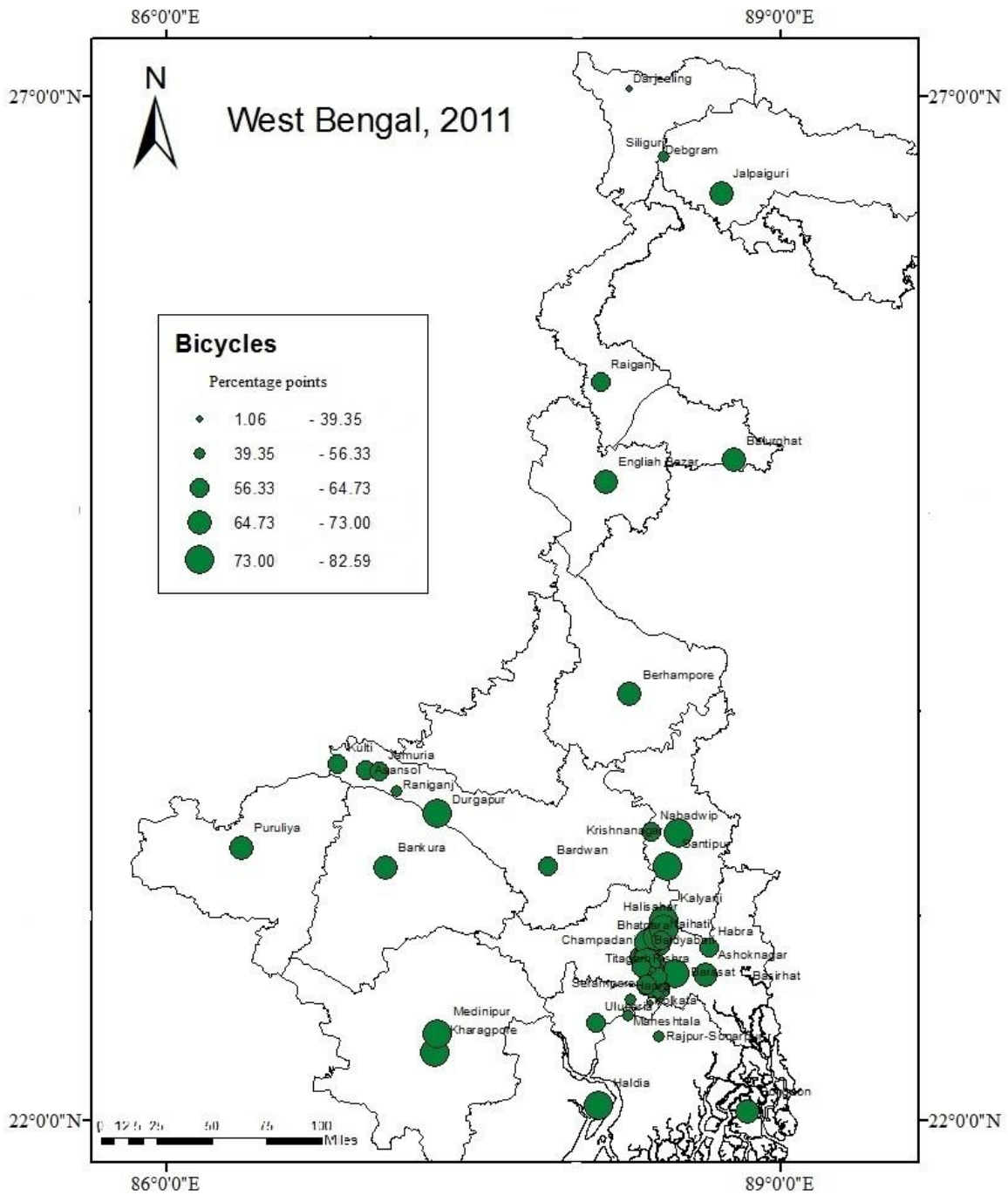
Source: Census of India, 2011

Map 4.9 Households having Phone in West Bengal



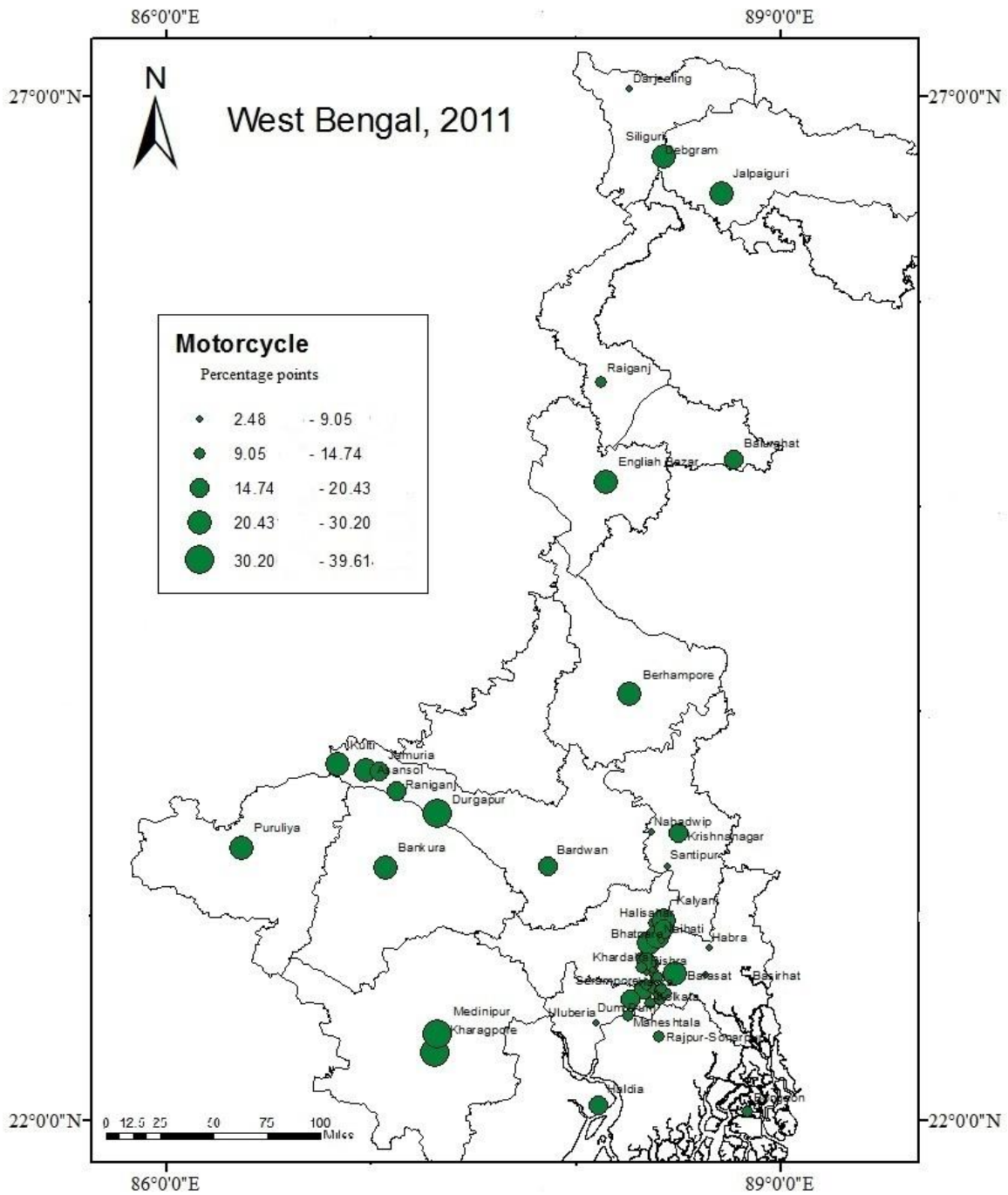
Source: Census of India, 2011

Map 4.10 Households having Bicycle in West Bengal, 2011



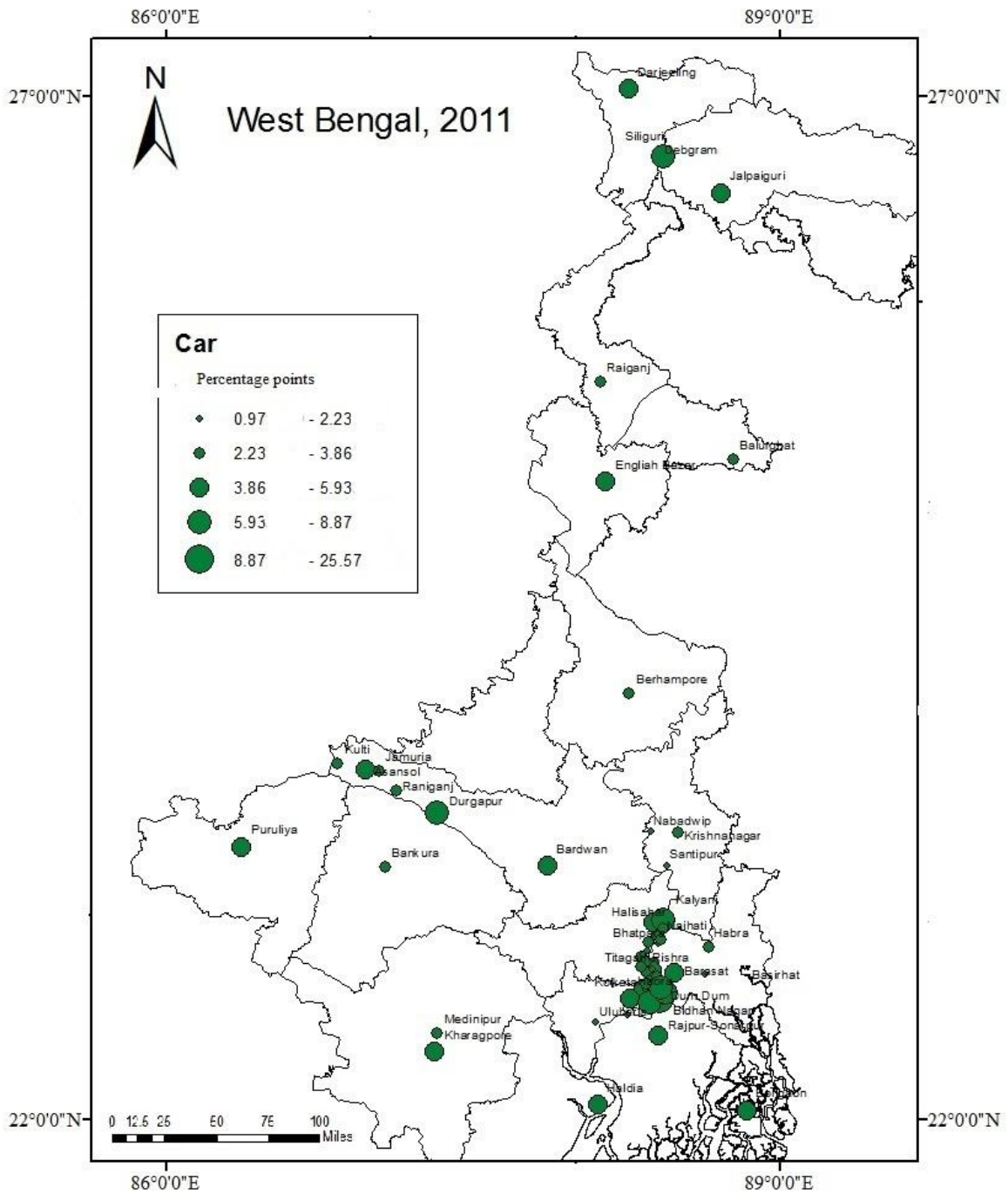
Source: Census of India, 2011

Map 4.11 Households having Motorcycle in West Bengal, 2011



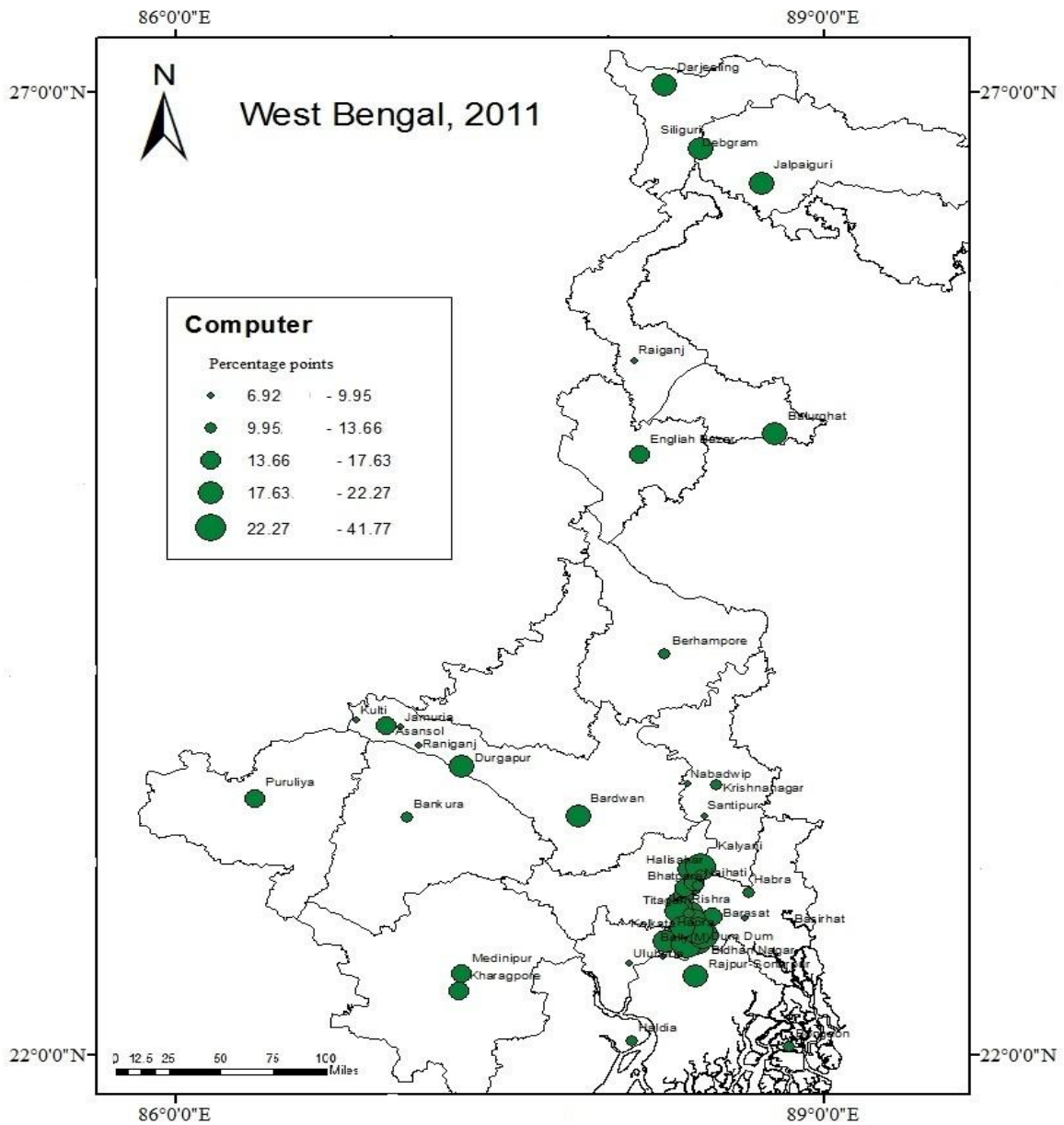
Source: Census of India, 2011

Map 4.12 Households having Cars in West Bengal, 2011



Source: Census of India, 2011

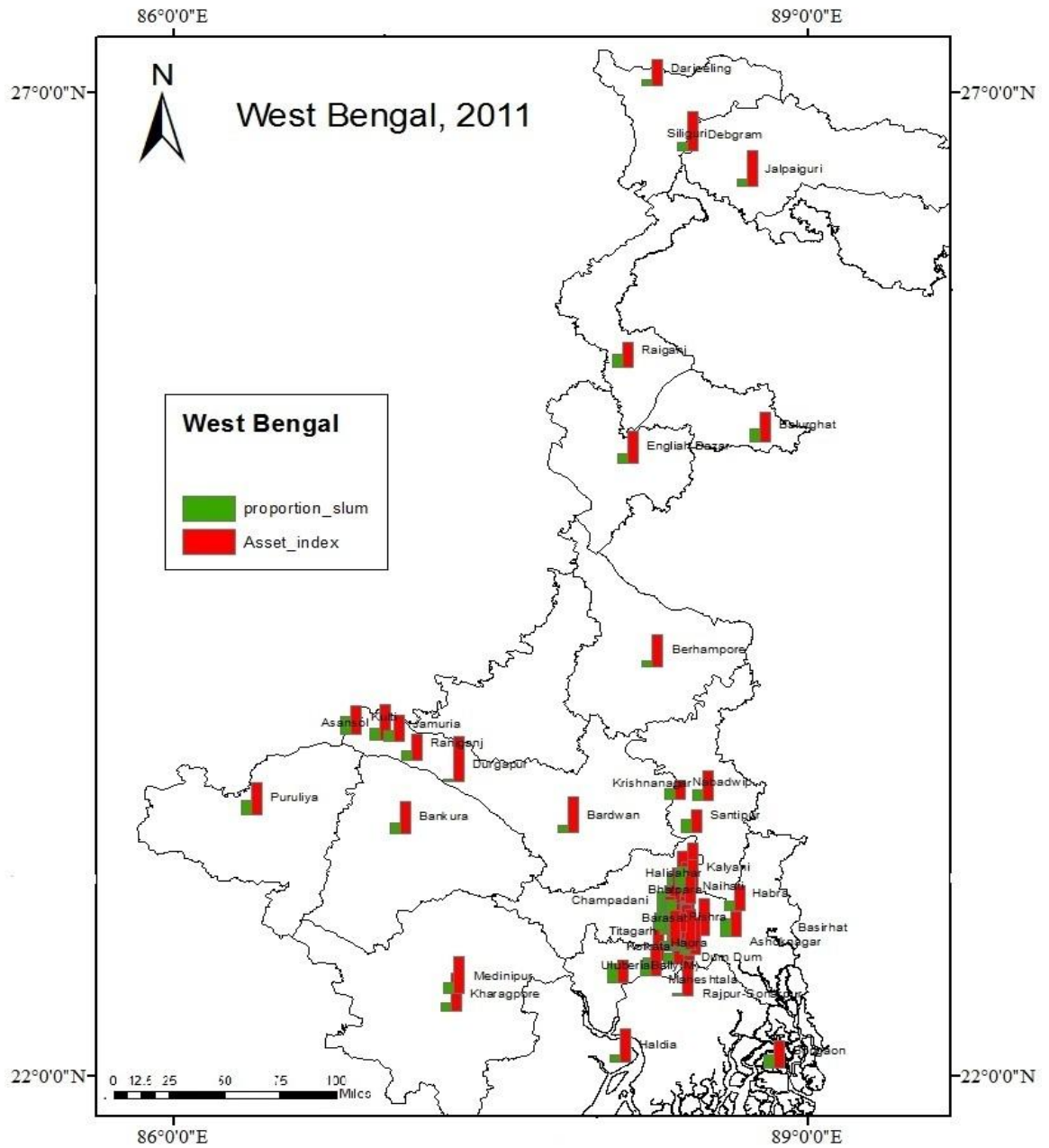
Map 4.13 Households having Computers in West Bengal



Source: Census of India, 2011

The Map 4.8 to 4.13 depicts the similar situation in this state also, Televisions, phones, bicycles and motorcycles are available in higher percentage to the households of the class I towns in the state and Cars and computers are the assets whose proportion is higher in and around Kolkata. Relationship could be established between the two with the help of the distribution map 4.14

Map 4.14 Asset index and proportion of slum in class I towns in West Bengal



Source: Census of India, 2011

In map 4.14, Asset Index and proportion of slum population of class I towns is shown. It is being depicted that in those towns where Asset Index is high, proportion of slum is high and vice versa (appendix-20). In the following section, assets of the households in urban agglomeration are being discussed.

4.3.2 Availability of assets in urban agglomeration and proportion of Slum population residing in these urban agglomerations in the state of West Bengal

The table 4.4 shows the assets in the urban agglomerations and proportion of slum living in these urban agglomerations.

Table 4.4 Assets in the urban agglomerations of the state of West Bengal and proportion of slum living in these agglomerations

Name of Urban Agglomeration	Radio	T.V	Computer	Phone	cycle	Motorcycle	Car	<i>prop_slum*</i>
Kolkata	39.55	80.24	21.31	70.67	45.31	13.05	6.12	0.29
Asansol	13.34	71.30	11.57	68.42	60.09	25.73	4.13	0.40
Siliguri	23.40	77.91	18.78	71.59	54.45	27.95	7.38	0.24
Durgapur	21.47	75.49	18.99	71.08	74.42	39.61	7.95	0.08
Barddhaman	20.77	78.35	15.66	69.77	77.93	26.97	4.04	0.22
English Bazar	7.55	81.15	17.57	73.05	66.79	21.92	4.24	0.30
Habra	19.26	59.41	10.46	69.19	67.87	8.41	2.61	0.42
Kharagpur	14.53	74.50	14.16	69.51	77.73	37.45	4.69	0.25
Santipur	32.10	63.63	13.85	63.58	64.74	8.94	3.42	0.31
Raiganj	9.20	60.80	9.95	54.77	59.69	14.74	2.85	0.40
Krishnanagar	14.86	78.98	11.33	71.21	79.27	17.27	2.98	0.32
Nabadwip	14.31	55.10	6.94	58.06	64.12	4.95	1.05	0.35
Jalpaiguri	14.78	79.72	17.94	59.97	67.79	26.62	5.19	0.22
Balurghat	6.64	77.81	18.09	67.23	68.89	17.69	3.34	0.43
Darjiling	15.38	88.58	20.49	84.29	1.07	2.49	5.59	0.21
Puruliya	8.98	66.25	14.92	64.21	67.90	27.01	4.15	0.41
Correlation with slum population	-0.354	-0.544	-0.565	0.496	0.114	-0.433	-0.734	

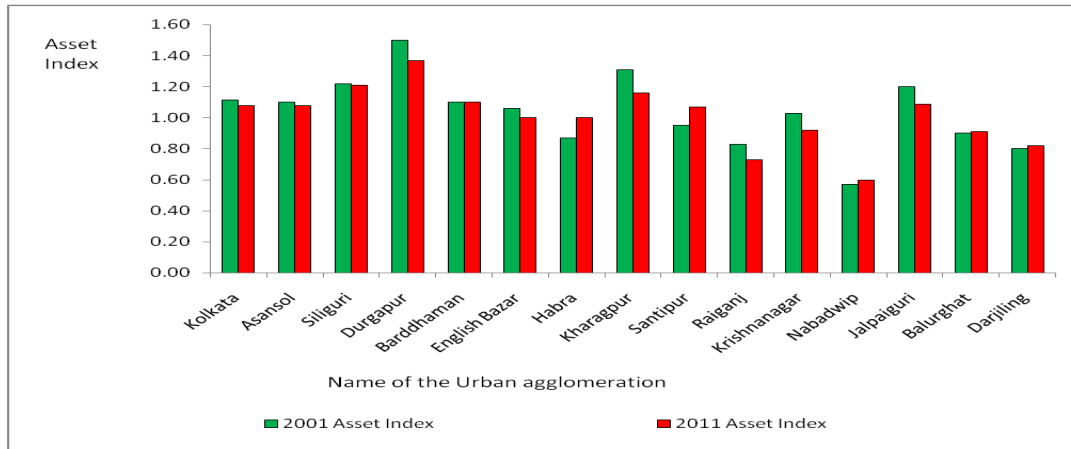
Source: Census of India, 2011

Note: * proportion of slum population

In the table 4.4, it has been shown that in those urban agglomerations where assets are less available, proportion of slum population is more, especially Cars and Computers (correlation between cars and computers and slum population is highly negative). In Asansol, Balurghat, Habra urban agglomeration, where proportion of assets (especially Cars, Computers and Television) are less than the other agglomeration, proportion slum is much higher than the other urban agglomeration. The analysis of every durable goods is not possible. So, asset index in being calculated to know the essence of asset availability in the agglomeration of the state.

The Figure 4.4 and 4.5, decipher the information about the asset index and proportion slum population respectively, living in the urban agglomerations of the state of West Bengal.

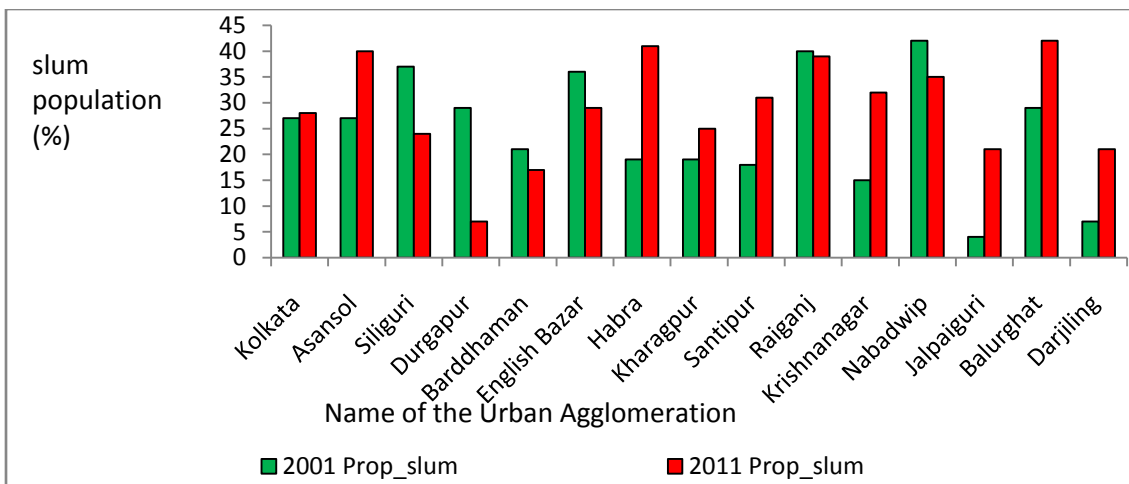
Figure 4.4 Asset index in urban agglomerations of West Bengal



Source: Census of India, 2011

Asset Index of urban agglomeration in West Bengal, as shown in figure 4.3, has a different pattern than of Maharashtra. In most of the towns Asset Index is being declined during 2001-2011 except in some agglomeration. This explains that in spite of increasing the wealth of the households is declining. This may be because of the increasing slum population in the state which is shown in the figure no.4.4

Figure 4.5 Proportion of slum population in urban agglomerations of West Bengal



Source: Census of India, 2011

The figure 4.5 depicts that in most of the agglomerations proportion of slum increased to a large extent than 2001 level. Those urban agglomerations which have high value of asset index have less proportion of slum population and vice versa. But there is something interesting about the asset index is being decreasing during 2001-2011 in the urban agglomeration of the state except Habra and Santipur urban agglomeration and proportion slum population increasing in most of the agglomerations.¹⁶⁸

4.3.3 Availability of assets and proportion of Slum population in Reclassified class I towns of the state of West Bengal

As it has been discussed earlier that a large chunk of urban population lives class I towns and of these towns' population about half of the population resides in million plus cities so the class I towns are being reclassified into some hypothetical towns. The table no. of appendix tells us about the asset index and proportion of slum population lives in reclassified towns of the state of West Bengal. Asset index is more in metro cities than the other towns, and is unit correlation between asset index and proportion of slum population. While in other categories of towns asset index and proportion of slum population is negatively correlated. The same trend is being depicted in both the Census.

Table 4.6 Asset index and proportion of slum population in reclassified class I towns of West Bengal

Classification of Towns	2001		2011	
	Asset Index	prop_slum*	Asset Index	prop_slum*
Metro cities (Above 10 lakhs)	0.893	28.74	1.003	26.79
Regional metros (5 to 8 lakhs)	-	-	1.008	22.18
Juvenile cities (3 to 5 lakhs)	1.028	27.48	1.009	28.32
Incipient cities (1 to 3 lakhs)	1.100	24.50	1.019	32.67

Source: Census of India, 2001 and 2011

Note: * proportion of slum population

The table 4.6 shows the value of asset index increased in metro cities while others remain at the edge. In 2001, proportion of slum population decreases as the index improves while it is not followed in 2011 that is proportion of slum population increased as the index improved in most of the cases. The assets are necessary for the upward movement at the

¹⁶⁸ Census of India, 2001 and 2011

development levels, and particularly transitions out of poverty. As assets accumulate, households move on the living standard and people living in slum condition move to a better society and slum would decline.

4.3.4 Relationship between proportion of slum population and available assets in the state of West Bengal

4.3.4.1 *Correlation matrix:* Table no.4.7 is about the correlation matrix between different assets and proportion of slum population of the urban agglomeration of the state of West Bengal.

Table 4.7 Correlation matrix of assets and proportion of slum population in urban agglomeration of West Bengal

<i>Assets</i>	<i>Radio</i>	<i>Television</i>	<i>Computer</i>	<i>Telephone</i>	<i>Bicycle</i>	<i>Motorcycle</i>	<i>Car</i>	<i>prop_slum*</i>
Radio	1							
Television	0.059	1						
Computer	0.308	0.815	1					
Telephone	0.153	0.726	0.584	1				
Bicycle	-0.158	-0.346	-0.397	-0.502	1			
Motorcycle	-0.136	0.258	0.259	0.003	0.538	1		
Car	0.375	0.630	0.814	0.496	-0.253	0.549	1	
prop_slum*	-0.354	-0.544	-0.565	-0.401	0.114	-0.433	-0.734	1

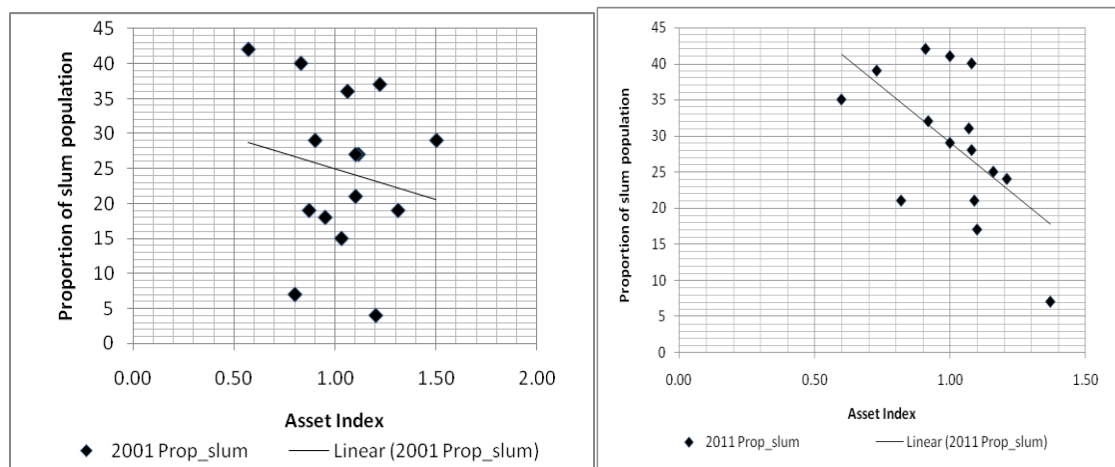
Source: Census of India, 2011

Note: * proportion of slum population

The table shows that there is interrelationship between assets and slum population. The selected households' consumer durables are negatively correlated (except bicycle which is positively correlated but very weak correlated) with the proportion of slum population. In west Bengal also, Cars and Computers have the highest value of correlation (negative). As the slums' population is of low strata/ low income group of the society, these luxurious good are less available to them. Bicycles have the positive relationship but to a negligible extent, that means it has no effect on the slum population concentration.

4.2.4.2 Scatter plot: The figure no.4.5 show the relationship between asset index and proportion of slum population of urban agglomeration of the state of West Bengal.

Figure 4.6 Scatter diagram to show the relationship between proportion of slum population and asset index in West Bengal, 2001 and 2011



Source: Census of India, 2001 and 2011

The figure 4.6 shows scatter diagram which tells the relationship between proportion of slum population and asset index of the urban agglomeration of the state of West Bengal that there is negative relation persist in between proportion slum population and asset index as the points indicating the proportion of slum are downward sloping. In 2001 the relation is not very much clear as points are scattered and line of best fit is also slightly tilted yet there is indication of negative slope. And during 2011, the slope is much steeper than 2001, diagram, here a clear cut negative relation is being depicted in the diagram. The causation effect can be seen with the help of regression analysis in the following section.

4.3.4.3 Regression analysis: The table 4.8 tells the relationship between proportion of slum population and asset index of the urban agglomeration of the state of West Bengal with the help of regression coefficients.

Table 4.8 Regression coefficients of the state of West Bengal

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.5948	5.1744	0.0001	0.3464	0.8431
Asset Index	-0.2967	-2.6493	0.0200	-0.538	-0.0547
R Square	0.35				
Adjusted R Square	0.30				

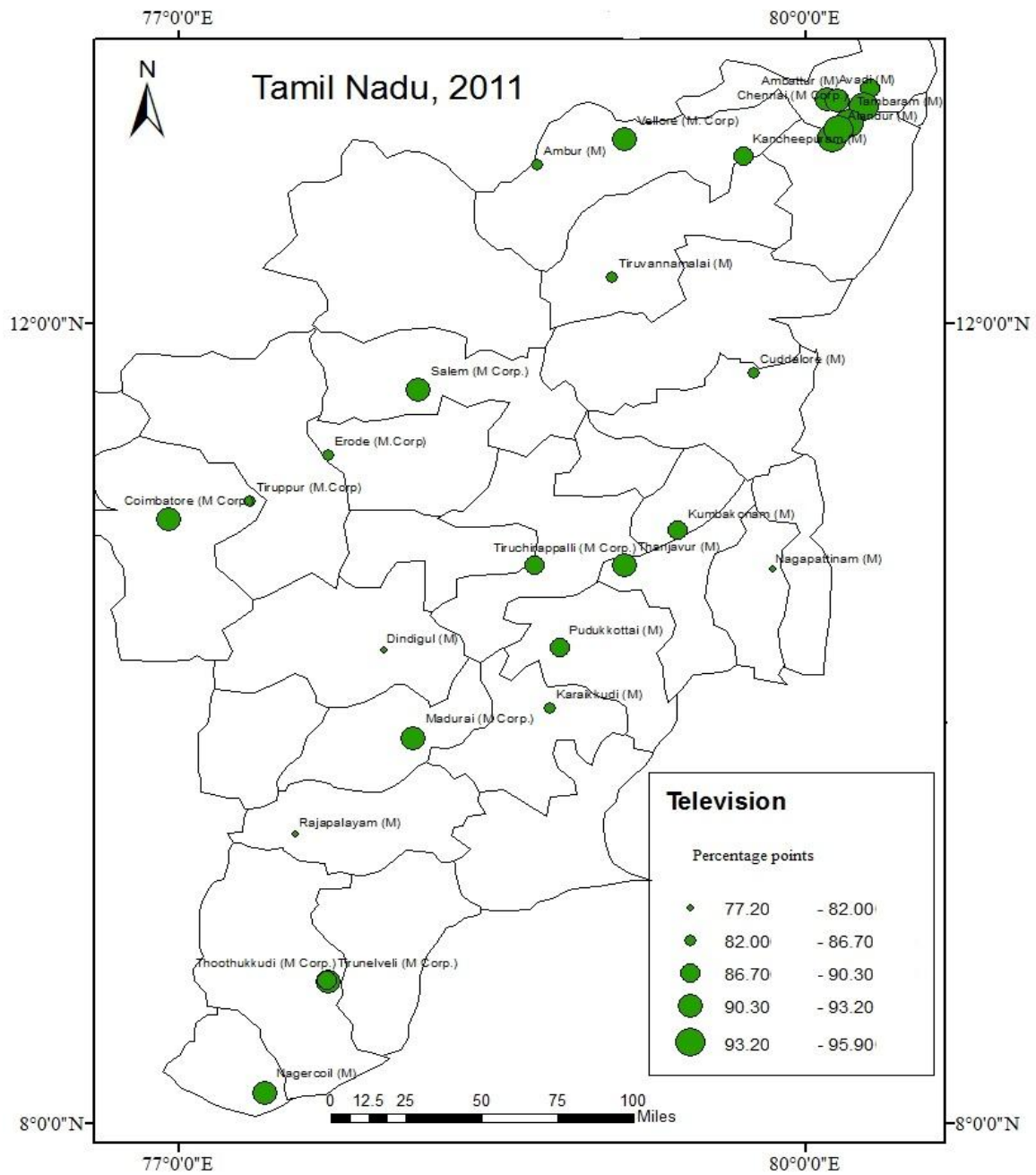
Source: Census of India, 2011

In table 4.8, the Simple Linear Regression model explains the negative relationship among the dependent variable that is Slum Population and an independent variable is Asset Index of the state of West Bengal. The p-values used for testing of null hypothesis against covariate explains for the possible rejection of the null hypothesis ($H_0: \beta=0$), accounted by the low p-value (< 0.05), that is 0.0001 for intercept term and 0.020 for Asset index. The negative coefficient of asset index indicates that there is also negative relationship between the two variables and if a unit change occurs in the asset index the corresponding slum population will show a decline by 0.29 units. The value of R square indicates that around 35% of the variations in the dependent variable around the mean are explained by Asset index, or one may explain it as 35% of the values fit the model. The model explains the causation between the slum population and asset index.

4.4.1 Availability of assets in class I towns in the state of Tamil Nadu

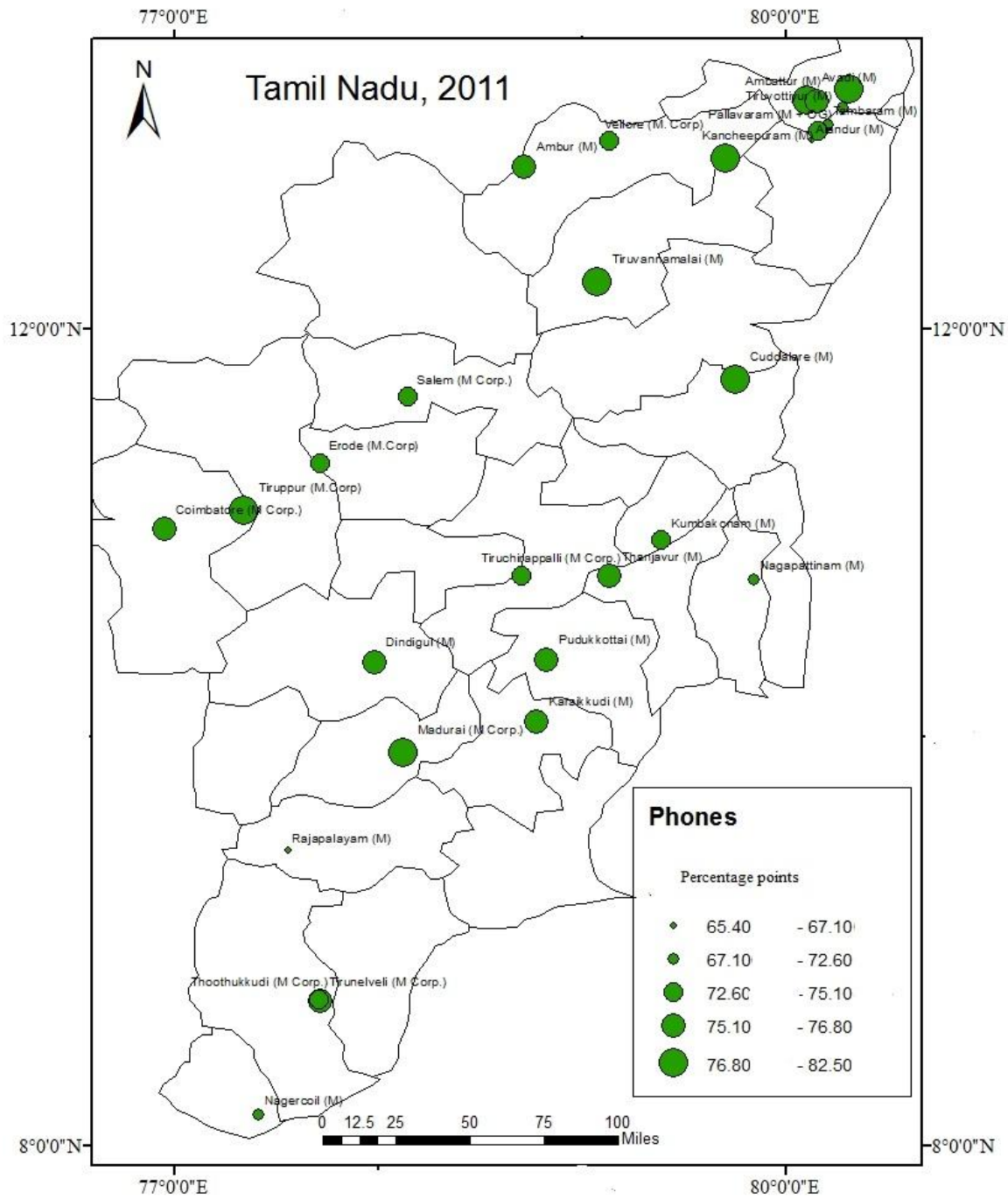
In Tamil Nadu, in terms of availability of assets, the situation is better than the other two states. As per the NFHS-3 report, 44.4% of households having radio, 68.2% having Television, 32.2% having phones, only 6.9% having computers while the mode of transports used by the household are 47.8% of households uses bicycles, 29.9% uses motorcycles and only 4.2% having the ownership of cars. According to Census of India, 2011, 22.7% of households having radio, 56.8% having Television, 69.1% having phones, only 13.3% having computers while the mode of transports used by the household are 30.5% of households uses bicycles, 24.9% uses motorcycles and only 5.9% having the ownership of cars. The map no.4.15 to 4.20 shows the available assets to the households of class I towns of Tamil Nadu (appendix-16).

Map 4.15 Households having Television in Tamil Nadu



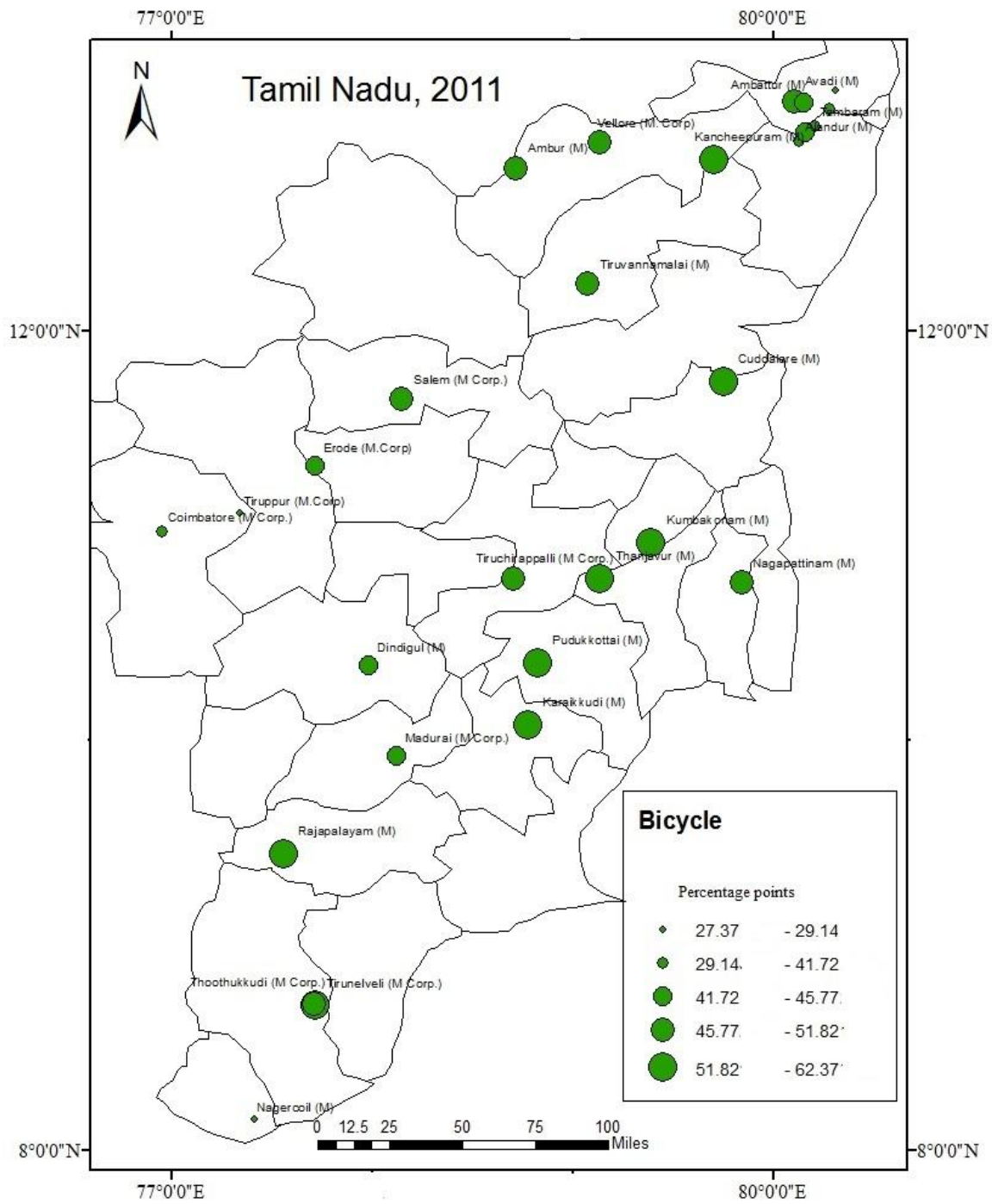
Source: Census of India, 2011

Map 4.16 Households having Phone in Tamil Nadu



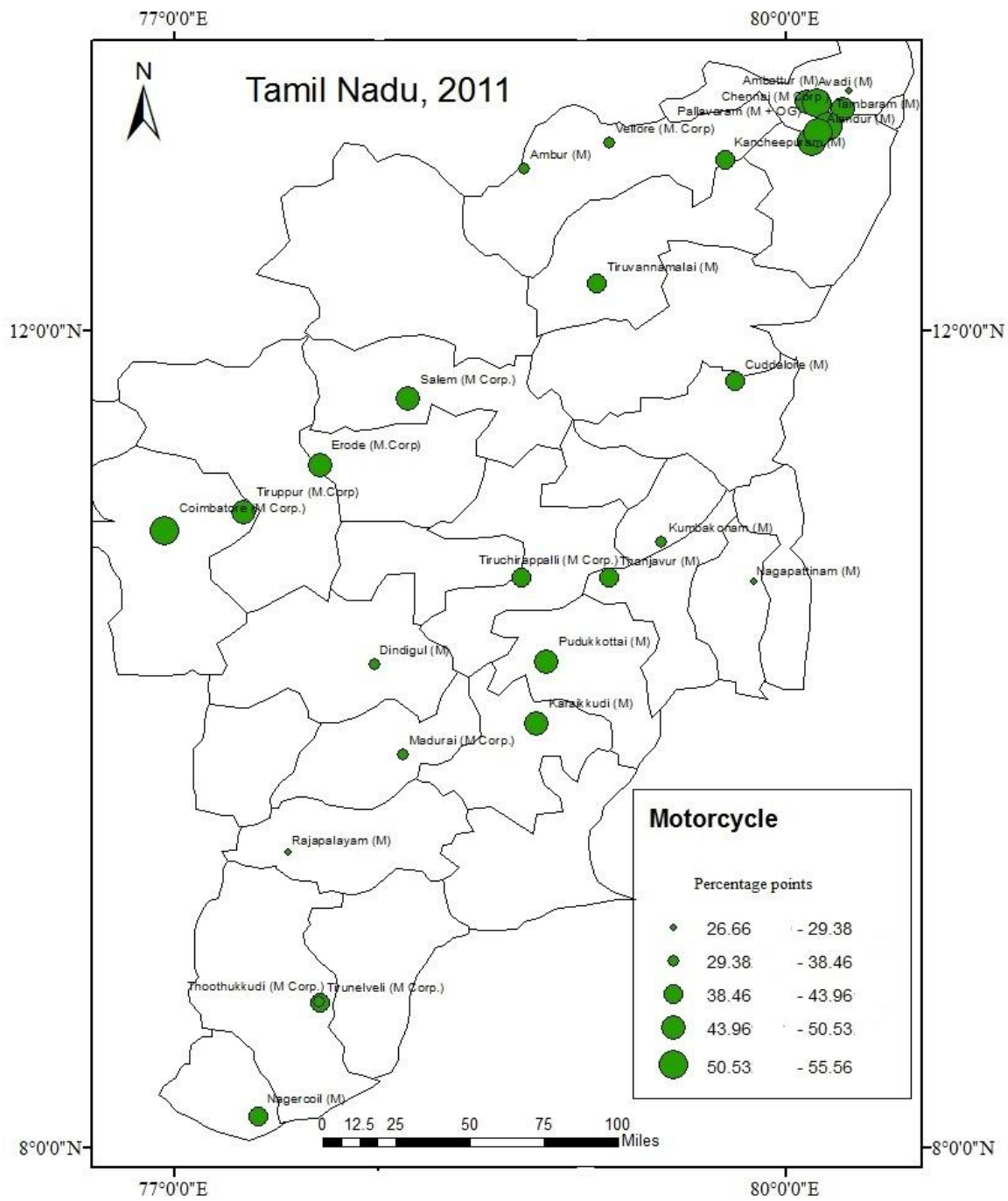
Source: Census of India, 2011

Map 4.17 Households having Bicycle in Tamil Nadu



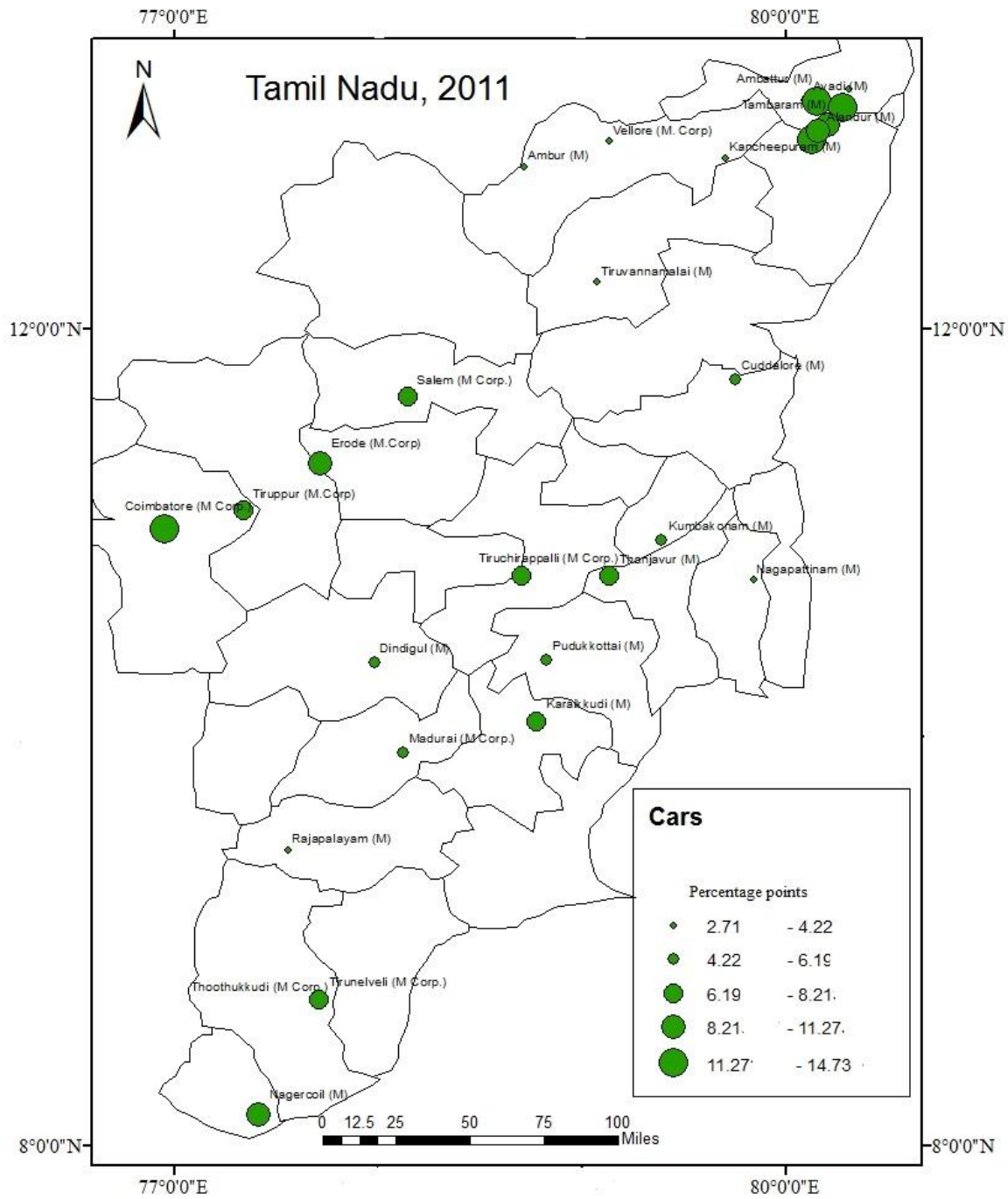
Source: Census of India, 2011

Map 4.18 Households having Motorcycle in Tamil Nadu



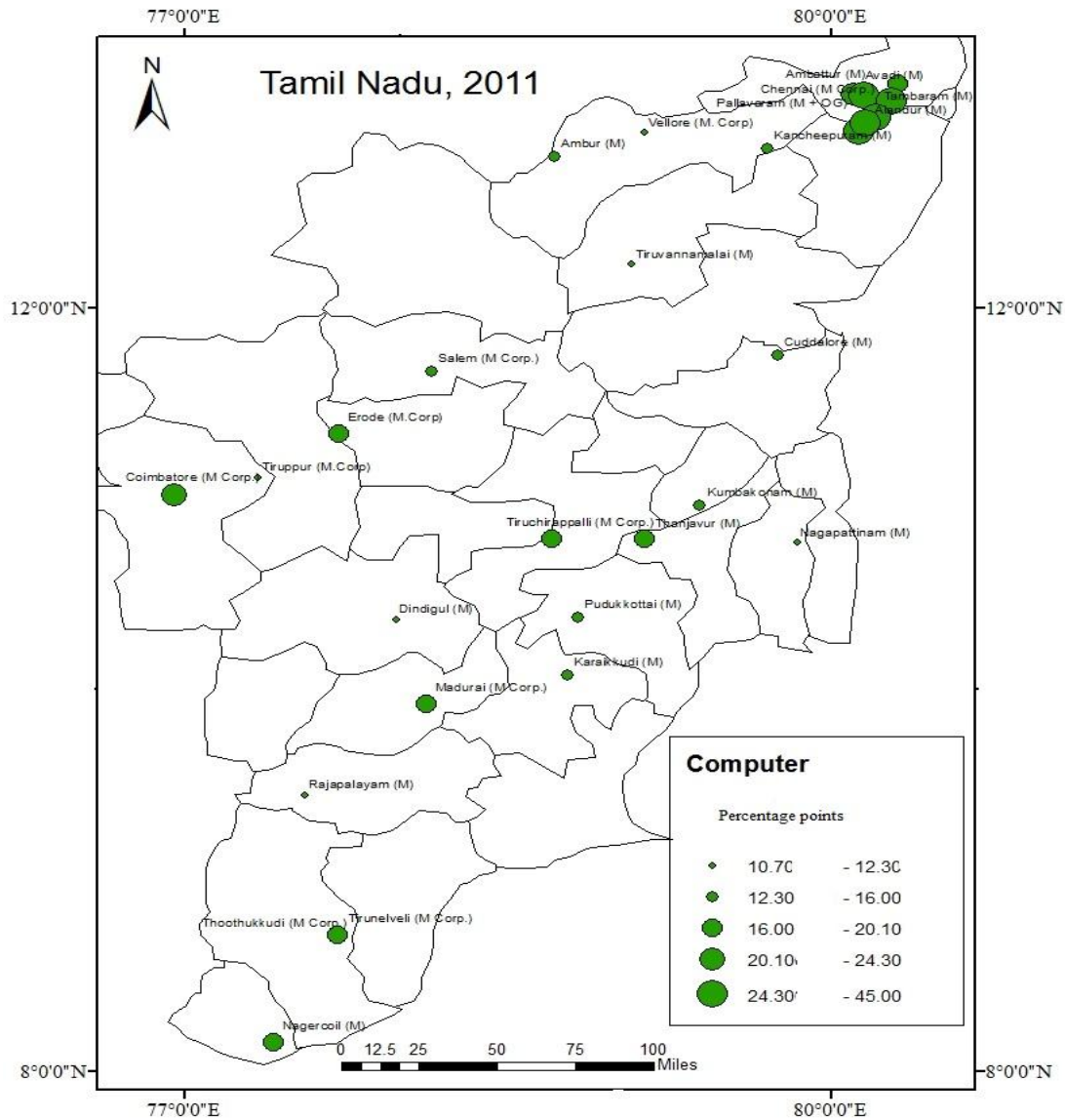
Source: Census of India, 2011

Map 4.19 Households having Cars in Tamil Nadu



Source: Census of India, 2011

Map 4.20 Households having Computers in Tamil Nadu



Source: Census of India, 2011

In Tamil Nadu, Television, phones, bicycles, motorcycles have been found in most of the households in most of the class I towns. Cars and Computers have a different pattern than other assets. Cars and Computers have the largest share in and around Chennai metropolitan. Except in Chennai region, all the other towns have a very low percentage share of Cars and Computers in the state. A composite index of assets and proportion of slum is depicted in map 4.21.

not be established between assets and slum. Class I towns are clubbed to form the urban agglomeration to know the pattern and relationship between assets and slum population.

4.4.2 Availability of assets in urban agglomeration and proportion of Slum population in Tami Nadu

The available assets to the households of the class I towns of state is being discussed in the above portion. In the following section it is being discussed of urban agglomerations of the states, as the towns of the adjoining areas and of the urban agglomeration depicts the similar characteristics. The following table shows the assets of the urban agglomeration of the state of Tamil Nadu along with the proportion of slum population.

Table 4.9 Assets in the urban agglomerations of the state of Tamil Nadu and proportion of slum living in these agglomerations

Name of Urban Agglomeration	Radio	Television	Computer	Telephone	Bicycle	Motorcycle	Car	P_S*
Chennai	34.19	94.48	31.69	73.63	38.84	47.15	12.10	0.28
Coimbatore	32.79	90.79	22.73	76.47	38.08	53.51	12.81	0.12
Madurai	36.14	91.40	16.70	78.90	45.77	36.77	5.55	0.27
Tiruchirappalli	42.11	89.20	20.10	75.00	47.67	42.29	7.19	0.27
Tiruppur	18.44	85.70	11.70	82.50	27.37	50.53	8.21	0.16
Salem	20.80	91.60	14.10	75.10	48.36	48.93	6.85	0.22
Erode	24.25	85.40	18.50	73.90	44.74	50.14	10.27	0.18
Tirunelveli	36.26	90.30	17.00	73.50	51.82	37.88	7.51	0.14
Vellore	9.77	91.70	11.60	74.80	50.18	34.14	3.73	0.23
Thoothukkudi	28.59	91.40	14.50	75.70	56.50	43.97	6.20	0.16
Dindigul	31.16	82.00	12.30	75.30	43.93	38.47	5.22	0.47
Kancheepuram	25.69	88.80	13.90	79.90	62.37	40.04	4.15	0.22
Kumbakonam	31.48	86.70	16.00	76.20	58.36	47.18	6.72	0.41
Thanjavur	23.66	89.10	14.40	74.40	61.89	36.66	5.06	0.27
Thanjavur	35.49	91.40	16.70	76.20	55.98	43.41	6.97	0.20
Correlation with slum population	0.152	-0.446	-0.100	-0.179	0.169	-0.309	-0.354	

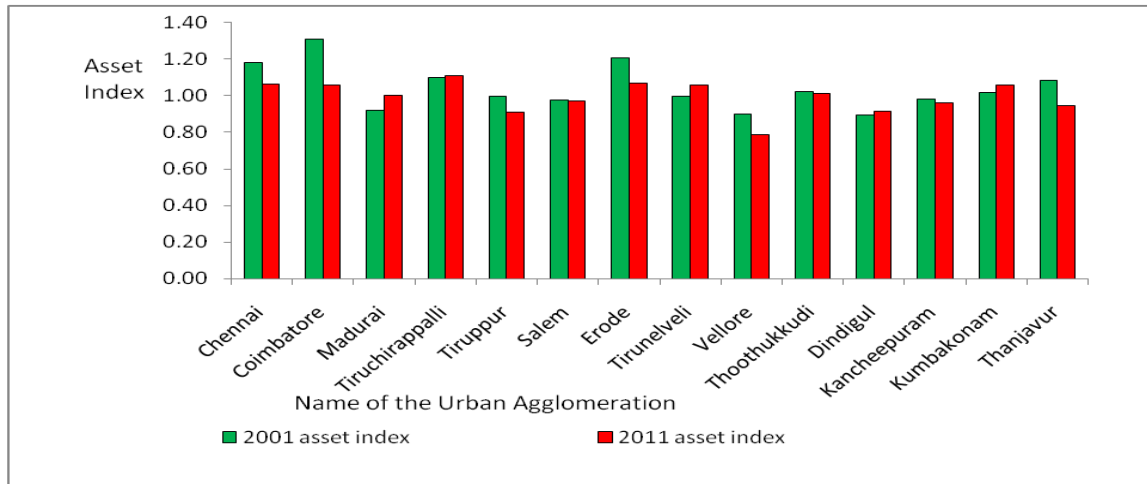
Source: Census of India, 2011,

Note: * proportion of slum population

The table 4.9 shows that in those urban agglomerations where durable goods are more, proportion of slum population is less except in Chennai urban agglomeration where assets are more as well as proportion of slum population is high. In this state value of correlation (negative) of proportion slum population is more with Television, Motorcycle and Cars. But all the values are less than 0.5 which means, they have little effect on each

other. In Tamil Nadu a strong correlation could not be established, we can say assets are more evenly distributed in this state.

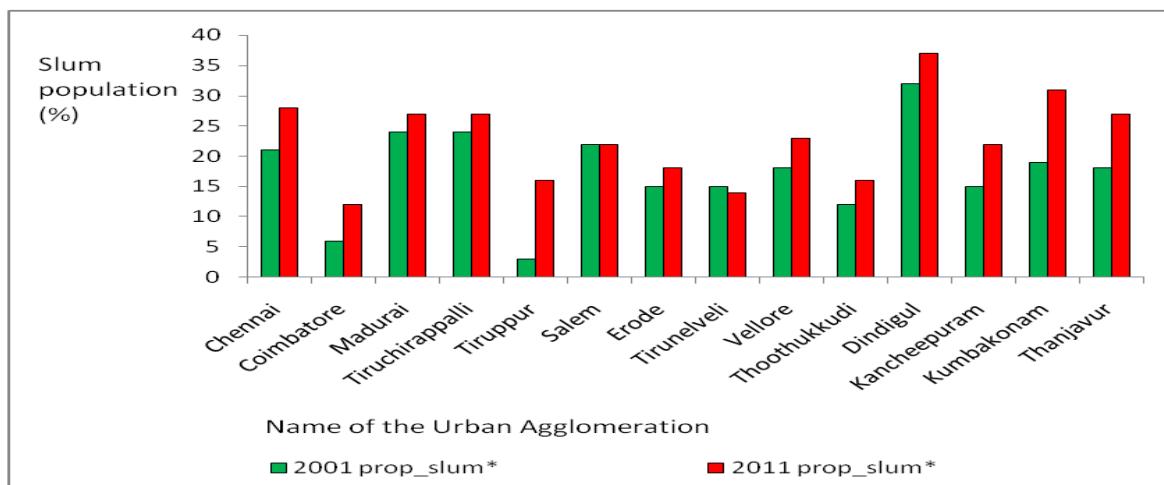
Figure 4.7 Asset index in urban agglomerations of Tamil Nadu



Source: Census of India, 2001 and 2011

In Tamil Nadu change in Asset Index is very less during 2001-2011. In some agglomeration, Asset index decreased while in some agglomeration it is increased and in most of the agglomeration more or less remains similar in both the periods. What could be the effect on change in proportion of slum population is shown in the figure no.4.8

Figure 4.8 Proportion of slum population in urban agglomerations of Tamil Nadu



Source: Census of India, 2001 and 2011

Note: * proportion of slum population

The figure 4.8 depicts that proportion of slum population has an increasing trend. It is clear that in those agglomerations, where value of Asset Index declined, proportion of

slum population expanded. It can be seen that increase in slum population is more than that of Asset Index. That means slum population is increasing at a greater pace which has to be regulated.

4.4.3 Availability of assets and proportion of Slum population in Reclassified class I towns of Tamil Nadu

In Tamil Nadu, only three metro cities are there which are having population more than ten lakhs. In this state in 2011, there are no regional metros. Here as the asset index improves proportion of slum also increases. This can be seen in the following table.

Table 4.10 Asset index and proportion of slum in reclassified class I towns of Tamil Nadu

Classification of Towns	2001		2011	
	Asset index	prop_slum*	Asset index	prop_slum*
Metro cities (Above 10 lakhs)	1.372	0.189	1.038	0.261
Transitional metros (8 to 10 lakhs)	0.999	0.150	1.000	0.244
Regional metros (5 to 8 lakhs)	1.001	0.228	-	-
Juvenile cities (3 to 5 lakhs)	0.997	0.120	0.999	0.180
Incipient cities (1 to 3 lakhs)	1.000	0.243	1.010	0.240

Source: Census of India, 2011

Note: * proportion of slum population

Table 4.10 shows that almost all the category of towns has the value near 1. The value of Asset Index of Transitional metros, Juvenile metros, and Incipient metros increased during 2001-2011 and proportion of slum population reduced. In Metro cities value of Asset Index reduced in 2011 and proportion of slum population increased. Appendix- tells us about the asset index, proportion of slum population and correlation between asset index and proportion of slum population. Here, there is negative correlation in incipient cities (Correlation between asset index and proportion of slum population is about -0.14) while rest all the categories shows the positive correlation between asset index and proportion of slum population (appendix-22).

4.4.4 Relationship between proportion of slum population and available asset in the state of Tamil Nadu

4.4.4.1 *Correlation matrix:* The table 4.11 is about the correlation matrix between different assets and proportion of slum population

Table 4.11 Correlation matrix of assets and proportion slum population in of Tamil Nadu

<i>Assets</i>	<i>Radio</i>	<i>Television</i>	<i>Telephone</i>	<i>Bicycle</i>	<i>Motorcycle</i>	<i>Car</i>	<i>prop_slum</i>
Radio	1						
Television	0.764	1					
Telephone	0.634	0.774	1				
Bicycle	0.831	0.871	0.771	1			
Motorcycle	0.299	0.686	0.758	0.493	1		
Car	0.068	0.394	0.486	0.098	0.831	1	
prop_slum	-0.016	-0.018	-0.075	-0.077	-0.264	-0.426	1

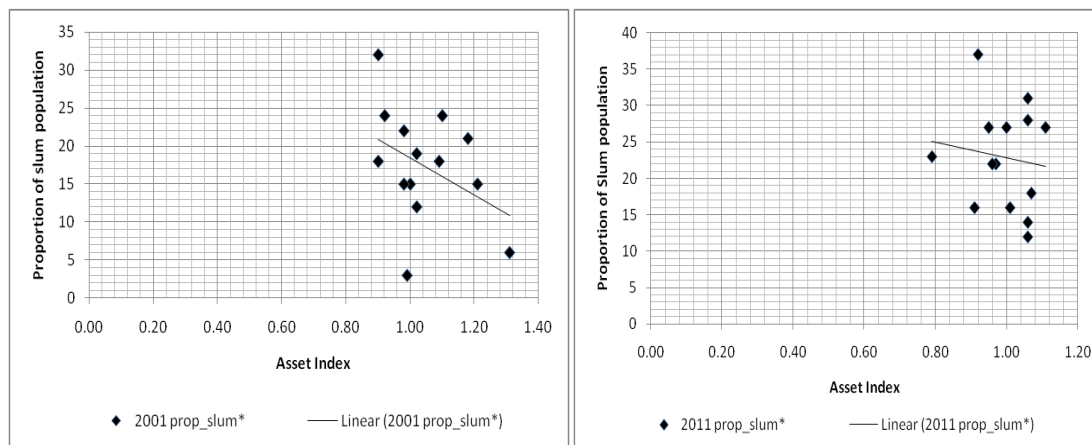
Source: Census of India, 2011

Note: * proportion of slum population

The table 4.11 tells us about the correlation matrix between available assets and proportion of slum population. Here also assets are negatively correlated but the relation is very weak among the assets and proportion of slum, only Cars have the value of -0.43 of the correlation between cars and slum population. Rest all the assets have the value less than -0.2, which is almost negligible.

4.4.4.2 *Scatter diagram:* The figure 4.9 shows the relationship between asset index and proportion of slum population of urban agglomeration of the state of Tamil Nadu

Figure 4.9 Scatter diagram to show the relationship between proportion of slum population and asset index in Tamil Nadu, 2001 and 2011



Source: Census of India, 2001 and 2011

The figure 4.9 shows the negative relation between slum population and asset index. In this state points indicating the slum population are scattered in the graphs and downward sloping. As compared to other two states here, the line of fit is steep in 2001 graph and it flattens in 2011 which indicates that the relationship between slum population and asset index becoming blurred as we move from 2001 to 2011.

4.4.4.3 Regression analysis: The following table tells the relationship between proportion of slum population and asset index of the urban agglomeration of the state of Tamil Nadu with the help of regression coefficients.

Table 4.12 Regression coefficients of the state of Tamil Nadu

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	33.6735	1.4122	0.1832	-18.2785	85.6255
asset index	-10.8707	-0.4551	0.6571	-62.9063	41.1648
R Square	0.01697				
Adjusted R Square	-0.06494				

Source: Census of India, 2011

In the table 4.15, the Simple Linear Regression model does not explain the causation between the slum population and asset index. The p-values used for testing of null hypothesis against covariate explain for the possible rejection of the null hypothesis ($H_0: \beta=0$), accounted by the low p-value (< 0.05), here it is 0.1832 for intercept term and 0.6571 for Asset Index. Here, the value of R square indicates that around 1.6% of the variations in the dependent variable around the mean are explained by Asset Index, or one may explain it as only 1.6% of the values fit the model. Therefore it can be said that this model does not explain the causation effect of asset index on the increase or decrease of the proportion of slum population. When all class I towns of all the three states; Maharashtra, West Bengal and Tamil Nadu, taken together the regression values are shown in table 4.12.

Table 4.13 Regression coefficients of the state of Maharashtra, West Bengal and Tamil Nadu

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.5915	9.1660	0.0000	0.4638	0.7192
Asset index	-0.3126	-4.9909	0.0000	-0.4365	-0.1887
R Square	0.1629				
Adjusted R Square	0.1564				

Source: Census of India, 2011

The Simple Linear Regression model explains for negative relationship among the dependent variable that is Slum Population and an independent variable is Asset Index of the state of Maharashtra, West Bengal and Tamil Nadu. The p-values used for testing of null hypothesis against covariate explains for the possible rejection of the null hypothesis accounted by the low p-value (< 0.01), that is 0.0000 for intercept term and 0.0000 for Asset index. The negative coefficient of asset index very clearly indicates that there stands negative relationship between the two variables and if a unit change occurs in the asset index the corresponding slum population will show a decline by 0.31 units. The value of R square indicates that around 16% of the variations in the dependent variable around the mean are explained by Asset Index, or one may explain it as 15% of the values fit the model. So the model explains the causation between the slum population and Asset Index that is inverse relationship between Asset Index and slum population of the all three states.

4.5 Conclusion

It can be concluded that there is negative/ inverse relationship between asset index and proportion of slum living in class I towns of the state either of Maharashtra, West Bengal or Tamil Nadu. It can be said that by increment of assets reduces proportion of slum population in these states. This relation is more evident with computers and cars (selected for the analysis), these are goods which are owned by the higher income groups and are evident that slums are the shelter of poor community. That is why there is positive relationship with bicycles.

Therefore it can be suggested that to curb the menace of slum population and its growth in urban areas, there should be improvement in the asset index. As people move up on the ladder of the economic development and condition of slum would improvement. The slum is all about the conditions where the people live and if conditions improves slum will automatically decreases.

Chapter-5

Summary and Conclusions

Urbanization refers to the process of being urban. It is a complex process of change pertains to population concentration, structural transformation and socio-psychological change reshaping both people and spaces. Urbanization is a multifaceted process which involves concentration of population densities higher than those associated with agricultural populations and escalating concentration of individuals and activities in towns and cities. Population shift (migration) from rural to urban areas implies the physical shift of the population from rural to urban areas. Structural changes in the economy of a region, occupational shift from agricultural to non agricultural and land use shift, which can be change in situ that is without change in residence. A change in the socio-cultural and behavioural aspects of people, e.g. people gradually adopts a new way of urban life, i.e. urbanism. Consequently, there is improvement in standard of living, change in 'life style' and change in the institutional framework. Thus, there is a chain of shifts.

There is great difference in urbanization in developed and less developed nations. Developed countries has been experiencing a very high level of urbanization but their population size is low, while in the developing countries where urbanization level is low in spite of having a huge chunks of base population. The absolute number of urban population is much higher than those of the developed nations.

In India, about 31 percent of total population lives in urban areas. The Indian urbanization is of subsistence nature. It implies that the migrants from rural areas attracted to the urban centers not for urban environment but for employment. They may be living in worse living condition but stick to the cities for jobs. This affects badly the quality of life in the urban places, especially in the class I and metropolitan cities. The Indian urbanization has poly-metropolitan apex in which the million plus cities dominate the entire urban scheme accounting for more one third of India's total urban population. The big cities are exploding in their population while small towns are stagnating. About 60 percent of urban population lives in class I towns of the country.

Urbanization is increasing at a great pace but without the same pace in the improvement in the infrastructure in urban spaces. Due to lack of basic facilities in urban areas like, affordable housing, sanitation facility, proper waste management, treated source of drinking water, etc. lead to growth of slum in urban centers. Slums are the conditions of living without basic services. This study is related to the class I towns of three states of India, Maharashtra, West Bengal and Tamil Nadu.

- These are the states of the country having large urban as well as slum population. Both the rate of urbanization and growth of slum are higher than the national average, in all three states. There is prevalence of concentration of population in metro cities in all three states. The three large mega cities of India, Mumbai, Kolkata, and Chennai are in these states i.e. Maharashtra, West Bengal and Tamil Nadu, respectively.
- In Maharashtra, there are ten metro cities (population more than 10 lakh), and about 70 percent and 75 percent of class I towns' urban and population respectively, lives in these metro cities. This shows the concentration of population in metro cities in the state. The similar trend of urban population in metro is prevalent in West Bengal and Tamil Nadu as well. But numbers of metro cities are less than that of Maharashtra in West Bengal and Tamil Nadu. In all the three states urban population is growing at much faster rate than their rural counter parts. Slum population growth is higher than that of urban population in these centers. A slum is characterized by lack of durable housing, insufficient living area, lack of access to clean water, inadequate sanitation and insecure tenure indicates that as the urban population grows without the proper growth of infrastructure. There is interdependent relationship between basic amenities and slum population. So it is being tried to correlate the Amenities and assets availing the household of the urban area with the proportion of slum population.
- For the analysis, with the help of selected basic facilities provided to the households, Amenity Index is calculated, to know the level of availability of amenities in class I towns. The result shows that in Maharashtra and West Bengal, most of the cities/metros or urban agglomerations have inverse relationship between Amenity Index and proportion of slum population. While in Tamil Nadu,

a clear cut relationship between Amenity index and proportion of slum population could not be established. It might be possible because amenities available to the households of Tamil Nadu is more evenly distributed among the class I towns(Amenity Index is around 1), wide variation is not seen as compared to other two states (Maharashtra and West Bengal).

- The concentration of Amenity as well as proportion of slum is not seen in Tamil Nadu in some towns as in other two states but it is increasing, concentration of slum population is growing in Chennai which was 19 percent in 2001 and increased to 28 percent in 2011. This would lead to the similar condition as the other two states in coming decades. A large proportion of slum population of Maharashtra, West Bengal and Tamil Nadu lives in Greater Mumbai (49%), Kolkata (29%) and Chennai (41%), respectively. It comes in light that there is tendency of people to live in large cities as there is general perception that big cities provide better infrastructure. But data shows that amenities in Greater Mumbai are lesser than other towns of the state. While in other two states (West Bengal and Tamil Nadu), Kolkata and Chennai have highest value of Amenity Index along with the highest share of slum population. While the relationship with the assets tells the same story that there is negative/ inverse relationship between Asset Index and proportion of slum living in class I towns of the state either in Maharashtra, West Bengal or Tamil Nadu.
- It can be said that by the increment of assets reduces proportion of slum population in these states. This relation is more evident with computers and cars (selected for the analysis), these are goods which are owned by the higher income groups and are evident that slums are the shelter of poor community.
- This relation between amenities, assets and slum population has policy implications as to reduce the slum population, provide basic amenities and assets to the households which will improve their standard of living and ultimately lead to reduction in growth of slum and check the future slum formation. As people move up on the ladder of the economic development and condition of slum would improve. The slum is all about the conditions where the people live and if conditions improves slum will automatically decrease.

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Appendix

Appendix 1 Percentage share of Population across various classes of Towns in India

Census Year	Percentage share of Population across various classes of Towns					
	I	II	III	IV	V	VI
1901	21.68	11.47	16.92	22.76	20.75	6.42
1911	23.38	9.63	18.92	20.97	20.21	6.88
1921	24.17	11.34	18.26	19.40	19.42	7.41
1931	24.12	12.54	19.83	19.75	18.12	5.65
1941	31.64	12.97	18.41	17.54	15.99	3.45
1951	37.88	12.18	17.93	15.05	13.65	3.30
1961	44.34	12.16	20.08	14.35	8.05	1.05
1971	48.78	13.59	18.35	12.87	5.62	0.79
1981	52.57	14.09	17.08	11.24	4.34	0.68
1991	56.68	13.33	16.35	9.77	3.43	0.45
2001	62.29	12.04	14.72	7.90	2.76	0.29
2011	60.79	10.15	14.12	10.47	3.97	0.50

Source: Census of India

Appendix 2 Growth rate of Urban and Slum population in Maharashtra

Sr. No.	Name of the towns	Exponential growth rate (%)		Decadal growth rate (%)	
		U_P	S_P	U_P	S_P
1	Achalpur	4.15	4.72	51.49	60.32
2	Ahmadnagar	22.43	26.45	841.73	1307.72
3	Akola	9.55	10.89	159.93	197.10
4	Ambarnath	4.68	11.08	59.67	202.77
5	Amravati	9.97	8.55	170.87	135.12
6	Aurangabad	16.71	17.77	431.72	490.97
7	Badlapur	28.31	26.36	1596.62	1295.87
8	Barshi	9.53	10.43	159.46	183.65
9	BhiwandiNizampur	7.20	16.41	105.47	416.17
10	Bhusawal	23.82	21.48	982.23	757.15
11	Bid	4.17	4.96	51.75	64.19
12	Chandrapur	13.77	17.26	296.21	461.95
13	Dhule	14.30	12.98	317.83	266.34
14	Gondiya	11.56	11.33	217.81	210.40
15	Greater Mumbai	8.71	6.15	138.98	84.98
16	Hinganghat	13.86	12.96	299.80	265.41
17	Ichalkaranji	29.04	26.55	1725.04	1321.77
18	Jalgaon	27.92	17.63	1530.63	482.72
19	Jalna	9.99	14.22	171.61	314.66
20	Kalyan-Dombivli	25.42	35.33	1170.75	3323.73
21	Kolhapur	20.94	20.76	711.93	697.10
22	Latur	14.92	14.41	344.56	322.31
23	Malegaon	12.80	6.76	259.60	96.64
24	Mira-Bhayandar	25.76	26.44	1214.07	1307.48
25	Nagpur	10.29	10.24	179.90	178.35
26	NandedWaghala	14.72	15.86	335.73	388.19
27	Nandurbar	17.11	16.94	453.22	444.13
28	Nashik	20.58	20.49	683.28	676.12
29	Navi Mumbai	16.86	16.22	439.65	406.44
30	Osmanabad	11.30	17.78	209.50	491.74
31	Panvel	29.90	26.23	1888.29	1278.07
32	Parbhani	14.03	12.02	306.61	232.73
33	PimpriChinchwad	25.94	21.00	1238.27	716.79
34	Pune	15.10	16.41	352.46	415.76
35	SangliMirajKupwad	29.21	27.82	1756.08	1515.79
36	Satara	32.70	29.19	2530.09	1751.41
37	Solapur	16.91	15.74	442.48	382.35
38	Thane	17.29	12.80	463.49	259.63
39	Udgir	15.89	19.21	389.81	582.50
40	Ulhasnagar	17.88	18.20	497.63	517.09
41	Vasai-Virar City	35.34	18.67	3324.93	546.66
42	Wardha	13.61	12.41	289.80	246.02
43	Yavatmal	8.44	10.26	132.54	179.10

Source: Census of India, 2001 and 2011

*Note: U_G= Urban population growth (2001-2011), S_P = slum population growth (2001-2011).

Appendix 3 Growth rate of Urban and Slum population in West Bengal

Sr. No.	Area Name	Exponential growth rate (%)		Decadal growth rate (%)	
		U_P	S_P	U_P	S_P
1	Asansol	1.71	2.24	18.61	25.13
2	AshoknagarKalyangarh	0.86	9.30	8.95	153.40
3	Baharampur	1.98	2.74	21.91	31.52
4	Baidyabati	1.12	N/A	11.90	N/A
5	Bally	1.17	-4.73	12.44	-37.67
6	Balurghat	1.22	4.81	12.92	61.79
7	Bankura	0.65	N/A	6.68	N/A
8	Bansberia	-0.05	7.45	-0.47	110.58
9	Baranagar	-0.22	-0.27	-2.22	-2.62
10	Barasat	1.85	7.10	20.26	103.40
11	Bardhaman	0.96	0.89	10.04	9.31
12	Barrackpur	0.57	13.71	5.81	293.83
13	Bhadreswar	-0.44	0.83	-4.33	8.69
14	Bhatpara	-1.36	N/A	-12.74	N/A
15	Bidhan Nagar	2.72	4.78	31.23	61.20
16	Bongaon	0.64	10.01	6.56	172.14
17	Chanddani	0.75	1.52	7.75	16.38
18	Chandannagar	0.28	-1.49	2.89	-13.80
19	Darjiling	1.03	0.57	10.83	201.30
20	Dum Dum	1.25	N/A	13.32	N/A
21	Durgapur	1.38	-12.17	14.82	-70.39
22	English Bazar	2.41	0.49	27.29	5.06
23	Habra	1.43	8.38	15.38	131.08
24	Haldia	1.63	6.01	17.67	82.43
25	Halisahar	0.03	15.12	0.34	353.72
26	Haora	0.67	-3.48	6.90	-29.40
27	Hugli-Chinsurah	0.41	3.24	4.14	38.19
28	Jalpaiguri	0.67	15.76	6.97	383.46
29	Jamura	1.42	-1.39	15.24	-13.01
30	Kalyani	2.03	3.24	22.45	38.23
31	Kamarhati	0.49	34.76	4.99	3133.38
32	Kanchrapara	0.27	8.63	2.68	137.06
33	Kharagpur	0.95	3.77	9.98	45.82
34	Khardaha	-0.71	4.51	-6.85	56.99
35	Kolkata	-0.17	-0.52	-1.67	-5.09
36	Krishnanagar	0.96	8.49	10.03	133.78
37	Kulti	0.79	14.69	8.25	334.56
38	Maheshtala	1.52	N/A	16.37	N/A
39	Medinipur	1.22	3.04	13.02	35.54
40	Nabadwip	0.88	-1.04	9.15	-9.86
41	Naihati	0.12	N/A	1.21	N/A
42	North Barrackpur	0.71	-6.47	7.39	-47.63
43	North Dum Dum	1.24	32.82	13.22	2561.89
44	Panihati	0.80	-0.69	8.30	-6.71
45	Puruliya	0.62	N/A	6.38	N/A
46	Raiganj	1.06	0.76	11.14	7.93
47	RajarhatGopalpur	3.93	11.69	48.21	221.77
48	RajpurSonarpur	1.97	N/A	21.79	N/A
49	Raniganj	1.53	5.68	16.49	76.52
50	Rishra	0.95	4.91	9.95	63.33
51	Santipur	0.94	6.64	9.80	94.29
52	Serampore	-0.84	-0.98	-8.09	-9.32
53	Siliguri	0.83	26.92	8.66	-29.74
54	South Dum Dum	0.27	0.66	2.77	6.83
55	Titagarh	-0.64	0.95	-6.18	9.94
56	Uluberia	1.52	1.38	16.43	14.76
57	UttarparaKotrung	0.57	N/A	5.84	N/A

Source: Census of India, 2001 and 2011

*Note: U_G= Urban population growth (2001-

2011), S_P = slum population growth (2001-2011), N/A = data not available (data on slum of these towns is not available)

Appendix 4 Growth rate of Urban and Slum population in Tamil Nadu

Sr. No.	Area Name	Exponential growth rate (%)		Decadal growth rate (%)	
		U_P	S_P	U_P	S_P
1	Alandur	1.17	19.01	12.40	569.30
2	Ambattur	4.05	-0.77	49.92	-7.45
3	Ambur	1.40	1.12	15.04	11.90
4	Avadi	4.11	6.28	50.82	87.43
5	Chennai	0.68	4.93	6.98	63.72
6	Coimbatore	1.21	7.94	12.87	121.18
7	Cuddalore	0.90	2.13	9.46	23.76
8	Dindigul	0.51	-2.32	5.27	-20.70
9	Erode	0.43	2.21	4.36	24.68
10	Kancheepuram	0.71	4.64	7.34	59.06
11	Karaikkudi	2.09	2.27	23.23	25.46
12	Kumbakonam	0.01	3.60	0.14	43.36
13	Kurichi	2.50	2.89	28.37	33.51
14	Madavaram	3.43	0.09	40.94	0.95
15	Madurai	0.92	2.29	9.58	25.67
16	Nagapattinam	1.00	-1.34	10.47	-12.54
17	Nagercoil	0.77	2.25	8.01	25.20
18	Pallavaram	4.81	1.32	61.79	14.15
19	Pudukkottai	0.74	-3.32	7.70	-28.26
20	Rajapalayam	0.64	5.44	6.65	72.26
21	Salem	1.74	1.77	19.02	19.37
22	Tambaram	2.37	2.55	26.72	29.01
23	Thanjavur	0.35	0.95	3.54	9.98
24	Thoothukkudi	0.96	4.53	10.08	57.22
25	Tiruchirappalli	1.19	2.48	12.67	28.09
26	Tirunelveli	1.40	1.31	15.01	13.96
27	Tiruppur	2.54	20.57	28.97	682.49
28	Tiruvannamalai	1.07	1.96	11.27	21.64
29	Tiruvottiyur	1.61	-1.27	17.51	-11.90
30	Vellore	0.47	3.04	4.84	35.54

Source: Census of India, 2001 and 2011

*Note: U_G= Urban population growth (2001-2011), S_P = slum population growth (2001-2011).

Appendix 5 Percentage of households having basic Amenities in Class I towns of Maharashtra

Name of the town	P_G	P_T.W	P_E	P_L.f	P_B.f	P_C.d	P_B	P_S
Achalpur	53.48	48.63	88.1	75.96	69.86	8.81	46.72	66.01
Ahmadnagar	77.68	84.83	97.82	86.41	91.29	69.44	75.34	10.62
Akola	65.2	53.73	93.87	74.19	78.66	9.65	57.82	38.47
Ambarnath	80.54	81.31	97.77	65.2	90.68	58.27	77.53	62.63
Amravati	71.9	61.95	95.19	83.22	82.77	10.46	59.75	36.92
Aurangabad	77.08	76.65	97.93	93.39	93.27	84.68	67.47	18.81
Badlapur	85.75	89.87	98.19	84.66	94.52	79.11	86.8	5.89
Barshi	66.7	65.73	92.77	57.36	68.2	23.07	64.31	38.54
BhiwandiNizampur	56.36	55.22	96.39	37.15	63.97	75.38	42.62	48.67
Bhusawal	75.68	76.79	97.02	75.79	85.47	6.88	68.06	9.24
Bid	70.98	70.41	95.78	84.67	82.73	17.47	62.07	65.9
Chandrapur	71.31	45.25	94.49	76.81	79.84	32.65	69.94	25.24
Dhule	74.48	77.73	95.33	66.9	87.36	13.8	55.51	23.93
Gondiya	71.13	34.31	93.34	86.11	84.3	24.38	70.41	31.47
Greater Mumbai	71.7	77.7	97.19	57.62	87.87	81.7	86.48	41.85
Hinganghat	67.78	54.46	94.29	78.08	78.27	11.24	69.04	25.01
Ichalkaranji	73.72	82.48	96.35	63.66	86.29	12.39	54.58	5.48
Jalgaon	72.07	80.19	96.78	73.9	82.31	21.11	63.55	6.13
Jalna	60.23	31.32	94.5	72.73	73.8	23.16	57.8	36.82
Kalyan-Dombivli	81.4	87.33	98.76	85.85	93.85	73.2	88.82	7.87
Kolhapur	78.22	87.7	97.99	79.27	91.57	34.87	80.08	12.32
Latur	70.55	78.51	96.74	86.65	84.26	15.07	67.66	22.49
Malegaon	49.56	59	93.32	39.32	83.3	5.47	24.87	27.81
Mira-Bhayandar	84.53	89.22	98.66	87.09	95.62	84.85	90.73	7.61
Nagpur	75.07	76.88	97.9	94.57	93.92	90.44	74.28	35.73
NandedWaghala	65.32	53.85	95.46	85.6	82.99	47.47	58.47	22.95
Nandurbar	74.76	73.55	93.58	71.35	85.24	48.58	65.19	18.08
Nashik	79.57	84.8	96.8	79.68	90.45	90.28	77.72	12.77
Navi Mumbai	81.04	83.96	98.33	77.77	94.15	87.44	84.56	18.53
Osmanabad	74.88	51.25	92.62	69.17	74.83	14.49	73.15	32.31
Panvel	85.32	89.42	98.04	88.67	94.76	85.37	91.12	5.03
Parbhani	61.41	39.12	93.4	74.86	72.01	18.88	55.17	24.59
PimpriChinchwad	81.32	85.93	98	84.49	85.19	79.09	81.51	7.47
Pune	75.95	90.37	98.31	79.18	91.6	96.12	86.36	22.1
SangliMirajKupwad	72.77	75.47	96.18	81.39	85.6	37.97	69.29	5.39
Satara	76.21	85.08	97.19	77.69	91.74	72.69	82.83	3.8
Solapur	66.86	64	93.64	64.57	79.12	57.23	63.11	18.43
Thane	77.47	85.89	98.12	71.38	94.74	87.53	82.6	17.75
Udgir	58.95	56.49	90.98	73.75	71.23	7.44	55.97	20.42
Ulhasnagar	69.36	85.9	98.42	70.76	90.79	66.5	71.29	16.73
Vasai-Virar City	78.48	56.63	97.34	80.09	91.31	74.15	79.03	2.92
Wardha	80.87	77.45	97.34	86.68	90.32	14.77	78.15	25.65
Yavatmal	65.99	56.29	93.58	70.01	75.93	18.73	61.11	43

Source; Census of India, 2011

Note; P_G =Houses in good condition, P_T.W=Households using Tap water from treated source, P_E=Households having Electricity, P_L.f=Households having latrine facility within the premises, P_B.f=Households having bathing facility within the premises, P_C.d=Households having Closed drainage, P_B=Households availing banking services, P_S=Percentage of slum population

Appendix 6 Percentage of households having basic Amenities in Class I towns of West Bengal.

Name of the town	P_G	P_T.W	P_E	P_L.f	P_B.f	P_C.d	P_B	P_S
Asansol	61.85	84.4	87.97	79.26	64.96	15.81	67.47	35.13
AshokenagarKalyangarh	49.87	37.98	84.5	96.21	54.16	5.34	61.9	54.69
Baidyabati	64.03	68.5	90.99	96.51	79.74	15.2	74.92	22
Bally	66.52	90.81	93.35	95.59	73.98	28.6	79.86	14.91
Balurghat	63.51	8.24	86.36	95.25	70.79	15.87	74.31	42.77
Bankura	54.8	49.33	81.4	64.64	58.14	11.71	72.75	33.73
Bansberia	58.58	91.22	89.95	80.64	62.36	13.57	63.07	37.15
Baranagar	67.21	91.44	96.34	95.26	82.93	27.9	85.65	22.25
Barasat	59.61	17.48	88.21	96.77	69.14	10.14	72.05	26.7
Barddhaman	63.38	54.87	90.22	84.51	71.05	15.89	77.97	21.71
Barrackpore	71.57	89.55	95.82	94.33	77.97	22.7	79.03	14.03
Berhampore	62.3	9.27	87.02	90.89	73.06	14.65	74.65	21.16
Bhadreswar	57.69	84.93	92.03	80.87	57.09	8.69	74.71	60.63
Bhatpara	55.51	84.47	94.13	87.02	53.85	13.17	66.23	19.42
Bidhannagar	67.26	89.71	93.31	84.26	73.47	62.44	86.87	35.43
Bongaon	50.6	10.02	86.8	94.21	46.17	16.24	62.52	37.04
Chamdani	54.3	35.64	93.37	75.77	47.31	7.66	72.78	79.08
Chandannagar	62.36	73.36	93.26	92.71	78.91	15.47	81.51	22.16
Darjiling	73.96	40.45	97.42	78.65	71.14	26.54	80.44	21.12
Dum Dum	78.49	45.81	97.41	97	87.45	27.43	88.01	24.76
Durgapur	57.89	79.31	82.97	78.66	70.23	32.11	75.86	7.68
English Bazar	56.84	70.68	89.19	91.59	75.34	32.64	74.91	29.71
Habra	51.95	19.92	82.04	95.72	50.69	13.09	63.42	31.27
Haldia	58.34	16.14	77.19	84.24	39.16	12.56	71.16	22.34
Halisahar	44.17	95.07	90.23	88.8	59.68	7.77	70.37	68.04
Haora	63.34	69.87	94.17	93.99	75.66	29.81	78.68	7.75
Hugli-Chinsurah	62.2	93.36	95.04	95.7	82.43	20.07	79.78	13.92
Jalpaiguri	63.53	88.02	88.31	94.15	76.83	9.06	80.38	21.52
Jamuraia	39.19	63.51	80	44.46	35.82	8.03	57.62	32.97
Kalyani	64.73	88	87.58	97.68	65.28	47.82	75.15	54.24
Kamarhati	59.39	93.7	96.37	93.77	73.42	21.5	75.43	35.32
Kanchrapara	56.08	42.64	91.8	92.93	70.11	10.63	70.53	26.03
Kharagpur	68.65	58.48	83.75	84.64	71.34	9.96	74.27	25.34
Khardah	73.41	91.82	95.71	97.46	84.26	22.4	80.85	36.72
Kolkata	66.42	84.9	96.21	94.93	81.78	81.31	83.76	31.35
Krishnanagar	56.57	26.73	89.18	96.65	70.9	17.1	78.19	32.33
Kulti	52.57	83.05	78.75	56.13	46.4	9.16	60.11	56.37
Maheshtala	56.45	76.48	95.24	92.7	55.74	12.71	65.51	47.05
Medinipur	59.14	87.14	85.2	85.24	69.4	9.84	71.19	33.14
Nabadwip	41.52	21.85	76.9	94.53	45.36	6.72	51.12	35.42
Naihati	61.44	92.01	94.03	91.38	68.39	18.94	72.72	8.49
North Barrackpore	74.69	86.4	95.68	96.79	86.16	15.36	85.95	5.43
North DumDum	66.27	72.5	96.06	97.4	76.81	14	79.49	28.45
Panihati	64	11.71	96.42	97.85	78.14	10.12	79.46	24.16
Puruliya	57.03	67.21	75.8	64.85	57.88	10.45	62.44	41.36
Raiganj	44.9	8.18	73.62	83.68	58.6	9.29	60.29	39.49
RajarhatGopalpur	67.28	34.79	94.64	98.66	76.32	24.3	77.3	20.61
RajpurSonarpur	67.57	19.12	93.01	98.61	72.92	16.77	79.66	6.97
Raniganj	54.39	84.41	79.13	61.64	49.63	13.32	62.95	30.15
Rishra	65.32	90.13	95.14	91.71	69.52	17.83	84.31	70.52

Santipur	39.44	7.65	77.01	93.17	39.63	6.75	46.56	39.75
Serampore	65.97	92.54	92.96	93.67	80.21	41.9	84.22	30.49
Siliguri	64.62	47.97	91.76	93.98	74.06	10.96	68.37	23.96
South DumDum	75.72	53.35	96.53	97.11	84.9	43.94	86.85	27.69
Titagarh	50.63	7.58	93.66	67.31	34.9	44.58	70.2	96.57
Uluberia	50.55	3.3	82.06	67.2	23.54	7.78	49.23	58.27
UttarparaKotrung	76.03	81.81	95.29	95.44	83.25	17.56	85.03	16.39

Source; Census of India, 2011

Note; P_G =Houses in good condition, P_T.W=Households using Tap water from treated source, P_E=Households having Electricity, P_L.f=Households having latrine facility within the premises, P_B.f=Households having bathing facility within the premises, P_C.d=Households having Closed drainage, P_B=Households availing banking services, P_S=Percentage of slum population

Appendix 7 Percentage of households having basic Amenities in Class I towns of Tamil Nadu

Name of the town	P_G	P_T.W	P_E	P_L.f	P_B.f	P_C.d	P_B	P_S
Alandur	87.53	84.31	99.29	97.96	97.24	95.34	83.22	18.3
Ambattur	83.94	34.75	98.54	96.13	95.09	60.46	76.17	11.8
Ambur	76.56	52.53	96.49	81.53	81.92	46.55	48.16	28.9
Avadi	84.42	14.57	98.92	91.3	90.93	31.55	72.67	33.4
Chennai	81.71	79.04	99.08	95.59	95.56	95.99	71.12	28.9
Coimbatore	75.49	95.79	98.32	87.81	91.74	59.68	69.53	12.3
Cuddalore	72.12	62.5	95.93	74.6	71.92	39.12	63.78	17.7
Dindigul	76.34	82.97	96.96	74.87	86.21	38.2	53.59	46.6
Erode	79.56	84.74	97.99	87.5	89.62	70.43	63.84	17.6
Kancheepuram	84.19	79.74	98.79	88.57	90.78	85.58	57.24	21.8
Karaikkudi	77.81	67.38	96.72	86.28	80.46	29.36	64.6	41.3
Kumbakonam	68.49	6.25	97.21	81.44	71.13	50.61	69.42	26.9
Kurichi	79.7	92.82	96.12	83.8	86.51	44.42	63.67	6.9
Madavaram	81.52	36.33	98.99	94.81	94.12	31.02	66.91	9.2
Madurai	83.97	86.74	98.83	91.91	90.5	88.5	60.74	27.3
Nagapattinam	65.78	60.28	96.4	74.48	69.76	32.32	68.42	34.8
Nagercoil	73.62	78.18	98.71	93.71	81.28	43.88	68.99	4.8
Pallavaram	85.37	50.4	99.22	93.96	93.89	33.92	76.1	24.6
Pudukkottai	76.19	79.48	96.75	81.23	74.8	36.03	64.15	31.3
Rajapalayam	79.64	79.62	95.96	61.93	75.25	26.4	45.8	19.9
Salem	78.54	83.49	96.69	75.13	80.94	38.35	52.08	21.8
Tambaram	82.56	53.65	98.9	91.36	92.1	52	75.21	42.2
Thanjavur	74.64	23.85	97.14	84.11	76.66	46.88	69.94	19.5
Thoothukkudi	76.54	88.13	98.58	92.46	86	50.95	61.91	16.4
Tiruchirappalli	79.23	82.58	97.41	81.27	81.69	55.11	68.75	27
Tirunelveli	79.83	84.3	97.81	83.11	68.79	38.35	70.17	14.4
Tiruppur	75.58	94.65	98.37	88.07	88.72	49.73	42.69	16.2
Tiruvannamalai	82.95	80.03	96.39	82.67	83.62	45.3	57.96	23.6
Tiruvottiyur	80.1	30.84	98.51	93.52	94.12	70.82	56.29	33.6
Vellore	81.62	82.65	97.8	83.77	86.56	37.35	50.24	23.1

Source; Census of India, 2011

Note; P_G =Houses in good condition, P_T.W=Households using Tap water from treated source, P_E=Households having Electricity, P_L.f=Households having latrine facility within the premises, P_B.f=Households having bathing facility within the premises, P_C.d=Households having Closed drainage, P_B=Households availing banking services, P_S=Percentage of slum population

Appendix 8 Amenity index and proportion slum population in reclassified towns of Maharashtra

Name of the town	Reclassification	Amenity Index	proportion of slum population
Greater Mumbai		0.992	0.41
Pune		1.104	0.22
Nagpur		1.069	0.35
Thane		1.06	0.17
Pimpri Chinchwad	Metro cities (above 10 lakhs)	1.049	0.07
Nashik		1.066	0.12
Kalyan-Dombivli		1.065	0.07
Vasai-Virar City		0.975	0.02
Aurangabad		1.041	0.18
Navi Mumbai		1.076	0.18
Malegaon	Transitional metros (8-10 lakhs)	0.56	0.27
Solapur		0.845	0.18
Mira-Bhayandar		1.113	0.07
Bhiwandi Nizampur		0.759	0.48
Amravati		0.754	0.36
Nanded Waghala	Regional metros (5-8 lakhs)	0.832	0.23
Kolhapur		0.924	0.12
Ulhasnagar		0.962	0.16
Sangli Miraj Kupwad		0.874	0.05
Jalgaon		0.809	0.06
Akola		0.7	0.38
Latur	juvenile cities (3-5 lakhs)	0.818	0.22
Dhule		0.768	0.23
Ahmadnagar		1.015	0.10
Chandrapur		0.787	0.25
Parbhani		0.678	0.24
Ichalkaranji		0.764	0.05
Jalna		0.679	0.36
Ambarnath		0.951	0.62
Bhusawal		0.787	0.09
Panvel		1.118	0.05
Badlapur		1.087	0.05
Bid		0.794	0.65
Gondiya	incipient cities (1-3 lakhs)	0.766	0.31
Satara		1.021	0.03
Barshi		0.727	0.38
Yavatmal		0.725	0.43
Achalpur		0.631	0.66
Osmanabad		0.737	0.32
Nandurbar		0.876	0.18
Wardha		0.862	0.25
Udgir		0.669	0.20
Hinganghat		0.736	0.25

Source: Census of India, 2011

Appendix 9 Amenity index and proportion slum population in reclassified towns of West Bengal

Area Name	Reclassification	Amenity Index	proportion of slum population
Kolkata	Metro cities	1.565	0.31
Haora		1.15	0.07
Durgapur	Regional metros	1.156	0.07
Asansol		1.0179	0.35
Siliguri		0.977	0.24
Maheshtala	Juvenile cities	0.956	0.47
Rajpur Sonarpur		0.965	0.07
South DumDum		1.290	0.27
Rajarhat Gopalpur		1.059	0.20
Bhatpara		0.951	0.19
Panihati		0.915	0.24
Kamarhati		1.116	0.35
Barddhaman		1.002	0.21
Kulti		0.833	0.56
Bally		Incipient cities	1.200
Barasat	0.868		0.26
North DumDum	1.060		0.28
Baranagar	1.220		0.22
Uluberia	0.591		0.58
Naihati	1.065		0.08
Bidhannagar	1.638		0.35
Kharagpur	0.975		0.25
English Bazar	1.127		0.29
Haldia	0.786		0.22
Berhampore	0.886		0.21
Raiganj	0.698		0.39
Serampore	1.290		0.30
Hugli-Chinsurah	1.301		0.13
Medinipur	1.005		0.33
Chandannagar	1.079		0.22
Uttarpara Kotrung	1.153		0.16
Balurghat	0.883		0.42
Krishnanagar	0.92		0.32
Barrackpore	1.171		0.14
Santipur	0.62		0.39
Jamura	0.710		0.33
Habra	0.787		0.31
Bankura	0.856		0.33
North Barrackpore	1.158		0.05
Kanchrapara	0.919		0.26
Raniganj	0.878		0.30
Nabadwip	0.665		0.35
Halisahar	0.93		0.68
Rishra	1.097		0.70
Ashokenagar Kalyangarh	0.778		0.54
Baidyabati	1.050		0.22
Puruliya	0.865		0.41
Darjiling	1.032		0.21
Titagarh	0.891		0.96
Dum Dum	1.167		0.24
Champdani	0.773	0.79	
Bongaon	0.782	0.37	
Khardah	1.205	0.36	
Jalpaiguri	1.052	0.21	
Bansberia	0.974	0.37	
Bhadreswar	0.940	0.60	
Kalyani	1.302	0.54	

Source: Census of India, 2011

Appendix 10 Amenity index and proportion slum population in reclassified towns of Tamil Nadu

Name of the town	Reclassification	Amenity Index	proportion of slum population
Chennai	Metro cities	1.21	0.28
Coimbatore		1.108	0.12
Madurai		1.171	0.27
Tiruchirappalli	Transitional metros	1.045	0.27
Salem		0.944	0.21
Tirunelveli	juvenile cities	0.988	0.14
Ambattur		1.059	0.11
Tiruppur		0.995	0.16
Avadi		0.909	0.33
Tiruvottiyur	incipient cities	0.967	0.33
Thoothukkudi		1.04	0.16
Pallavaram		1.016	0.24
Nagercoil		1.003	0.04
Thanjavur		0.903	0.19
Dindigul		0.944	0.46
Vellore		0.942	0.23
Tambaram		1.051	0.42
Cuddalore		0.903	0.17
Alandur		1.271	0.18
Kancheepuram		1.108	0.21
Erode		1.094	0.17
Tiruvannamalai		0.973	0.23
Kumbakonam		0.841	0.26
Rajapalayam		0.845	0.19
Kurichi		1.028	0.06
Madavaram		0.953	0.09
Pudukkottai		0.959	0.31
Ambur		0.879	0.28
Karaikkudi		0.941	0.41
Nagapattinam	0.862	0.34	

Source: Census of India, 2011

Appendix 11 Regression coefficients of Maharashtra

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	182.9518	1.1200	0.2704	-148.6760	514.5797
P_G	-0.4585	-0.5951	0.5556	-2.0229	1.1059
P_T.W	-0.1207	-0.4800	0.6342	-0.6313	0.3899
P_E	-0.9133	-0.4592	0.6489	-4.9505	3.1239
P_L.f	-0.0948	-0.3499	0.7285	-0.6450	0.4554
P_B.f	-0.3586	-0.5865	0.5613	-1.5997	0.8826
P_C.d	0.0176	0.1488	0.8826	-0.2231	0.2584
P_B	0.1009	0.2471	0.8062	-0.7278	0.9296
R Square	0.3018				
Adjusted R Square	0.1622				

Source; Census of India, 2011 Note; P_G =Houses in good condition, P_T.W=Households using Tap water from treated source, P_E=Households having Electricity, P_L.f=Households having latrine facility within the premises, P_B.f=Households having bathing facility within the premises, P_C.d=Households having Closed drainage, P_B=Households availing banking services, P_S=Percentage of slum population

Appendix 12 Regression coefficients of West Bengal

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	17.0982	0.5514	0.5839	-45.2212	79.4175
P_G	-0.6723	-1.5183	0.1354	-1.5622	0.2176
P_T.W	0.0204	0.2602	0.7958	-0.1373	0.1782
P_E	0.8019	1.6220	0.1112	-0.1916	1.7953
P_L.f	-0.0378	-0.1522	0.8796	-0.5365	0.4610
P_B.f	-1.0146	-3.0468	0.0037	-1.6838	-0.3454
P_C.d	0.0964	0.5960	0.5539	-0.2287	0.4216
P_B	0.7075	1.3715	0.1765	-0.3292	1.7442
R Square	0.4431				
Adjusted R Square	0.3636				

Source; Census of India, 2011 Note; P_G =Houses in good condition, P_T.W=Households using Tap water from treated source, P_E=Households having Electricity, P_L.f=Households having latrine facility within the premises, P_B.f=Households having bathing facility within the premises, P_C.d=Households having Closed drainage, P_B=Households availing banking services, P_S=Percentage of slum population

Appendix 13 Regression coefficients of Tamil Nadu

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-2.7544	-0.0081	0.9936	-709.0134	703.5047
P_G	-0.0084	-0.0137	0.9892	-1.2740	1.2572
P_T.W	-0.1316	-1.4386	0.1643	-0.3214	0.0581
P_E	0.6636	0.1702	0.8664	-7.4217	8.7489
P_L.f	-0.7263	-1.2341	0.2302	-1.9468	0.4942
P_B.f	0.3357	0.6637	0.5138	-0.7132	1.3845
P_C.d	0.0593	0.4447	0.6609	-0.2174	0.3361
P_B	0.0249	0.0906	0.9287	-0.5455	0.5953
R Square	0.1462				
Adjusted R Square	-0.1255				

Source; Census of India, 2011 Note; P_G =Houses in good condition, P_T.W=Households using Tap water from treated source, P_E=Households having Electricity, P_L.f=Households having latrine facility within the premises, P_B.f=Households having bathing facility within the premises, P_C.d=Households having Closed drainage, P_B=Households availing banking services, P_S=Percentage of slum population

Appendix 14 Assets in the class I towns of the state of Maharashtra

Name of the towns	Radio	Television	Computer	Telephone	Bicycle	Motorcycle	Car
Achalpur	7.74	60.45	6.72	52.07	52.23	23.79	3.23
Ahmadnagar	37.55	85.55	21.92	71.74	56.63	54.84	11.17
Akola	22.14	74.1	13.63	62.16	52.58	38.38	5.97
Ambarnath	25.01	82.87	22.36	73.32	19.96	22.57	5.36
Amravati	8.43	77.99	13.91	62.73	52.69	43.73	6.37
Aurangabad	19.51	78.22	20.17	75.62	29.78	47.57	9.6
Badlapur	26.99	85.37	31.62	79.41	20.71	24.26	6.17
Barshi	17.9	73.18	11.61	66.43	52.27	29.42	4.98
Bhiwandi Nizampur	18.63	50.6	9.79	71.14	15.11	16.89	2.89
Bhusawal	18.71	82.06	13.48	66.17	59.46	42.01	4.16
Bid	20.31	71.72	12.89	69.99	36	37.05	5.88
Chandrapur	11.53	78.6	13.39	68.79	55.51	43.18	6.58
Dhule	24.96	74.67	14.11	70.05	61.25	38.31	6.35
Gondiya	11.47	79.16	13.17	63.63	62.19	44.43	6.37
Greater Mumbai	36.07	85.12	32.16	72.04	10.87	15.64	12.75
Hinganghat	8.78	77.06	6.56	65.02	61.21	32.97	3.27
Ichalkaranji	34.31	75.35	9.83	66.43	58.4	38.03	6.97
Jalgaon	20.07	78.86	15.09	64.4	46.01	41.16	5.6
Jalna	9.46	75.33	11.79	69.85	44.27	36.65	5.01
Kalyan-Dombivli	38.95	88.9	32.32	75.45	16.21	20.6	6.13
Kolhapur	51.25	85.36	22.31	70.4	44.13	54.95	14.02
Latur	7.94	72.2	13.49	73.32	34.26	38.19	6.7
Malegaon	5.96	37.87	10.01	56.17	54.94	18.87	2.16
Mira-Bhayandar	30.49	88.82	32.89	78.16	15.31	21.32	8.08
Nagpur	36.83	86.99	20.66	72.71	64.46	57.48	11.71
Nanded Waghala	20.31	68.07	15.05	72.28	34.14	31.73	5.36
Nandurbar	6.79	77.06	11.97	70.87	30.25	42.34	5.89
Nashik	31.14	83.18	25.92	74.95	42.6	50.61	13.62
Navi Mumbai	23.87	83.99	37.24	78.19	18.39	25.94	15.95
Osmanabad	20.53	71.61	13.32	70.31	40.9	38.13	5.53
Panvel	30.35	90.15	48.32	75.27	34.01	47.33	19.41
Parbhani	15.42	68.01	11.7	67.11	53.08	31.92	4.08
Pimpri Chinchwad	30.66	79.89	27.5	83.1	33.49	50.76	12.9
Pune	50.38	87.97	38.62	74.03	32.81	58.98	21.47
Sangli Miraj Kupwad	40.26	75.63	16.54	67.07	63.28	42.76	9.12
Satara	39.25	86.02	24.14	70.99	34.55	50.28	13.24
Solapur	24.61	71.51	13.71	67.13	56.31	33.84	4.62
Thane	21.35	84.47	29.62	75.61	13.09	21.63	10.95
Udgir	8.03	56.65	8.74	69.06	22.79	23.06	3.68
Ulhasnagar	20.27	81.81	19.03	73.92	12.46	27.06	5.56
Vasai-Virar City	33.8	79.49	22.19	77.23	18.52	19.17	4.95
Wardha	15.56	84.65	14.66	64.05	51.54	53.7	7.83
Yavatmal	16.71	75.04	12.97	58.92	51.33	41.51	7.05

Source: Census of India, 2011

Appendix 15 Assets in the class I towns of the state of West Bengal

Name of the towns	Radio	Television	Computer	Telephone	Bicycle	Motorcycle	Car
Asansol	13.48	76.29	15.2	70.66	60.7	30.2	4.99
Ashokenagar Kalyangar	22.13	59.6	8.57	68.46	71.77	8.48	2.24
Baidyabati	42.37	78.27	16.54	68.57	71.69	12.93	2.74
Bally	40.8	77.43	20.99	74.92	55.27	16.78	4.57
Balurghat	6.64	77.81	18.09	67.23	68.89	17.69	3.34
Bankura	19.56	66.14	10.98	62.57	70.13	27.54	3.34
Baranagar	38.64	84.01	22.01	76.64	39.35	10.65	4.9
Barasat	37.5	70.58	17.13	69.63	59.15	9.67	4.71
Barddhaman	20.77	78.35	15.66	69.77	77.93	26.97	4.04
Barrackpore	28.45	84.59	22.27	70.4	64.6	16.79	4.29
Basirhat	19.1	56.6	10.56	63.14	72.7	11.66	2.97
Berhampore	17.84	81.42	13.23	68.61	73	24.56	3.29
Bhadreswar	26.66	66.31	14.08	61.23	68.64	11.79	1.69
Bhatpara	28.72	71.15	11.73	66.19	67.26	8.31	1.62
Bidhannagar	44.86	82.73	41.77	51.18	35.36	14.5	25.5
Bongaon	9.29	65.81	12.52	68.55	68.97	10.02	4.06
Champdani	17.66	61.25	8.86	62.55	61.92	7.33	1.2
Chandannagar	36.12	79.14	17.63	64.85	82	22.75	3.43
Darjiling	15.38	88.58	20.49	84.29	1.07	2.49	5.59
Dum Dum	30.8	85.82	25.21	74.12	35.22	12.97	6.5
Durgapur	21.47	75.49	18.99	71.08	74.42	39.61	7.95
English Bazar	7.55	81.15	17.57	73.05	66.79	21.92	4.24
Habra	16.87	59.25	12.03	69.8	64.62	8.35	2.93
Haldia	24.85	57.06	13.07	66.13	76.54	15.41	5.93
Halisahar	11.75	67.09	12.17	66.11	72.09	12.76	2.68
Haora	43.83	79.45	18.82	72.27	50.4	18.64	4.46
Hugli-Chinsurah	34.55	83.39	16.65	70.72	82.6	23.59	3.7
Jalpaiguri	14.78	79.72	17.94	59.97	67.79	26.62	5.19
Jamuraia	9.04	64.48	6.92	69.11	64.73	20.43	2.99
Kalyani	27.57	69.96	24.74	66.2	79	23.89	7.42
Kamarhati	31.39	83.19	21.22	74.95	43.93	8.5	3.37
Kanchrapara	33.15	77.79	13.25	73.07	76.97	18.35	2.91
Kharagpur	14.53	74.5	14.16	69.51	77.73	37.45	4.69
Khardah	29.22	85.13	25.99	73.74	66.44	13.77	5.2
Kolkata	47.54	84.65	26.2	71.51	26.23	12.15	8.88
Krishnanagar	14.86	78.98	11.33	71.21	79.27	17.27	2.98
Kulti	16.69	68.36	8.24	65.71	59.99	22.3	3.11
Maheshtala	41.89	75.14	9.15	72.74	56.33	11.01	2.03
Medinipur	20.99	71.59	14.4	65.9	76.54	33.96	3.87
Nabadwip	14.31	55.1	6.94	58.06	64.12	4.95	1.05
Naihati	26.85	74.34	13.67	68.85	59.28	9.06	2.39
North Barrackpore	34.32	88.01	16.3	79.02	78.41	18.59	3.18
North DumDum	38.42	82.15	15.45	73.92	57.79	9.76	3.57
Panihati	39.65	84.09	18.01	72.72	63.66	12.05	3.86
Puruliya	8.98	66.25	14.92	64.21	67.9	27.01	4.15
Raiganj	9.2	60.8	9.95	54.77	59.69	14.74	2.85
Rajarhat Gopalpur	27.19	80.02	25.68	76.3	37.4	12.03	7.21
Rajpur Sonarpur	35.05	80.91	18.23	76.42	55.38	12.44	4.41
Raniganj	10.87	63.74	8.06	63.66	52.75	19.64	3.81
Rishra	39.17	73.57	15.99	69.36	56.26	8.84	2.53
Santipur	21.85	50.43	7.64	52.08	75.35	7.56	0.98
Serampore	36.78	78.87	19.97	71.44	63.16	12.69	2.9
Siliguri	23.4	77.91	18.78	71.59	54.45	27.95	7.38
South DumDum	38	86.87	30.34	67.9	32.23	10.21	8.78
Titagarh	13.56	62.93	11.02	64.15	31.81	4.19	1.03
Uluberia	30.82	48.63	8.31	55.23	61.32	7.89	1.7
Uttarpara Kotrung	43.08	83.56	20.45	63.69	60.51	13.71	3.75

Source: Census of India, 2011

Appendix 16 Assets in the class I towns of the state of Tamil Nadu

Name of the towns	Radio	Television	Computer	Telephone	Bicycle	Motorcycle	Car
Alandur	32.86	95.9	45	67.1	41.73	55.56	14.73
Ambattur	31.16	93.2	36.1	75.8	42.96	53.21	13.42
Ambur	5.58	82.9	13.7	76.4	47.83	33.82	2.72
Avadi	35.52	91.1	24.3	81.8	51.33	49.35	5.84
Chennai	36.01	95.4	32.2	72.6	37.03	46.59	13.23
Coimbatore	33.19	91.3	23.2	75.9	38.54	54.09	13.36
Cuddalore	25.02	85.7	13.4	79.2	56.33	40.21	5.7
Dindigul	31.16	82	12.3	75.3	43.93	38.47	5.22
Erode	24.25	85.4	18.5	73.9	44.74	50.14	10.27
Kancheepuram	25.69	88.8	13.9	79.9	62.37	40.04	4.15
Karaikkudi	31.48	86.7	16	76.2	58.36	47.18	6.72
Kumbakonam	23.66	89.1	14.4	74.4	61.89	36.66	5.06
Kurichi	29.38	86.2	18.3	81.1	34.2	48.55	8.11
Madavaram	33.53	93	25.9	79.6	49.91	55.82	9.6
Madurai	36.14	91.4	16.7	78.9	45.77	36.77	5.55
Nagapattinam	26.77	79.7	11.5	70.4	48.74	28.18	3.5
Nagercoil	20.38	92.6	19.5	72.3	29.15	41.14	9.62
Pallavaram	33.41	94.8	35.7	73.3	45.55	53.1	10.64
Pudukkottai	30.45	88	15.5	76.8	58.76	47.75	5.95
Rajapalayam	19.83	77.2	10.7	65.4	58.35	26.67	2.88
Salem	20.8	91.6	14.1	75.1	48.36	48.93	6.85
Tamparam	31.18	94	36.2	72.3	41.04	51.37	11.27
Thanjavur	35.49	91.4	16.7	76.2	55.98	43.41	6.97
Thoothukkudi	28.59	91.4	14.5	75.7	56.5	43.97	6.2
Tiruchirappalli	42.11	89.2	20.1	75	47.67	42.29	7.19
Tirunelveli	36.26	90.3	17	73.5	51.82	37.88	7.51
Tiruppur	18.44	85.7	11.7	82.5	27.37	50.53	8.21
Tiruvannamalai	12.57	85.7	12	78.7	51.63	43.79	4.23
Tiruvottiyur	22.28	89.7	18.7	78.9	27.55	29.38	3.16
Vellore	9.77	91.7	11.6	74.8	50.18	34.14	3.73

Source: Census of India, 2011

Appendix 17 Asset index and proportion of slum population in urban agglomerations of Maharashtra

Name of Urban Agglomeration	2001		2011	
	Asset Index	prop_slum*	Asset Index	prop_slum*
Ahmadnagar	1.3	7	1.32	11
Aurangabad	1.01	17	1.04	19
Bhiwandi Nizampur	0.52	19	0.6	49
Bhusawal	0.92	12	0.96	9
Greater Mumbai	1	44	1.02	33
Ichalkaranji	0.91	7	1.04	5
Kolhapur	1.31	13	1.41	12
Malegaon	0.97	34	0.61	28
Nagpur	1	36	0.9	36
Nashik	1.23	13	1.29	13
Pune	1.05	17	1.03	17
Sangli Miraj Kupwad	1.2	6	1.21	5
Satara	1.3	5	1.29	4
Yavatmal	1.01	36	0.93	43

Source: Census of India, 2001 and 2011

Note: * proportion of slum population

Appendix 18 Asset and proportion of slum population with their correlation in the reclassified towns of Maharashtra

Name of the towns	Reclassification	Asset index	prop_slum*	Correlation
Greater Mumbai		1.100	0.41	0.292 [^]
Pune		1.651	0.22	
Nagpur		1.358	0.35	
Thane		0.995	0.17	
Pimpri Chinchwad	Metro cities	1.265	0.07	
Nashik		1.290	0.12	0.519 [#]
Kalyan-Dombivli		1.051	0.07	
Vasai-Virar City		0.910	0.02	
Aurangabad		1.037	0.18	
Navi Mumbai		1.198	0.18	
Malegaon	Transitional	0.606	0.27	
Solapur	metros	0.941	0.18	-0.943
Mira-Bhayandar		1.043	0.07	
Bhiwandi Nizampur		0.599	0.48	
Amravati		0.904	0.36	
Nanded Waghala	Regional metros	0.855	0.23	-0.776
Kolhapur		1.411	0.12	
Ulhasnagar		0.821	0.16	
Sangli Miraj Kupwad		1.207	0.05	
Jalgaon		0.941	0.06	
Akola		0.949	0.38	
Latur	juvenile cities	0.827	0.22	
Dhule		1.025	0.23	-0.403
Ahmadnagar		1.320	0.10	
Chandrapur		0.944	0.25	
Parbhani		0.834	0.24	
Ichalkaranji		1.044	0.05	
Jalna		0.821	0.36	
Ambernath		0.882	0.62	
Bhusawal		0.956	0.09	
Panvel		1.529	0.05	
Badlapur		1.005	0.05	
Bid		0.878	0.65	
Gondiya	incipient cities	0.958	0.31	
Satara		1.287	0.03	-0.529
Barshi		0.861	0.38	
Yavatmal		0.933	0.43	
Achalpur		0.655	0.66	
Osmanabad		0.898	0.32	
Nandurbar		0.800	0.18	
Wardha		1.029	0.25	
Udgir		0.599	0.20	
Hinganghat		0.786	0.25	

Source: Census of India, 2011

Note: [^] includes Greater Mumbai, [#] excludes Greater Mumbai, * proportion of slum

Appendix 19 Asset index and proportion of slum population in urban agglomerations of West Bengal

Name of Urban Agglomeration	2001		2011	
	Asset Index	Prop_slum	Asset Index	Prop_slum
Asansol	1.1	28	1.08	40
Balurghat	0.9	30	0.91	43
Barddhaman	1.1	22	1.1	22
Darjiling	0.8	8	0.82	21
Durgapur	1.5	30	1.37	8
English Bazar	1.06	36	1	30
Habra	0.87	19	1	42
Jalpaiguri	1.2	5	1.09	22
Kharagpur	1.31	19	1.16	25
Kolkata	1.11	27	1.08	29
Krishnanagar	1.03	15	0.92	32
Nabadwip	0.57	43	0.6	35
Raiganj	0.83	41	0.73	40
Santipur	0.95	18	1.07	31
Siliguri	1.22	37	1.21	24

Source: Census of India, 2001 and 2011

Appendix 20 Asset and proportion of slum population with their correlation in the reclassified towns of West Bengal

Name of the town	Reclassification	Asset Index	prop_slum*	Correlation
Kolkata	Metro cities	1.270	0.31	1
Haora		1.143	0.07	
Durgapur	Regional metros	1.367	0.07	-0.997
Asansol		1.077	0.35	
Siliguri		1.214	0.24	
Maheshtala	Juvenile cities	0.906	0.47	-0.442
Rajpur Sonarpur		1.056	0.07	
South DumDum		1.244	0.27	
Rajarhat Gopalpur		1.124	0.20	
Bhatpara		0.822	0.19	
Panihati		1.076	0.24	
Kamarhati		0.968	0.35	
Barddhaman		1.104	0.21	
Kulti		0.874	0.56	
Bally		1.146	0.14	
Barasat	1.020	0.26	-0.418	
North DumDum	1.001	0.28		
Baranagar	1.079	0.22		
Uluberia	0.722	0.58		
Naihati	0.854	0.08		
Bidhannagar	1.943	0.35		
Kharagpur	1.162	0.25		
English Bazar	0.996	0.29		
Haldia	1.013	0.22		
Berhampore	1.012	0.21		
Raiganj	0.734	0.39	-0.418	
Serampore	1.037	0.30		
Hugli-Chinsurah	1.170	0.13		
Medinipur	1.125	0.33		

Chandannagar	1.149	0.22
Uttarpara Kotrung	1.100	0.16
Balurghat	0.914	0.42
Krishnanagar	0.920	0.32
Barrackpore	1.106	0.14
Santipur	0.669	0.39
Jamuraia	0.810	0.33
Habra	0.781	0.31
Bankura	0.981	0.33
North Barrackpore	1.121	0.05
Kanchrapara	1.041	0.26
Raniganj	0.810	0.30
Nabadwip	0.596	0.35
Halisahar	0.810	0.68
Rishra	0.938	0.70
Ashokenagar Kalyangarh	0.773	0.54
Baidyabati	1.047	0.22
Puruliya	0.978	0.41
Darjiling	0.823	0.21
Titagarh	0.573	0.96
Dum Dum	1.126	0.24
Champdani	0.674	0.79
Bongaon	0.816	0.37
Khardah	1.158	0.36
Jalpaiguri	1.085	0.21
Basirhat	0.811	0.37
Bhadreswar	0.848	0.60
Kalyani	1.285	0.54

Source: Census of India, 2011

Note: * proportion of slum population

Appendix 21 Asset index and proportion of slum population in urban agglomerations of Tamil Nadu

Name of Urban Agglomeration	2001		2011	
	asset index	prop_slum*	asset index	prop_slum*
Chennai	0.23	0.21	1.06	0.28
Coimbatore	1.31	0.06	1.06	0.12
Madurai	0.92	0.24	1	0.27
Tiruchirappalli	1.1	0.24	1.11	0.27
Tiruppur	0.99	0.03	0.91	0.16
Salem	0.98	0.22	0.97	0.22
Erode	1.21	0.15	1.07	0.18
Tirunelveli	1	0.15	1.06	0.14
Vellore	0.9	0.18	0.79	0.23
Thoothukkudi	1.02	0.12	1.01	0.16
Dindigul	0.9	0.62	0.92	0.47
Kancheepuram	0.98	0.15	0.96	0.22
Kumbakonam	1.02	0.19	1.06	0.41
Thanjavur	1.09	0.18	0.95	0.27

Source: Census of India, 2001 and 2011

Appendix 22 Asset and proportion of slum population with their correlation in the reclassified towns of Tamil Nadu

Name of the town	Reclassification	Asset Index	prop_slum*	Correlation
Chennai	Metro cities	1.27	0.29	1.395
Coimbatore		1.22	0.12	
Madurai		1.00	0.27	
Tiruchirappalli	Transitional metros	1.11	0.27	1.283
Salem		0.97	0.22	
Tirunelveli	juvenile cities	1.06	0.14	0.556
Ambattur		1.32	0.12	
Tiruppur		0.91	0.16	
Avadi		1.13	0.33	
Tiruvottiyur	incipient cities	0.81	0.34	-0.142
Thoothukkudi		1.01	0.16	
Pallavaram		1.28	0.25	
Nagercoil		0.97	0.05	
Thanjavur		1.08	0.20	
Dindigul		0.92	0.47	
Vellore		0.79	0.23	
Tamparam		1.27	0.42	
Cuddalore		0.96	0.18	
Alandur		1.42	0.18	
Kancheepuram		0.96	0.22	
Erode		1.07	0.18	
Tiruvannamalai		0.85	0.24	
Kumbakonam		0.95	0.27	
Rajapalayam		0.77	0.20	
Kurichi		1.03	0.07	
Madavaram		1.22	0.09	
Pudukkottai		1.04	0.31	
Ambur		0.74	0.29	
Karaikkudi	1.06	0.41		
Nagapattinam	0.82	0.35		

Source: Census of India, 2011

Note: * proportion of slum population

