SPATIAL ANALYSIS OF URBAN SETTLEMENTS, FUNCTIONAL DIVERSIFICATION AND URBAN DEVELOPMENT IN ORISSA

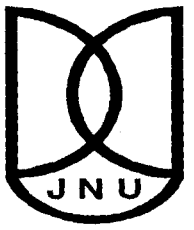
Dissertation submitted to Jawaharlal Nehru University

in partial fulfillment of the requirement

for award of the degree of

MASTER OF PHILOSOPHY

GOURABAMAYA PRADHAN



CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI- 110067
INDIA
2011

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

Date: 25.07.2011

DECLARATION

I, Gourabamaya Pradhan, hereby declare that the dissertation entitled "**SPATIAL ANALYSIS OF URBAN SETTLEMENTS, FUNCTIONAL DIVERSIFICATION AND URBAN DEVELOPMENT IN ORISSA**" for the award of the degree of **MASTER OF PHILOSOPHY** is my bonafide work and that it has not been submitted so far in part or in full, for any degree or diploma of this university or any other university.

Gourabamaya Pradhan
(GOURABAMAYA PRADHAN)

CERTIFICATE

It is hereby recommended that the dissertation may be placed before the examiners for evaluation.

25/07/11
DR. ANURADHA BANERJEE
Associate Professor
Centre for the Study of Regional Devt.
School of Social Sciences
Jawaharlal Nehru University
New Delhi-110 067, India
Dr. Anuradha Banerjee
(Supervisor)

Prof. Ravi. S. Srivastava
(Chairperson)
Chairperson
Centre of the Study of Rej. Dev.
School of Social Sciences
Jawaharlal Nehru University
New Delhi-110067

Tel. : 6107676, 6167557 Ext. 2466, 2463 Gram : JAYENU Fax : 91-011-6165886, 6198234

Acknowledgements

The completion of my research work would not have become reality without the co-operation extended to me by a number of people and organisations at different stages of the work.

First and foremost, I am grateful to my supervisor Dr. Anuradha Banerjee. I am deeply indebted to her for her meticulous guidance, sustained advice, constant encouragement and support. Above, all she had been a great source of inspiration and had always introduced me to fresh, new and contemporary development in the subject.

I sincerely thank the chairperson, Prof. Ravi. S. Srivastava, of the centre for his untiring support which made it possible for me to conduct my research. I also like to acknowledge the valuable help rendered by Mr. Verghese, Mr. Selvam and the non-teaching staff of the centre for their cooperation and help whenever sought.

I wish to acknowledge with gratitude the academic and administrative support I received in the Centre for the Study of Regional Development, School of Social Sciences, and Jawaharlal Nehru University in the course of my M.Phil work. I would also like to thank the staff of the Central Library, Jawaharlal Nehru University, and Documentation unit of the Centre for the Study of Regional Development, for providing me the required information and dataset.

I am thankful to University Grants Commission for providing me financial assistance. I cannot forget to acknowledge my family members for their constant moral support and encouragement to pursue higher studies. The motivation and blessings provided by my family cannot be expressed in words as without their support this dream could not have been fulfilled.

I am highly appreciative of the help, company and moral support of my friends who actively helped me whenever they could with my work. I would especially like to mention, Arvind, Yatish, Siba, Manas and Sayid who were always there for me. I would like to specially thank Ms. Sonalee Biswal who not only assisted me with my work but also was a constant moral support, whenever I needed her. I am deeply grateful to my parents, my brothers and sister for being a constant support of inspiration.

Place: JNU, New Delhi

Date: 25th July 2011 *(Gourabamaya Pradhan)*

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter II

Chapter III

Chapter IV

LIST OF MAPS

Chapter I

Introduction

1.1 Introduction

The term 'urbanisation' itself has been able to create enough interest and importance in the active development process in recent times at macro level and its percolated effects is extended to micro level as well in the present globalised world. Literally understood as the whole process of becoming urban, it is studied as a complex process involving demographic, economic, sociological and cultural transformation of the society. Urbanisation is a process whereby an increasing proportion of the population resides in urban areas, though the definition of urban place is not universal across the globe. Demographic process of urbanisation results in the continuous concentration of population in towns and cities which is supported by rural-urban migration. Understandably, urbanisation is associated with the change in the economy of a state whereby the non-agricultural activities become dominant. Thus, urbanisation is often recognised as the harbinger of the economic development though in reality both go hand in hand as the two are supplementary to each other. Concentration of the population and economic activity in space has been considered crucial for leveraging certain external economies that provide a base for improvement in efficiency; technological innovation and access to global market.[1] Social change and social heterogeneity are the other prominent feature of city life as cities are considered as social artefacts (Ramachandran.R, 1989)[2] Diversification of beliefs, norms and innovation of a mixed culture are intertwined in the 'elements of urbanism' as cities are the melting points where all rigidity gets diluted.

In terms of its structural transformation, urbanisation can be defined as a complex process of concentration of population, shift from rural to urban and occupational shift from agricultural to non- agricultural activities which make a rural place clearly distinctive from an urban one. Undoubtedly, the process of industrialization has led to the present level of urbanisation and thus it is said that 'Urbanisation is an index of transformation

---

[1] Kundu. Amitabh (2006) 'Trends and Patterns of Urbanisation and their Economic Implication' in *India Infrastructure Report*, 2006. pp. 32

[2] Ramachandran,R (1989), 'Urbanisation and Urban Structure in India' Oxford university Press, New Delhi, pp.76

from traditional rural economies to modern industrial one and it is a long term process' (Datta.P, 2006). Moreover, in the last two decades, cities and metropolitan regions have emerged as the major focal points of economic growth throughout the world. The way in which capitalism has evolved in recent times further enhances the role of the cities as 'growth engine'. Cities are key elements of the global economy, which is today very different from previous "world economies." The portion contributed by them especially in terms GDP has increased vastly.

The focus on urbanisation has shifted from developed nations now to developing countries where during the last two decades or so the urban growth rate has been phenomenal. Being the second most populous country in the world, India has a long history of urbanisation. Since Independence, India's urban population has increased five times whereas the total population increased by only three times. It is a well known fact that the urban scene across India very patchy at macro level and has contributed to uneven regional development. Continuous urban growth accompanied by rapid industrialisation in India has helped the maximization of the efficiency of market economy and at the same time it has resulted in some serious problems like environmental pollution, over congestion, decline in infrastructure availability and proliferation of slums. Developing strategies for management of rapid urban growth constitutes a major challenge for development planners and policy-makers. The strategies seek to meet the needs for gainful employment, housing, and essential services at acceptable economic and social cost. Also, they must ensure that urban growth contributes to national and regional economic growth, particularly through multiple, growth-inducing urban-rural interactions[3]. Rapid population growth and low investment in urban development has caused some serious problems for the sustenance of the urban people themselves and inhibiting the expected profits of urbanisation.

[3] Nath.V (1986), 'Urbanisation in India: Review and Prospects'. *Economic and Political Weekly.* Vol 21. No.8,1.

1.2 Statement of the Problem

Rapid urbanisation caused by demographic explosion and huge poverty induced rural-urban migration has ultimately led to the poor quality of urban life in India. Continuous concentration of population in large cities of India has stimulated Kingsley Davis to characterise its pattern as 'over-urbanisation' and he went on to say urban misery and rural poverty exist side by side and hence they can hardly be called dynamic. (Davis. K and Golden.H.H, 1954)[4]. Another scholar (Breese, 1969)[5] depicts urbanisation in India as 'pseudo urbanisation' where people arrive in cities not due to urban pull but due to rural push. Thus, present lopsided urbanisation dominated by class- I cities has been the result of poor urban planning, urbanisation with unsustainable economic base.

As rapid growth of urban population in developing countries acquires serious proportions, the study of urbanisation and its relation to development is attracting more critical attention of researchers, planners, and the governments concerned. Under the influence of Globalisation, Liberalisation and Privatisation, the inter-regional inequality has increased in India. The backward areas received meagre gainful employment and implementation of the policies formulated from a national perspective at regional level has only aggravated the existing problems further. The benefits of liberalization (Despande and Deshpande, 1998) generally accrue to only those who acquire new skills. It is unlikely that common man and the poor will benefit from the liberalization.[6]

According to Census of India, out of total population of 1028 million, urban areas contribute 268 million comprising 27.8 per cent of the total population. Compared to the many other developing countries, India's urbanisation level is low but the growth rate of urban population has been tremendous and continuous. In the last decade urban population grew at a rate of 31 per cent compared to 22 per cent of total population growth rate. As it is earlier also mentioned that India possesses a lopsided and patchy

---

[4] Davis.K and Golden.H.H (1954) : 'Urbanisation and Development in pre-Industrial Areas', *Economic Development and Cultural Change*, Vol.3.No.1

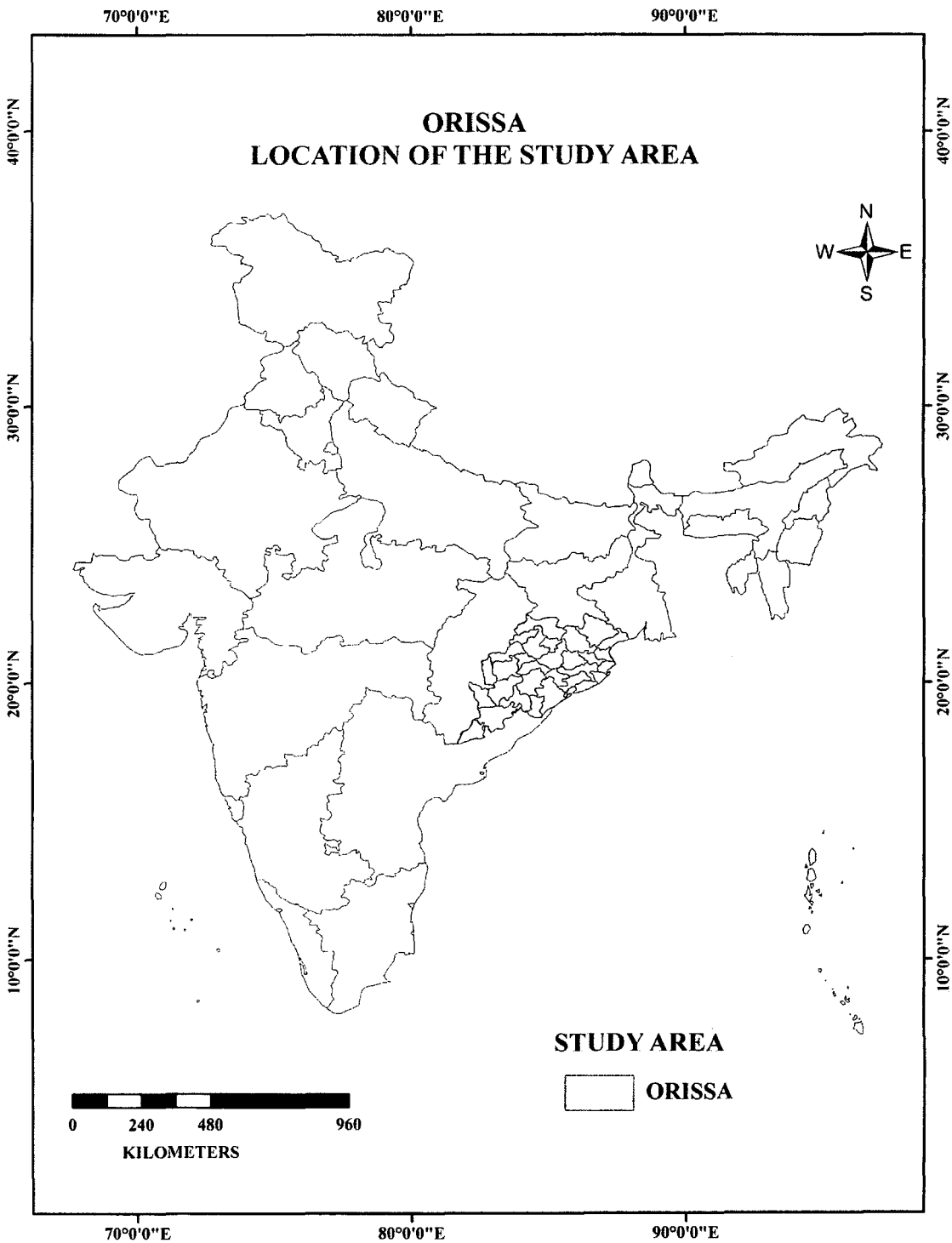
[5] Breese. G. (1969) : 'Urbanisation in Newly Developing Countries' , Prentice hall, New Delhi

[6] Despande.S and Despande.L. (1998): 'Impact of Liberalisation of Labour Market in India: What Do Facts from NSSO's 50th Round Show', *Economic and Political Weekly*, Vol33.No.22. pp21-31

urban picture where states like Tamil Nadu, Maharashtra, Goa, Mizoram, record more than 35 per cent of level of urbanisation, Himachal Pradesh, Bihar, Sikkim, Assam Orissa are at the lower end of the spectrum of level of urbanisation. Orissa is one of the backward and poor states of India with low urbanisation level. According to 2001 Census, only 15 per cent of its population live in urban areas. However, the low level of urbanisation in the state should not make one think that the urban sector is insignificant in Orissa. The most striking feature is that its urban growth in Orissa is almost equal to that of India. Compared to the India's urban growth rate of 31 per cent during 1991-2001, Orissa's urban population grew at 30 per cent during the same period. It would be interesting to mention that total population in Orissa tripled in 2001 from that of 1951 whereas the urban population increased nine times during the same period. Urban growth is quite high but the level of urbanisation is low and answering this paradoxical observation could surface some interesting findings. Moreover, like India's patchy urban picture Orissa's urban landscape seems to have dominated by an uneven distribution of urban centres and its urban process is worth researching to investigate the growth pattern, infrastructure status and urban development. Many urban studies have been conducted pertaining to highly or moderately urbanized areas but regions like Orissa where level of urbanisation is low but experiences reasonable urban population growth would be interesting to study. Also, the urban infrastructure and funds available for concerned agencies for their maintenance and the region specific problems would likely to present some hiding truths.

1.3. Study Area

The state of Orissa has been taken as study area. The state of Orissa is located in the east coast of India and bordered by the state of Chhattisgarh in the west, Jharkhand in the north, West Bengal in northeast and Bay of Bengal in the south. According to 2001 Census, the state stretching over an area of 155707 sq.km. had a population of 36804660 with a population density of 236 persons per square kilometre. Fifteen per cent of total population lived in urban areas in 2001. Urban population in Orissa has increased from 2.5 lakh in 1901 to around 60 lakhs in 2001. From 1950s, the urban population has been growing consistently and in the last two decades it has been parallel to that of India.


ORISSA
LOCATION OF THE STUDY AREA
70°0'0"E
80°0'0"E
90°0'0"E
40°0'0"N
30°0'0"N
20°0'0"N
10°0'0"N
N
W
E
S
STUDY AREA
ORISSA
0
240
480
960
KILOMETERS

As it is very well known that this state is one of the natural resource based states of India but its study of urban history has received limited consideration in academia with much interest covering smallest units of analysis. Thus urban sector of this state has remained as one of the neglected areas demanding much study to unearthen the undisclosed trend and pattern of urban landscape.

1.4 Literature Review

The literature review of a number of previous works gives detailed and a solid base for the theoretical framework of any study. To establish a clear understanding in the field of study of urbanisation and other related aspects especially in India, the entire body of literature has been subdivided into various sub themes.

1.4. a. Urban Expansion

Minocha, A.C.[7] (1993) has studied the pattern of urbanisation in Madhya Pradesh taking all 433 cities and towns and has analysed their growth pattern from 1971 to 1991. The author has also clubbed all the nine industrial category workers and divided them according to their employment status. The growth is partly due to the emergence of new urban centres within the proximity of large cities, new centres of minerals and industrial development and thermal power stations; and partly due to the creation of urban local bodies in a number of settlements which in fact exhibited rural characteristics. Majority of the towns, 381 out of 433 are small towns each with a population of less than 20000.

Markandey, K.[8] , (1990) has analysed spatial pattern of urbanisation in India capturing the temporal trend of the growth pattern. Applying rank size rule to this region, she confirmed that the population of cities in Rayalseema did not match to their rank in the urban hierarchy. High urban growth was found in western, central and southern regions. She also studied the city wise population growth, their distribution and composition and migration among them and rural-urban part.

---

[7] Minocha. A.C. (1993), " Pattern of Urbanisation in Madhya Pradesh', *Economic and Political Weekly*, Vol. 18, No 37, pp 1950-1961

[8] Markandey.K (1990), "Spatial-temporal Urbanisation", Rawat Publication, Jaipur

Stobart, J.[9] (2000) in his article titled "In Search of Casuality: A Regional approach to Urban Growth in Eighteenth –Century England', has studied that urbanisation in England in the eighteenth century is due to industrial development. His research was based on the national survey data which show massive urban development that was mainly economic and geographical in nature, particularly in north-west England. He measured the growth of manufacturing industries, transport and service industries in cities and towns and their urban population growth.

Shaw, A.[10] (1999) has discussed the pattern of urban growth of different size towns and cities which responded differently to the stimulants and deterrents coming from the economic and commercial transformation occurring in the last century, specifically the economic liberalisation of 1990s and the increasing presence of globalisation. This was done by focusing on major investment projects under investment in large metropolitan cities and the regions surrounding them. The size and sectoral break-up of these investments, their source, size and location are taken as the determining factors of the urban growth in those concerned areas. The newly emerging pattern of urban growth in India seemed to have followed the Sassen's theory on globalization which talks of migration caused due to capital and production redistribution. After domination of the top-heavy structure of the Indian urban scene right upto 1960s, the decentralisation and devolution of the financial and administrative functions of the cities are pressed as the need to have required structural transformation. The author has mentioned that the post-Independence development in India has not only led to the proliferation of large cities but together with global economic shift, it has also affected the economic structure of the largest cities.

Bhagat, R. B.[11] (2002) has dealt with the formal way of classification of rural and urban according to the Census of India and its connection with the decentralised governance

---

[9] Stobart. John (2000) , " In serch of casuality : A Regional approach to Urban Growth in Eighteenth – Century England ", *Geografiska Annaler SeriesB, Human Geography*, Vol. 82 , No. 3 (2000), pp 149-163

[10] Shaw. Annapurna (1999), "Emerging Patterns of Urban Growth in India", : *Economic and Political Weekly*, Vol. 34, No. 16/17 (Apr. 17-30, 1999), pp. 969-978

[11] Bhagat.R.B (2002), " Challenges of Rural-Urban Classification for Decentralised Governance", *Economic and Political Weekly*, Vol. 37, No. 25 (Jun. 22-28, 2002), pp. 2413-2416

practiced in the country. The definition of urban place in India indicates that the major force behind urbanisation is industrial activities, whereas the rural is treated as residual and synonymous with agricultural activities. He has pointed out that the 'agricultural-industrial dichotomy' is the cornerstone of rural-urban classification across the countries of the world though there are some exceptions to this general trend like in Nepal where places having population 9000 or more are treated as urban.

The Indian definition of urbanisation is dualistic as it incorporates both administrative and demographic criteria forming the municipal or statutory towns and census towns. There are so many places having more than three fourths of male working population in non-agricultural sector but they are yet to be accorded the municipal status. Due to lack of municipal status they are supposedly governed by the rural panchayats which affect their development programmes. Also, urbanisation in situ in India is very weak as urban centres grow up only when sudden investment is given by the state government in certain industrial and developmental projects or through administrative mechanism of transplanting district or tehsil headquarters. The author has argued that urbanisation in India is a problem rather that vehicle of development.

Rao, P. [12](1999) stated that urbanisation is a necessary condition of development of a place in general and the study area i.e Telengena in particular. This paper examined the trend of urbanisation in the region, growth of small and medium towns, contribution of different factors in urban growth and its future implications from the view point of the agricultural and industrial development. The patterns of urbanisation, the growth characteristics have been captured and planning implications have been suggested by him.

Suri, K. B. [13] (1972) in his article *'Growth of small towns in Gujarat'* has analysed the stages of development of small town. He tried to compare the growth of small towns with that of towns and cities of other size. He pointed out that the location factors had exerted

---

[12] Rao. Padmanabha ((19990, " Urbanisation in Telengana and its future Implications", in Ram Mohan Rao and S.Shimmardi (eds), " *Indian Cities: Towards next Millennium*", Rawat Publication , jaipur

[13] Suri. K.B. (1999), "Growth of small towns in Gujarat" , *Economic and Political Weekly*, Vol.7, No. 2, pp. 67-70

an important influence on the growth of small and medium towns. According to him, the small towns located nearer to the bigger ones and having the accessibility of the complementary areas of the later are more likely to grow at an increased pace than their counterparts. The author has also attempted to examine the variation of growth rate in relation to the favourable urban policy incentives and suggested few steps for balanced regional development.

Kewalramani, G.[14] *(1997)* has studied the spatial distribution of medium size towns of Konkan, nature of their urban growth, role played by nearest metropolis and their correlation with industrial development. Analysing the data given by Census, the author has argued that the growth of medium towns situated close to Bombay have grown faster than in other parts of the region. Moreover, this growth cannot only be attributed to the locational factors of the towns, but also due to the progress in the level of industrialisation. Unsurprisingly, Bombay which dominates the Konkan region does not appear to have contributed to the development of the hinterland resulting in a highly centralized development pattern of the region. It is the development of industries which has encouraged urbanisation in this region.

Nandy[15] (1985) in his book entitled *'Development of small and medium towns: An Evaluation of Administrative Machinery in a Medium sized Town'* conducted a field study of Karnal in Haryana which was under the programme of Integrated Development of Small and Medium Towns (IDSMT). He has evaluated the fruition of the planning methods and their implementation within the framework of administrative and policy implications.

Markandy, K.[16] (1990) in the chapter 'Economic Attributes of Urbanisation' has studied the functions performed by the Rayalseema region for its outside hinterland. The

---

[14] Kewalramani. Gita (1997), The role of medium towns in the spatial diffusion of development: the case study of Konkan region ' in Jayamamla Dedee (ed), " *Indian medium Towns: An Appraisal of their Role As Growth Centres* ", Rawat publication Jaipur

[15] Nandy (1985), " 'Development of small and medium towns: An Evaluation of Administrative Machinery in a Medium sized Town', , *Economic and Political Weekly*, Vol.17, No. 2, pp.1 67-175

[16] Markandey.K (1990),.ibid, pp.35

economic attributes have been studied in two ways: first, by anaysing the local and export character of the economy and second by the analysing the predominant functions of the towns. To find out the major functional categories, the author has used Nelson's method of classification and composite index has been computed to measure the growth of infrastructure.

Ramakrishna, G.[17] (1999) in his article '*Urbanisation and Economic Growth in India*' has tried to link urbanisation with the economic growth a region and has analysed the cause and effect relationship. Following the simple methodology of growth rate and correlation he concluded that there is a positive relation between urbanisation and economic growth. However, this association measured in terms of correlation coefficient is not statistically significant. The cities with larger population have higher growth rates of population compared to small and medium towns with regional variations in economic growth as well.

Recognising the importance and role of small and medium tows in the diffusion of innovations **Barai and Vijaylakshmi**[18] (1997) have studied the Bangalore metropolitan region. In the article entitled *'Impact of Medium sized towns in the development of the Bangalore Metropolitan region'* they concluded that medium sized towns have been channels of diffusion of innovations and change, the spread of benefits of urban development, the stimulation of rural economies and the integration of urban centres and rural settlements within the regions through social, economic, and administrative linkages.

[17]Ramakrishna.G (1999), ibid

[18] Barai and Vijaylakshmi, (1997), *'Impact of Medium sized towns in the development of the Bangalore Metropolitan region'*, , Economic and Political Weekly, Vol.14, No. 2, pp.5 67-585

1.4. b. Urban Functions

The concept of classifying towns and cities on the basis of the prevalent functions was proposed in early eighteenth century and this has been used as an important method of conducting urban research. As the towns diversify with multi economic functions, they are more likely to grow strengthening their dominance over hinterland, thereby drawing attention of the agents of investors and development bodies. Therefore, to have a balanced regional development, proper knowledge of the existing growth mechanism is sought by the urban planners.

Kurien, C. T. and J. Joseph[19] (1975), in their article named *"Urbanisation and Economic Change: A Pre-historic Investigation of Tamil Nadu"* have analysed the interrelationship between economic change and urbanisation. Growth of urban population, number of towns and cities and the concentration of population in bigger cities and towns are the main highlights features of their work. Using the data from the Census of India of 1961 and 1971 they have pointed out that the bigger towns are disproportionately growing at the cost of small towns.

Roy, K.[20] (1973) highlighted that the term 'function' is used to refer to economic activities and economic organisations. Thus, all activities that are concerned with the maintenance of the communities are included. Non economic functions such as cultural, religious and historic symbolism attached to a community are not included in the discussion of functional classification.

Reviewing the existing literature, two categories of classifying towns have been found. First group of scholars such as Christaller and Zipf classified the towns on the basis of their size of population or hierarchical classification. Another way of classification is on the basis of the functions of the towns such as manufacturing, educational, retail and educational etc. as adopted by C.D Harris in America and Ashok Mitra in India.

---

[19] C.T.Kurien and Joseph James [19](1975), "Urbanisation and Economic Change: A Pre-historic Investigation of Tamil Nadu", *Economic and Political Weekly*, Vol.10, No. 8, pp.359-370

[20] Kass Roy (1973), " A Functional Classification of Metrpoplitan Communities", Vol, 10, No 3, pp 127-445

Harris, C. D. [21](1943) in his classic article " *A Functional Classification of Cities in the United States"* attempted to categorise the cities into groups on the basis of their dominant urban function which served as the economic base to sustain growth over time. He chose 377 cities having a threshold population of 25000 according to the 1930 Census. He divided all occupations into 10 principal categories using percentage value of labourers in each group and classified them according to their predominant occupation. The paper attempted to distinguish different functions and proposed a quantitative method by taking two set of figures i.e. occupation and employment. Similarly, in the article *"A Service Classification of American Cities"*, the author H.J Nelson[22] (1955) classified the 897 cities having a population of at least 10000 according to 1950 Census of United States. He used the method of standard deviation from the mean which is still followed in contemporary research of similar topics.

Lal, A.[23] (1959) was the first to study functional classification of Indian towns in his article *"Some Aspects of functional classification of Cities and A proposed scheme of Classifying Indian cities"*. Using Location Quotient he classified 67 Indian class-I cities using 1951 Census data. He was of the view that all the cities are multi- functional except four mono-functional cities. The most commonly occurring functions of the towns are manufacturing, transport and public administrations. Maximum number of cities are specialised in retail trade followed by manufacturing, transport, education and public administration.

Ahmed, Q.[24] (1965) used 62 variables to classify 102 Indian cities on the basis of their functions. Using factor analysis, he has stated that 10 dimensions are required to account for over 70 per cent of the correlations among variables.

---

[21] C.D. Harris 1943) , " A Functional Classification of Cities in the United States", *Geographical review*, 1943, Vol 33, Pp 86-99

[22] H.J nelson (1955), "A Service Classification of American Cities", *Economic Geography*, 1955, Vol, 31 NO. 3, pp 189-210

[23] Lal. A, (1950), " Some Aspects of Functional Classification of Cities",*National Geographical Journal* of India's Office

[24] Ahmed.Q , (1965), " Indian Cities : Characteristics and Correlates", Research paper No. 102, University of Chicago, Department of Geography, pp 114

Mitra, A.[25] (1973) used seven categories of workers as variables grouped into three major functional types viz. manufacturing, trade and transport, and services. Thus, out of 2528 towns in 1961 Census, 655 were classified as manufacturing, 708 belonged to trade and transport and 429 to services. In his modified classification of 1981, Mitra grouped 219 Class I cities of the country into seven broad categories. These included manufacturing (80), trade (78), services (41), transport (9) artisan(8), mining and plantation(1). Folllowing this, the cities that are specialised in manufacturing are well distributed throughout the country except in the states of Kerala and Assam.According to him some of the cities such as Jamshedpur, Ulhasnagar Ludhiana, Salem,Ahmedabad and Surat exhibit high degree of specialisation in this field. The trade cities generally have low level of specialisation and are more or less ubiquitous.The cities which are highly specialised under this category include are Vijayawada, Siliguri and Katihar. The service cities are also uniformly distributed and cities like Chandigarh, Shillong, Bhubaneswar and Agartala are included in this category. Cities that exhibit high degree of specialisation in the field of transport and artisans are Dhanbad, Asansol, Andal and railway towns of Bhusawal and Kharagpur; Kolar and Bermo are the two mining towns and only one town specialises in the field of plantation that is Valparai in Tamil Nadu.

Rao, V. L. S. P.[26] (1964) classified the towns of Mysore state on the basis of the regression method. In this method he tried to correlate the population size with the percentage of population engaged in a particular function. He further discovered that the percentage of population in the industries decreased with the size of the town. He opined that Nelson's standard deviation method is useful only in case of a homogeneous population. But in the state of Mysore the population ranges from 10,000 to more than 20000 where the standard deviation method becomes meaningless.

Chandoke, N.[27] (1991) described the structure of cities and their change over time in post colonial days explaining the sociological angle of the city's interrelationship with the other

---

[25] Mitra. A. (1973), " A functional Classification of Indian Towns" , An All India Seminar on Population, 12-14 March, Institute of Economic Growth at registrar general of India's office

[26] Rao. V.L.S. P. 1964), " Towns of Mysore State", Indian Statistical Institute , Calcutta

[27]Chandoke.N. (1991), "The Post-Colonial City", *Economic and Political Weekly*, Vol. 26, No. 50 (Dec. 14, 1991), pp. 2868-2873

society forming process. She has argued that socially and spatially the city condenses the contradictions of social formations responding to the social struggles. Due to the huge rural-urban migration, informal economy and the casualisation and informalisation of the labour, there has been an increase in their vulnerability in the livelihood options. This has emerged in the post colonial era especially in the developing nations which she termed as the "pseudo urbanisation" to explain the phenomena. The urbanisation pattern in these developing countries has been strikingly different from that of the developed and first European nation's experience. The 'hyper urbanisation' is explained as a result of an 'urban bias' on the part of the third world elites who are responsible for the concentration of resource in the cities.

She also highlighted the Marxian view that the city at a specific historical period signified the transition from feudalism to capitalism. Moreover it was argued that in the post-colonial world, the city is a historical subject because it is a manifestation of the articulation; the symbiosis of the non-capitalistic modes of production and the dominant capitalist mode. Based on the city's life style and the modes of production, third world cities are often referred as 'cities of peasants'.

She argued that urban poor was the victim of the exclusionary process of capitalist development which very often keeps them away from the mainstream progress path.

1.4. c. Urban Infrastructure

Mishra and Mishra[28] (1998) in their book entitled *'Million Cities in India'* studied the various aspects of the million cities in India. The existing status of infrastructure, their temporal growth and the emerging multi-faceted problems were highlighted by the authors. They have laid particular thrust on the structural and management problems that our large cities face today. They dealt with the contemporary problems of urbanisation in India and they tried to catch the attention of the urban policy makers. They have highlighted the serious deficiency in infrastructure like drinking water, roads, electricity, hospitals, schools and recreational facilities etc. The financial inadequacy to strengthen

---

[28] Mishra and Mishra (ed.), (1998), " Million Cities in India" Growth Dynamics", Internal Structuring, Quality of Life and Planning Perspectives ", Sustainable Development Foundation, New Delhi, Vol I & II

and upgrade the service delivery mechanism holds the key responsible factor for the present sad state of affairs.

Kundu, A., S. Bagchi and D. Kundu[29] (1999) in their article entitled '*Regional distribution of Infrastructure and basic amenities in urban India: issues concerning of urban local bodies'* have analysed the availability of selected infrastructure and basic amenities across size class of urban centres and they tried to explore the socioeconomic factors which can explain the spatial and temporal variation. The organisation and financial system for the provision of infrastructure and basic amenities and the evaluation of the performances and the required interventions for their improvement are few other key areas of their analysis. They have argued that the Government and other institutions have not provided much support to the backward states, small and medium towns and to the poor. They have stated that privatisation, partnership arrangements, and promotion of community based projects have remained the only options for undertaking investments in basic amenities due to the resource crunch of the government. This changed perspective and a consequent decline in the public investment however, are likely to accentuate the disparity in the levels of amenities across different size class of urban settlements.

Kundu, A.[30] (2001) in his article 'Institutional Innovations for Urban Infrastructural Development: Indian Scenario' has stated that the process by which cities have emerged and the basic amenities are denied to the poor depends on the growing dependence on private resources for infrastructural investment. Gradually, the financial sectors are being privatised and are taking responsibility for urban development and this has serious implications for empowering the urban local bodies and hence dilution of their social commitments.

---

[29] Kundu.A. , Bagchi.S., Kundu.D. (1999*),* "Regional Distribution of Infrastructure and Basic Amenities in Urban India: Issues concerning Empowerment of Local Bodies ",*Economic and Political Weekly*, Vol. 34, No. 28 (Jul. 10-16, 1999), pp. 1893-1906

[30] *Ibid.* pp. 174-189

Das and Mukhopadhaya[31] (1999) attempted to study the importance of urban infrastructural facilities directly on the health condition of people residing there. Taking few indicators of urban basic services as the parameters of urban development in Calcutta they concluded that there is a positive correlation between health and socioeconomic status. In areas of unsafe drinking water storage and poor drainage facility, the people in lower socio-economic strata tend to fall ill more frequently than those from the upper strata.

Nagabhusanam[32] **(1999)** has projected the rate of growth of population by using geometrical projection for utilisiation of the civic amenities for 2001 and 2011. The author then correlated the future population with the existing level of basic amenities to find out the degree of inadequacy of civic amenities. The study has brought out the fact that the town of Tirupati might move towards economic inefficiency of various facilities and amenities such as residential, educational, medical, transport and recreational and other facilities.

1.4. d. Urban Planning

Kundu A.[33](1984) in his article '*Urban Planning at Crossroads*' attempted to trace the actual missing links in the planned resource allocation in various sectors of the economy and especially in urban development. The entire subject matter was also correlated with the past experience of the Five Year Plans and the deficiency lying in the highest level of policy making has been indicated.

As one of the various mistakes, he pointed out the non-realisation of targets right from inception of Five Year Plans. It is now accepted by the planning authorities itself that not

---

[31]Das.J. and Mukhopadhaya. S.C., (1999), 'Water Supply and Drainage Status in S. Dum Dum Municipal of Calcutta' jn R.R.M. Rao and S. Shimadri (eds*), Indian Cities: Towards Next Millennium*, Rawat Publication , Jaipur

[32]Nagabhusanam (1999), 'Structural and Morphological Transformation of Tirupati Town', in R.R.M.Rao and S.Shimadri (ed*), Indian Cities: Towards Next Millennium*, Rawat Publication , Jaipur

[33]Kundu.A. (1984), 'Urban Planning at Crossroads', *Economic and Political Weekly*, Vol. 19, No. 35 (Sep. 1, 1984), pp. 1520-1521

much can be done with regard to the settlement hierarchy or the urban structure, since govemment measures to encourage the growth of satellite towns and discourage that of large metropolitan cities are unlikely to be effective against the long-term trends in the economy. Thus, the large urban centres would continue to grow at a fast rate, despite governmental efforts to achieve the contrary.

Thus, by and large, it has been realised that the basic purpose of many plans and policies made to upgrade the urban infrastructure or better functioning of urban governance has proceeded in somewhat different manner that the expected.

Harris, N. [34](2003) in his article *' Globalisation and the Management of Indian Cities'* tried to assess the resulting radical changes in the conception of the spatial planning and the emergence of a new agenda for the management of the cities in the era of globalisation. The consistent growth of leading cities like London, New York, Tokyo, Paris, Mumbai, Mexico City, Sydney, Toronto etc. continued despite the efforts made to increase the number of small and medium cities which could not grab the fruits of globalisation like the former. Thus he advocated that liberating the cities is a key part of the agenda for the new century and for the eradication of poverty.

Kundu, A. and S. Gupta[35] (1996) in their article *'Migration, Urbanisation and regional Inequality'* has presented the dynamics of migration and urbanisation in the context of the changing structure of economic development. He tried to link all three and their changing complexities in the present globalised environment of interconnectedness and interdependence. Amitabh Kundu (1997) examined the prospect of urban growth in future years in the perspective of economic liberalisation. Taking into consideration the changes in the system of urban governance, land management practices as well as the attempts at commercialisation of infrastructure and basic services in 1990s, this paper has presented the trend and types of employment for males and females in urban and rural areas at national level.

---

[34] Nigel Harris, (2003), "Globalisation and the Management of Indian Cities' , *Economic and Political Weekly*, Vol. 38, No. 25 (Jun. 21-27, 2003), pp. 2535-2543

[35]Kundu.A. and Gupta.S. , (1996) , 'Migration, Urbanisation and regional Inequality', *Economic and Political weekly*, Vol. 31, No. 52, pp. 3391-3398

Chakravorty, S. [36](1996) attempted to examine the rightness and the way of implementation of the 'Mega City Programme' the first major urban policy initiative announced after economic liberalisation. Analysing infrastructure in five of the six largest metropolitan regions in India (Bombay, Calcutta, Madras, Hyderabad, and Bangalore), he attempted to answer these three questions viz. Is the amount of money being invested too little, and has it come too late to turn the situation around?; scond is the programme being targeted to the wrong cities? Finally: will the elite continue to remain beneficiaries, and the urban poor neglected?

He said that in the year 1990 Calcutta Metropolitan development Authority (CMDA) calculated that there will be a shortfall of Rs.6-7 billion, in addition to the infrastructure deficiencies that have accumulated in the first two years of plan inducement. Also he mentioned the time of sanction of the already inadequate fund to be too late to bring in the expected target in quick time. He argued that the non mega cities growth rate are much higher than that of the largest mega cities and also the later is saturated and could not be able to absorb the required input and sustain for long term. He was of the view that urban policies are pro –rich instead of pro-poor. He suggested the consideration of variations in the rate and spatial pattern of urbanisation instead of population size as criteria for the selection of cities for the programme is again not very much logical. The author established some important relationships in the field of urban developmental schemes announced in India and the real beneficiaries and the effectiveness of the scheme in its empirical rigour.

Kundu, A.[37] (1984) attempted to trace the actual missing links in the planned resource allocation in various sectors of the economy and especially the urban development and he clearly highlighted the Government's admission of this fact.

---

[36] Chakravorty. S. , (1996), "Too Little, in the Wrong Places? - Mega City Programme and Efficiency and Equity in Indian Urbanisation" *Economic and Political Weekly*, Vol. 31, No. 35/37, Special Number (Sep., 1996), pp.2565-2567+2569-2572

[37]Amitabh.A., (1984), "Urban Planning at Crossroads" , *Economic and Political Weekly*, Vol. 19, No. 35 (Sep. 1, 1984), pp. 1520-1521

As one of the various mistakes, he pointed out the non-realisation of targets right from inception of Five Year Plans. To cite some examples he mentioned the name like Lands Reforms Act, Urban Land Ceiling Act wherein insufficient motivations, manipulation by vested interests are witnessed. It is now accepted by the planning authorities that not much can be done with regard to the settlement hierarchy or the urban structure, since govemment measures to encourage the growth of satellite towns and discourage that of large metropolitan cities are unlikely to be effective against the long-term trends in the economy. Thus, the large urban centres would continue to grow at a fast rate, despite governmental efforts to achieve the contrary. However, in the meantime the change in the way of thinking at the urban policy making is witnessed in reference to the international funding as it has made the funding conditional to adherence to its guidelines. In its mandate the International Monetary Fund has made it very clear that 'urban economic expansion must take place only in areas with greatest potential for city expansion. Thus, it is now suggested that policy makers should awaken to the realities, accept the trends of urban growth for the purpose of future planning and make provision for infrastructure and other facilities for the growing multitudes in a handful of large cities.

Thus net result of this change in approach of urban development planning is the liberalisation of the entry of private entrepreneurs in the field of the urban infrastructure development. Thus by and large, it has been realised that the basic purpose of many plans and policies made to upgrade the urban infrastructure or better functioning of urban governance has proceeded in something different way that the expected.

I.4.e.Municipal Finance

Kundu, A.[38] (2003) in his article '*Urbanisation and Urban Governance: search for a perspective beyond Neo -Liberalism'* attempted to assess the changes in workforce structure and the system of governance associated with macroeconomic reforms and their impact on the rate and pattern of urbanisation in India. He argued that the process of urbanisation in India has been exclusionary in nature, as only a few large cities with a

[38]Kundu.A., (2003), "Urbanisation and Urban Governance: search for a perspective beyond Neo – Liberalism", *Economic and Political Weekly*, July 19, 2003: pp 3079-3087

large economic base are able to raise resources for development leaving out small and medium towns. The current macroeconomic and urban incentives are seemingly favouring the developed ones resulting a widening inequality. The backward states have to be provided special assistance in order to achieve a balanced regional developmental pattern.

Bagchi, S. [39](1999) has attempted to bring out some real hidden facts or actual working module involved in the modified provision. It was suggested that Decentralisation of urban governance policies through empowering Urban Local Bodies (ULBs) in better management and efficiency is necessary to achieve to the maximum possible extent. A detailed analysis of all minute level guidelines tells the fact that the ultimate decision of authorising and assigning selective taxes to the local bodies continues to reside with the state legislatures. The article also lamented that the devolution of functions and responsibilities have a long way to go to be completely authorised upon the ULBs. The author had even went on to say that empowering the ULBs should not remain limited to political empowerment as it does not make much sense without financial empowerment. As it is well known that the shortage of resources is a major problem faced by the ULBs in India. The author underestimated the Amendment Act on the financial front so far its actual fruition of purpose of the amendment itself. Thus by and large, he put some serious questions regarding the actual empowerment o the ULBs in true practical sense and termed it as 'a myth rather that a reality'. He illustrated some examples like abolition of 'octroi' in Gujarat in favour of his argument.

Pethe, A. and M. Ghedke [40](2002) analysed the funding aspect of Municipal services beyond the governmental sources of resources. This paper argues for a role for newer financial instruments like 'municipal-bonds' for financing urban infrastructure. It also argued that for these initiatives to be successful, a thick and efficient secondary market in this segment of the debt market is crucial. It will impart liquidity and create an incentive

---

[39]Bagchi, S., (1999), "Myth of Empowering Urban Local Bodies" , *Economic and Political Weekly, Vol.* 34, No. 37 (Sep. 11-17, 1999), p. 2637-2638

[40]Pethe.A and Ghedke.M. [40](2002), "Funding Urban Infrastructure: From Government to Markets", *Economic and Political Weekly* June 22, 2002

for individual agents to invest in the municipal bonds. They concluded that private sector participation may accelerate in the infrastructure sector but the government would still be playing a decisive role as a buyer, seller or supplier. Given the aim to reach a higher growth trajectory for the economy, a concerted approach to encourage and enable private sector participation in infrastructure would be critical, and a vibrant and deep secondary market for debt would be crucial in helping to accelerate such a process.

Sekhar, S. and S. Bidarkar[41] (1999) attempted analyse the comparative study of municipal budgets of five large cities in India- Ahmedabad, Bangalore, Chennai, Pune and Mumbai over a six year period of time giving useful insights into resource mobilisation and utilisation. The authors have discussed in detail the terms of allocation pattern, trends in important sources of revenue and in expenditure in important sectors in the cities. The analysis has shown that the comparative growth of the revenues in the cities has not kept pace with the growth of the size if the cities. Admitting the generality of the fact that the inadequacy of the municipal funds coming as a hindrance in the path of providing sufficient urban basic services, there is scope for both generating more resources and for using them more effectively and efficiently through improved planning, supervision and management.

1.5. Conceptual framework

Orissa is one of the least urbanised states of India. The study of urbanisation and process of urban development has many facets interlinked with each other. A uniform locational pattern of urban centres enables better service delivery in their respective complementary areas. The productivity of urban areas depends largely on their interaction with hinterland and for this a certain suitable pattern of growth of urban settlements. The sustainability of towns is simultaneously dependent on their socioeconomic characteristics which in turn affect the level of urban infrastructure facilities. Since the provision of infrastructure facilities are the responsibilities of the concerned urban local bodies (ULBs), their financial capabilities largely determines the level of development of the former. A small town where primary sector activities are performed is less likely to generate funds than to

[41] Sekhar.S. and Bidarkar.S , (1999), 'Municipal Budgets in india" Comparison across five Cities', *Economic and Political Weekly*, Vol. 34, No. 20 (May 15-21, 1999), pp. 1202-1208

a big city. Thus the functions performed in a town are interlinked with its financial management ultimately influencing the urban development and its future growth potential. However the reverse causality i.e. urban development boosts further growth and better urban planning and financial management can also be established.

Given the interrelationships between urban growth, spatial pattern of location, municipal finance, urban infrastructure, all these dimensions can be subsumed under one head of urban development though the degree and extent of correlation varies from region to region and time to time. At the backdrop of this conceptual framework, an attempt has been made to analyse the process of urbanisation and pattern of urban development in a time period of four decades 1971 to 2001. Since, the unit of analysis is the town, it is necessary to distinguish it clearly from rural places. According to Census of India followed in 1961, a place is counted as town when following conditions are fulfilled.

a) A municipal Corporation, a municipal Committee, a town area Committee or a notified Area Council or a cantonment board or,
b) The places fulfilling all of :
    - A Population of 5000 or more
    - More than 75 per cent of male workers should engage in non-1gricultural activities
    - A population density of 400 persons per sq.km.

1.6. Objectives

The specific objectives of the present study are:

- To analyse the spatio-temporal characteristics and trends and pattern of urbanisation in Orissa.
- To analyse the socio-economic development status in all class size towns and cities.
- To examine the status of infrastructure, basic amenities and municipal finance across size class towns and cities
- To explore the functional nature of urban centres and its relationship with growth and development of towns.

1.7. Research Questions

1. What are the factors held responsible for the present status of urbanisation in Orissa with particular reference to overall backwardness vis-a-vis India's urban development?
2. Has infrastructure and socio-economic development in towns of Orissa been commensurate with urban growth in the state?
3. Does the amount of municipal finance and pattern of its expenditure along with functional characteristics of towns reflect the urban process and development in the state?

1.8. Data Source

The research is based on the secondary source of data. To meet the above mentioned objectives, required data has been taken from following sources:

- Census of India, 1971, 'Orissa Town Directory and Primary Census Abstract, Series-16, Part VI-A
- Census of India, 1971, 'Orissa Town Directory, Series-16, Part VI-A
- Census of India, 1981, 'Orissa , Town Directory and Primary Census Abstract, Series-16, Part X-A
- Census of India, 1981, 'Orissa , Town Directory, Series-16, Part X-A
- Census of India, 1991, 'Orissa , Town Directory and Primary Census Abstract, Series-19, Part IX-A
- Census of India, 1991, 'Orissa , Town Directory, Series-19, Part IX-A
- Census of India, 2001, Population Totals, Series-21, Orissa
- Census of India, 2001, Town Directory, Series-21 , Orissa
- Census of India, 2001, Primary Census Abstract, Series-21, Orissa

1.9. Methodologies

Urbanisation and urban development covers multifaceted dimensions. To analyse various characteristics, various quantitative, cartographical, statistical techniques has been used.

The estimation of various growth rates, ratio, and growth differential involved mathematical formulae; the graphs and chart has been prepared using statistical techniques. The temporal and spatial pattern was shown through maps using cartographic methods.

1. **Growth rate:** To analyse total and urban population change various types of growth rate have been used.

Simple Growth rate = $(P_t-P_o)/P_o * 100$

$$\text{Exponential Growth rate} = \frac{\text{Ln}\,(P_t/P_o)}{t}$$

Where, P_t = Popiulation at t time, and

P_o = Population of the base year

2. **Rank Size Rule:** This has been used to study the rank size and their population distribution of towns of Orissa

According to this rule the population of a town is related with its rank in the form of Pareto's distribution:

$$P_r = K R^{-b}$$

Where, P_r is the population of the town whose rank is R. K and b are constants. The above equation is transformed into following after taking logarithm in both sides:

$Y = a - bX$

Where, $Y = \log P_r$

$X = \log R$ and $a = \log K$

Calculation of ***b*** and ***a*** are done as follows:

$$b = \frac{\Sigma xy - \frac{\Sigma x \Sigma y}{n}}{\Sigma x^2 - \frac{(\Sigma x)^2}{n}} \quad \text{and}$$

$$a = \bar{Y} - b\bar{X}$$

3. **Nearest Neighbour Analysis:** This method has been used to study spatial distribution of urban settlements in Orissa. The Nearest Neighbour Index, *R* is the ratio of the actual mean difference between nearest neighbour points in a given area to the mean expected distance of random distribution of the same number of points in the same area. This index (*R*) is a measure of the degree of departure from randomness in either of the two directions: towards uniformity or towards clustering. The statistical value of 'R' ranges from 0 to 2.1491. if all the values are clustered at one place then the 'R' would be equal to 0; a 'R' value of 2.1491 suggests an uniform pattern and if all r spaced randomly then 'R' would be equal to 1.

The formula is as follows:

$$\bar{D}_r = \frac{1}{2\sqrt{\frac{N}{A}}}$$

Where, N is the number of settlements and A is the area

$$\bar{D}_0 = \sum r / N$$

The Nearest Neighbour Index, $R = \bar{D}_0 / \bar{D}_r$

Composite Index: To examine the levels of development across towns and cities, a composite index of selected indicators has been constructed. For this purpose, 'Z-Score' has been used. The estimation of socioeconomic development and the infrastructure development has followed this method. As the indicators taken are presented in different units, they were made scale free by the following formula:

$$\text{Standardised Score} = \frac{\text{Actual value} - \text{mean}}{\text{Standard Deviation}}$$

By summing all the standardised scores of a town, the index of that town was calculated.

6. **Functional Classification by Nelson Method:** The deviation of percentage of workers engaged in different industrial categories from the mean employment of that category determined the function assigned to it. The nine fold industrial classification of workers given by Census of India was used for this. A town recording workers in construction more than one standard deviation plus the mean of the construction activities of all towns is given 'C1' and said to have specialisation in construction activities. Likewise a town falling between two standard deviation plus mean to three standard deviation plus mean is given a rating of 'C2'. Likewise, all the towns have been labelled their function. The town which did not qualify to come under specialisation of any category was labelled as diversified town.

7. **Herfindahl Index:** This index, first used by Howard J. Nelson has been applied to find out the level of specialization and diversification of towns and the different functions performed in towns. It is calculated by the following formula:

$$HI = \sum_{i=1}^{n} (Pi)^2$$

Where, HI is the Herfindahl Index,

P_i is the proportion of workers in ith category

The value of HI approaches zero when 'n' becomes larger and takes the value of unity when only one category in concentrated. For the purpose of convenience, it has been used in a modified form. The HI value was subtracted from unity to get the Transformed Herfindahl Index (THI). The 'THI' value taken here increases with the increase in diversification.

1.10. Chapterisation Scheme

The entire study has been subdivided into six chapters. All the towns of Orissa have been taken for the study from 1971 to 2001. The first chapter gives the introduction of the

study covering concepts and approaches of urban studies, the need of the study, objectives, research questions, data source, and methodologies. It provides the conceptual framework that lays the foundation of the study.

The second chapter entitled as '*Histogenesis and Spatio-Temporal Trends and Pattern of Urbanisation*' presents the introduction of study area followed by the evolution and growth of urban settlements in Orissa. In the later part, the spatial pattern of urban settlements has been analysed with their temporal changes.

The third chapter entitled as the *'Socioeconomic Characteristics of Towns and Cities'* deals with the status of various city characteristics indicating their socioeconomic status. The socioeconomic development of towns has been calculated and the development pattern across towns and different time periods has been analysed.

The Fourth chapter, entitled as '*Municipal Finance and Infrastructure facilities'* provides the detailed analysis of source of municipal receipts in ULBs and expenditure pattern. In the second section, availability of infrastructure facilities in towns and their development pattern was examined for different time periods tracing the temporal change.

The chapter five, entitled as the *'Functional Classification of Towns'* deals with the nature of functions performed by the towns. The functional classification and the extent of diversification across towns and across different industrial categories have been correlated with the existing infrastructure facilities and the status municipal finance.

The sixth chapter, entitled as the *'Summary and Conclusion'* illustrates the major findings of the study and broad conclusion coming out of this study.

Chapter II

Histogenesis and Spatio-temporal Trends and Patterns of Urbanisation

2.1 Introduction

More than often, spatial distribution of settlements varies from region to region. Also, their growth and development experiences temporal variations. In other words, spatial analysis checks their locational attributes while the temporal trend tries to identify the change occurring through time. The spatial distribution of settlements is determined by their absolute geographical location and the relative nearness and interaction with the rest of the settlements. For example, a place near to a higher order town or city is likely to be better served by required goods and services and hence it has high growth potential than a remotely located place.

The geographical attributes of a region significantly determine its stage of development and whole lot of affairs. Moreover, habitation and growth of human settlements in a region are positively influenced by locational advantages. Concentrated habitation, a striking feature of urban settlements serves as a functional causality of enhanced livelihood sustenance supported by favourable physiographic conditions and relative nearness to higher order service centres. The soil conditions, water availability, climate profoundly influences the culture and living standards of people of any region. Orissa, one of the mineral rich states of India is considered to have adequate raw materials along with pleasant tropical climate, coastal plains and fair amount of water availability. Though culturally rich Orissa is endowed with many natural resources but it lags behind many leading states and the nation on contemporary socioeconomic development front.

In this chapter, the growth of number of settlements across size class, increase in population residing in class towns their temporal comparison has been made preceded by the geographical background of the study area.

2.2. Geographical Background of Study Area

2.2. a. Location of the State

Orissa, one of the major states of India extends from 17^0 49' N to 22^0 34'N latitude and from of 81^0 27'E and 87^0 29'E longitudes. According to Census of India, 2001 it has an area of about 155707 sq.km. It is bounded by Bay of Bengal in the east, West Bengal in the north-east, Jharkhand in the north, Chhattisgarh in the west and Andhra Pradesh in the south. Orissa was separated from Bihar and came into existence on

April 1, 1936. The capital was shifted from Cuttack, a historic city at the apex of Mahandi delta to Bhubaneswar, a planned modern town of the post –Independence period in 1956. According to Census of India, 2001 there are 30 districts and a total of 138 towns in Orissa. The state capital, Bhubaneswar is the largest city which also known as the temple city. To name other important towns in the state are Cuttack, Sambalpur, Brahmapur, Rourkela, Baripada, Puri and Baleshwar.

2.2. c. Physiography

Physiographically, Orissa can be divided into three broad regions. These are coastal plains, middle mountainous country, plateaus and rolling uplands.

2.2.c. (i) ***Coastal Plains:*** These are the depositional landforms of recent origin and geologically belong to the Post-Tertiary Period. This region stretches from the West Bengal border, i.e. from the River Subarnarekha in the north to the River Rushikulya in the south. The coastal plains are narrow in north, narrowest in Chilika coast, broad in south and widest in the middle. They are gift of six major rivers namely the Subarnarekha, the Budhabalanga, the Baitarani, the Brahmani, the Mahanadi, and the Rushikulya. As these are formed by the deltas of above six rivers it is also called as the "Hexadeltaic region". Stretched along the coast of Bay of Bengal, the coastal plains are one of the most intensively cultivated areas of the state. This fertile green tract is also known as 'rice bowl' of Orissa.

2.2.c. (ii) ***The Middle Mountainous Region:*** The middle mountainous region covers about three-fourth area of the entire State. Geologically it is a part of the Indian Peninsula which as a part of the ancient landmass of the Gondwanaland. The major rivers of Orissa with their tributaries have cut deep and narrow valleys. This region is well marked by a number of interfluves or watersheds. The Eastern Ghats is interrupted by a number of broad and narrow river valleys and flood plains. The average height of this region is about 900 metres above the mean seal level. This Middle Mountainous Region is comprised of many second order regions such as the Similipal and Meghasani Mountain, the Mankarnacha-Malayagiri and Gandhamardhan Mountains, the watershed between the Brahmani and the Baitarabi interfluve, the common interfluve of the Mahanadi, the Rushikulya and the Vamsadhara, the Potangi and Chandragiri mountain ranges.

2.2. c. (ii) ***Plateaus and Rolling Uplands:*** The high plateaus are found in mountaing ranges with an average elevation of 300-600 metres. The plateaus are mostly eroded plateaus forming the western slopes of the Eastern Ghats. There are two broad plateaus in Orissa: (i) the Panposh - Keonjhar -Pallahara plateau comprises the Upper Baitarani catchment basin, and (ii) the Nabrangpur-Jeypore plateau comprises the Sabari basin.

The rolling uplands are lower in elevation than the plateaus having heights varying from 15 metres to 300 metres. They are rich in soil nutrients and offers good opportunities for cultivation of paddy in wet areas.

Major rivers of Orissa re the Mahanadi, the Brahmani, the Baitarani,the Subarnarekha, the Budhabalanga and the Rushikulya. All these rivers are non-perennial in nature as they are not snow-fed. The Mahanadi river (857 kms long) is the largest in Orissa and sixth largest in India. It originates from the Amarkantak hills of the Bastar Plateau in Raipur district of Chhatisgarh. Second largest river, the Brhamani and the Baitarani originate from southern slopes of chhotnagpur plateau. Rest of the rivers owe their origin in the hilly plateaus of Orissa.

2.2. d. Climate: Orissa on the eastern coast of India enjoys a tropical monsoon type of climate which is characterised by very hot summer and maximum rainfall during monsoon season. The climate is characterised by high temperature from March to May and high rainfall from June to September. Major source of rainfall is the south west monsson though small amount of rainfall occurs during the period of retreat monsson especially in north eastern parts of the state.The annual average rainfall is about 200 cm out of which about 76 per cent of rainfall is received during June – September caused by south west monsoon. The variability of rainfall is 15-20 per cent in south and south western parts of the state whereas it is below 15 per cent in north and north eastern regions. During the winter, except northern Orissa, all other parts remain almost dry as the prevailing north-eastern retreating monsoon is a wind which blows over the landmass of Orissa.

The mean annual temperature of the state is influenced by latitude, elevation and proximity to the sea. The western regions of the state experience higher temperature compared to coastal region. The mean annual average temperature of the state is 26^0 C.

2.2. e. Economy of Orissa

Orissa is endowed with abundant natural resources and has a lage coastline of 529 km. Orissa's abundant mineral resources is recognised from the fact that it constitutes 28 per cent of Iron Ore, 24 per cent of Coal, 59 per cent of Bauxite and 98 per cent of chromite of India's total reserves. Besides the reserves of major mineral, other minerals like china clay, fire clay, limestone, quartz, precious and semi precious stone, copper, manganese and vanadium are also found. The comparative advantage on this regard has helped the state to attract many multinational mining companies to invest. However industrialisation which started in Orissa only after Independence has not matched to its status of availability of natural and mineral resources. Major industries in the state are Rourkela steel plant, NALCO, Coal mines at Talcher and Ib valley, paper mills at Chowdar and Brajrajnagar, thermal power plants in Talcher-Angul area, Fertiliser plants, cement plants etc.

Major crops grown in the state are cereals – rice, ragi, small millets, maize, wheat; pulses – gram, tur and other pulses; oilseeds – sesamum, mustard, groundnut, castor linseed and til; cash crops – jute, sugarcane, chillies etc. The coastal plain of Orissa dominates so far the agricultural production is concerned. Large coastline offers ample scope of fishing to the local inhabitants. By and large, Orissa's economy is more agriculture based and less industry and service oriented.

2.2. f. Demography

According to Census of India, 2001, the state had a population of 36804660 out of which 18660570 were males and 18144090 were females implying a sex ratio of 972 females per thousand males. Orissa comprising 4.74 per cent of India's total landmass accounts for 3.58 per cent of country's population. The state holds the eleventh rank in population size among the states and union territories. Population of the state is unevenly distributed with a population density of 236 persons per sq. kilometre. Among the districts Ganjam is the most populated district with 3160635 accounting 8.6 per cent of the state's population whereas Deogarh with a population of 274108 is the least populated district constituting 0.7 per cent of the state's population.

As per 2001 Census, the Scheduled caste population in the state constitutes 16.5 per cent of the state's total population while 22.1 per cent of population comes under Scheduled tribe category. Crude birth rate and death rate is recorded at 22.3 and 9.5 respectively. The literacy rate of the state is 63.1 per cent as compared to the national average of 64.8 per cent. Orissa being an agrarian economy most of its residents live in rural areas. In 2001 Census, fifteen per cent of state's total population lived in urban areas as compared to national average of 28 per cent. However, here it may be noted that urban population in the state have been growing at a rate parallel to the national growth rate in last two to three decades. Number of towns in the state has increased from 124 in 1991 to 138 in 2001.

2.3. Origin and History of Urban Centres in Orissa

Throughout human history, towns and cities have been considered as important centres society transformation. They have set the platform for economic, social, cultural and political change. Though the present state of urban scenario is largely the creation of last century and accelerated by industrialisation and later globalisation, their origin is traced long back during early stage of human habitation especially at the places of favourable geographical conditions. India's urbanisation history is traced during Indus Valley Civilisation dating back to 2350 B.C.

Orissa has a very rich culture and traditions dated back to hoary past. Also known by its old names of Kalinga, Utkal and Odra, in the past the state's boundary extended far beyond the present one. Frequent reference is made to Kalinga in the 'Mahabharata' and by the time of 5^{th} Century B.C. Kalinga-Utkal region on the eastern coast of India, had acquired recognition and fame. Orissa in the early centuries before the Christian era owing to exploitation and use of iron ore and development of agriculture underwent transformation in the economic fields. As a result of economic development, urban settlement like Tosali (presently Dhauli), Samapa (Jaguada) an others came into prominence. Being the chief centres of trade, administration, economy these urban centres played dominant role in shaping the destiny of ancient Orissa and in its foreign relations. The evidence of urban settlements in coastal Orissa comes from the excavations at Dhauli and Jaugada which were also the political nerve centres of Kalinga under Ashoka Maurya.

Similarly, the excavation conducted at Dhauli supplemented to the fact that during the period of Ashoka there was the progress of urbanisation in Orissa. The process of urbanisation and emergence of urban centres probably encouraged the merchants of Kalinga to carry on trans - oceanic commerce in ancient times..The increased trade and commercial interactions led to establishment of many other allied activities and small towns or large villages surrounding the chief urban centres.

The systematic excavation at Sisupalagarh near Bhubaneswar provided concrete evidence of a well planned early historical fortified city of Orissa. Other important identified are Tosali, the provincial capital of the emperor Ashoka and Kalinganagari, the capital city of the Chedi dynasty under Kharavela. These cities were under occupation between 3rd Century B.C. to the middle of the 4th century A.D. The early centres of religion are found to be one of the most inhabited places in the past where large number of followers of any spiritual leaders concentrated and in due course of time turned into places of attraction. The early Buddhist sites of Lalitgiri and Udayagiri are reported to have overseas links with southeast Asia and China. Other important urban trade centres were Sisupalagarh near Bhubaneswar, Manikpatna on the bank of Chilika Coast and Rsdhanagara. The emergence of the urban and important centres of habitation is attributable to the nearness to the coast, places of abundant resources or the administrative centres.

In the interior western Orissa, Asurgarh in Kalahandi was one of the early urban centres. Literally meant by the 'fort of demons' the town Asurgarh is a very ancient in the history and culture of western Orissa. Indeed, forts bearing names Asurgarh are found in different parts of western Orissa usually on the bank of the river or in the outskirts of the village or towns.[1] As instances of well organised and systematic urban development with proper planning has been traced even during very ancient times, historical evidence showed the unique water management system in Asurgarh. The inhabitants of the towns realised the importance of water.

Two such huge tanks in Western Orissa have been identified, one at Maraguda urban complex in Nuapara district and the other at Asurgarh urban centre in Kalahandi district. Asursagar also known as Udit Sagar, has covered an area of more than 200

[1] Singh. P.K. , *'Asurgarh -an early urban centre of Orissa'* , Orissa Historical Research Journal, Vol. XLVII, No.3. pp 49

acres of land.11 Its alignment is from east to west exactly corroborating the cardinal directions of tank as outlined by Varahamihira (6th century A.D.)[2]. The fact that many early urban centres in Orissa were located on the confluence or bank of rivers confirms that water sources were a vital contributing factor for urban development in ancient Orissa. The water gallery found in early Indian urban centres and forts invariably circumscribed. Sanskrit and Pali literatures as well as *Vastusastras* exhibit moat, ditch or natural water barriers as safety valve of defence for the fort or the capital city.[3]

Orissa, a land of temples and old towns is rich in its historical and cultural heritage. It is now on the threshold of large scale urbanisation and industrialisation. Some of the towns like Puri (Shri Purushotampur) and Jajpur (Viragu nagari) are mentioned in Hindu mythology as seats of culture and tradition. In the past, most of the towns in Orissa have originated along the side of rivers because the rivers acted the principal means of communication and transport. Many of them have developed at the water points either as trade centres or as seats of administration. Like many earliest urban centres in the world, the security concerns were also considered and therefore the town building process took not of that and started to develop along the side of rivers as it provided the much needed natural defence. Mahanadi, the longest, the broadest and deepest of all rivers in the state, accounts for 30.6 per cent of towns and 34.2 per cent of urban population. The Rushikulya, the Brahmani and the Baitarani come next in order in this respect.[4]

Better water facilities, transport and communities, developed agriculture along with a high pressure of population, more number of towns and cities were developed the coastal areas than to the western interior region. Moreover port facilities in Orissa and its maritime relations with overseas countries acted as the catalyst for the growth and emergence of new towns in this region.

Most of the old towns were the seats of administration or centres of Hindu religion. The fact that a large number of towns in Orissa bear the suffix 'garh' (for example Athgarh, Bargarh, Deogarh, Keonjhargarh) which means fort tells about the presence of many provinces and the importance of old forts. In fact they formed the nucleus of

---

[2] Behera , S.C. , (Ed.), *Asurgarh Interim Excavation Reports* , Sambalpur University, 1982 ,p. 7.
[3] Clark , G. , *Water In Antiquity* , Vol. XVII , 1944 , P. 69.
[4] Sinha.B.N., '*Geography of Orissa*' (1999), National Book Trust of India, pp. 185

urban development in the state. The prominent religious centres were Puri, Jajpur, Kendrapara. The holy city of Puri still continues to be on of the large towns of Orissa though the other two had lost their prominence to some extent in subsequent years. Cuttack, the old capital of orissa, has been the leading town in almost all fields from the very beginning and remains its dominance in present time too. Katak (Cuttack), being the capotal city of Utkala, has been the nerve- centre of orissan history, politics and culture since 989 A.D. witnessing the rule of the Somavamsis, the Gangas, the Gajapatis, the Afghans, the Mughals, the Marathas, the British and finally the elected democratic Government of Independent Orissa.[5] Being the business hub of Orissa it has maintained its commercial supremacy.

Dhauli, located near Bhuabaneswar was an important urban centre during the period of Ashoka'rule and its famous rock edict is well known. The site contains a large number of artefacts which clearly suggest the development of urban culture in ancient days.[6] Jaugada, on the bank of Rushikulya river was one of the earliest urban centres. This town located near the present town Brahmapur held the centre stage of the Rushikulya Valley Civilisation. .Jajpur Town is one of the oldest cities of Orissa. It was the capital of Orissa (Utkala) during the reign of Keshari Dynasty (12-13th. century AD).

These historical fort cities and religious towns gradually lost their prominence except the diversified business and administrative centres. Cuttack, Sambalpur and Brahmapur served as the chief nodal centres of three broad regions of Orissa- coastal, western and southern Orissa respectively. Orissa known much for its mining and natural resources availability, it attracted the investors and foreign rulers. Thus the places of mineral resources like Keonjhar, Talcher, Rajgangpur, Sunabeda etc, continued their urban status. Small and medium towns dominated the urban scenario of the state till Independence of India. There were 14 towns in India in 1901 and this increased to 24 in 1921. Though state's total population decreased in the decade of 1911-1921, the urban population increased by 2.3 per cent and in contrast the number of towns became one less. The number of towns increased to 39 in 1951 when the largest town of the state Cuttack City was labelled as class I city by the Census of

---

[5] Dehuri. Dinabandhu (2007), ' *Cuttack City : Promotion of Education in Orissa in the Pre-Independence Era* ' Orissa Review, Feb-March, 2007, pp.48

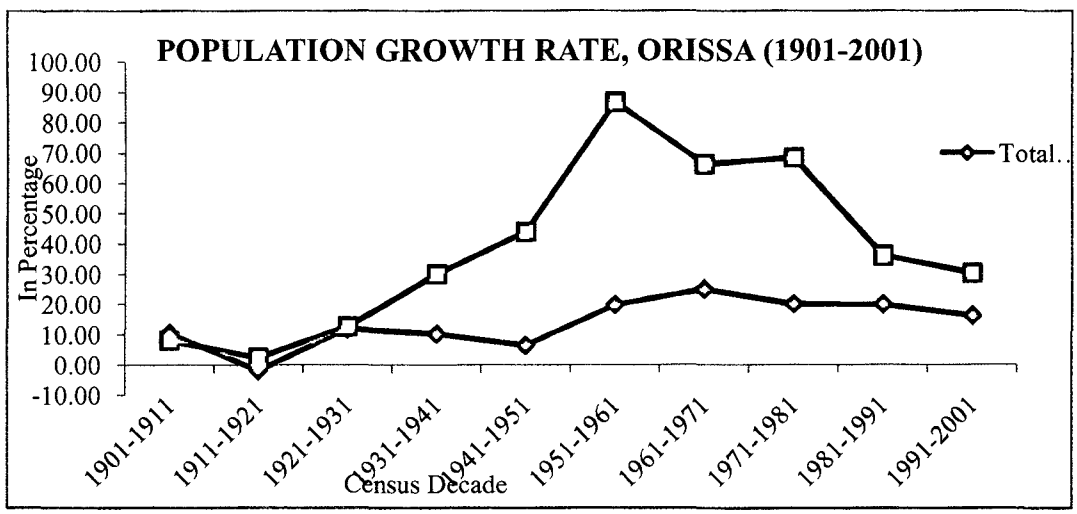
[6] Patra.B. , ' Dhauli: An Historical Urban Centre of Orissa', Orissa Review, July- 2006, pp. 49

India. During this period, the port towns Gopalpur, Paradeep, Chandbali were developed. Few towns have also developed because of the generation of hydel power. Machkund, Balimelanagar, and Rengali were prominent among them. In 1956, capital was shifted to Bhubaneswar from the old historical city of Cuttack. The state's new capital is the best planned town in the country, next only to Chandigarh.

2.4. Population Growth and Process of Urbanisation

The urban population of Orissa has increased at a larger pace than the state's total population in each successive decade except 1901-1911.Till 1931, there had not been much difference in the growth rates of urban population and total population of the state. The urban population grew at a rate of three times higher than that of total population during 1941 as the number of towns increased from 21 in 1931 to 29 in 1941.

Fig: 2.1



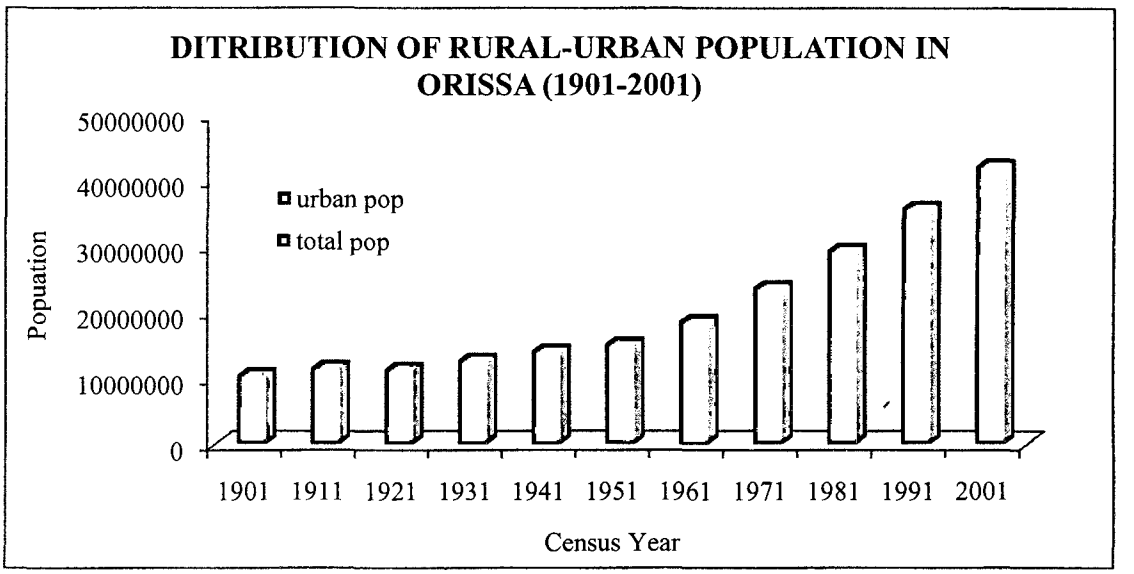
SoSource: Census of India, 2001, General Population Totals, Orissa, Series, 21

In the next decade this difference even furthered as urban population growth rate (44.01 per cent) was more than seven times higher than total population growth of just 6.38 per cent. As the figure 2.1 suggests, the urban population kept on growing at a much higher pace than total population till 1981. Though, in last two decades their difference has narrowed still urban population continues to grow at a much higher pace.

In spite of high growth rate of urban population in Orissa, it comes under the list of low urbanised states of India. The rural urban distribution of population shown in

figure 2.2 revealed the very small proportion of the urban population in total population of the state. In fact, the state seemed to be urban only after Independence as the proportion of urban population was very little till 1951.

Fig: 2.2



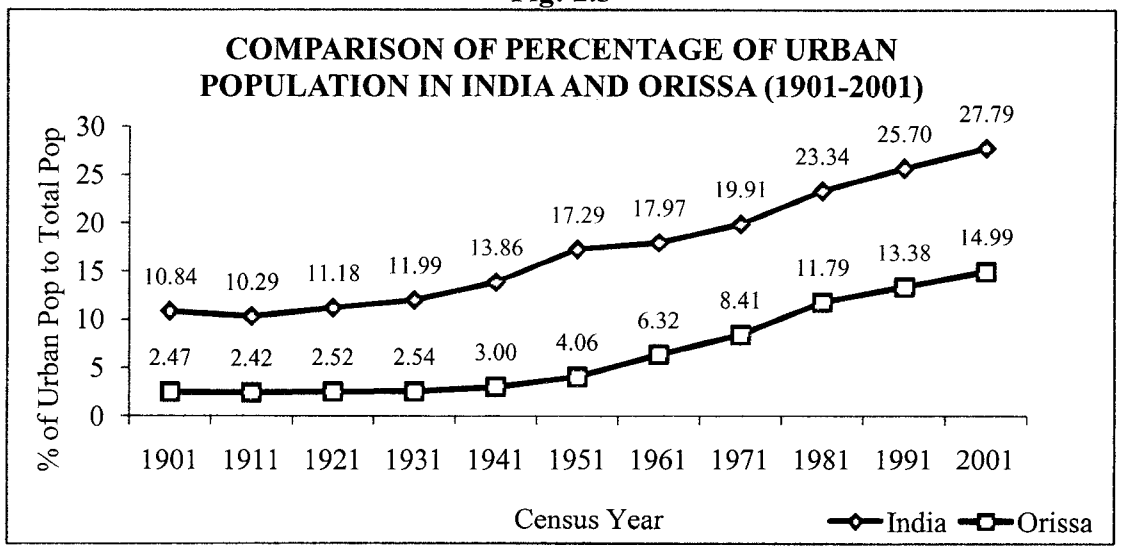
Source: census of India, 2001, General Population Totals, Orissa, Series, 21

2.5. Degree of Urbanisation

The degree or level of urbanisation in a state is measured in a number of ways. The most common and understood criterion is the percentage of urban population to the total population[7]. The percent urban population may theoretically range from is 0 to unity. But this situation is not a reality. Fig: 2.3 shows the comparative picture of the level of urbanisation in Orissa and India. The percentage of population living in urban areas of the state is very starting from the very beginning of the 20th century as level of urbanisation stood at meagre 2.47 per cent to total population. As shown in the fig:2.3, the level of urbanisation remained practically same till 1931 as it changed by only 0.06 units during 1901 to 1931.It is interesting to note that the trajectory of curve of urbanisation level have been mostly identical exhibiting little fluctuations in 1940s and 1950s.

[7] Dutta.P (2006), ' Urbanisation in India ' , Abstract of the paper at European Population Conference, 21-24 June, 2006. Pp. 5

Fig: 2.3



Source: census of India, 2001, General Population Totals, Orissa, Series, 21

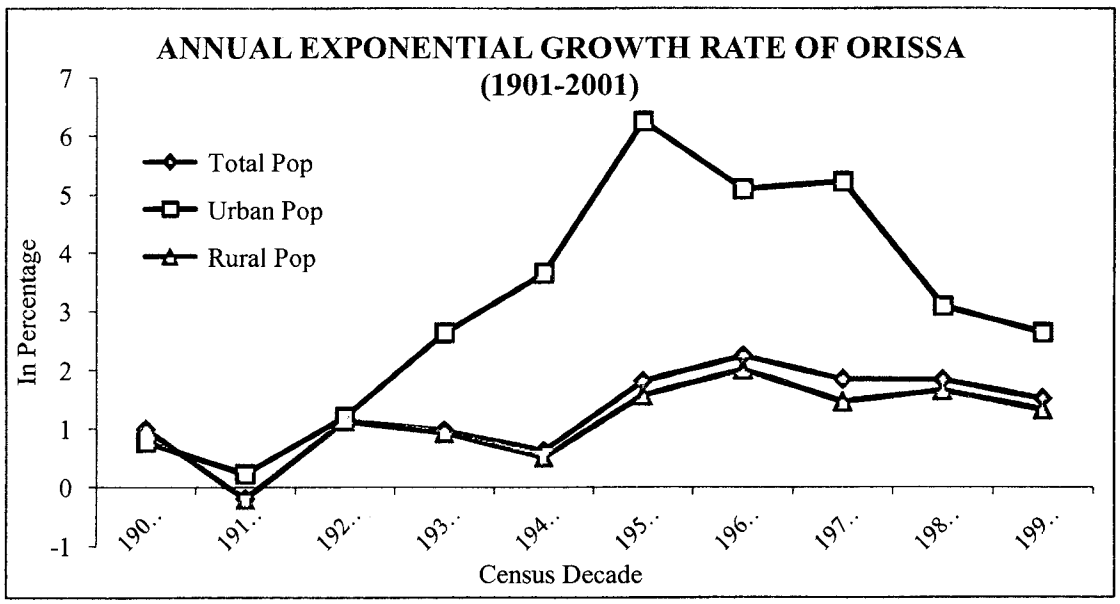
Moreover, it seems like the status of Orissa is same as the status of India among developing countries of the world. This may be further explained that India is known as one of the low urbanised countries though its urban growth is quite high during last few decades. Orissa is placed in a corresponding state of affairs in India among its states. After Independence level of urbanisation grew faster and it increased from 4.1 per cent to 8.4 per cent in 1971. In the next decade it went by more than three percentage units, highest in its urban history. Still a large proportion of the state lives in rural areas as urban population accounted only fifteen per cent as compared to the national average of 27.8 per cent. The coastal districts are more urbanised than interior districts and this is explained by the old tradition of lack of developmental activities in western Orissa.

2.6. Pace of Urbanisation

Urbanisation in Orissa has been relatively slow compared to many industrialised developed states of India. Fig.2.4 reveals that the percentage of annual exponential growth rate of urban population has recorded consistent increase except a marginal decline during 1901-1911 and 1991-2001. The maximum increase in the growth rate of urban population has recorded in 1950s. This phenomenon is explained by the reclassification of town groups. This trend again departured in 1971 and this is attributed to the new definitional criteria of towns adopted by 1961 Census. So

declassification of towns has led to the deceleration of the growth rate of urban population.

Fig: 2.4



Source: census of India, 2001, General Population Totals, Orissa, Series, 21

Post 1971, a consistent decrease in the annual growth rate of urban population has been witnessed upto 2001.The 1991-2001 decade posted a major significant decline in annual urban population growth rate. Unsurprisingly, the annual growth rate of urban population is more than the total population growth rate which is more than that of rural. The rural and total population has passed through same kind of trajectory path in terms of their annual exponential growth rate though rural population grew relatively slower than total population in post independence period.

2.7. Urban Growth by Size Class

Here, urban growth by size class basically refers to the growth in number of towns of different size and the proportion of urban population residing among them. Indian Census classifies the towns on the basis of their

Table: 2.1

Classification of Towns by Size Class

Size Class	Population
I	100,000 and above
II	50,000 – 99,999
III	20,000 – 49,999
IV	10,000 – 19,999
V	5000 – 9,999
VI	Below 5,000

population size as shown in the table:2.1. India's urbanisation reflects a top heavy structure suggesting the dominance of big cities which accommodate disproportionately high proportion of urban population. In contrast to that, a greater share of Orissa's population had been living in small and medium towns. Though Orissa reported to have a long history of urbanisation, first class town emerged in Orissa only in post Independence period in 1951.The number of towns have been successively growing in each census year as evidenced by the table 2.2. The number of towns increased almost three times from just 14 in 1901 to 39 in 1941.Analysing the growth of number of towns and distributional pattern among size class of towns, it has been found that real impetus of urbanisation started during late 1950s and early 1960s. The trend of larger urban population residing in small and medium towns got a departure and large towns started to grow at the expense of others and small towns in particular. Till, 1961, Cuttack was the only city having a population more than one lakh and in the next Census, four class I cities were recorded such as twin cities of Cuttack and Bhubaneswar, state's capital, Rourkela as leading industrialised city and Brahmapur which is known as very old nodal centre of Southern Orissa.

Table: 2.2

Size Class of Towns and Urban Population in Orissa

CENSUS YEAR	All Towns	Class I		Class II		Class III		Class IV		Class V		Class VI	
		Towns	Pop (in %)	Towns	Pop (in %)	Towns	Pop (in %)	Towns	Pop (in %)	Towns	Pop (in %)	Towns	Pop (in %)
1901	14	---	---	1	20.17	3	37.67	5	29.87	4	10.56	1	1.73
1911	24	---	---	1	19.09	5	33.62	6	28.09	9	14.21	3	4.99
1921	20	---	---	1	18.12	2	25.38	6	33.09	9	20.54	2	2.87
1931	21	---	---	1	20.57	3	30.07	6	26.78	10	21.53	1	1.05
1941	29	---	---	1	18.01	3	25.60	8	27.53	16	27.93	1	0.93
1951	39	1	17.26	1	10.49	5	23.24	8	18.15	23	30.03	1	0.83
1961	62	1	13.19	3	20.55	8	20.27	22	27.99	25	17.13	3	0.87
1971	81	4	30.04	2	7.97	20	31.72	23	17.13	30	12.69	2	0.45
1981	108	6	35.53	8	15.86	26	24.44	40	17.42	25	6.31	3	0.44
1991	124	8	41.86	10	14.65	29	21.99	52	17.28	22	3.94	3	0.28
2001	138	9	45.61	15	18.03	36	19.92	48	12.82	24	3.16	6	0.45

Source: census of India, 2001, General Population Totals, Orissa, Series, 21

Since then, total number of towns has been continuously increasing especially the large and medium towns. Conversely, the number of Class V towns declined steadily while the total number of towns increased from 81 to 108 in 1981. The holy City of Puri, western Orissa's chief nodal centres Sambalpur and Rourkela Civil township qualified as Class I towns in 1981.According to latest Census, 2001, the total number of towns was 138 with 9 Class I towns, 15 Class II towns, 36 Class III towns , 48 Class IV towns, 24 Class V and 6 Class 6 towns.

Fig: 2.5 and Fig: 2.6 present the percentage distribution of towns and pattern of distribution of urban population residing in different size of towns. Orissa having no class I city till 1941, as evidenced by Fig: 2.5, around 40 per cent of all towns in the state are class V towns and quite interestingly in 1951, they constituted 59 per cent of all towns in the state. Also, small towns accommodated 40 per cent of urban population till late 1940s and in specific class III towns constituted large proportion of urban population which reflects that the early few urban centres in the form of princely headquarters or regional market centres were the major towns of urban activities. Absence of systematic urban growth is noticed till the time of Independence. A thorough investigation of figures 2.5 and 2.6 presents three broadly distinct phase of urban growth by size class and pattern of urban population distribution. In first phase, 'lower middle and bigger small' towns (i.e. Class III & IV towns) accommodated maximum proportion of urban population and maximum number of towns were reported to be in the category of Class III, IV and V group. This trend continued till late 1940s. In the second phase in upto 1961, big towns developed at the expense of small towns while medium towns remained more or less unchanged. In the third phase, the trend started to follow an altogether different pattern as Class I and II towns emerged and they accommodated larger proportion of urban population too. Rightfully, later part of analysis of this study has focused this phase (1971-2001) of urban process and development which indicates the recent high urban growth and is expected to follow this trend in next few decades at least. Clear disproportionate distribution of urban population in few big cities like Bhubaneswar, Cuttack, Brahmapur, Rourkela, Puri, Sambalpur, Baripada etc is noticed and next order medium towns managed to maintain their tempo with little fluctuations and this has

caused gradual diminish of small towns. Moreover, it may also be attributed to the fact that not many new towns were added and small towns moved to next higher category.

Since 1971, Class I towns kept growing at the expense of Class III and V towns and rest recorded little variations. The number of Class I towns increased from 4 in 1971 to 9 in 2001 and proportion of urban population living there went up from 30 per cent to 45 per cent. With the fall in number of small towns which pocketed 30 per cent of urban population in 1971 and it decreased almost half to 16 per cent in 2001 whereas the share of medium town witnessed just 1.74 units in percentage change.

2.8. Rank Size Pattern of Towns

The rank-size rule is an empirical regularity found in the urban system of many countries of the world.[8] According to this rule, the population of a town is related with its rank in the form of Pareto's distribution model which is discussed in methodological part in first chapter. Though, this rule is more fitted with developed countries having an old tradition, wide use of this formula is practiced in urban research. This technique is credited to well known scholar G.K.Zipf who popularised this in his book 'Human Behaviour and the Principle of Least Effort'.

This rule was applied to the towns separately for the year 1971, 1981, 1991 and 2001 and estimated population was plotted along with actual population against their respective ranks. Scatter diagram of application of rank size rule for all the towns in 1971 presented in fig: 2.7 shows that largest towns at the top and smallest towns at the bottom are the underpopulated towns. Interestingly, Gopalpur, the smallest towns had the largest difference (44 per cent) between actual population and estimated population followed by the largest city, Cuttack which was found to be having 33 per cent less population than estimated population. Among other class I towns, Rourkela Steel Township was underpopulated while the population of Bhubaneswar was found to have 21 per cent less than the estimated population. Almost half of class III towns are overpopulated and rest.

---

[8] Mahmood.A. ' *Statistical Methods in Geographical Analysis'* , rajesh Publications, New Delhi, 2002, pp.75

Fig: 2.5

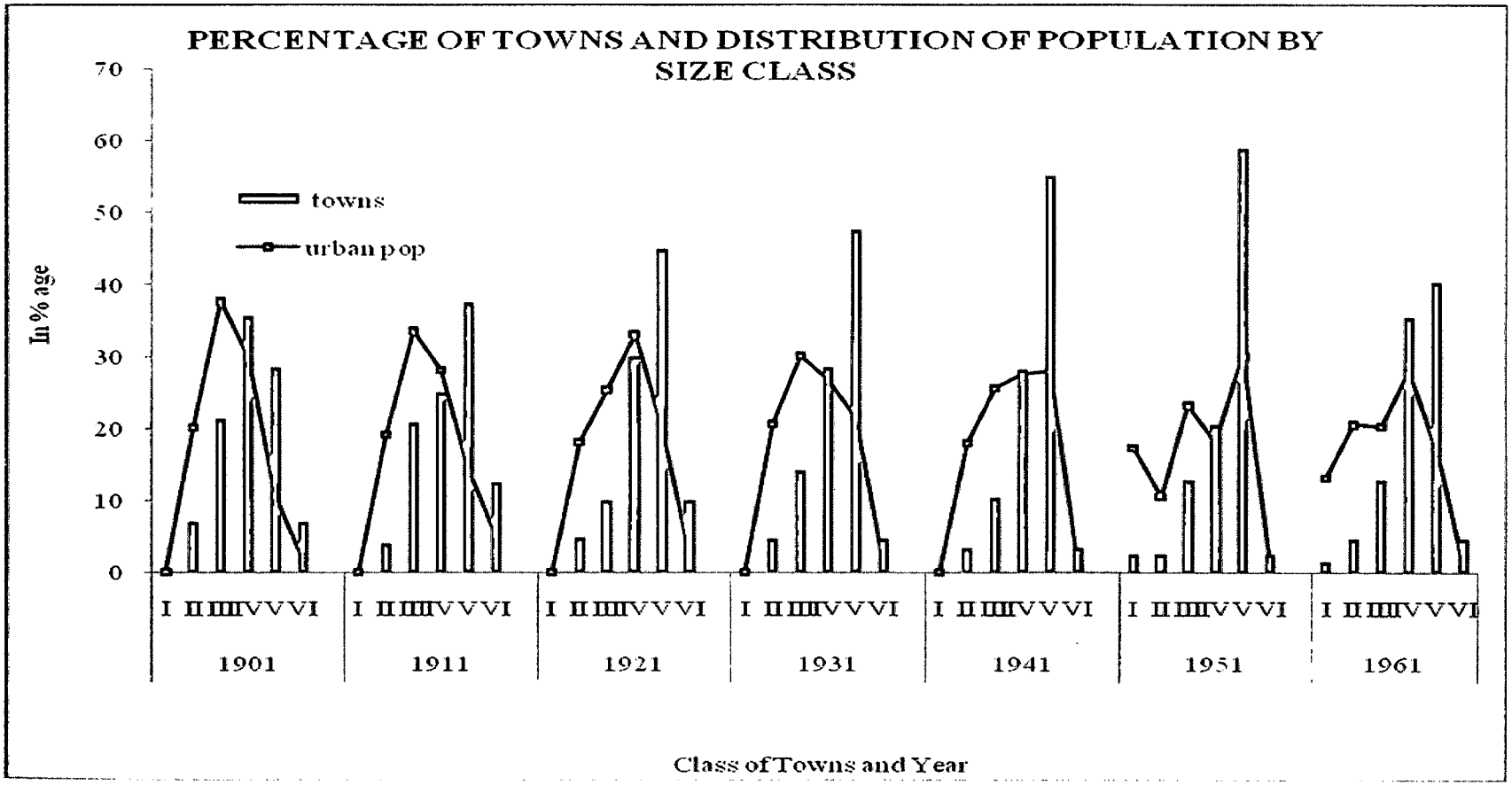
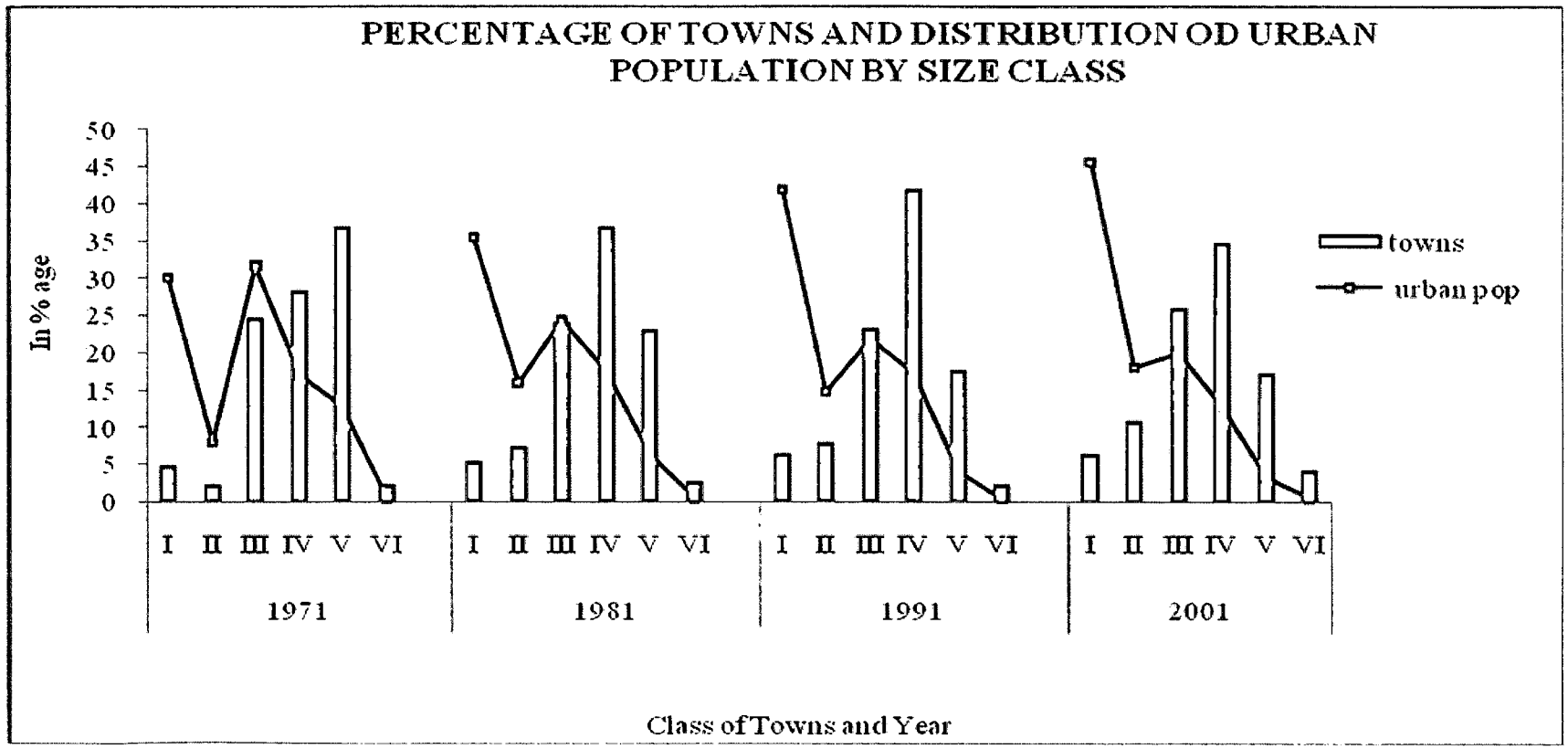

PERCENTAGE OF TOWNS AND DISTRIBUTION OF POPULATION BY SIZE CLASS
70
60
50
40
30
20
10
0
towns
urban pop
In % age
I II III IV V VI
1901
1911
1921
1931
1941
1951
1961
Class of Towns and Year

Fig: 2.6


PERCENTAGE OF TOWNS AND DISTRIBUTION OD URBAN POPULATION BY SIZE CLASS
In % age
50
45
40
35
30
25
20
15
10
5
0
towns
urban pop
I II III IV V VI
1971
1981
1991
2001
Class of Towns and Year

RANK SIZE RELATIONSHIP OF TOWNS IN ORISSA , 1971-2001

Fig:2.7

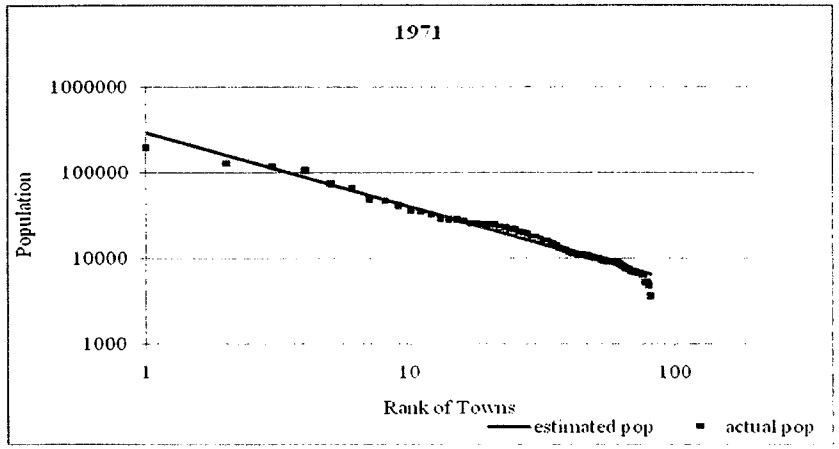


Fig:2.8

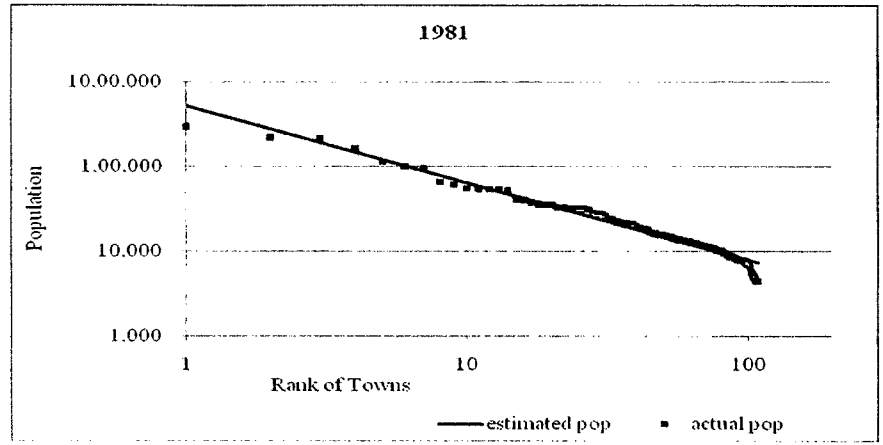


Fig:2.9

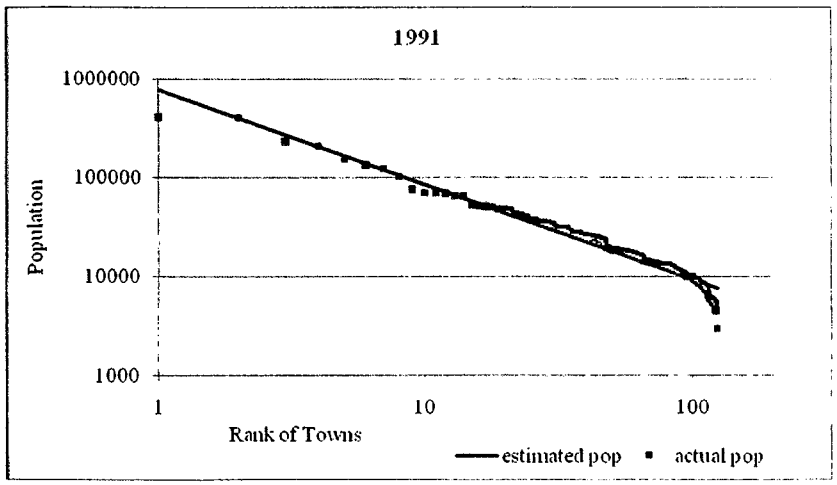
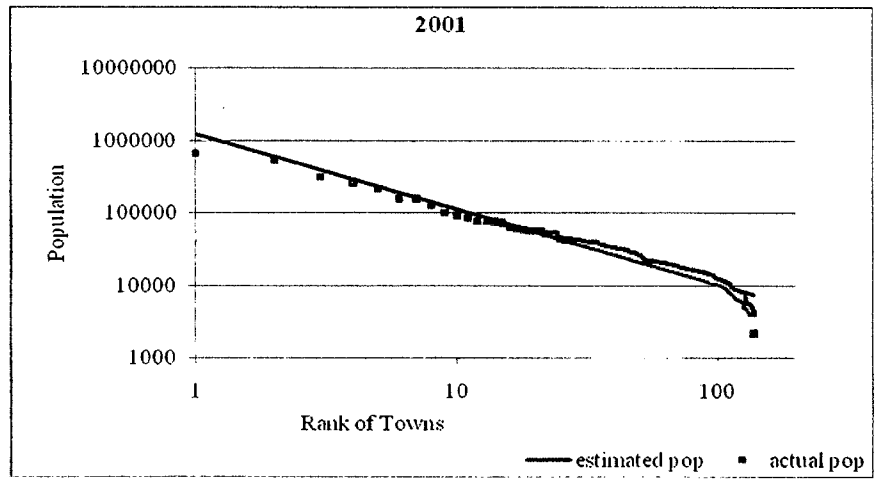


Fig:2.10



half remained in other side. Thus, by and large medium towns fitted nearer to the rank size rule distribution pattern while extreme ends deviated more both ways i.e. overpopulated and underpopulated. Fig: 2.8 suggests more or less similar trend for the towns in 1981 except much deviation of few Class III towns. Smallest towns were found to having higher positive deviation from estimated population and it is explained by the fact that most of them were census towns having a population base of below five thousand which is one of the criteria for a place to qualify as a town.

In 2001, more number of bigger towns of the state continued to have less population than their respective estimated population as all class I and II towns within a deviation range of 5 per cent to 45 per cent except four Class II towns as evidenced by the fig: 2.10. Maximum of Class III, IV and V towns are over populated with Purusottampur having highest deviation negative 22 per cent followed by Remuna, Soro, Pipili. The Smallest census town O.C.L.Township had a deviation of more than double of its actual population itself as it is 71 per cent under populated. Fig.2.9 showing distribution of population in 1991 suggested an intermediary stage between that seen in 1971 and 2001. The analysis of rank size distribution of towns in last three decades suggested that top big cities did not act as the way they would have done in developed advanced nations whereas the smallest cities accommodated much more than their estimated population. Here, it may be noted that this is why there is not a million plus city in the state not even the state capital whose population is compensated by small industrial and mining towns.

2.9. Nearest Neighbour Analysis

The uniform distribution of urban places as postulated by Christaller's central place theory has stimulated considerable interest in pattern analysis.[9]Out of this interest has evolved a growing awareness among geographers to study the spatial pattern of urban places in the real world[10]. The evolution of the settlement pattern of any area is governed

[9] Christaller. W. (1933), ' The Hostory of Central Places in Southern Germany', translated by C.baakin, 1966, (Englwood Cliffs:Prentice Hall)

[10] Thakur.B, 'Nearest Neighbour Analysis: As a Measure of Urban Place Paterns" *Indian Geographical Studies*, Res. Bull, 1, pp.58

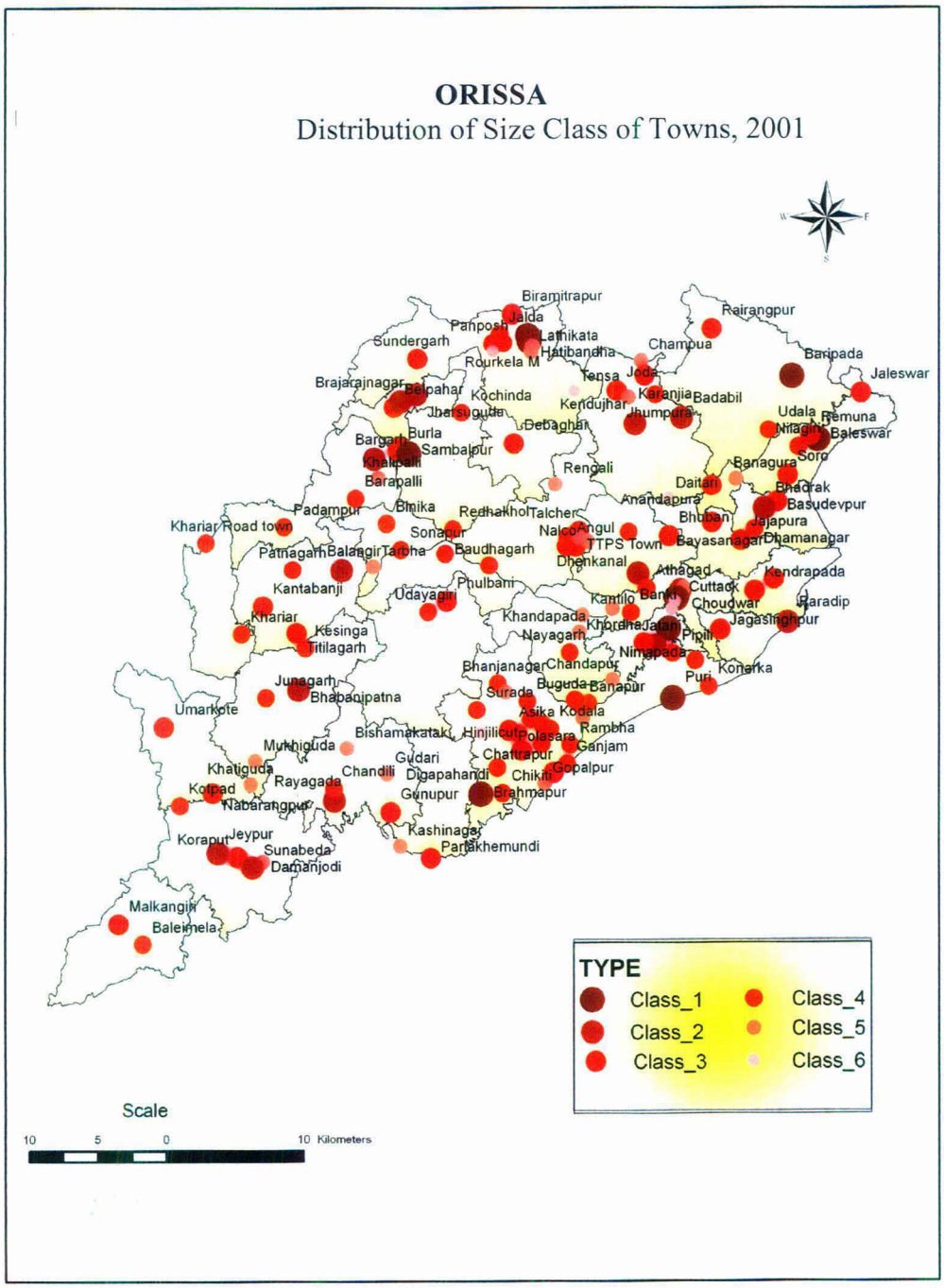
by a number of factors which vary from one region to another and hence we get varying pattern in the spatial distribution of settlements. Nearest Neighbour analysis helps in distinguishing three types of distribution pattern namely: (1) uniform, (2) random and (3) clustered. Much of the pioneering work of this kind in Geography has been done by King and Dacey.[11]

This method was originally devised by plant ecologists Clark and Evans[12] who applied the formula to an analysis of the species of plant communities. The nearest neighbour method is useful for analysing point patterns as it serves for a test of randomness.[13]. This method has been used to study spatial distribution of urban settlements in Orissa and the attempted to trace the change during 1971-2001. To present the distribution pattern, the nearest neighbour index(R) has been calculated. This *R* is the ratio of the actual mean difference between nearest neighbour points in a given area (D_r) to the mean expected distance of random distribution of the same number of points in the same area i.e. (D_0), detailed methodological part is given in first chapter. This index (*R*) is a measure of the degree of departure from randomness in either of the two directions: towards uniformity or towards clustering. The statistical value of 'R' ranges from 0 to 2.1491. if all the values are clustered at one place then the 'R' would be equal to 0; a 'R' value of 2.1491 suggests an uniform pattern and if all r spaced randomly then 'R' would be equal to 1. Firstly, all the settlement units were shown as points and nearest town of each town was identified and following the formula of nearest neighbour technique, the nearest neighbour index was calculated which is shown in the table 2.3. In 1971, statistical value of 'R' was found to be 1.0660 which suggested that the towns are spaced randomly. There were 81 towns altogether in 1981 in Orissa and their spatial distribution pattern was random with two selective areas of clustering. The state capital, Bhuabaneswar was surrounded by Cuttack

[11] Dacey.M.P., 'Analysis Of Central Place And Point Pattern By Nearest Neighbour Method' *Land Studies in Geography Series B, Human Geography* 24 (1962), 55-75 and King.L.J, 'A Quantative Expression of the Pattern of Urban Settlements in the Selected Areas of United States', *Tijdsschrift voor Economische en Sociale Geografic,* Vol. 53, 1961, pp.1-7

[12] Clark.P.J and evans.F.C. : ' Distance to Nearest Neighbour as a measure of spatial Relationships in populations', *Ecology*, 35:4 (1954), pp.445-53

[13] Thakur.B., .ibid..pp.59


ORISSA
Distribution of Size Class of Towns, 2001
Biramitrapur
Rairangpur
Jaida
Panposh
Lathikata
Champua
Sundergarh
Hatibandha
Baripada
Rourkela M
Tensa
Jaleswar
Brajarajnagar
Belpahar
Kochinda
Karanjia
Badabil
Kendujhar
Jhumpura
Udala
Jharsuguda
Deogarh
Nilagiri
Remuna
Baleswar
Burla
Bargarh
Sambalpur
Soro
Khaliapali
Rengali
Banagura
Barapalli
Daitari
Bhadrak
Padampur
Bhika
Redhakhol
Talcher
Anandapura
Basudevpur
Kharian Road town
Sonapur
Nalco
Angul
Bhuban
Jajapura
Patnagarh
Balangir
Tarbha
Baudhagarh
TTPS Town
Bayasanagar
Dhamanagar
Dhenkanal
Athagad
Kantabanji
Phulbani
Cuttack
Kendrapada
Udayagiri
Kantilo
Banki
Choudwar
Paradip
Khariar
Khandapada
Khordha
Jagasinghpur
Kesinga
Nayagarh
Jatani
Pipili
Titilagarh
Nimapada
Bhanjanagar
Chandapur
Konarka
Junagarh
Surada
Buguda
Banapur
Puri
Bhabanipatna
Umarkote
Asika
Kodala
Bishamakatak
Hinjilicut
Polasara
Rambha
Mukhiguda
Ganjam
Chatrapur
Gudari
Khatiguda
Chandili
Digapahandi
Gopalpur
Rayagada
Chikiti
Koraput
Gunupur
Brahmapur
Nabarangpur
Jeypur
Kashinagar
Sunabeda
Parlakhemundi
Damanjodi
Malkangiri
Balimela
TYPE
Class_1
Class_2
Class_3
Class_4
Class_5
Class_6
Scale
10 5 0 10 Kilometers

and few other small towns and another clustering of towns were noticed in Ganjam district where the district headquarter Brahmapur was surrounded by port towns og Gopalpur and other small and medium towns. Apart from few other groupings of 2-3 closely located towns, rest of the towns wee randomly spaced.

Table: 2.3

Nearest Neighbour Analysis of Towns in Orissa

Year	r_E	r_A	R	Pattern
1971	21.9273	23.3745	1.0660	Random
1981	18.9851	19.8765	1.0470	Random
1991	17.7179	19.8118	1.1182	Random
2001	16.7952	19.6618	1.1707	Random (approaching uniform)

Source: Compiled from the Census of india, Town Directory, Orissa, 1971, 1981, 1991, 2001

No major change in the spatial distribution of towns were observed in 1981 from that of 1971 as evidenced by 'R' value. The major striking change noticed was the development of few mining and industrial towns such as Deral colliery Township, F.C.I Township, Talcher Thermal Power Station Township surrounding Angul. In 1991, the spatial distribution of towns in Orissa as a whole approached towards uniformity as the 'R' value increased to 1.1182. The coastal Orissa witnessed a more densely distribution of towns as few more small towns developed around big market centres and others of administrative and allied activities. In western Orissa, towns were randomly distributed except few industrial clusters surrounding steel City of rourkela in Sundergarh district and Keonjhar in northern Orissa..This advance towards uniform distribution of settlements continued in 2001 also as evidenced by the 'R' value shown in the table: 2.3. In 2001, towns located in the central region of Orissa were more spacious than in wetern most parts and their spatial distribution approached towards clustering in Coastal region. Thus, by and large the

spatial distribution of towns in 2001 approached towards uniformity starting from randomness in 1971.

2.8 Conclusion

The origin and development of towns and process of urbanisation is traced long ago but it failed to continue and modern day urbanisation more driven by industrialisation and all round development of economy during the early and middle part of 20th century.Till 1971, its level of urbanisation was not able to reach the double digit figure and small and medium towns dominated the urban scenario of the state except tw or three big cities.Nevertheless, the number of towns kept on increasing consistently and the state's urban population growth rate paralleled the national average in last three decaded or so. Though process of urbanisation was gained currency much late, it has been gaining momentum in recent past and expected to follow this in near future. Moreover, few big coastal cities like Bhubaneswar, Cuttack, Baleshwar, Puri and other cities like Rourkela, Brahmapur, Sambalpur, Baripada dominated the urban structure of the state and remained as the more attracted destination for people movng towards urban centres in the state.The total number of towns in the state increased from 39 in 1951 to 138 in 2001 . The nine big cities of the state accomodated 46 per cent of the total state's urban population in 2001. The urban population grew at a rate of 30 per cent during 1991-2001 as comapred to the total population growth of 16 per cent during the same period. Capital city of Bhuabaneswar is the biggest city in the state followed by Cuttack, Brahmapur and Rourkela. The spatial distribution of the towns in the state is approaching towards uniformity with few urban clusters of administrative and industrial cities and other diversified old cities of their own historical legacy like Cuttack and Brahmapur.

Chapter III

Socio-economic Characteristics of Towns

3.1 Introduction

The process of urbanisation is associated with societal transformations whereby demographic, economic, social, cultural aspects of population and region as a whole undergo changes. It is also a process of territorial reorganization in that it shifts the locations, as well as the characteristics, of population and production activities.[1] Understandably, towns and cities, the units of analysis in urban studies are the focal points of economic development and in that process, city characteristics such as sex ratio, literacy, structure of labour force, social heterogeneity etc. change with time. The rural urban migration, a major cause of urban growth is believed to be age and sex selective which makes the demographic and social characteristics of population of urban centres distinctive from their hinterland and rural areas. Zachariah's [2] study indicates selectivity in age, sex, marital status and family status. Also, more numbers of people get engaged in manufacturing and tertiary sector activities in cities and towns where economic base is largely driven by industrialisation. Moreover, a healthy urbanisation is expected to have better socio economic status of cities in terms of their demographic, economic, social attributes. In other words, the living conditions, and quality of life in city determines the future of urbanisation which is desired to create sustainable cities promoting better living conditions. In this chapter, few selected characteristics of the urban centres in Orissa are looked into and their temporal change is discussed vis-a-vis urban growth and their socioeconomic development status.

3.2 Sex Ratio

Sex ratio, the ratio between the numbers of population in both sexes is used as the most common method of analysis of gender equity. In India, sex ratio is generally defined as the number of females per thousand males and Indian Census provides data on this. The male dominated sex structure of population of India has been a cause of concern since last few decades and this is found to be more skewed in urban areas due to selective

[1] Little.K., (2004), *'Urbanisation as a social Process: an essay on movement and change in contemporary Africa'*, Routledge, 2004.

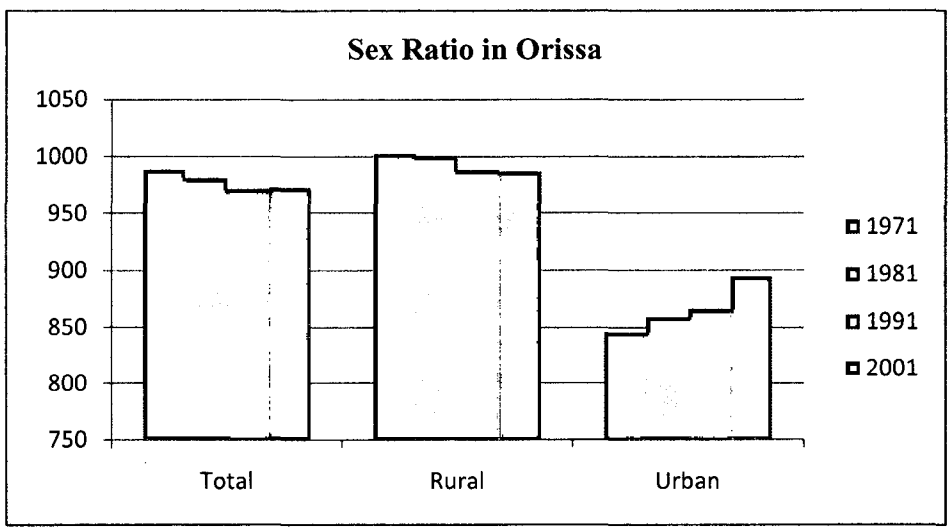
[2] Zachariah.K.C. (1968), 'Migrants in Greater Bombay', Asia Publishing House

migration towards urban areas. Women still possess less of a range of productive resources, including land, education, and financial resources[3]. The increasing gender sensitiveness has generated wide spread effort to bridge the gap between two sexes for equity of socioeconomic development. Gender inequalities lead to higher levels of malnutrition, poverty, illness, and other deprivations, with an adverse impact on the quality of life, productivity of farms and enterprises, and governance[4]. Till 1961, sex ratio in Orissa was quite favourable for females and it started to decline afterwards.

3.2. a. Sex Ratio in Orissa

Sex ratio in urban Orissa is quite low as compared to the state's figure whereas in rural areas the sex composition of population is found to be more or less balanced. In 1971, the sex ratio in urban areas was in an alarming state as there were as low as 845 females per thousand males. Nevertheless, sex ratio improved in successive census years and rural sex ratio witnessed a declining trend.

Fig: 3.1



[3] World Bank, (2000), 'Policy and Research Bulletin', July--September, Vol. II, No. 3.

[4] Human Development Report, Orissa (2004), Planning and Co-ordination Department, Government Orissa

Source: Census of India, Primary Census Abstract Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

In 1981, sex ratio in urban areas recorded an increase of fourteen points from that of 1971 and this trajectory bent down in 1991 showing an improvement of jus seven points. This state of affairs is explained by the fact that rural urban female migration in the state is higher than that of male. Moreover, the proportion of rural-urban female migration has increased over time which facilitated the improvement in sex ratio in urban centres. According 49th round of NSS data, rural urban female migration was 28.61 percent and it increased to 32.10 per cent in 55th round and further went up to 36.70 per cent in 64th round. Though this lacks the temporal appropriateness, it indicates the increasing trend of rural urban female migration in the state which serves as the causality of increasing sex ratio in urban Orissa. At this point, it is hard to find the exact cause of this, whether because of differential fertility trend in rural and urban areas or sex selective rural - urban migration. During 1991-2001, sex ratio in urban Orissa recorded a positive change of 29 points whereas rural areas recorded continuous decline in sex ratio 1971 onwards. The sex ratio in the state also declined successively except 1991-2001 when a marginal increase of one point is noticed.

3.2. b. Sex Ratio in Towns

Town wise analysis of sex ratio suggests a wide range of variation where large towns recorded low sex ratio compared to small and medium towns. In 1971, all four class I cities witnessed a sex ratio below 775 except Brahmapur where the corresponding figure was 931. There were only 724 females per thousand males in the capital city and this may be explained by the disproportionate male migration to the city being the most diversified and developed urban centre in the state. In 1971, Cuttack - the largest and oldest town in Orissa showed a sex ratio of 774 and even lesser proportion of females cohabited with males in Rourkela Steel Township which may be explained by its industrial base as chief economic functions. It is noteworthy to mention that the number of females were even less than half of males in the port city of Paradip (464), the lowest among all towns in Orissa in 1971. Paradip projected a sharp decline in sex ratio and similarly an imbalance

in the sex ratio in the 0-6 age-group has come to light.[5]. Other towns showing skewed sex ratio are Angul (596), Chowdwar (646), Jajpur Road (706), and Nayagarh (721). There were as many as ten towns where a sex ratio below 800 was recorded. In 1971, out of 81 towns, a sex ratio of less than 900 was witnessed in 36 towns. There were four towns- Bellaguntha (1044), Polasara (1038), Kotpad (1029), Purushottampur (1014) where females outnumbered males.

In 1981, again the small and medium towns exhibited fairly balanced sex ratio whereas large cities and class I towns showed low sex ratio. Moreover, purely industrial towns of places of certain dominant function witnessed low sex ratio as the prominent industrial activities of the towns preferably captured male workers. To name few of them having low sex ratio are Rengali Dam Project Township (609), Talcher Thermal Power Township (705), and Fertiliser Corporation of India Township (706).The lowest sex ratio again was recorded in Paradip (554) and Angul is the another town where low sex ratio has been a cause of concern since last few decades or so. Highest sex ratio of 1055 was found in Kotpad followed by Bellaguntha (1047), Kodala (1034), and Kashinagara (1032). There were eight towns having a sex ratio more than one thousand. It is interesting to note that Polasara and Tarbha are the two towns where the number of females is exactly equal to the number of males showing a sex ratio of 1000. Out of total 108 towns in 1981, in 51 towns there were less than 900 females per thousand males and a very skewed distribution of sex ratio was found among the towns.

Table: 3.1 shows the striking case of baffling figure of sex ratio in Paradip Phosphates where there were only 487 females per thousand males. Other towns showing extreme low sex ratio in the states are Damanjodi (663), Rengali Dam Project Township (686), Paradip (721). Among all class I cities, the state capital witnessed lowest sex ratio of 752 followed by Cuttack (798), Rourkela (802) and Brahmapur recorded highest of 922. Fifty towns out of total 124 towns exhibited sex ratio below 900 and there are six towns showing a sex ratio of more than 1000 which happened to be small towns. By and large, maximum towns in 1991 exhibited low sex ratio which remains a cause of concern.

[5] 'Dip In Port Town Population' – The Telegraph, 11th April 2011, Calcutta Edition

Continuing the improving trend of sex ratio, the number of towns having a sex ratio less than 800 declined to three in 2001 from 11 in 1991. The large cities of the state remained in the list of low sex ratio towns leading by Bhubaneswar (798). Out of total nine Class I towns, five witnessed a sex ratio less than 900 and Sambalpur recorded maximum of 929. Among all the towns of 138 in the state, the highest sex ratio was observed in G.Udayagiri (1056), followed by Kashinagara (1047), Bellaguntha (1018). The sex ratio in almost towns improved over time as per cent age of towns showing sex ratio below 900 declined from 40 in 1991 to 27 in 2001. The small towns except predominantly industrial centres showed higher sex ratio compared to the medium and large towns in Orissa. The lowest sex ratio was found in Dungamal (576) and interestingly the sex ratio of the state capital is the third lowest among all the towns in 2001. This is because the rural urban male migration to Bhubaneswar continued while other small towns of industrial activities witnessed improvement in proportion of population between two sexes.

3.2. c. Change in Sex Ratio

The sex ratio in urban Orissa is quite unfavourable to females and even lower than national average and the towns in the state exhibited skewed sex ratio where cases of half females to males are reported. The pattern of change in sex ratio is also highly fluctuating and skewed like prevalence of sex ratio in towns and cities. During 1971-1981 time period, on one hand, a change of over 100 pints in sex ratio is noticed in certain town and as many as 70 points decline in sex ratio occurred in some other on the other hand. The highest positive change of 105 points recorded in Burla followed by Angul (90), Jatni (85), and Chowdwar (76). It may be noted that the towns which had lowest sex ratio in 1971 witnessed maximum increase in sex ratio in 1981. There are as many as 11 towns that recorded an increase of over 50 points in sex ratio between 1971-1981. The highest decline in sex ratio was documented in Deogarh (-70 points). The towns that witnessed a declining trend of sex ratio in 1981 had fairly balanced sex ratio in 1971 barring few instances like Talcher, Kendujhor, Jharsuguda which happened to be industrial and mining towns. This is probably due to steady flow of male in-migrants to join the labour force. All the class I towns including Bhubaneswar showed betterment of sex ratio except

Brahmapur. Padampur is the only town where sex ratio remained unchanged during 1971-1981 and sex ratio declined in 29 towns out of total 81 towns. The highest increase (167 points) in sex ratio was observed in F.C.I.Township during 1981-1991. Other towns showing sharp increase in sex ratio between 1971– 1981 continued improving in the following decade as well. Sex ratio improved in sixty eight towns in 1991 out of total 108 towns in 1981. Majority of the towns recording maximum decline in sex ratio in the previous decade gained significantly in 1981-1991.During the same period, maximum decline in sex ratio was

Table: 3.1

Sex Ratio in Towns of Orissa							
Name of Town	Sex Ratio				Change in Sex Ratio		
	1971	1981	1991	2001	1971-1981	1981-1991	1991-2001
Anandapur	858	879	906	954	21	27	48
Anugul	596	686	804	820	90	118	16
Asika	957	938	944	934	-19	6	-10
Athagad	956	912	941	946	-44	29	5
Athmallik	-	-	-	940	-	-	-
Balagoda(bolani)	-	839	800	877	-	- 39	77
Balangir	913	922	901	932	9	-21	31
Baleshwar	832	868	867	903	36	-1	36
Balimela	-	846	918	936	-	72	18
Balugaon	-	-	899	892	-	-	-7
Banapur	-	955	963	972	-	8	9
Bangura	-	-	-	930	-	-	-
Banki	908	879	882	922	-29	3	40
Barapali	945	965	969	953	20	4	-16
Barbil	794	844	851	904	50	7	53
Bargarh	854	875	906	923	21	31	17
Baripada	808	838	853	878	30	15	25
Basudebpur	-	918	922	936	-	4	14
Baudhgarh	927	913	939	937	-14	26	-2
Belagachhia	-	-	-	952	-	-	-
Bellaguntha	1044	1047	1030	1018	3	- 17	-12
Belpahar	-	-	887	858	-	-	-29
Bhadrak	858	868	894	925	10	26	31
Bhanjanagar	916	923	948	931	7	25	-17
Bhawanipatna	901	897	893	921	-4	-4	28
Bhuban	925	943	917	936	18	-26	19
Bhubaneswar	724	756	752	798	32	-4	46

Binika	-	963	944	954	-	-19	10
Biramitrapur	942	953	931	971	11	-22	40
Bishamkatak	-	-	-	990	-	-	-
Brahmapur	931	924	922	919	-7	-2	-3
Brajarajnagar	807	863	861	909	56	-2	48
Buguda	993	1024	1008	975	31	-16	-33
Burla	724	829	850	907	105	21	57
Byasanagar	-	-	-	884	-	-	-
Champua	-	-	877	880	-	-	3
Chandabali	829	882	964	D*	53	82	-
Chandapur	-	-	-	980	-	-	-
Chandili	-	865	940	960	-	75	20
Charibatia	-	-	803	844	-	-	41
Chhatrapur	961	930	968	964	-31	38	-4
Chikiti	-	974	928	982	-	-46	54
Chitrakonda	-	878	949	D*	-	71	-
Choudwar	646	722	795	859	76	73	64
Cuttack	774	801	798	870	27	-3	72
Dadhapatna	-	-	-	888	-	-	-
Daitari	-	847	876	864	-	29	-12
Damanjodi	-	-	663	840	-	-	177
Debagarh	911	841	887	911	-70	46	24
Dera colliery township	-	735	774	831	-	39	57
Dhamanagar	-	-	-	973	-	-	-
Dhenkanal	791	817	852	892	26	35	40
Digapahandi	-	986	926	965	-	-60	39
Dungamal	-	-	-	576	-	-	-
F.C.I.Township	-	706	873	902	-	167	29
G.udayagiri	-	924	999	1056	-	75	57
Ganjam	-	929	937	946	-	8	9
Ghantapada	-	-	798	863	-	-	65
Gopalpur (CT)	-	-	887	D*	-	-	-
Gopalpur(NAC)	996	965	971	997	-31	6	26
Govindpur	929	D*	-	-	-	-	-
Gudari	982	997	988	1009	15	-9	21
Gunupur	975	954	992	985	-21	38	-7
Hatibandha	-	-	878	899	-	-	21
Hinjilicut	952	956	945	970	4	-11	25
Hirakud	847	885	884	919	38	-1	35
Jagatsinghpur	-	917	926	919	-	9	-7
Jajapur	873	874	906	933	1	32	27
Jajapur Road	706	726	852	D*	20	126	-
Jalda	-	938	907	950	-	-31	43
Jaleswar	932	896	934	961	-36	38	27

Jatani	831	916	917	933	85	1	16
Jeypur	959	950	971	970	-9	21	-1
Jharsuguda	893	870	873	904	-23	3	31
Jhumpura	-	-	-	906	-	-	-
Joda	870	936	908	927	66	-28	19
Junagarh	990	1012	981	961	22	-31	-20
Kamakshyanagar	-	840	855	880	-	15	25
Kantabanji	927	920	909	922	-7	-11	13
Kantilo	-	947	976	952	-	29	-24
Karanjia	-	858	895	901	-	37	6
Kashinagara	-	1032	1039	1047	-	7	8
Kavisurjyanagar	995	979	913	942	-16	-66	29
Kendrapara	884	881	906	924	-3	25	18
Kendujhar	866	836	844	886	-30	8	42
Kesinga	923	942	956	971	19	14	15
Khaliapali	-	-	-	928	-	-	-
Khalikote	959	927	915	939	-32	- 12	24
Khandapada	-	-	945	933			-12
Khariar	995	991	936	958	-4	- 55	22
Khariar road	961	953	968	980	-8	15	12
Khatiguda	-	-	-	938	-	-	-
Khordha	856	869	876	916	13	7	40
Kochinda	854	866	915	950	12	49	35
Kodala	-	1034	992	996	-	- 42	4
Konark	-	-	918	915	-		-3
Koraput	890	914	892	924	24	- 22	32
Kotpad	1029	1055	1019	1013	26	- 36	-6
Lathikata	-	-	-	886	-	-	-
Makundapur	-	-	-	954	-	-	-
Malkangiri	884	889	927	934	5	38	7
Mukhiguda	-	-	-	846	-	-	-
Nabarangapur	974	964	969	899	-10	5	-70
Nalco	-	-	760	877	-	-	117
Nayagarh	721	716	790	854	-5	74	64
Nilagiri	-	-	930	953	-	-	23
Nimapada	-	886	906	934	-	20	28
Nuapatna	-	-	905	919	-	-	14
O.C.L.Industrial	-	-	-	863	-	-	-
Padmapur	950	950	925	965	0	-25	40
Panposh	-	-	940	971	-	-	31
Paparahandi	-	996	D*	-	-	-	-
Paradip	464	554	721	737	90	167	16
Paradip Phosphates	-	-	487	D	-	-	-
Parlakhemundi	980	982	967	979	2	- 15	12

Patnagarh	945	952	959	960	7	7	1
Pattamundai	-	-	977	980	-	-	3
Phulbani	817	827	843	893	10	16	50
Pipili	-	970	956	944	-	-14	-12
Polasara	1038	1000	1008	985	-38	8	-23
Pratapsasan	-	-	-	920	-	-	-
Puri	860	877	882	919	17	5	37
Purusottampur	1014	966	976	961	-48	10	-15
Rairangpur	927	893	929	960	-34	36	31
Rajagangapur	861	849	884	941	-12	35	57
Rambha	975	1007	1007	991	32	0	-16
Raurkela	725	748	802	858	23	54	56
Raurkela industrial	757	802	832	890	45	30	58
Rayagada	939	950	943	957	11	-7	14
Redhakhol	-	-	-	898	-	-	-
Remuna	-	-	-	916	-	-	-
Rengali Dam Project	-	609	686	858	-	77	172
Sambalpur	847	892	894	929	45	2	35
Sonapur	943	931	897	887	-12	-34	-10
Soro	-	946	977	957	-	31	-20
Sunabeda	862	892	931	943	30	39	12
Sundargarh	908	928	911	950	20	-17	39
Surada	943	1004	971	964	61	-33	-7
Talcher	868	828	821	816	-40	-7	-5
T.T.P.S. Township	-	705	800	830	-	95	30
Tarbha	947	1000	973	968	53	-27	-5
Tensa	-	-	840	869	-	-	29
Titlagarh	908	907	907	932	-1	0	25
Udala	-	829	867	923	-	38	56
Umarkote	911	959	979	957	48	20	-22

Source: Census of India, Primary Census Abstract Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

* D – Town Declassified

noticed in kavisuryanagar (-66) followed by Digapahandi (-60), Khariar (-55), Chikiti (-46). The prevalence of sex ratio in towns of Orissa and its change over the years is highly fluctuated and didn't follow any specific pattern. There were 18 towns that recorded a decline of 20 points in sex ratio during 1981-1991 and it is good to note that fourty three towns witnessed an increase of more than 20 points in sex ratio. Rambha and Titlagarh are the two towns where sex ratio remained unchanged during the same period.

In 2001, sex ratio in some towns increased considerably. The highest improvement was recorded in Damanjodi as sex ratio was increased by 177 points from 663 in 1991 to 840 in 2001.Other towns witnessing high increase in sex ratio are Rengali Dam Project Township (172), Nalco (117), and Balagoda (77). The fact that 89 towns out of total 124 towns in 1991 showed improvement in sex ratio in 2001 is a welcome step. Moreover, eighteen towns witnessed an increase of 50 or more points in sex ratio and an increase of 30 or more points in sex ratio was recorded in 43 towns. Thus, table3.1 indicates that though the sex ratio in towns of India is highly unfavourable for females, over the years it has been improving. All the class I towns except Brahmapur recorded positive change in sex ratio during 1991-2001. The rural sex ratio of Orissa is in much better position compared to sex ratios of the urban areas. This is possibly due to male migration to urban areas because of pull factors.[6]

A detailed analysis of sex ratio in the towns of Orissa between 1971- 2001 as given in the table:3.1 suggests that the towns having lowest sex ratio kept on improving in successive decades and decline in sex ratio was noticed generally among those showed fairly higher sex ratio. To mention the extreme cases of them are, Paradip's sex ratio rose from 464 in 1971 to 737 in 2001, Angul from 596 to 820 and Chowdwar from 646 to 859 and in addition to that eight towns recorded an increase of more than 100 points in sex ratio during same period. As mentioned earlier, these towns exhibited low or very low sex ratio 1971. The towns witnessing maximum decline in sex ratio are Nabarangpur (-75), Sonepur (-56), Purusottampur (-53), Talcher (-52) and incidentally, more or less balanced sex ratio was observed in these towns except Talcher. The sex ratio in Bhubaneswar kept on improving in each successive decade except during 1981-1991 (decreased by 4 points). By and large, the sex ratio in Orissa has been declining in Orissa as a whole and the situation the urban centres remained to be favourable for males though improvement has been noticed in some cases.

[6] Singh.H. (2010), 'Gender Imbalance in Socio-economic and Demographic Characteristics, 2001 Census', in '*Orissa Review*', Dec, 2010, p 224

3.3 Literacy Rate

Literacy rate is a basic and common indicator of educational advancement of a country. Education is both an indicator and an instrument of development, and its attainment is a major factor behind the accumulation of human capital. Education increases labour productivity in both urban and rural sectors and has long been identified as one of the most important determinants of economic growth.[7] The literate people are likely to work more efficiently than illiterates and thus productivity of labour force is influenced by the literacy of a region.

It is widely realised that societies with a higher percentage of literates have higher levels of development.[8].Moreover, literacy affects the demographic phenomena like fertility, mortality and migration as it has been recognised that fertility is highest among illiterates and death rates decline with the level of educational level attained. In addition, skilled and educated labourers are more mobile and migrate to higher order settlements, thus affecting the demographic and social structure of society.

3.3. a. Definition and Concept

The word literacy means a state of being able to read and write. The principal source of data on literacy is Census. According to Indian Census, a person is considered as literate if he or she is able to read and write a simple message with understanding in any language. The method of calculating literacy rate has been changed over the years and accordingly data was collected. From 1961 to 1981 census, all children below the age of 5 years were regarded as illiterate and while calculating the literacy rate the population of 0-4 year age group is deducted. Till 1981, the formula for computing the literacy rate was:

$$\text{Literacy Rate} = \frac{\text{Number of Literates}}{\text{Population aged 5+}} \times 100$$

[7] Human Development Report, Orissa (2004), *Planning and Co-ordination Department,* Government Orissa, pp. 99

[8] ibid, p. 101

From 1991 onwards, to compute refined literacy rate, the base population was changed from total population to 'population aged 7 years and above. Thus, modified formula is:

$$\text{Literacy Rate} = \frac{\text{Number of Literates}}{\text{Population aged 7+}} \times 100$$

Due to non availability of data sometimes total population is used in the denominator and it is called crude literacy rate.

3.3.b. Literacy Rate in Orissa

Over the years, the state has witnessed noticeable success in literacy rate. The total literacy rate in 2001 doubled than what it was in 1971. Overall literacy rate was increased from 30.53 per cent in 1971 to 38.53 per cent in 1981. The improving trend continued and more than ten percentage points increase was recorded in total literacy rate in the state between 1981-1991.

Table: 3.2

Literacy Rate in Orissa

Year	Total			Rural			Urban		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
1971	30.53	44.50	16.29	28.09	42.03	14.10	57.02	68.96	42.53
1981	38.83	53.34	23.99	35.70	50.45	20.93	62.19	73.30	49.01
1991	49.09	63.09	34.68	45.46	60.00	30.79	71.99	81.21	61.18
2001	63.08	75.35	50.51	59.84	72.93	46.66	80.84	87.93	72.87
Crude Literacy Rate									
1971	26.18	38.29	13.92	24.09	36.14	12.06	49.00	59.94	36.05
1981	35.37	47.10	23.42	31.49	44.51	18.45	54.77	65.13	42.72
1991	40.80	52.41	28.83	37.65	49.59	25.56	61.19	69.55	51.55
2001	53.90	64.27	43.24	50.86	61.80	39.77	71.13	77.58	63.92

Source: Census of India, Primary Census Abstract Orissa, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

As per the latest 2001 Census, the state's literacy rate is 63.08 per cent, an increase of 14 percentage points over 1991 figure of 49.09 per cent. Though the temporal improvement in literacy rate in Orissa is significant, still it lags behind the national average of 64.84 percent according to 2001 Census. Table: 3.2 shows that literacy rate of both sexes are improving over the time in rural and urban areas. A detailed investigation of the data given in the table: 3.2 indicates that till 1991, improvement in literacy rate in the state has been accelerating. By and large, this growth in literacy rate is said to be impact of Total

Literacy Campaign (TLC) which was launched in the state since 1990-91. However, during the last decade this increasing trend slowed down in urban areas unlike rural areas and Orissa as a whole. Nevertheless, it is found that the female literacy rate is improving at a much faster rate than their counterpart in both rural and urban areas. In spite of that, more than half of rural females are illiterates according to 2001 Census. The crude literacy rate, calculated by taking population of all age groups as base was also given in the above table to relate the literacy rates of the towns, for which refined or effective literacy rate could not be calculated due to non-availability of data. After examining the literacy status and their improvement over time in the state, it is useful to look into sex disparity and rural urban disparity in literacy rate which will be followed by town wise analysis.

3.3.c. Disparity in Literacy Rate

More often, illiteracy is associated with socioeconomic backwardness and literacy is promoted in all areas and among all social groups of population. Though balanced regional development with equal representation of both males and females is attempted to achieve, age old disparities between sexes, regions, groups are noticed due to various reasons. The following table:3.3 shows the disparity of literacy rate in Orissa between male-female and rural –urban areas. The improvement in literacy rate in Orissa ahs been analysed and differential amount of increase in rural and urban areas has resulted a situation where disparity in those areas are also undergoing changes which is shown in table:3.3. Moreover the sex disparity in literacy rate has been estimated and a decline in it has been found. Unsurprisingly, the male-female literacy disparity is more in rural areas. The literacy disparity between sexes was 1.7319 in 1971 and it has been declining in each successive decade .During last decade, this sex disparity in literacy rate went down significantly from 0.8194 in 1991 to 0.4916 in 2001. In rural Orissa, male-female disparity in literacy rate was as high as 1.987 in 1971 and it decreased to 1.4099 in 1981. Females are certainly becoming literate at a much faster rate as the sex disparity reduced from .9484 in 1991 to 0.5631 in 2001. Sex disparity in literacy rate is low in urban Orissa and is further showing improvement as shown in the table: 3.3. The rural-urban disparity in literacy rate is understandably high among females as rural area witnessed wide male-

female disparity in literacy rate. Like sex disparity, the rural-urban disparity in literacy rate has been following narrowing with passage of time and the improvement rate is high among females. Though both male and female literacy rates in the rural and urban areas were low in 1970s, has been going up positively.

Table: 3.3

Regional and Sex Disparity in Literacy Rate in Orissa

	Year	Total Literacy	Male Literacy	Female Literacy	Male-Female Disparity
Total	1971	30.53	44.50	16.29	1.7319
	1981	38.83	53.34	23.99	1.2233
	1991	49.09	63.09	34.68	0.8194
	2001	63.08	75.35	50.51	0.4916
Rural	1971	28.09	42.03	14.10	1.9807
	1981	35.70	50.45	20.93	1.4099
	1991	45.46	60.00	30.79	0.9484
	2001	59.84	72.93	46.66	0.5631
Urban	1971	57.02	68.96	42.53	0.6214
	1981	62.19	73.30	49.01	0.4957
	1991	71.99	81.21	61.18	0.3275
	2001	80.84	87.93	72.87	0.2066
Rural-Urban Disparity					
	1971	1.0297	0.6406	2.0160	
	1981	0.7419	0.4530	1.3412	
	1991	0.5838	0.3535	0.9866	
	2001	0.3508	0.2057	0.5619	

Source: Census of India, Primary Census Abstract Orissa, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

* (Males/Females)-1

** (Urban/Rural)-1

Simultaneously, the gender gap and rural-urban disparity has been diminishing over last two or three decades. Thus, literacy rate in the state is on a path of improvement though it still lags behind the national average. Following section discussing town wise analysis of literacy rate will give a more detailed picture of literacy rate of both sexes and their disparity level.

3.3.d. Literacy Rate in Towns

Certain adjustments have to be made for enabling comparative analysis of temporal trend of literacy in Orissa. Prior to 1991, town wise 0-4 year age group population is not available and thus literacy rates had to be calculated by taking total population as base. The same principle was followed to calculate literacy rates of towns in 1991 and 2001 to make them comparable with that of previous years and to capture the change in each decade. Thus, literacy rate presented here is crude.

The table: 3.4 shows that in 1971, Angul had the highest literacy rate of 68.91 per cent followed by Nayagarh (68.19 per cent), Bhubaneswar (62.23 per cent) and Phulbani (61.16 per cent). Highest male literacy of 84.51 per cent was recorded in Phulbani followed by Nayagarh, Angul, Bhubaneswar and their corresponding figures are 78.56 per cent, 75.60 per cent, and 70.81 per cent respectively. Female literacy is also high in these towns. The towns showing low literacy rates in 1971 are Junagarh (28.38 per cent), Kesinga (28.40 per cent), Joda (28.84 per cent), Biramitrapur (29.64 per cent), Rambha (29.97 per cent) and Barbil (31.51 per cent). It may here be noted that maximum of towns showing low literacy rates are mining or industrial towns where workers engaged are unskilled. Most of the towns showing higher literacy rates were located in Coastal areas of the state as out of top 20 towns showing highest literacy; only four are from western interior regions.

Table: 3.4

LITERACY RATE IN TOWNS OF ORISSA

	1971				1981				Change (1971-1981)		
Town_Name	Total	Male	Female	M-F Disparity	Total	Male	Female	M-F Disparity	Total	Male	Female
Anandpur	54.07	64.92	41.42	0.57	50.20	61.48	37.38	0.64	-3.87	-3.44	-4.04
Angul	68.91	75.60	57.69	0.31	68.89	77.59	56.20	0.38	-0.02	2.00	-1.48
Aska	50.93	63.36	37.95	0.67	56.90	67.31	45.81	0.47	5.97	3.95	7.86
Athgarh	52.79	65.59	39.40	0.66	57.16	67.62	45.68	0.48	4.37	2.03	6.27
Balangir	49.30	61.48	35.96	0.71	52.89	64.17	40.65	0.58	3.59	2.68	4.70
Balasore	51.24	60.21	40.46	0.49	56.08	64.85	45.98	0.41	4.84	4.64	5.52
Banki	49.00	66.11	30.17	1.19	58.60	72.64	42.64	0.70	9.60	6.53	12.47
Barapali	36.51	51.34	20.82	1.47	40.95	53.96	27.47	0.96	4.44	2.63	6.65

Barbil	31.51	42.59	17.55	1.43	39.58	51.32	25.67	1.00	8.07	8.73	8.12
Bargarh	51.41	62.60	38.33	0.63	52.66	63.54	40.23	0.58	1.25	0.95	1.90
Baripada	57.61	66.88	46.12	0.45	60.77	69.54	50.31	0.38	3.16	2.66	4.19
Baudh	46.47	61.75	30.00	1.06	57.19	72.78	40.12	0.81	10.72	11.03	10.13
Bellaguntha	37.00	50.32	24.25	1.07	46.76	61.39	32.78	0.87	9.76	11.08	8.53
Bhadrak	40.18	51.54	26.92	0.91	47.73	58.25	35.61	0.64	7.55	6.71	8.69
Bhanjanagar	49.48	62.94	34.78	0.81	60.44	72.12	47.78	0.51	10.96	9.18	13.01
Bhawanipatna	45.53	58.80	30.86	0.91	52.69	65.96	37.89	0.74	7.16	7.16	7.04
Bhuban	34.71	50.04	18.15	1.76	43.38	57.02	28.92	0.97	8.67	6.98	10.77
Bhubaneswar	62.23	70.81	50.39	0.41	67.00	74.16	57.54	0.29	4.77	3.35	7.15
Biramitrapur	29.64	39.53	19.14	1.06	40.09	51.20	28.44	0.80	10.45	11.68	9.30
Brahmapur	51.00	62.65	38.47	0.63	57.97	68.05	47.05	0.45	6.97	5.40	8.58
Brajrajnagar	44.35	56.18	29.70	0.89	42.65	54.43	29.00	0.88	-1.70	-1.74	-0.69
Buguda	40.93	53.54	28.23	0.90	50.13	64.15	36.44	0.76	9.20	10.61	8.21
Burla	53.74	65.14	37.99	0.71	55.20	67.27	40.65	0.65	1.46	2.13	2.66
Chandbali	44.10	56.60	29.01	0.95	52.25	63.49	39.52	0.61	8.15	6.88	10.51
Chatrapur	56.18	68.63	43.22	0.59	63.81	73.91	52.96	0.40	7.63	5.28	9.74
Chowdwar	53.68	65.54	35.31	0.86	61.94	72.40	47.46	0.53	8.26	6.86	12.15
Cuttack City	58.25	65.29	49.20	0.33	63.15	70.81	53.58	0.32	4.90	5.52	4.39
Deogarh	44.49	57.86	29.80	0.94	54.00	65.62	40.18	0.63	9.51	7.76	10.38
Dhenkanal	52.96	64.51	38.36	0.68	58.41	68.06	46.59	0.46	5.45	3.55	8.23
Gopalpur	33.71	43.62	23.77	0.84	36.00	45.11	26.55	0.70	2.29	1.49	2.78
Govindpur	35.40	47.05	22.84	1.06	Declassified			-	-	-	-
Gudari	47.13	62.31	31.67	0.97	45.67	57.41	33.88	0.69	-1.46	-4.89	2.21
Gunupur	38.24	49.84	26.33	0.89	46.01	57.38	34.09	0.68	7.77	7.53	7.76
Hinjili	36.73	50.88	21.87	1.33	46.52	61.94	30.40	1.04	9.79	11.06	8.53
Hirakud	48.62	61.04	33.95	0.80	53.80	65.74	40.31	0.63	5.18	4.70	6.36
Jajpur	48.58	60.61	34.80	0.74	56.31	66.73	44.38	0.50	7.73	6.13	9.58
Jajpur Road	46.94	58.80	29.61	0.99	53.33	63.06	39.92	0.58	6.39	4.26	10.31
Jaleshwar	43.14	54.74	30.70	0.78	49.03	59.72	37.11	0.61	5.89	4.99	6.41
Jatni	58.37	67.70	46.99	0.44	63.35	72.69	53.15	0.37	4.98	4.99	6.16
Jeypore	46.21	57.56	34.38	0.67	53.69	64.83	41.97	0.54	7.48	7.27	7.59
Jharsuguda	50.39	61.73	37.71	0.64	50.08	62.32	36.01	0.73	-0.31	0.59	-1.70
Joda	28.84	40.92	14.96	1.73	38.98	52.55	24.48	1.15	10.14	11.63	9.52
Junagarh	28.38	40.25	16.39	1.46	34.16	46.73	21.74	1.15	5.78	6.48	5.36
Kantabanji	46.92	59.53	33.31	0.79	47.52	59.80	34.17	0.75	0.60	0.27	0.86
Kavisuryanagar	37.09	53.64	20.46	1.62	46.55	60.29	32.51	0.85	9.46	6.64	12.05
Kendrapara	45.54	56.87	32.72	0.74	57.24	67.94	45.10	0.51	11.70	11.06	12.38
Keonjhar	46.44	58.22	32.85	0.77	59.31	68.99	47.73	0.45	12.87	10.77	14.88
Kesinga	28.40	42.09	13.55	2.11	32.11	43.97	19.52	1.25	3.71	1.88	5.97
Khalikote	46.09	63.11	28.34	1.23	53.42	68.68	36.95	0.86	7.33	5.56	8.61
Khariar	37.90	51.29	24.45	1.10	46.17	61.62	30.58	1.02	8.27	10.33	6.13
Khariar Road	37.65	49.23	25.61	0.92	43.10	54.87	30.74	0.78	5.45	5.63	5.13
Khordha	46.09	56.11	34.39	0.63	60.14	70.78	47.91	0.48	14.05	14.67	13.51

Koraput	34.64	43.25	24.97	0.73	46.06	56.14	35.02	0.60	11.42	12.89	10.05
Kotpad	40.11	52.10	28.45	0.83	44.87	55.12	35.16	0.57	4.76	3.02	6.71
Kuchinda	40.03	52.30	25.65	1.04	45.08	56.75	31.60	0.80	5.05	4.45	5.95
Malkangiri	31.80	42.17	20.07	1.10	38.62	47.31	28.83	0.64	6.82	5.15	8.76
Nabarangpur	45.69	57.57	33.49	0.72	52.64	63.95	40.91	0.56	6.95	6.38	7.43
Nayagarh	68.19	78.56	53.80	0.46	76.02	84.04	64.81	0.30	7.83	5.48	11.01
Padampur	43.05	56.79	28.60	0.99	49.79	63.84	35.01	0.82	6.74	7.04	6.41
Paradip	47.32	57.65	25.07	1.30	52.56	63.68	32.50	0.96	5.24	6.03	7.43
Paralakhemundi	49.53	62.54	36.26	0.72	54.43	65.72	42.94	0.53	4.90	3.17	6.68
Patnagarh	39.77	54.39	24.31	1.24	44.78	57.63	31.28	0.84	5.01	3.24	6.98
Phulbani	61.16	84.51	33.03	1.56	60.54	73.34	45.05	0.63	-0.63	-	12.03
Polasara	31.93	46.48	17.91	1.60	36.69	50.71	22.67	1.24	4.76	4.23	4.76
Puri	52.06	61.43	41.18	0.49	59.49	67.38	50.49	0.33	7.43	5.95	9.30
Purushottampur	34.23	46.58	22.05	1.11	38.90	52.39	24.93	1.10	4.67	5.81	2.88
Rairangpur	47.02	57.96	35.22	0.65	57.56	68.18	45.66	0.49	10.54	10.22	10.44
Rajgangpur	42.90	52.17	32.14	0.62	50.37	59.62	39.48	0.51	7.47	7.46	7.33
Rambha	29.97	40.36	19.30	1.09	39.32	55.97	22.79	1.46	9.35	15.61	3.49
Rayagada	41.85	52.37	30.64	0.71	46.66	56.71	36.08	0.57	4.81	4.33	5.43
Rourkela Civil TS	51.05	61.13	37.15	0.65	56.88	66.15	44.47	0.49	5.83	5.03	7.32
Rourkela Steel Township	54.37	63.24	42.64	0.48	62.18	70.41	51.92	0.36	7.81	7.16	9.28
Sambalpur	52.07	61.47	40.87	0.50	52.65	62.85	41.22	0.52	0.58	1.38	0.35
Sonepur	43.10	59.28	25.94	1.28	50.43	65.80	33.92	0.94	7.33	6.52	7.97
Sunabeda	33.12	44.14	20.33	1.17	44.30	52.83	34.73	0.52	11.18	8.68	14.40
Sundargarh	52.33	62.68	40.92	0.53	58.61	67.34	49.19	0.37	6.28	4.66	8.27
Surada	43.31	56.17	29.69	0.89	50.03	62.85	37.27	0.69	6.72	6.68	7.58
Talcher	40.39	53.10	25.75	1.06	53.37	65.22	39.05	0.67	12.98	12.13	13.29
Tarbha	39.44	54.78	23.25	1.36	50.62	65.78	35.46	0.86	11.18	11.00	12.21
Titlagarh				2.89	45.96	58.27	32.37	0.80	-3.44	-	6.75
Umarkot	31.56	41.36	20.80	0.99	39.81	50.38	28.79	0.75	8.25	9.02	7.99
Balagoda	-	-	-	-	44.09	55.65	30.31	0.84	-	-	-
Balimelanagar	-	-	-	-	46.57	58.49	32.48	0.80	-	-	-
Banapur	-	-	-	-	48.38	59.81	36.59	0.63	-	-	-
Basudebpur	-	-	-	-	39.04	54.71	21.97	1.49	-	-	-
Binika	-	-	-	-	35.46	51.25	19.06	1.69	-	-	-
Chandili	-	-	-	-	46.94	59.63	32.27	0.85	-	-	-
Chikiti	-	-	-	-	45.26	59.51	30.63	0.94	-	-	-
Chitrakonda	-	-	-	-	38.50	50.80	24.49	1.07	-	-	-
Daitari	-	-	-	-	49.83	61.34	36.24	0.69	-	-	-
Dera Colliery TS	-	-	-	-	61.81	72.99	46.61	0.57	-	-	-
Digapahandi	-	-	-	-	43.28	53.88	32.53	0.66	-	-	-
F.C.I.Township	-	-	-	-	73.12	78.45	65.57	0.20	-	-	-
G.Udayagiri	-	-	-	-	55.40	67.85	41.94	0.62	-	-	-
Ganjam	-	-	-	-	55.41	70.74	38.90	0.82	-	-	-

Jagatsinghpur	-	-	-	-	54.26	65.10	42.43	0.53	-	-	-
Jalda	-	-	-	-	36.30	48.76	23.02	1.12	-	-	-
Kamakshyanagar	-	-	-	-	56.90	70.53	40.68	0.73	-	-	-
Kantilo	-	-	-	-	57.71	71.06	43.62	0.63	-	-	-
Karanjia	-	-	-	-	47.99	60.29	33.64	0.79	-	-	-
Kashinagar	-	-	-	-	26.38	36.03	17.01	1.12	-	-	-
Kodala	-	-	-	-	35.50	51.76	19.77	1.62	-	-	-
Nimapada	-	-	-	-	60.98	71.86	48.69	0.48	-	-	-
Paparahandi	-	-	-	-	22.96	32.56	13.32	1.44	-	-	-
Pipili	-	-	-	-	49.94	60.84	38.69	0.57	-	-	-
Rengali Dam	-	-	-	-	47.67	60.13	27.21	1.21	-	-	-
Soro	-	-	-	-	43.77	56.47	30.34	0.86	-	-	-
T.T.P.S Township	-	-	-	-	71.53	79.09	60.81	0.30	-	-	-
Udala	-	-	-	-	56.82	66.71	44.90	0.49	-	-	-

Source: *Census of India, Primary Census Abstract Orissa, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)*

Interestingly, the male female disparity in literacy rate is high in the towns showing low total literacy rate. Kesinga, which reported second lowest literacy rate in 1971 also showed highest literacy disparity of 2.107 among two sexes. A disparity index of more than one (meaning thereby male literacy rate more than double of female literacy rate) is reported in as many as 27 towns out of total 81 towns in 1971. Similarly, the towns showing higher literacy rate recorded lower male-female disparity.

In 1981, the highest literacy rate was recorded in Nayagarh (76.02 per cent) which also showed highest male literacy of 84.04 per cent. Next to that are Fertiliser Corporation of India Township (73.12 per cent), Talcher Thermal Power Station Township (71.53 per cent) and this is probably due to the presence of high skilled labourers of the industry located therein. Like in 1971, the small towns and census towns such as Paparahandi (22.96 per cent), Kashinagar (26.38 per cent), and Kesinga (32.11 per cent) are the towns of least literacy rate in 1981. The widest literacy disparity among two sexes is found in Binika (1.6884) followed by Kodala (1.6177), Basudebpur (1.4899). One can say that this disparity has been narrowed as the number of towns showing a disparity index of more than one has reduced from 27 in 1971 to 16 in 1981 in spite of increase in number of towns in 1981. However, this male female disparity in literacy has increased marginally in towns such as Anandpur, Angul, Jharsuguda, Rambha, Sambalpur and Titlagarh. Surprisingly, the literacy rate decreased in some towns like Anandpur, Brajrajnagar,

Gudari, Jharsuguda, Phulbani and Titlagarh. Khordha recorded maximum improvement of 14 percentage points during 1971-1981 where change in male and female literacy rates is 14.67 and 13.51 percentage points. Other towns recording significant progress in literacy rate are Talcher, Keonjhar, Kendrapara Koraput, Tarbha, Sunabeda etc.

Literacy rate increased significantly from 47.67 per cent in 1981 to 64.95 per cent in 1981 and male and female literacy rates went up by 14.05 per cent and 24.28 per cent respectively during the same period. Small and medium towns showed higher improvement in 1981-1991 and fertiliser Corporation of India Township is the only towns that recorded decline in literacy rate. The progress pattern of literacy during 1981-1991 strikingly shows that female literacy rate increased more vigorously than male and total literacy rate. A sharp increase of 24.28 percentage points in female literacy rate is noticed in Rengali followed by Sonepur (16 per cent), Chandbali (14.77 per cent), Bhuban (14.13 per cent) and as many as thirty towns recoded an increase more than 10 percentage points. It is disheartening to note that male literacy declined in 1981 from that of 1971 in five towns namely F.C.I.Township, Umarkote, Angul, Baudhgarh, Bhanjanagar whereas female literacy increased in all towns during the same period.

In 1991, Charbatia showed maximum total literacy as well as highest male and female literacy rate. Next to this, are Nayagarh (79.39 per cent), T.T.P.S. Township (75.57 per cent), Paradip Phosphates (74.83 per cent), F.C.I.Township (71.98 per cent). Damanjodi, a newly added town in 1991 showed impressive 70.36 per cent of literacy that was closely followed by Bhubaneswar with 69.95 per cent. The widest male-female disparity in literacy rate was noticed in Binika with a disparity index of 1.0 and coincidentally, the less literate towns recorded maximum disparity between sexes. Likewise, the top literate towns showed less male-female disparity in literacy rate.

Table: 3.5

LITERACY RATE IN TOWNS OF ORISSA											
Town	1991				2001				Change(1991-2001)		
	T	M	F	M-F Disparity	T	M	F	M-F Disparity	T	M	F
Anandapur	59.04	68.24	48.90	0.40	70.93	78.74	62.74	0.25	11.89	10.51	13.85
Anugul	69.69	76.90	60.73	0.27	78.35	82.84	72.88	0.14	8.66	5.94	12.15
Asika	64.96	73.95	55.45	0.33	71.76	78.16	64.91	0.20	6.79	4.21	9.46
Athagad	61.48	69.18	53.31	0.30	71.14	77.34	64.59	0.20	9.66	8.17	11.29
Balagoda	53.47	63.25	41.25	0.53	60.43	70.32	49.16	0.43	6.97	7.07	7.91
Balangir	61.59	71.28	50.85	0.40	71.84	79.20	63.95	0.24	10.25	7.92	13.10
Baleshwar	60.23	67.48	51.86	0.30	72.88	78.10	67.10	0.16	12.65	10.62	15.24
Balimela	49.31	58.83	38.93	0.51	56.38	65.84	46.28	0.42	7.07	7.01	7.35
Balugaon	53.09	63.22	41.82	0.51	65.33	73.16	56.55	0.29	12.24	9.94	14.73
Banapur	55.60	67.00	43.76	0.53	68.26	76.05	60.25	0.26	12.66	9.05	16.49
Banki	65.28	76.09	53.03	0.43	75.18	81.63	68.18	0.20	9.90	5.54	15.16
Barapali	50.23	60.34	39.79	0.52	65.18	74.57	55.32	0.35	14.95	14.23	15.53
Barbil	44.30	54.76	32.01	0.71	54.84	64.00	44.71	0.43	10.54	9.24	12.70
Bargarh	56.33	65.16	46.57	0.40	70.77	77.46	63.52	0.22	14.45	12.30	16.95
Baripada	65.74	72.78	57.50	0.27	74.63	80.38	68.07	0.18	8.88	7.61	10.57
Basudebpur	47.11	59.73	33.42	0.79	59.38	69.36	48.72	0.42	12.28	9.63	15.31
Baudh	60.13	72.29	47.18	0.53	71.51	80.82	61.57	0.31	11.38	8.53	14.39
Bellaguntha	51.95	63.06	41.16	0.53	66.80	75.01	58.75	0.28	14.86	11.95	17.59
Belpahar	58.01	67.32	47.51	0.42	69.06	77.13	59.64	0.29	11.05	9.81	12.13
Bhadrak	51.45	59.78	42.12	0.42	62.76	69.01	56.01	0.23	11.31	9.23	13.88
Bhanjanagar	63.26	71.94	54.11	0.33	76.69	82.71	70.22	0.18	13.42	10.77	16.11
Bhawanipatna	58.52	68.93	46.86	0.47	69.16	77.23	60.40	0.28	10.64	8.30	13.54
Bhuban	54.81	65.60	43.05	0.52	67.53	75.38	59.15	0.27	12.72	9.78	16.10
Bhubaneswar	69.95	74.95	63.30	0.18	77.90	82.15	72.57	0.13	7.95	7.20	9.26
Binika	43.67	57.64	28.87	1.00	61.43	73.81	48.46	0.52	17.77	16.18	19.60
Biramitrapur	51.43	61.26	40.88	0.50	62.24	70.40	53.84	0.31	10.81	9.14	12.96
Brahmapur	63.97	72.02	55.25	0.30	75.07	81.15	68.46	0.19	11.10	9.12	13.22
Brajarajnagar	51.17	61.48	39.19	0.57	67.14	75.17	58.31	0.29	15.97	13.69	19.12
Buguda	53.68	64.44	42.99	0.50	65.93	74.81	56.81	0.32	12.25	10.37	13.82
Burla	62.23	72.15	50.55	0.43	71.67	79.12	63.47	0.25	9.44	6.96	12.92
Champua	61.71	69.86	52.42	0.33	71.25	76.11	65.72	0.16	9.54	6.25	13.30
Chandabali	63.23	71.85	54.29	0.32	Declassified in 2001			--	---		---
Chandili	53.37	63.55	42.54	0.49	64.23	72.94	55.16	0.32	10.86	9.39	12.63
Charibatia	85.13	88.61	80.80	0.10	84.56	87.56	81.01	0.08	-0.57	-1.05	0.21
Chhatrapur	69.81	78.88	60.44	0.30	78.00	83.94	71.83	0.17	8.19	5.07	11.38
Chikiti	52.16	63.40	40.05	0.58	62.14	73.58	50.49	0.46	9.97	10.17	10.43
Chitrakonda	43.50	53.94	32.51	0.66	Declassified in 2001			--		--	--
Choudwar	66.07	74.57	55.39	0.35	74.34	80.44	67.22	0.20	8.26	5.88	11.84
Cuttack	69.19	75.27	61.57	0.22	75.82	80.29	70.68	0.14	6.63	5.02	9.11
Daitari	58.73	70.73	45.02	0.57	68.55	76.78	59.03	0.30	9.83	6.05	14.01
Damanjodi	70.36	77.81	59.14	0.32	82.19	83.98	80.07	0.05	11.83	6.17	20.93
Debagarh	58.40	67.55	48.08	0.40	66.56	73.68	58.74	0.25	8.16	6.13	10.65
Dera colliery	67.34	75.32	57.04	0.32	76.61	81.89	70.25	0.17	9.27	6.57	13.21
Dhenkanal	67.27	74.34	58.98	0.26	77.77	82.67	72.27	0.14	10.49	8.33	13.29
Digapahandi	51.26	62.19	39.45	0.58	58.29	67.34	48.92	0.38	7.04	5.15	9.47
F.C.I.Township	71.98	77.08	66.15	0.17	90.76	92.67	88.65	0.05	18.78	15.59	22.50

G. Udayagiri	64.20	73.57	54.81	0.34	73.67	80.09	67.58	0.19	9.47	6.52	12.77
Ganjam	60.01	73.42	45.69	0.61	71.91	82.34	60.87	0.35	11.90	8.93	15.18
Ghantapada	57.28	68.39	43.36	0.58	70.50	77.71	62.14	0.25	13.22	9.32	18.78
Gopalpur (CT)	66.56	76.45	55.40	0.38	Declassified in 2001			--	--	--	--
Gopalpur (NAC)	39.02	47.39	30.39	0.56	50.19	58.00	42.35	0.37	11.17	10.61	11.96
Gudari	52.73	62.92	42.42	0.48	59.28	68.24	50.39	0.35	6.55	5.32	7.97
Gunupur	49.71	60.03	39.30	0.53	62.77	71.14	54.27	0.31	13.06	11.10	14.97
Hatibandha	56.40	65.38	46.17	0.42	69.85	77.36	61.49	0.26	13.45	11.98	15.32
Hinjilicut	51.90	63.44	39.69	0.60	63.64	73.45	53.52	0.37	11.74	10.02	13.83
Hirakud	60.45	70.45	49.15	0.43	69.18	77.78	59.82	0.30	8.72	7.32	10.67
Jagatsinghapur	63.65	71.04	55.67	0.28	74.43	80.22	68.13	0.18	10.78	9.18	12.47
Jajapur	64.28	72.68	55.00	0.32	73.58	79.08	67.68	0.17	9.30	6.40	12.68
Jajapur Road	60.46	68.36	51.19	0.34	Declassified in 2001			--	--	--	--
Jalda	47.83	59.39	35.10	0.69	62.66	72.60	52.21	0.39	14.83	13.21	17.10
Jaleswar	52.97	62.21	43.09	0.44	64.26	72.36	55.84	0.30	11.29	10.15	12.75
Jatani	68.85	75.82	61.26	0.24	75.99	81.51	70.06	0.16	7.14	5.69	8.81
Jeypur	57.65	66.39	48.65	0.36	67.80	74.93	60.46	0.24	10.15	8.54	11.81
Jharsuguda	55.80	66.18	43.91	0.51	67.76	75.90	58.75	0.29	11.96	9.72	14.85
Joda	45.73	56.92	33.40	0.70	53.49	63.21	43.00	0.47	7.76	6.29	9.60
Junagarh	39.21	50.99	27.19	0.88	54.81	65.41	43.78	0.49	15.60	14.41	16.58
Kamakshyanagar	63.21	72.74	52.05	0.40	72.88	80.39	64.34	0.25	9.67	7.65	12.28
Kantabanji	55.84	66.60	43.99	0.51	64.16	72.62	54.98	0.32	8.32	6.01	11.00
Kantilo	64.01	74.93	52.82	0.42	71.06	79.29	62.41	0.27	7.05	4.36	9.59
Karanjia	54.48	65.35	42.34	0.54	66.92	74.55	58.47	0.28	12.44	9.20	16.13
Kashinagara	34.78	45.88	24.09	0.90	42.09	52.12	32.51	0.60	7.31	6.24	8.42
Kavisuryanagar	54.74	67.07	41.24	0.63	61.67	70.79	51.99	0.36	6.93	3.72	10.74
Kendrapara	63.12	70.94	54.48	0.30	73.61	79.01	67.76	0.17	10.49	8.07	13.28
Kendujhar	62.95	71.66	52.63	0.36	73.02	79.02	66.25	0.19	10.07	7.36	13.62
Kesinga	40.71	51.50	29.42	0.75	54.42	65.28	43.25	0.51	13.72	13.78	13.83
Khalikote	55.97	68.95	41.79	0.65	65.37	75.90	54.15	0.40	9.40	6.96	12.36
Khandapada	63.99	73.14	54.30	0.35	73.90	81.24	66.03	0.23	9.91	8.10	11.73
Khariar	52.17	64.46	39.05	0.65	61.25	71.01	51.06	0.39	9.08	6.55	12.01
Khariar Road	46.22	56.72	35.37	0.60	60.03	69.42	50.44	0.38	13.81	12.70	15.08
Khordha	66.43	74.27	57.48	0.29	76.61	82.31	70.40	0.17	10.18	8.04	12.91
Kochinda	53.79	62.99	43.73	0.44	66.39	73.17	59.26	0.23	12.61	10.18	15.53
Kodala	45.95	60.33	31.45	0.92	53.30	64.78	41.78	0.55	7.35	4.45	10.33
Konark	41.55	48.96	33.49	0.46	56.89	63.94	49.19	0.30	15.34	14.98	15.70
Koraput	58.58	69.89	45.90	0.52	66.29	74.30	57.63	0.29	7.71	4.41	11.72
Kotpad	47.15	56.47	38.00	0.49	58.20	67.04	49.48	0.35	11.05	10.57	11.48
Malkangiri	43.56	53.38	32.96	0.62	55.36	63.26	46.90	0.35	11.80	9.88	13.94
Nabarangapur	55.82	64.83	46.52	0.39	69.37	77.34	60.52	0.28	13.55	12.51	13.99
Nalco	66.58	72.13	59.27	0.22	72.71	77.48	67.26	0.15	6.13	5.36	7.99
Nayagarh	79.39	84.86	72.46	0.17	83.32	86.02	80.15	0.07	3.93	1.16	7.69
Nilagiri	49.59	57.79	40.78	0.42	59.28	65.60	52.65	0.25	9.69	7.81	11.86
Nimapada	68.84	77.03	59.79	0.29	78.52	83.60	73.08	0.14	9.68	6.57	13.29
Nuapatna	47.27	58.89	34.43	0.71	63.93	73.27	53.76	0.36	16.66	14.38	19.33
Padmapur	56.02	66.18	45.03	0.47	68.53	77.18	59.57	0.30	12.52	11.01	14.54
Panposh	58.09	64.29	51.50	0.25	66.70	73.09	60.12	0.22	8.60	8.80	8.62
Paradip	55.35	63.87	43.54	0.47	71.72	77.73	63.55	0.22	16.36	13.86	20.02
Paradip Phosphates	74.83	78.79	66.70	0.18	Declassified in 2001			--	--	--	--
Parlakhemundi	58.06	68.26	47.52	0.44	67.47	75.51	59.26	0.27	9.41	7.25	11.74
Patnagarh	51.90	62.71	40.63	0.54	65.63	74.66	56.22	0.33	13.73	11.95	15.58
Pattamundai	57.71	67.26	47.94	0.40	70.65	77.12	64.05	0.20	12.94	9.86	16.11

Phulabani	65.94	76.08	53.89	0.41	75.33	82.54	67.25	0.23	9.39	6.46	13.35
Pipili	56.06	65.73	45.95	0.43	68.69	75.40	61.59	0.22	12.62	9.66	15.63
Polasara	44.61	57.75	31.58	0.83	52.32	62.44	42.05	0.49	7.71	4.69	10.47
Puri	66.36	72.22	59.71	0.21	73.96	78.54	68.96	0.14	7.60	6.32	9.26
Purusottampur	47.93	60.63	34.92	0.74	59.61	70.11	48.68	0.44	11.68	9.48	13.76
Rairangpur	61.94	70.28	52.97	0.33	71.45	78.02	64.60	0.21	9.51	7.74	11.63
Rajagangapur	58.53	66.14	49.92	0.32	67.75	73.72	61.40	0.20	9.21	7.58	11.47
Rambha	43.96	58.40	29.62	0.97	55.16	67.25	42.96	0.57	11.20	8.85	13.34
Raurkela	61.87	70.04	51.68	0.36	73.53	79.47	66.87	0.19	11.66	9.43	15.19
Raurkela Industrial TS	68.73	75.58	60.50	0.25	63.13	71.08	54.82	0.30	-5.61	-4.51	-5.68
Rayagada	52.32	61.42	42.68	0.44	73.51	79.29	66.77	0.19	21.19	17.88	24.09
Rengali Dam	64.95	74.18	51.49	0.44	74.89	80.95	67.82	0.19	9.94	6.77	16.33
Sambalpur	59.42	67.65	50.20	0.35	69.48	75.75	62.73	0.21	10.06	8.10	12.52
Sonapur	63.08	74.89	49.92	0.50	73.67	81.81	64.48	0.27	10.59	6.92	14.56
Soro	53.73	63.22	44.01	0.44	66.69	73.86	59.19	0.25	12.96	10.64	15.18
Sunabeda	53.88	62.53	44.58	0.40	61.11	69.07	52.68	0.31	7.23	6.53	8.10
Sundargarh	65.65	72.27	58.40	0.24	74.24	78.98	69.24	0.14	8.58	6.72	10.84
Surada	56.37	66.12	46.32	0.43	62.51	71.18	53.52	0.33	6.14	5.06	7.20
Talcher	59.60	69.35	47.73	0.45	71.32	78.96	61.94	0.27	11.72	9.61	14.22
Talcher Thermal	75.57	81.59	68.05	0.20	84.25	88.34	79.31	0.11	8.67	6.75	11.26
Tarbha	57.61	69.54	45.34	0.53	67.14	77.17	56.78	0.36	9.53	7.63	11.44
Tensa	64.23	69.88	57.50	0.22	67.99	74.86	60.08	0.25	3.76	4.98	2.58
Titlagarh	54.77	65.83	42.56	0.55	64.87	73.90	55.18	0.34	10.10	8.07	12.62
Udala	57.86	67.33	46.94	0.43	73.64	78.79	68.07	0.16	15.78	11.46	21.13
Umarkote	40.01	49.21	30.60	0.61	55.55	64.09	46.62	0.37	15.54	14.87	16.02
Athmallik	-	-	-	-	63.84	73.49	53.58	0.37	-	-	-
Bangura	-	-	-	-	56.58	67.74	44.58	0.52	-	-	-
Belagachhia	-	-	-	-	73.24	79.94	66.21	0.21	-	-	-
Bishama Katek	-	-	-	-	66.54	75.50	57.48	0.31	-	-	-
Byasanagar	-	-	-	-	70.70	77.07	63.50	0.21	-	-	-
Chandapur	-	-	-	-	68.14	74.75	61.39	0.22	-	-	-
Dadhapatna	-	-	-	-	71.61	79.26	62.99	0.26	-	-	-
Dhamanagar	-	-	-	-	49.86	58.27	41.22	0.41	-	-	-
Dungamal	-	-	-	-	81.68	88.86	69.22	0.28	-	-	-
Jhumpura	-	-	-	-	67.46	74.22	60.01	0.24	-	-	-
Khaliapali	-	-	-	-	73.39	80.88	65.31	0.24	-	-	-
Khatiguda	-	-	-	-	69.36	78.00	60.14	0.30	-	-	-
Lattikata	-	-	-	-	71.85	78.56	64.29	0.22	-	-	-
Makundapur	-	-	-	-	69.31	78.99	59.16	0.34	-	-	-
Mukhiguda	-	-	-	-	70.43	79.64	59.54	0.34	-	-	-
OCL Industrial Township	-	-	-	-	88.66	90.42	86.63	0.04	-	-	-
Pratapsasan	-	-	-	-	65.57	73.54	56.90	0.29	-	-	-
Redhakhol	-	-	-	-	64.91	74.60	54.11	0.38	-	-	-
Remuna	-	-	-	-	59.99	67.93	51.32	0.32	-	-	-

Source: Census of India, Primary Census Abstract Orissa, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21

During last decade Rayagda witnessed highest increase in total literacy rate as well as male and female literacy rate. Remarkably, female literacy rate went up by 24.09 per cent and male literacy rate by 17.88 per cent.

The table: 3.5 indicates that the towns recording high growth in literacy rate between 199-2001 are F.C.I.Township, Binika, Nuapatna, Paradip, Brajrajnagar, Udala, Junagah. Literacy rate decreased in two towns namely Raurkela Industrial Township and Charibatia during the same period. During the last decade maximum towns showed significant progress in literacy rate. The comparative study of literacy reveals that as many as 65 towns reported an increase of more than ten percentage points in 1991-2001 and literacy rate was improved in another 21 towns. The average male-female literacy disparity also reduced substantially from 0.45 in 1991 to 0.28 in 2001.The highest disparity declined from one to 0.60. It is grossly appreciating to mention that the number of towns showing sex disparity in literacy more than a figure of 0.5 was reduced from 44 in 1991 to just five in 2001. The literacy disparity between male and female narrowed substantially in towns such as Binika, Rambha, Junagarh, Kodala, Basudebpur, Jajpur Road etc while it increased in Tensa and Raurkela Industrial Township. In 2001, more than seventy per cent literacy rate is observed in all class I towns except Sambalpur which reported 69.48 per cent.

3.4 Work Participation Rate

One of the major aspects of human societies from the very early times in the context of survival and subsistence has been the division of labour.[9] Understandably, some people have to work for production either for their own consumption or others dependent on them and they are classified as workers in contrast to non workers who are not engaged in the production of goods and services. Furthermore, workers are classified according to the sectors of economy they are engaged in, nature of their work they perform, amount of earnings they have. All these aspects of population speak of its economic characteristics. The Indian Census has been collecting information on economic activity of individual

[9] Premi.M.K. (2006), *'Population of India in the New Millennium : Census 2001'* National Book Trust Of India, pp.229

right from the beginning and definition of 'worker' has undergone many changes over time. The work participation rate is expressed as the percentage of working population to the total population and a higher figure of this indicates lower dependency ratio which augurs well for the economy of a region.

In 1961 and 1971 Census, persons engaged in economically productive work are categorised as 'workers'[10] and other as the 'non-workers'. From 1981 onwards, a worker has further been classified as 'main workers'[11] and 'marginal workers'[12]. The 'work participation rate' is computed by the following formula:

$$\text{Work Participation Rate} = \frac{\text{Total Number of Workers}}{\text{Total Population}} \times 100$$

The resulting figure of the above formula would be crude because the denominator includes even children in the 0-4 year's age group who are not expected to work. Therefore, often it is refined by taking the population aged 15-59 in the denominator. To, calculate the work participation rate for the period of 1991 and 2001, both main workers and marginal workers were combined to get the numbers of total workers.

Since the towns and cities are recognised as the driving agents of the economy of a region, the work participation rate therein holds even more importance from the economic productivity point of view. According the above mentioned formula, work participation rate of total persons, males and females has been calculated and town wise study of workers is analysed here preceded by a general overview of labour force scenario in the state. The sex difference of workers in towns is also captured and a presentation of work participation rate in different size class towns is mentioned too.

---

[10] Worker – A Person whose main activity is participation in any economically productive work by his physical or mental activity

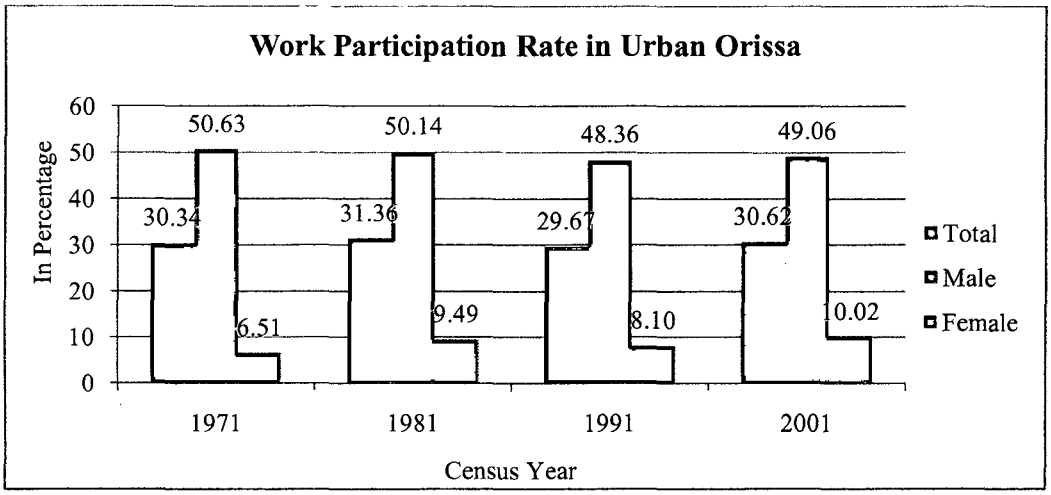
[11] Main Worker – A Person who worked in some economic activity for pay or profit or even supervision for 183 days or more in a year

[12] Marginal Worker – A person who worked for some time during the year but for less than 183 days in a year

3.4.a. Work Participation Rate in Urban Orissa

In 1971, work participation rate in urban Orissa was 30.34 per cent. In 1981, the data given on workers changed to main workers and marginal workers and according data was adjusted by clubbing both to get the total number of workers. Work participation rate in urban Orissa increased by one percentage point in 1981. This increase in work participation rate is partly due to the fact that women's economic activities were better captured in 1981 census..

Fig: 3.2



Source: *Census of India, Primary Census Abstract Orissa, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21*

A departure is noticed in this increasing trend of work participation rate in 1991 as the corresponding figure stands at 29.67 per cent Work Participation rate again increased by one percentage point to 30.62 per cent in 2001. The male work participation rate is always higher than that of female in each Census. However, the sex difference between workers is gradually reducing in each successive decade from 1971 to 2001 which implies a faster growth in female work participation rate in Urban Orissa. Still, the female literacy in the state is quite low may be due to the fact that women are more involved in household activities which are not considered as work according to Census criteria.

Table: 3.6 reveals that work participation rate is more or less same in different class towns in Orissa. Maximum increase in participation rate is observed in class VI towns till

1991 and declined in 2001. The increase in work participation rate occurred more in small and medium towns and this growth is being shifted to bigger towns and cities in last decade. The sex difference between work participation is noticed more in Class I towns and this trend continued till 2001. Male and female participation was more in small towns and this is getting reversed to Class I and II towns with time. Till 1981, female work participation was highest in Class V towns and from 1991 onwards Class IV towns recorded maximum work participation rate.

Table: 3.6

Work Participation Rate in Class wise Towns in Orissa												
Town Class	1971			1981			1991			2001		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
I	30.54	50.37	5.54	30.27	49.21	7.31	29.93	48.83	6.95	30.97	49.74	9.29
II	29.12	48.56	6.25	30.77	50.35	7.84	28.48	47.28	7.54	29.74	48.23	9.30
III	30.70	51.36	6.44	31.70	50.47	9.94	29.03	47.62	7.90	29.98	48.24	10.23
IV	29.34	49.15	6.88	32.54	50.79	12.43	30.66	48.66	11.25	31.31	48.78	12.73
V	31.06	52.71	8.35	34.27	51.86	15.21	30.38	49.62	9.10	32.05	49.97	12.39
VI	29.10	49.86	8.09	32.56	51.26	10.41	33.03	53.31	5.95	29.27	49.04	7.38
Total	30.34	50.63	6.51	31.36	50.14	9.49	29.67	48.36	8.10	30.62	49.06	10.02

Source: *Census of India, Primary Census Abstract Orissa, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21*

In 2001, work participation rate increased in all Class wise towns except Class VI. The fact that small towns are losing their significance has already been established in previous chapter. Similarly the female work participation is observed more in each smaller towns as it decreased from the spectrum of Class VI to I towns. By and large, the total work participation rates did not show much variation across class wise towns and female work participation rate recorded little to moderate difference.

3.4. b. Work Participation Rate in Towns of Orissa

In 1971, highest work participation rate was recorded in Paradip, where half of the population were engaged in economic activities. It is due to the fact that a large proportion of residents were engaged in various economic activities enabled by port facilities and also significant proportion got involved in fishing. Paradip is one of the

largest all-weather marine fishing hubs of not only Orissa but in the eastern coast of India. Next to Paradip, other towns showing higher work participation rate are Jajpur Road (41.34 per cent), Barbil (39.88 per cent), and Choudwar (39.37 per cent). It is useful to mention that all these towns showing high work participation rate are either industrial or mining towns. Other industrial towns in state like Joda, Brajrajnagar, Raurkela, and Rajgangpur are also in the higher side so far the work participation is concerned. Few other small and medium towns like Baudh, Chandbali, Khariar Road, Kesinga etc. also witnessed high work participation rate and this is probably due to large number of workers were engaged in primary sector which is supported by the observation that female work participation in these towns is relatively higher. In almost all the towns, male work participation rate is disproportionately higher than that of females. In 1981, highest work participation rate of 58.46 per cent was observed in Rengali Dam Project Township followed by Paradip (47.16 per cent), Paparahandi (46.92 per cent). The towns showing high work participation arte in 1971 recorded decline in the same in 1981. Maximum decrease of 5.57 per cent in work participation was observed in Biramitrapur and a decline of three to five percentage points in work participation rate in another nine towns namely Baudh, Jajpur Road, Brajrajnagar, Barbil, Choudwar, Sonepur, Raurkela Industrial Township, Jatni and Chandbali. On the other hand, Gudari recorded an increase of 11.23 percentage points followed by Kotpad that increased 10.94 percentage points. On the whole, out of 81 towns in

Table: 3.7

Work Participation Rate in Towns of Orissa							
Name of Town	Work Participation Rate				Change in WPR (in % age points)		
	1971	1981	1991	2001	1971-1981	1981-1991	1991-2001
Anandapur	25.17	28.49	26.85	27.90	3.31	-1.64	1.06
Anugul	30.62	33.53	30.53	33.04	2.91	-3.00	2.52
Asika	27.27	27.16	28.03	30.89	-0.11	0.87	2.86
Athagad	25.61	29.10	26.66	27.97	3.49	-2.44	1.31
Athmallik	-	-	-	35.08	-	-	-
Balagoda(bolani)	-	32.09	31.77	27.20	-	-0.32	-4.57
Balangir	27.71	27.48	27.00	28.53	-0.23	-0.48	1.52
Baleshwar	28.72	29.85	28.97	28.99	1.13	-0.88	0.02
Balimela	-	31.64	30.05	31.35	-	-1.59	1.30
Balugaon	-	-	28.54	28.05	-	-	-0.49
Banapur	-	26.95	26.75	27.20	-	-0.20	0.45
Bangura	-	-	-	34.69	-	-	-

Banki	25.17	24.10	23.88	30.33	-1.08	-0.22	6.45
Barapali	35.30	40.55	35.34	31.94	5.25	-5.22	-3.40
Barbil	39.88	35.25	31.20	30.89	-4.63	-4.05	-0.31
Bargarh	30.17	29.42	29.42	28.96	-0.75	0.00	-0.46
Baripada	27.30	30.08	29.51	30.44	2.78	-0.57	0.93
Basudebpur	-	29.67	26.58	26.38	-	-3.09	-0.19
Baudhgarh	36.97	31.56	30.09	31.61	-5.41	-1.47	1.52
Belagachhia	-	-	-	27.25	-	-	-
Bellaguntha	26.46	34.43	31.16	32.27	7.97	-3.27	1.11
Belpahar	-	-	28.33	31.14	-	-	2.81
Bhadrak	26.83	27.87	25.89	27.02	1.04	-1.98	1.13
Bhanjanagar	26.03	26.04	28.05	27.73	0.02	2.00	-0.31
Bhawanipatna	28.10	29.50	28.74	29.57	1.40	-0.75	0.83
Bhuban	26.79	29.25	26.44	26.17	2.45	-2.81	-0.26
Bhubaneswar	32.06	32.38	32.80	33.32	0.32	0.41	0.53
Binika	-	43.54	46.02	37.59	-	2.48	-8.43
Biramitrapur	33.29	27.72	28.72	29.55	-5.57	0.99	0.84
Bishamkatak	-	-	-	31.78	-	-	-
Brahmapur	27.62	27.17	27.05	28.82	-0.45	-0.12	1.78
Brajarajnagar	34.60	29.39	28.15	25.71	-5.21	-1.25	-2.43
Buguda	28.57	32.48	27.96	31.58	3.91	-4.52	3.62
Burla	31.53	30.95	28.72	29.39	-0.57	-2.23	0.67
Byasanagar	-	-	-	29.28	-	-	-
Champua	-	-	27.53	28.64	-	-	1.11
Chandabali	35.75	32.06	25.59	D	-3.69	-6.46	
Chandapur	-	-	-	29.79	-	-	-
Chandili	-	32.41	29.63	28.99	-	-2.78	-0.65
Charibatia	-	-	28.47	30.49	-	-	2.03
Chhatrapur	26.20	28.73	26.09	26.16	2.52	-2.63	0.06
Chikiti	-	38.41	32.55	36.70	-	-5.86	4.14
Chitrakonda	-	31.69	30.21	D	-	-1.48	-
Choudwar	39.37	34.75	28.53	28.29	-4.62	-6.22	-0.24
Cuttack	29.80	30.41	30.57	32.13	0.61	0.16	1.56
Dadhapatna	-	-	-	28.64	-	-	-
Daitari	-	34.54	29.21	30.53	-	-5.33	1.32
Damanjodi	-	-	41.20	30.51	-	-	-10.68
Debagarh	28.64	32.62	28.40	33.12	3.98	-4.22	4.72
Dera colliery township	-	31.65	28.38	28.72	-	-3.27	0.34
Dhamanagar	-	-	-	29.23	-	-	-
Dhenkanal	28.47	30.33	29.22	28.99	1.86	-1.11	-0.23
Digapahandi	-	32.66	33.16	35.02		0.50	1.86
Dungamal	-	-	-	46.87	-	-	-
F.C.I.Township	-	35.84	28.92	27.80	-	-6.92	-1.13
G.udayagiri	-	33.70	29.06	29.81	-	-4.64	0.76
Ganjam	-	29.02	24.03	25.76	-	-4.99	1.72
Ghantapada	-	-	30.22	30.31	-	-	0.09
Gopalpur (CT)	-	-	28.18	D	-	-	-
Gopalpur(NAC)	29.61	31.33	27.50	31.05	1.72	-3.83	3.55
Govindpur	31.61	D	-	-	-	-	-
Gudari	28.72	39.94	34.53	33.79	11.23	-5.41	-0.75
Gunupur	28.39	34.19	31.72	33.97	5.80	-2.47	2.25
Hatibandha	-	-	28.07	25.08	-	-	-2.99

Hinjilicut	27.88	32.96	29.34	31.18	5.07	-3.61	1.83
Hirakud	32.57	30.08	30.50	30.45	-2.50	0.43	-0.05
Jagatsinghpur	-	30.08	28.03	32.22		-2.05	4.18
Jajapur	27.71	26.63	24.29	25.21	-1.08	-2.34	0.93
Jajapur Road	41.34	36.09	30.24	D	-5.25	-5.85	-
Jalda	-	26.51	26.40	24.99	-	-0.12	-1.41
Jaleswar	28.22	30.16	28.70	31.59	1.94	-1.46	2.90
Jatani	29.05	25.25	24.13	26.00	-3.80	-1.12	1.86
Jeypur	28.02	31.89	30.42	32.17	3.87	-1.47	1.75
Jharsuguda	30.13	33.70	31.80	31.26	3.57	-1.90	-0.54
Jhumpura	-	-	-	31.19	-	-	-
Joda	36.25	34.03	32.80	33.59	-2.22	-1.23	0.79
Junagarh	30.29	34.10	34.67	32.98	3.81	0.57	-1.69
Kamakshyanagar	-	31.23	29.57	31.86	-	-1.65	2.29
Kantabanji	25.68	29.61	28.67	26.89	3.93	-0.94	-1.78
Kantilo	-	27.28	25.38	31.87	-	-1.90	6.49
Karanjia	-	37.12	30.30	32.20	-	-6.83	1.90
Kashinagara	-	42.79	42.56	45.77	-	-0.24	3.21
Kavisurjyanagar	29.35	30.81	28.74	30.04	1.46	-2.07	1.29
Kendrapara	24.40	25.89	24.98	27.57	1.49	-0.91	2.58
Kendujhar	28.53	33.54	29.21	29.34	5.01	-4.33	0.13
Kesinga	33.52	31.86	31.74	33.55	-1.66	-0.12	1.81
Khaliapali	-	-	-	29.58	-	-	-
Khalikote	28.29	32.10	28.41	29.04	3.81	-3.69	0.63
Khandapada	-	-	25.66	25.23	-	-	-0.43
Khariar	28.92	32.59	31.35	32.56	3.66	-1.23	1.21
Khariar road	33.81	36.13	33.14	36.05	2.32	-2.99	2.90
Khatiguda	-	-	-	29.38	-	-	-
Khordha	27.10	26.96	27.45	27.09	-0.15	0.49	-0.36
Kochinda	32.86	35.56	39.29	31.78	2.70	3.73	-7.51
Kodala	-	33.40	32.16	42.36	-	-1.24	10.20
Konark	-	-	27.46	32.66	-	-	5.20
Koraput	32.30	36.32	31.25	31.93	4.02	-5.07	0.67
Kotpad	29.08	40.02	33.86	35.16	10.94	-6.16	1.30
Lathikata	-	-	-	28.19	-	-	-
Makundapur	-	-	-	27.96	-	-	-
Malkangiri	35.28	35.85	32.86	34.45	0.56	-2.99	1.59
Mukhiguda	-	-	-	35.02	-	-	-
Nabarangapur	28.73	33.15	30.22	31.21	4.42	-2.93	0.99
Nalco	-	-	37.71	36.09	-	-	-1.62
Nayagarh	29.10	31.10	26.49	27.46	1.99	-4.60	0.97
Nilagiri	-	-	31.27	33.12	-	-	1.85
Nimapada	-	30.04	28.80	30.11	-	-1.23	1.31
Nuapatna	-	-	39.03	39.76	-	-	0.73
O.C.L.Industrial Township	-	-	-	33.11	-	-	-
Padmapur	30.67	30.81	30.31	28.77	0.14	-0.50	-1.55
Panposh	-	-	26.10	28.63	-	-	2.53
Paparahandi	-	46.92	D	-	-	-	-
Paradip	49.74	47.16	34.25	35.27	-2.58	-12.90	1.01
Paradip Phosphates	-	-	52.15	D	-	-	-
Parlakhemundi	26.92	30.94	26.84	31.81	4.02	-4.10	4.97
Patnagarh	29.37	29.71	31.18	28.83	0.33	1.48	-2.36

Pattamundai	-	-	21.82	27.45	-	-	5.63
Phulbani	30.63	30.06	30.16	29.29	-0.56	0.10	-0.87
Pipili	-	31.26	29.46	29.73	-	-1.80	0.27
Polasara	32.09	34.60	33.78	32.19	2.50	-0.81	-1.60
Pratapsasan	-	-	-	33.19	-	-	-
Puri	29.39	28.87	27.65	29.99	-0.52	-1.22	2.34
Purusottampur	29.65	35.06	35.52	33.54	5.41	0.46	-1.98
Rairangpur	27.08	32.34	29.48	28.81	5.26	-2.86	-0.67
Rajagangapur	32.48	33.52	30.51	27.13	1.04	-3.01	-3.38
Rambha	31.16	41.11	36.08	31.00	9.94	-5.03	-5.08
Raurkela	34.39	33.97	31.12	28.82	-0.42	-2.85	-2.29
Raurkela industrial township	33.17	29.21	26.93	28.29	-3.95	-2.28	1.36
Rayagada	30.58	32.51	31.41	31.83	1.93	-1.09	0.42
Redhakhol	-	-	-	35.82	-	-	-
Remuna	-	-	-	31.86	-	-	-
Rengali Dam Project township	-	58.46	34.64	26.16	-	-23.82	-8.48
Sambalpur	28.82	33.52	30.49	31.56	4.70	-3.02	1.07
Sonapur	35.07	30.57	31.33	29.64	-4.50	0.76	-1.69
Soro	-	27.13	27.72	27.56	-	0.59	-0.15
Sunabeda	31.66	34.95	29.74	32.95	3.29	-5.21	3.21
Sundargarh	28.14	30.67	28.35	28.73	2.53	-2.32	0.37
Surada	25.83	30.24	28.73	29.64	4.41	-1.51	0.91
Talcher	27.99	30.08	29.69	32.04	2.09	-0.39	2.35
T.T.P.S. Township	-	34.13	27.65	32.28	-	-6.48	4.63
Tarbha	31.62	35.10	33.22	31.89	3.48	-1.88	-1.32
Tensa	-	-	24.35	30.43	-	-	6.08
Titlagarh	28.41	29.45	29.49	29.72	1.03	0.04	0.23
Udala	-	33.70	32.22	33.79	-	-1.49	1.57
Umarkote	31.85	37.67	34.06	35.15	5.81	-3.61	1.09

Source: Census of India, Primary Census Abstract Orissa, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21

D- Declassified Town

1971, fifty five towns recorded increase in their work participation rate and twenty five towns declined on the same front while Govindpur was declassified in 198. All the towns showing increase in work participation in 1971-1981 reversed their trend in the following decade, indeed maximum towns recorded decline in 1991 which contributed to the reduction in the percentage of workers in Urban Orissa as a whole mentioned earlier. Kuchinda is the only town that continued its increasing trend in work participation till 1991 and as high as eighty nine towns out of total 108 towns in 1981 showed negative growth in work participation in 1991 Census. Rengali Dam Project Township witnessed a significant decline of 23.82 percentage points in 1991 over its rate in 1981 and second highest decrease was noticed in Paradip (12.90 per cent) in the same period. Kuchinda,

Binika, Bhanjanagar and Patnagarh are the only four towns where work participation rate increased by more than one percentage point in 1991 and their figures are 3.73, 2.48, 2.00 and 1.48 percentage points respectively. In 1991, the highest work participation rate is noticed in Paradip Phosphates (52.15 per cent) followed by Binika (46.02 per cent), Kashinagara (42.56 per cent), Damanjodi (41.20 per cent).

Towns recording increase in work participation in 1991 declined on the same front in 2001 census. The highest increase in work participation noticed in Kodala (10.2 per cent) followed by Kantilo (6.49 per cent), Banki (6.45 per cent); it is interesting to note that these towns recorded decline in work participation rate in previous decade. Maximum decrease of 10.68 per cent) in work participation rate was observed in Chandbali. Rengali was the highest declining town in work participation as per 1991 census and it further decreased in 2001 by 8.48 percentage points. Out of 124 towns in 1991, work participation rate reduced in fourty towns in 2001 census. Among all nine Class I towns in 2001, highest work participation was noticed in Bhubaneswar (33.32 per cent) followed by Cuttack (32.13 per cent), Sambalpur (31.56 per cent), Baripada (30.44 per cent).Since 1971, work participation has been declining in Rourkela in each census years till 2001 and the same happened in Raurkela Industrial Township till 1991 and it marginally improved in 2001. The variation in work participation in towns highly fluctuated from census to census as the towns recording increase in work participation in 1981 reversed their trend in subsequent censuses except few which maintained marginal increase in 2001. Maximum of towns witnessed decline in work participation in 1991. By and large, during 1971-2001, small and medium towns and few other industrial towns like Talcher have been reporting gross increase in work participation rate as evidenced by the table: 3.6. On the other hand, work participation rate has been declining rapidly in Paradip till 1991and marginally increased in 2001 by one percentage point. Few other towns like Chowdwar, Barbil, and Brajrajnagar recorded significant decline in work participation rate during 1971-2001 and this is primarily caused due to closure of main industries running therein.

3.4. c. Sex Difference in Work Participation

The male work participation rate is higher than that of females in all towns and each census time period. The difference sex difference in work participation rate very high as

the highest male work participation rate in 1971 was 71.81 per cent recorded in Paradip whereas the highest female work participation in 1971 was 18.13 observed in Polasara. The widest sex difference in work participation (69.6 percentage points) was noticed in Paradip followed by Choudwar (57.88 per cent), Brajrajnagar (55.83 per cent) and many more towns recorded a difference of well above fourty to fifty percentage points. The towns where industry or mining served as its chief economic function recorded maximum discrepancy in work participation rate between males and females. R.B.Bhagat and K..C.Das[13] has also mentioned that female work participation in Orissa is very low and the differences between male and female are wide enough to think upon. More than 40 percentage points of sex difference in work participation rate is found in as many as 58 towns in 1971 out of total 81 towns and remaining towns did not show any better figures as the lowest difference recorded was 28.45 percentage points which itself is very high. In 1981, the female work participation rate improved in few towns as the highest female literacy rate recorded was 32.89 per cent in Paparahandi followed by Kashinagar (31.50 per cent). It may be here, noted that in 1981, there were 12 towns that showed a female work participation rate more than 20 per cent while no town in 1971 could have attained that status. Paradip continued to be the town where sex difference in work participation is highest with a difference of 60.56 percentage points. The sex difference remained to be disproportionately high and the maximum discrepancy was observed in Paradip Phosphates with 70.36 percentage points. However, in 2001, the highest discrepancy lowered moderately to 66 reported in Dungamal and Kodala is the town where a lowest difference of 18.62 percentage points. By and large, the male female difference in work participation has lowered marginally and it is attributed to the fact that more number of females is gradually engaged in marginal workers though more specifically in smaller towns of rural character. The work participation rates of female workers in the marginal work category are much higher in the rural areas of Rajasthan, Madhya Pradesh and Orissa[14]. The census towns and the newly added towns in 1981 and thereafter are more of

[13] Bhagat.R.B and Das.K.C. , (2008) , 'Levels, Trends and Structure of Workforce in India: Census Based Study 1981-2001

[14] Ibid, pp.28

rural character and not much practical difference is found in rural and urban areas in terms of economic functions. In these towns relatively larger proportion of females get engaged in marginal and primary sector activities, thereby enabling an increase in female work participation rate. Nevertheless, the sex difference in work participation rate is very wide in towns of Orissa with very little pace of bridging of that gap over the years.

3. 5. Socio-economic Development

Various socio-economic characteristics of towns has been discussed earlier and now an attempt is made to analyse the socio-economic development status more objectively. For this purpose, a socioeconomic development has been constructed by taking following indicators.

1. Female Literacy rate: Literacy rate is considered as an important social indicator to show the social development of any region. Here, female literacy is taken because, male literacy was found to be relatively high around 70 per cent but in few towns less than 40 per cent of females are illiteterates. The sex difference in literacy has been a cause of worry in the path of social development. The male literacy was higher than that of females in all towns and by taking the later as an indicator; the sex disparity could also be included as a factor in determining development status.

2. Total Work Force Participation: It represents the economic engagement of people and higher work participation rate indicates low dependence ratio and better economic productivity. The standard of living in a region is also influenced by the proportion of population employed in economic activities. Due to sharp difference in male and female work participation rate, total work participation rate was preferred.

3. Sex ratio of workers engaged non-industrial activities: This indicator represents both social and economic status of a region. The sex ratio can capture the difference between the two sexes. Sex ratio of workers employed in non-agricultural activities can illustrate the differential economic engagement between males and females. The non agriculture activities included all industrial categories except cultivators and agricultural labourers.

Taking these three indicators, a socio-economic development index was constructed. To do so, 'Z-Score' method was applied. All these variables were made scale free by taking their standardised value. The summation of those standardised scores of a town was taken

as the index value of that town. The socioeconomic development index was calculated separately for 1971, 1981, 1991, 2001 and the temporal comparison was made.

Based on the values of the index, five categories were made to show the level of socioeconomic development in towns of Orissa from 1971 to 2001.

3.5.a. Very High Level

The towns showing very high level of socioeconomic development were Baudh, Biramitrapur, Sonepur, Paradip and Barbil in 1971. All of them are small towns except Biramitrapur and Barbil. The high index vale was found to be high in small towns because the sex difference in non-agriculture activities is high in bigger cities. Rengali dam Project Township toped in the ranking of socioeconomic development in all towns in Orissa. There has been constant decline in level of socioeconomic development in the percentage of towns under this category. The number of towns having very high level of socioeconomic development has increase from 5 in 1971 to 6 in 1981. All the towns having very high socioeconomic development are small towns and this is attributed to the observation that the sex ratio of workers engaged in non-agricultural activities is comparatively very high than other towns.

The first position was held by Rengali Dam project Township because a very high figure of 58 per cent work participation rate with moderate female literacy and sex ratio. In 1991, Paradip phosphates scored the highest index value followed by Binika. In 2001 again, two small towns-Kashinagar and Nalco had been ranked as the towns with very socioeconomic development because of the high sex ratio in the former and high literacy and work participation rate in the later.

3.5.b. High Level

Post 1991, the percentage of towns in this category has decreased. The important towns of Orissa like Angul, Bhubaneswar, Cuttack and Rourkela Steel Township fell under this category. The percentage of towns with high socioeconomic development has substantially decreased from 19 per cent in 1981 to 11 per cent in 1991 of the total towns in respective years. In 1991, Cuttack slipped to the medium category whereas towns like Kuchinda, Sonepur improved their socioeconomic status. In 2001 again, maximum of

Table: 3.8

Distribution of towns in different categories of socioeconomic development

1971				1981		
Category	Values	No. of Towns	Percentage of Towns		No. of Towns	Percentage of Towns
very high	More than 2.19	5	6.17	More than 2.34	6	5.56
high	0.72- 2.18	14	17.28	0.94-2.33	20	18.52
medium	-0.75- 0.71	41	50.62	-0.46-0.93	42	38.89
low	-2.22- (-0.76)	17	20.99	-1.85- (-0.94)	29	26.85
very low	Less than -0.77	4	4.94	Less than (-0.95)	11	10.19
Total Towns		***81***	***100.00***	***Total Towns***	***108***	***100.00***
	1991			**2001**		
Category		No. of Towns	Percentage of Towns		No. of Towns	Percentage of Towns
very high	More than 3.65	2	1.61	More than 3.55	2	1.45
high	1.82- 3.64	14	11.29	1.69- 3.54	16	11.59
medium	-0.01 – 1.81	42	33.87	-0.17- 1.68	52	37.68
low	-1.84- (-0.02)	57	45.97	-2.03- (-0.18)	57	41.30
very low	Less than -1.85	9	7.26	Less than -2.04	11	7.97
Total Towns		***124***	***100.00***	***Total Towns***	***138***	***100.00***

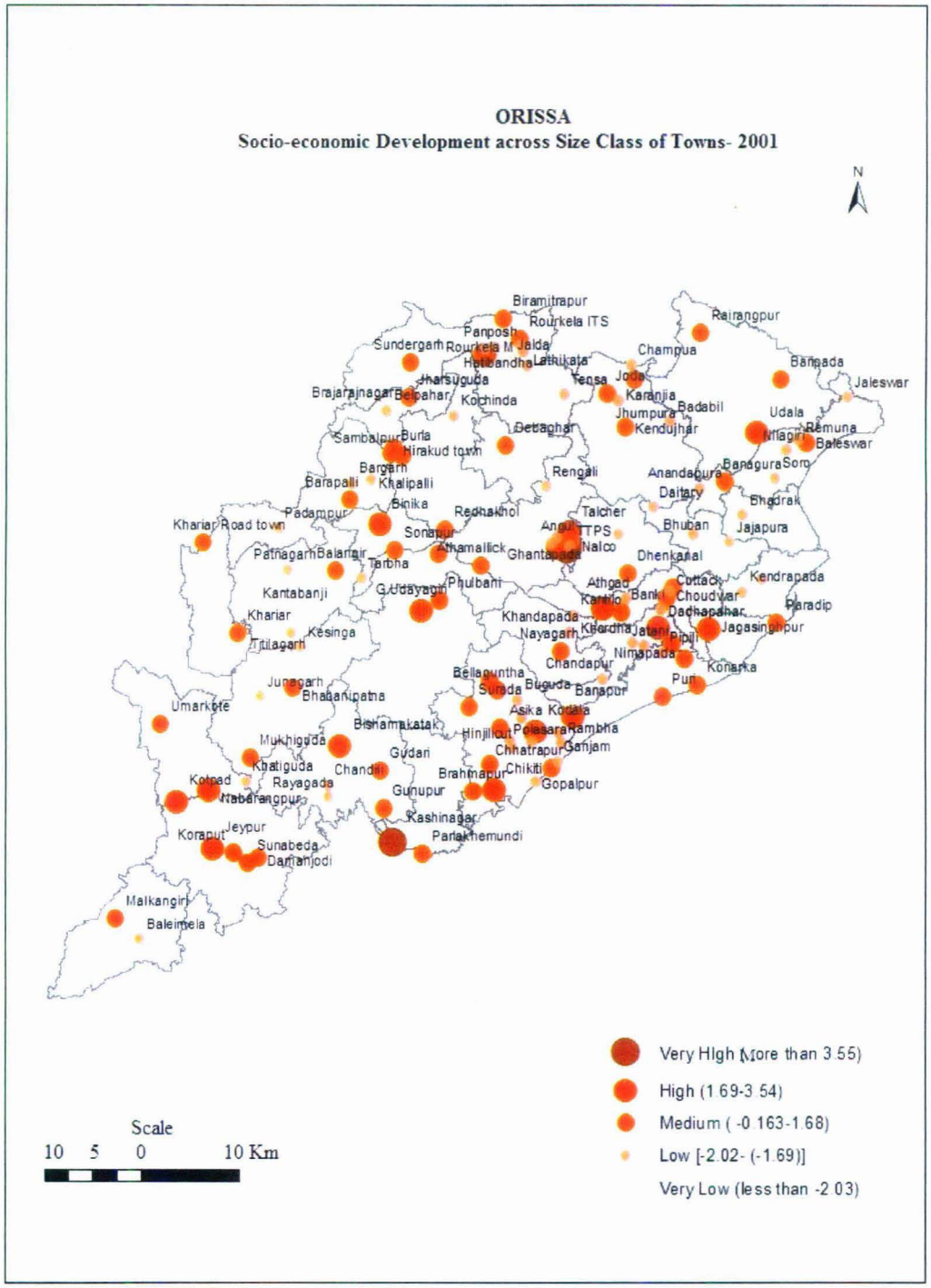
towns with high socioeconomic development are small towns and the reason is same as they have recorded a relatively higher sex ratio of workers in non-agricultural activities.

3.5.c. Medium level

More than half of the towns fell under this category in 1971 and the percentage of towns with medium level of socioeconomic development has gone down to 39 per cent in 1981.Puri Brahmapur, Raurkela, Sundergarh had moderate development which continue to be in the same category till 2001.Out of total 138 town, 52 towns had witnessed medium level of socioeconomic development in 2001.

ORISSA

Socio-economic Development across Size Class of Towns- 2001



3.5.d. Low Level

Towns placed under this category generally had low level of female literacy and work participation rate. These are located away from the district headquarters and performed below par on the literacy front. The proportion of towns in this category has systematically reduced and many medium towns like Balangir, Rayagada, and Jatni recorded low socioeconomic development status which can be attributed to the fact that, education sector is partially developed and the male dominance in labour force was seen. Rengali dam Project Township slipped to low category from very high category in 1981 which could explained by the in skewed sex ratio. The majority of workers were involved in construct activities which are mostly performed by males. This category held the largest share of the total towns 1991 onwards whereas the medium level towns were more prior to that.

3.5.e. Very Low Level

Banki, Bhadrak, Bhuban and Kendrapara are the towns which had very low socioeconomic development in 1971 and they remained in the same category till 1991 while Kendrapara moved one step up the order in 2001. Five per cent of the towns were under this category in 1971 bur substantially increased to 10 per cent in 1981. All the towns having very low level of socioeconomic development were small towns and newly added towns. These towns had recorded a low female literacy rate and low representation of females in non-agricultural activities. It may further be added that the females employed in economic activities are of basically primary activities.

By and large, socioeconomic development status of towns has not improved much as the share of low and very low category towns are becoming dominant with passage of time.

3.6. Conclusion

Socioeconomic characteristics of towns have improved considerably during 1971-2001. A maximum of 29 points increase was recorded in sex ratio in urban Orissa in the last decade whereas the state capital witnessed significant increase of 46 points during the same period. Literacy rate systematically increased at all levels-total, male and female. The sex disparity in literacy rate has reduced to one third in 2001 to that in 1971.

Though the improvement in literacy rate and work participation rate was noticed in towns of Orissa, the sex differences especially in work participation rate are found to be wide.

The observation that females are still not getting employed in non-agricultural activities was more highlighting till 1991, and that has contributed to the low socioeconomic development status. The increase in literacy rate is minimal in small towns located away from the chain of economic production centres connected by the leading towns and low work participation rate has fuelled their stagnation or decline in growth potential. Also, the observation of many medium towns with low socioeconomic development had come in the way of connecting small towns to the complementary area of large towns. At the same time, the large towns did not act much differently and their accentuation continued. Female work participation rate was found to be relatively higher in small towns compared to large and medium towns. It might have been caused by the observation that agricultural activities are dominant in small towns and significant proportion of them is females. The increase in socioeconomic development of many such towns was caused more by the economic factor like expansion of share of workers and the progress in literacy rate but the sex differential between work participation rate remains as a cause of concern.

Chapter IV

Municipal Finance and Infrastructure Facilities in Towns of Orissa

4.1. Introduction

The urban growth has been accelerating significantly since last three decades or so. In Orissa, with a growth rate of 69 per cent, the urban population increased at a rate four times higher than rural population which recorded 16 per cent growth during 1971-1981. The urban growth is still more than double of its rural counterpart in subsequent decades. Continuous increase of urban population along with disproportionately high concentration of urban in-migrants especially in big cities have thrown the challenge of building adequate infrastructure facilities and basic services in urban areas. But, it is increasingly realised that the expansion of infrastructure facilities has not been commensurate to that of urban growth and this state of affairs is found to be precarious especially in developing countries like India. While the urbanisation phenomenon is widely accepted as being an inevitable by-product of development, there are many undesirable outcomes too that have resulted.[1]

The municipal bodies (urban local bodies) are statutorily responsible for the provision and maintenance of basic infrastructure and services like health, sanitation, water supply, and many other important amenities in cities and towns. For this, ULBs need adequate finances and sadly, it is very often unavailable to most of the cases in India in general and Orissa in particular. With increasing population and increasing demand for urban infrastructure services, the capacities of local governments in many developing and newly industrialised countries are overburdened.[2] While the ULBs need enhanced resources to meet the growing demand of infrastructure, indeed they are experiencing tremendous fiscal deficit even to maintain the existing services. The municipalities depend on property taxes, local option taxes, user fee and service charges, government grants, loans from various development agencies- both internal and external. Since the above mentioned sources are proved to be insufficient, the urban local bodies have no other way of becoming increasingly dependent on higher levels of government to meet their requirements. The shortage of required resources has seriously affected the basic

[1] Sridhar.K.S and Reddy.A.V. (2010), 'State of Urban Services in Indian Cities:Spending and Financing', Oxford University Press, 2010. Pp. 1

[2] *Ibid.*

urban services and poor people being the most vulnerable are forcibly pushed towards perils of diseases.

Urban studies in recent years have overwhelmingly focused on the aspect of financing and organisation of resources in urban local bodies in towns and cities. Review of studies conducted by the National Institute of Urban Affairs (NIUA)[3] and the National Institute of Public Finance & Policy [4] indicate that the finances of municipal bodies are in a mess; a majority of them are not able to raise adequate resources from their own sources to meet increasing expenditure on services. This has been held responsible for one of the important reasons of the urban areas in India witnessing deterioration in the standard of quality of public life. Recognising the importance of this municipal finance management, Government and development agencies have sought to address this in their urban renewal and reform programmes. The Good Urban Governance Campaign (GUGC), undertaken in partnership with the United Nations Centre for Human Settlements identified six key issues that were central to good urban governance. These were urban decentralization, municipal finance, urban environment, integration of the poor and marginalized, transparency and civic engagement, and municipal management and capacity building.

It is thus, felt necessary to discuss the finances of the Urban Local Bodies – covering the different sources of receipts, pattern of expenditure of available resources, the per capita receipt and expenditure of resources in different size class towns and the gap between them. Since the municipal finances and the provision of infrastructure facilities are closely interrelated, in this chapter, the status of both has been examined across different size class towns. In the first section the sources of finances of ULBs and the areas of expenditure has been analysed and an investigation of availability of infrastructure facilities is presented in second section.

---

[3] NIUA (2000); First State Finance Commissions – Recommendations Regarding Transfers, Sharing and Devolution of Taxes, a background paper prepared for the National Meet on Approach to State – Municipal Fiscal Relations', organized by *the National Institute of Urban Affairs, National Institute of Public Finance and Policy and Indo-US FIRE Project, New Delhi, 16 June.*

[4] NIPFP (1995) Redefining State – Municipal Fiscal Relations – Options and Perspective for the State Finance Commissions, *National Institute of Public Finance and Policy, New Delhi*, Vol-.I

Municipal governments in India have been in existence for many years. The first municipal corporation was created by a Royal Charter in Madras in 1688. In the present form and structure, the municipal bodies owe their existence to what is known as the Lord Ripon's Resolution adopted on May 18, 1882.

Urban Local Bodies are classified into four major categories namely, municipal corporations, municipalities (municipal council, municipal board, municipal committee), town area committee and notified area committees. The municipal corporations and municipalities are fully representative bodies, while the notified area committees and town area committees are either fully or partially nominated bodies

Among all urban local governments, municipal corporations are distinguished as they are enjoying a greater degree of fiscal autonomy and functions. On the other hand, municipalities have less autonomy, smaller jurisdictions and have to deal with the state governments through the Directorate of Municipalities or through the collector of a district. These local bodies are subject to detailed supervisory control and guidance by the state governments.

4. 2.Municipal Finance in Orissa

In 1936, when Orissa was formed as a separate state, there were eight municipalities. Established in 1855, Berhampur is the oldest municipality in the state. In 1869, Jajpur and Kendrapara municipalities were constituted in 1869 followed by Cuttack, Balasore, Puri, Sambalpur, and Paralakhemundi which came into existence in 1867, 1877, 1881, 1883 and 1886 respectively. With the merger of princely states in Orissa the number of urban local bodies increased to 29 in 1949. According to 2001 Census there are 138 towns in Orissa, out of them urban local bodies existed in 105 towns. Orissa comprise of Municipal Corporations, Municipalities and Notified Area Councils. There were two Municipal Corporations in Bhubaneswar and Cuttack, 32 Municipalities and 71 Notified Area Council.

4.2. a. Sources of Municipal Finance

The Urban Local Bodies receive their financial resources through a large array of tax and non-tax revenue. In addition to that, they also get funds from state Government in the form of grants-in-aids and loans by various development agencies.

Census of India has classified the source of municipal finance into six categories. These are:

1. Revenue through taxes
2. Revenue derived from municipal properties
3. Government grants
4. Loans
5. Advances
6. Other sources

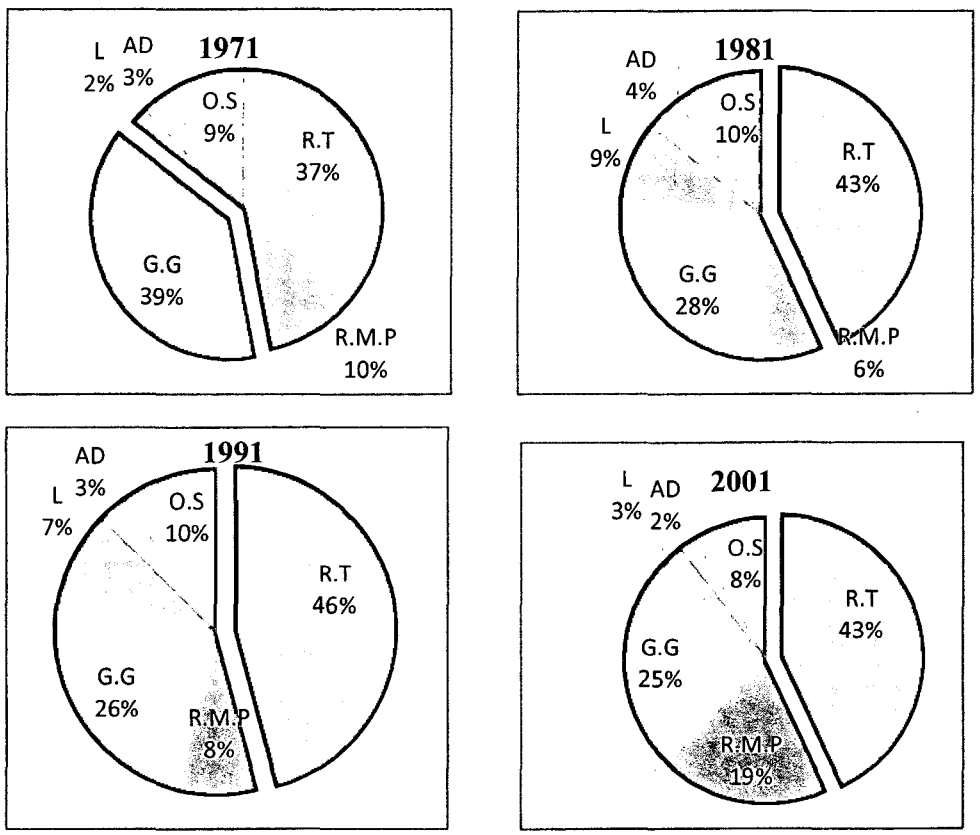
Further, the above mentioned sources can be categorised into following three broad categories:

- *Internal sources*: The major components of this source come in the form of tax revenue and non-tax revenue. Tax revenue comprises of property taxes, theatre/show tax and tax on advertisements, boats etc. The property tax is the tax on real property on the estimated market value of the property. Tax on vehicles, animals, trade and callings and professions e. Rents from municipal assets; income from municipal undertakings, user charges; fees and fines; income from municipal investments etc. form the major shares of non-tax revenue of the ULBs.
- *External Sources*: Government grants, aids loans and advances are the prime means of receipts of finances by ULBs from external sources. These are given to correct financial miss-match upon certain conditionalities and assumptions that municipal governments are not able to generate required resources.
- *Other sources*

Here, an attempt has been made to study the structure of the sources of municipal finances in the towns of Orissa. The census towns and other towns like Industrial Township have been excluded from this study as they do not have such nodal organisation or urban local body. Figure: 4.1 showing percentage distribution of different sources of municipal finance reveals that revenue through taxes has been the major source of municipal finance in the urban local bodies of the towns in Orissa. In 1971, Government Grants contributed 39 per cent of the total receipt of ULBs in Orissa.

Figure: 4.1

Percentage Share of Different Source of Municipal Finances in Orissa



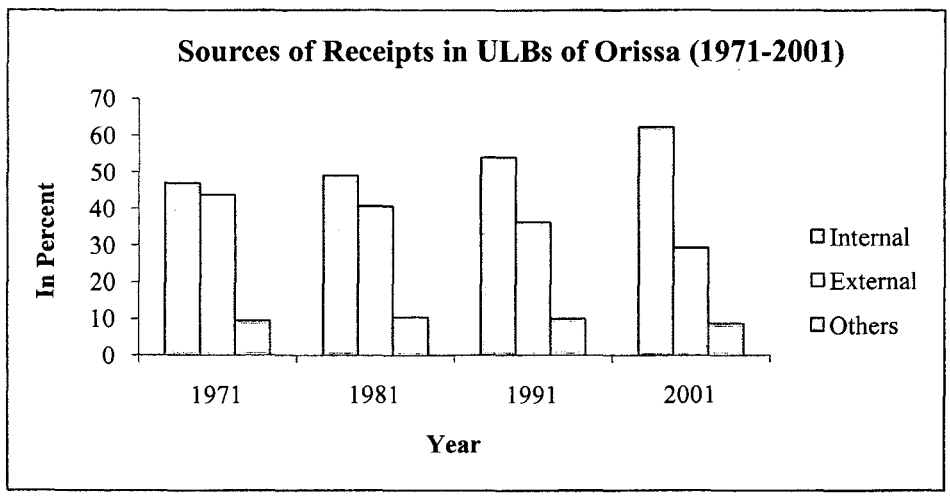
R.T.-Revenue through Taxes; **R.M.P**-Revenue through Municipal Properties; **G.G**-Government Grant; **L**-Loan; **A.D**-Advance; **O.S**-Other Sources

Source: Census of India, Town Directory Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

Next to that, 37 per cent was derived from revenue through taxes. Loans and advances did not account much to the total receipt of finances by ULBs. The share of revenue through municipal properties was 10 per cent and other sources accounted for nine percent. The share of receipts collected from revenue through taxes has went up from 47 per cent in 1971 to 43 per cent in 1981 and it further increased to 46 per cent in 1991.Another striking feature of the structure of sources of municipal finances is that proportion of Government grants has been declining considerably. Its share was 39 per cent in 1971 and decreased to 25 per cent in 2001. The share of loan expanded from meagre 2 per cent in 1971 to nine per cent in 1991 and after that it has been declining. The revenue through municipal properties has increased significantly in 1991-2001 and this is mainly due to better collection of municipal rents, undertakings and fair charges of user fees and fines. The financial receipts from other sources and advances have not changed much in the state since 1971.

The following figure: 4.2 indicates that the share of funds received from external sources has been diminishing over the years and funds generated within capabilities of ULBs themselves are going up.

Fig: 4.2



Source:• Census of India, Town Directory Orissa,, 1971(series16), 1981(Series 16), 1991(Series 19), 2001(Series 21)

In 1971, receipts of finances from internal sources - taxes, non-tax revenues, property taxes, and municipal properties accounted for 47 per cent and external sources in the

form of grants, loans and advances contributed 44 per cent of the total municipal finances in the state., The contribution of external sources have systematically decreased to 36 per cent in 1991 from 41 per cent in 1981 and considerably shrinked to 29 per cent in 2001.

On the other hand, the ULBs continued to be able to generate more financial resources as the share of receipts raised from 49 per cent in 1981 to 54 per cent in 1981 and another eight percentage points increased in 2001. The funds received from other sources have remained more or less same during 1971 to 2001 with just a marginal decrease of one percentage points in last decade.

4. 2.b.Areas of Revenue Expenditure

The municipal bodies need to take care of a lot of service delivery activities. The maintenance of physical infrastructure and provision of basic services and amenities are chief functions of the ULBs. A better service delivery mechanism provided by them needs adequate amount of finances. Though, more than often, the resource deficit has affected the quality of urban public life, the direct job of providing basic services is the responsibility of the urban local bodies. The expenditure pattern of ULBs in different sector will have the final say regarding the conditions of a town or city making it livable or unlivable. Savage and Dasgupta[5], reviewing the case of Bangalore argued that more revenue and better infrastructure do not mean better services.

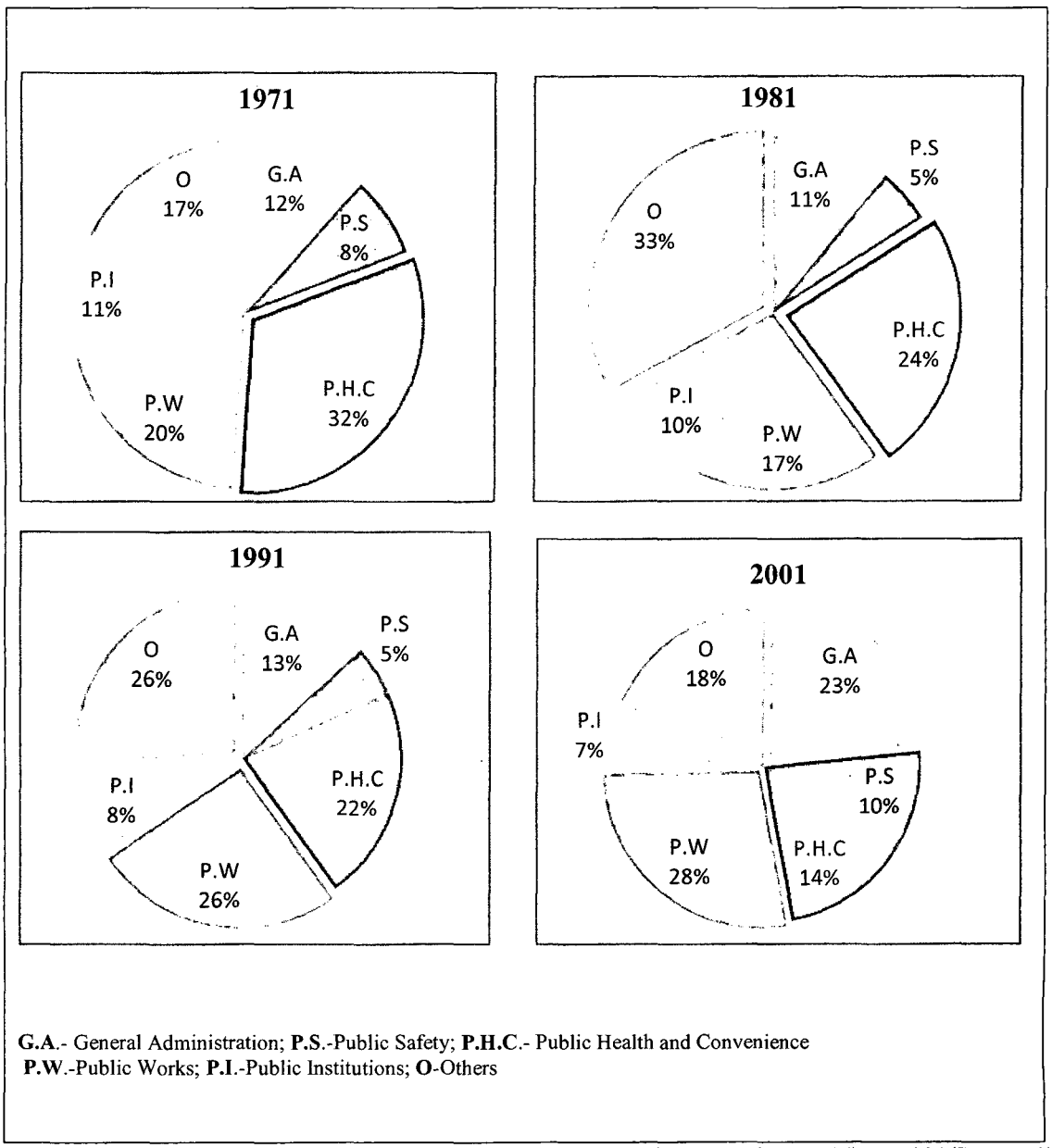
Thus, here it has been attempted to analyse the areas of expenditure of ULBs since 1971. The public health and convenience was focused more in 1971 as this sector accounted for 32 per cent of total expenditure. Public health includes water supply, sewerage and sanitation, eradication of communicable diseases etc. Twenty per cent of total expenditure devoted to public works which comprises of construction and maintenance of inner city roads and other physical infrastructure. The general administration of ULBs constituted 12 per cent of total expenditure followed by 11 per cent by public institutions like educational and vocational study centres, recreational halls, community halls etc. Over the years, the proportion of expenditure on public institutions has decreased and on

[5] Savage.D and Dasgita.S (2006), *'Governance Framework for Delivery of Urban Services'*, in 3iNetwork (ed.), *India Infratructure Report 2006:Urban Infrastructure*, New Delhi;Oxford University Press,pp 43-58

the contrary the spending on general administration has been increasing. Till 1991, the spending on general administration has not changed much whereas it rose substantially from 13 per cent to more than 23 per cent of the total expenditure in 2001.

Figure: 4.3

Area of Expenditure of ULBs in Orissa (1971-2001)



G.A.- General Administration; **P.S.**-Public Safety; **P.H.C.**- Public Health and Convenience
P.W.-Public Works; **P.I.**-Public Institutions; **O**-Others

Source: Census of India, Town Directory Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

The growing need to expand roads and other physical infrastructure and their maintenance has resulted in the increase of spending on public works as it increased from 20 per cent in 1971 to 27 per cent of the total expenditure in 2001.On the contrary, the percentage of expenditure on public health has declining significantly from 32 per cent in 1971 to 24 per cent in 1981 and further decreased to 13 per cent in 2001.

The figure: 4.3 shows that the public safety expenditure increased substantially from 5 per cent in 1991 to more than 10 per cent in 2001. The expenditure on public safety includes fire protections, fire fighting services, street lighting and other emerging services. In 1991-200, the thrust area of spending has shifted from public health to general administration and the decrease on the expenses on other miscellaneous sector which are not specified is discernible. The general administration pertains to the activities related to prescribing and enforcing building bye-laws, encroachments on public land, registration of births and deaths, etc. Expenses under the head of 'others' include development activities related to town planning and establishment of commercial markets. In 2001, more than fifty per cent of expenditure was committed to activities related to general administration and public works.

4.2. c. Source of Municipal Receipts in Different Size Class Towns

Above analysis indicated that the receipts from the revenue through taxes and municipal properties constituted the major source of financial resources of ULBs in the state. The structure of municipal finances varies across different size class towns and analysis of their percentage share in different time periods has been attempted in this section.

From the table:4.1 it is evident that the considerable portion of municipal resources in medium and small towns was received from external sources and the share of collection through taxes and non tax revenue from internal sources has been decreasing over the years. This trend is prominently visible more 1991 onwards and contrastly, the Class I towns and big cities have depended more on themselves. This is due to the fact that bigger cities perform better in tax collection, non-tax revenue and other user charges because of proper management of municipality functions compared to small and medium towns. In a way, it can be said that, small and medium towns have losing their

Table: 4.1

Percentage Share of Receipts from Different Sources and Areas of Expenditure across Size Class Towns, 1971-2001

Town Class	Source of Revenue							Areas of Expenditure						
	R.T	R.M.P	G.G	L	AD	O.S	Total	G.A	P.S	P.H.C	P.W	P.I	O	Total
	1971							1971						
Class I	41.02	4.82	37.12	2.36	1.06	13.62	100.00	8.29	5.47	38.00	18.98	12.64	16.62	100.00
Class II	37.99	5.69	40.13	0.59	5.24	10.35	100.00	9.96	3.46	40.93	11.12	18.55	15.98	100.00
Class III	38.42	15.08	37.52	1.71	3.09	4.18	100.00	13.71	12.67	22.14	24.69	9.17	17.62	100.00
Class IV	28.96	15.76	41.07	2.88	4.33	6.99	100.00	14.14	6.97	24.26	26.45	8.69	19.49	100.00
Class V	22.33	13.93	41.85	6.84	2.75	12.30	100.00	17.58	5.61	40.12	18.73	3.33	14.63	100.00
Class VI	38.16	17.87	31.14	8.04	0.00	4.80	100.00	19.17	24.07	35.11	13.05	8.59	0.00	100.00
Total	36.94	10.03	38.57	2.23	2.91	9.33	100.00	11.65	7.59	31.84	20.43	11.43	17.06	100.00
	1981							1981						
Class I	50.41	3.48	27.34	7.60	4.54	6.62	100.00	7.19	5.24	23.83	15.66	14.28	33.79	100.00
Class II	42.09	5.49	20.42	14.67	3.71	13.63	100.00	8.82	4.18	19.75	19.05	6.21	41.98	100.00
Class III	36.93	8.98	27.62	9.06	1.60	15.81	100.00	15.55	4.31	28.97	13.05	6.49	31.63	100.00
Class IV	31.23	11.61	39.81	2.97	3.89	10.48	100.00	19.41	6.19	23.55	24.23	5.03	21.60	100.00
Class V	19.25	9.89	47.48	9.25	3.24	10.88	100.00	22.55	8.83	18.54	25.95	6.93	17.20	100.00
Class VI	21.22	10.47	46.75	0.00	10.04	11.52	100.00	13.17	4.43	33.32	22.14	0.30	26.64	100.00
Total	43.06	6.02	28.10	8.65	3.83	10.33	100.00	10.92	5.09	23.97	17.08	10.06	32.89	100.00
	1991							1991						
Class I	50.44	6.55	23.69	8.88	2.58	7.87	100.00	10.77	5.48	24.38	25.58	10.29	23.50	100.00
Class II	47.30	9.89	23.90	4.92	2.95	11.05	100.00	15.55	5.03	14.34	22.91	6.98	35.19	100.00
Class III	37.29	9.34	32.16	3.91	2.74	14.57	100.00	14.90	4.28	20.03	24.89	5.27	30.64	100.00
Class IV	32.06	12.13	36.20	2.44	4.23	12.94	100.00	20.50	5.35	19.02	26.36	4.52	24.24	100.00
Class V	22.00	12.96	58.79	0.05	2.03	4.18	100.00	22.52	3.60	17.28	42.04	0.42	14.14	100.00
Class VI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	45.89	8.01	26.61	6.89	2.80	9.81	100.00	13.20	5.19	21.75	25.35	8.32	26.19	100.00
	2001							2001						
Class I	50.05	26.09	15.30	1.73	0.58	6.25	100.00	24.34	11.38	12.61	27.71	8.25	15.71	100.00
Class II	42.71	13.19	31.52	3.44	2.66	6.50	100.00	20.51	10.16	12.75	23.94	8.41	24.24	100.00
Class III	36.52	11.68	32.46	2.75	2.87	13.71	100.00	21.49	8.72	16.69	30.64	3.42	19.04	100.00
Class IV	22.89	7.23	46.59	4.67	5.22	13.39	100.00	25.01	7.52	13.60	27.09	2.91	23.87	100.00
Class V	18.94	10.07	62.77	4.62	1.60	2.01	100.00	33.70	4.27	13.08	30.01	3.40	15.55	100.00
Class VI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	43.052	19.132	24.94	2.534	1.86	8.484	100.00	23.4	10.3	13.45	27.62	6.859	18.4	100.00

Source: Census of India, Town Directory Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

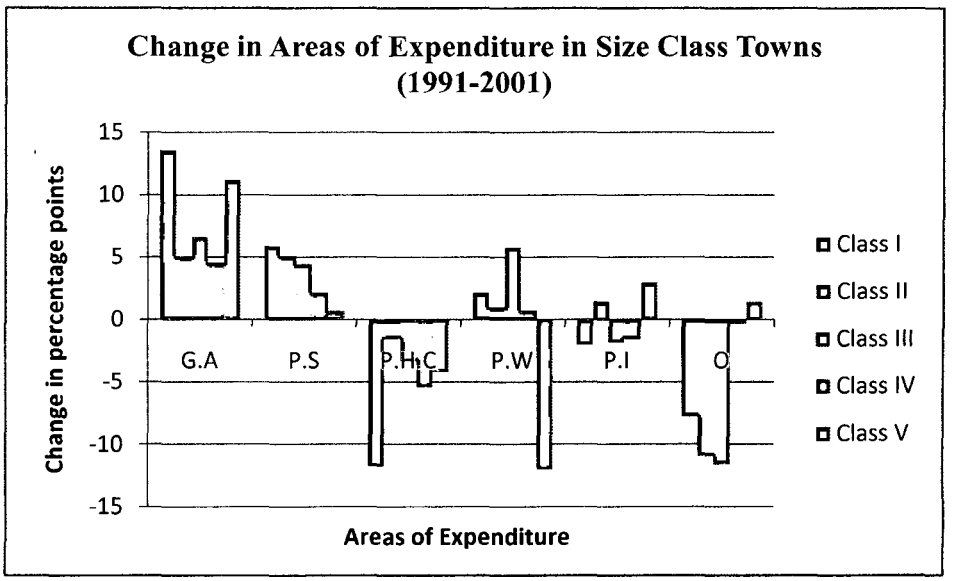
significance in the urban scene and large part of their receipt come either through government grants or aids and loans. In 1971, this variation among different size class towns was less and post 1991 period experienced widening of this deviations resulting increased dependence of small towns on external sources aid.

Class I towns received 41 per cent of their total receipt from revenue through taxes and 37 per cent from government grants in 1971. In Post 1981 period, the share of revenue through tax has become more than half of the total funds received in Class I cities. The proportion of revenue through municipal properties in Class I towns increased hugely from just six and half percent in 1991 to more than 26 per cent in 2001 and resultantly the internal sources of municipal finances contributes 76 per cent of the total receipts of funds as against 57 per cent in 1991. The reverse trend is noticed in small towns as Class V towns received 56 per cent of their funds from internal sources in 1971 and this decreased to 29 per cent in 2001, whereas the contributed of government grant alone increased from 42 per cent in 1971 to 63 per cent in 2001. Not much change is observed in the structure of municipal sources in medium towns. The table: 4.1 reveals that revenue through taxes and government grants are the two major sources of resource collection in Class III towns where receipt from revenue through municipal properties contributed around 10 per cent of the total finances received. This trend has, by and large, remained same since 1971 with little variation in the breakup of the sources of finances in those towns. The smallest towns did not get anything as loan except in 1971 and this might be due to their inability to pay high interest rate and lack of mortgage security. It is clearly evident that, small and medium towns depended much on external sources like government grant, loan and advances from various agencies and the receipts from those sources have increased over the years and conversely, substantive proportion of the total finances was received from revenue through taxes and municipal properties in Class I towns in other big towns. Thus, the gradual shift of dependence from own tax revenue collections to outside sources(grants, aids, loans etc) is discernible as one goes below across size class towns from Class I to Class VI.

4.2. d. Pattern of Expenditure in Different Size Class Towns

The spending on public health and convenience by Urban Local Bodies (ULBs) in the state has decreased significantly from 32 per cent in 1971 to 13 per cent in 2001 and perceptible increase is noticed on the expenses in the sectors of general administration, public works and public safety. This overall picture of pattern of expenditure of ULBs is significantly different from the areas of expenditure in different size class towns. The table:4.1 indicates that the spending on general administration has increased more in Class I cities and Class II town in comparison to small and medium towns. In Class I towns expenses on public safety which include spending on fire fighting services, street lighting and other safety measures increased substantially from 5 per cent of total expenditure in 1971 to more than 11 per cent in 2001 and 3 per cent to 10 per cent in Class II towns, whereas it decreased from 24 per cent in 1971 to 4 per cent in 1981 in Class VI towns (in 1991 and 2001 there were no class VI towns which had any of ULBs). The expenditure pattern in other medium towns has not fluctuated much. This is probably due to the greater need of maintenance of safety measures in bigger towns as these are prone to crime, theft, burglary, fire break out and other such behaviour making them needful of more preventive and remedial measures. Similarly, realising the greater need of physical infrastructure the spending on public works increased substantially from 19 per cent in 1971 to 28 per cent in 2001 in Class I towns. This increase is even more in Class II towns as the corresponding figure increased from 11 per cent in 1971 to 24 per cent in 2001. The same trend is observed in all other group of towns except in Class VI towns where the same increased in till 1981 and decreased then onwards. The spending on public institutions like recreational and community halls, educational institutions declined more in bigger towns compared to small towns. During 1991-2001, spending on general administration and public safety increased in towns of all classes.

Figure: 4.4



Note: **G.A.** - General Administration; **P.S.**-Public Safety; **P.H.C.** - Public Health and Convenience **P.W.**-Public Works; **P.I.**-Public Institutions; **O**-Others

Source: Census of India, Town Directory Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

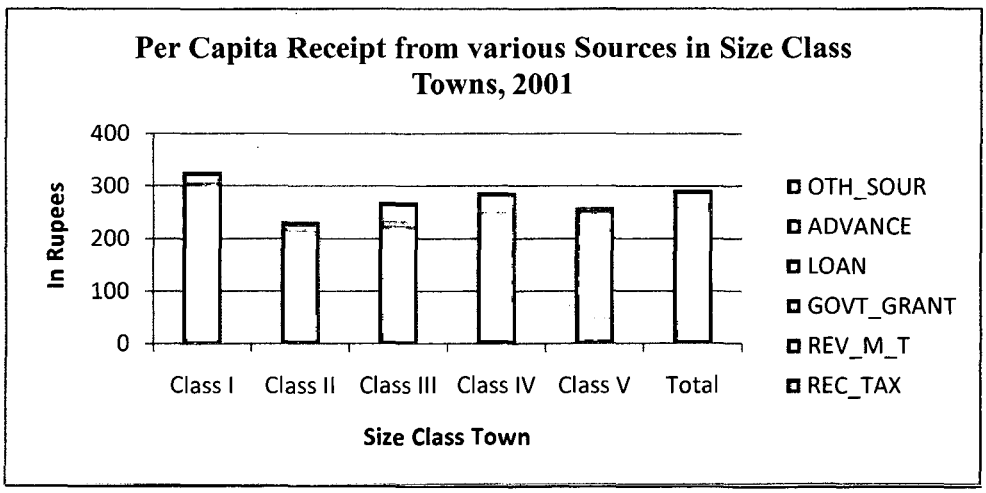
General administartion expenditure increased most in Class I towns by 14 percentage points followed by Class V towns (11 percentage points) and class III, II,IV towns recorded seven, five and 4.5 percentage points respectively. The percentage expenditure on public health sector decreased in all towns whereas the spending on public works activities increased except class V towns. The expenditure on pblic institutions decreased except in Class II and V towns. The spending under the head of others has decreased in towns of all classes except a marginal increase in Class V towns. The above figure:4.4 does not show the change occuring in Class VI towns because there were no Class VI towns having urban local body in 1991 and 2001.

4. 2.e. Per Capita Receipt and Expenditure of all Resources

Earlier analysis has revealed that percentage share of finances received from internal sources to total receipt is more in big cities and other towns especially small towns received major share from external sources in the form of grants and aid. In addition, it has also been found that per capita receipt from taxes is 164 rupees in Class I towns

where as it is less than 50 rupees in Class VI towns. Likewise, the per capita receipt through municipal properties is directly proportional to the size of the town. Conversely, the per capita receipt from grants and aid was found to be more in small towns.

Fig: 4.5

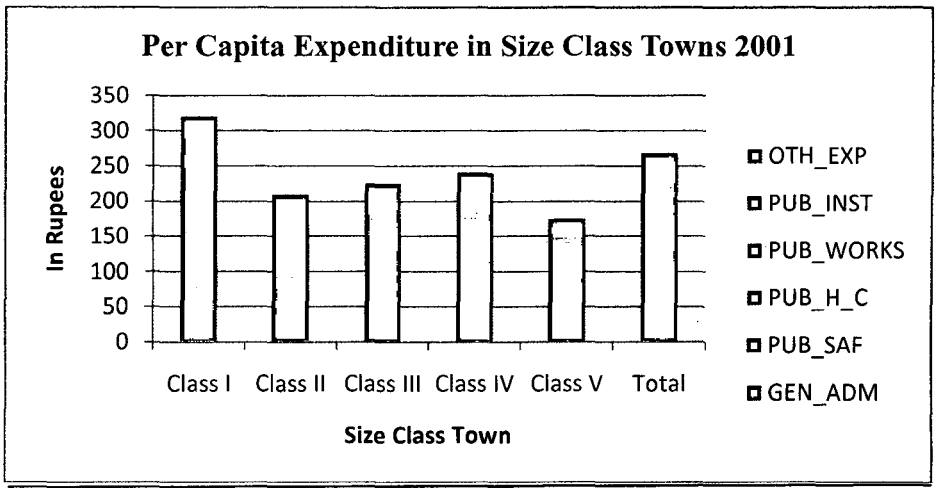


Source: Census of India, Town Directory Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

This differential pattern of municipal finance could be linked to their growth potential and also the expenditure pattern which is considerably associated with the level of infrastructure. This aspect could be more clearly established in later part of this chapter after analysing the infrastructure development pattern in size class towns. The total per capita receipt in big cities is also well above small towns. The class I cities recorded the highest per capita receipt of ₹ 327 followed by class IV towns (₹ 289), class III towns (₹270). The lowest per capita receipt in class II towns might have been caused by the fact that in these towns the reduction in finances from their own tax and non-tax revenues was not compensated by required funds coming from external sources. The per capita expenditure was found to higher than per capita in towns of all size class and in the Orissa as a whole. The expenditure pattern followed the similar variations like that of receipt of ULBs. In the aspect of municipal finance, both the receipt and expenditure was dominant in class I cities followed by class IV and class III towns. The highest per capita expenditure on public works in bigger towns might lead to better infrastructure therein.

The disproportionately highest receipt of finances and the per capita expenditure in class I cities indicates the better municipal functioning in bigger cities.

Fig: 4.4



Source: Census of India, Town Directory Orissa,, 1971(series16), 1981 (Series 16), 1991(Series 19), 2001(Series 21)

The per capita receipt exceeded the per capita expenditure in all class towns but this could not necessarily suggest that the municipal finances are adequate in the towns of Orissa. The per capita expenditure on public institutions has a strong positive relationship between size of the towns. A highest of ₹ 26 per person was spent on public institutions in class I cities while it was ₹ 18 in class II and it was as low as ₹ 6 in class V towns. Thus, the disproportionate pattern of per capita receipt and expenditure has clearly bee found it could be held partly responsible for differential pattern of infrastructure which is discussed in following section.

4.3. Level of Urban Infrastructure and Civic Amenities

The rapid growth of urban population in recent past has caused great strain on the existing urban infrastructure which ranges from the basic physical civic amenities like road network facility, source and capacity of water storage, medical facilities, educational facilities etc. Urban growth caused both by natural increase and accelerating flow of immigrants resulted in low degradation of such basic facilities when viewed from the angle of per capita availability and in general, the quality of life in urban areas have

deteriorated. Provision of water, sanitation, drainage and safe disposal of wastes are central to good housing and living conditions[6]. In addition to this, in the present competitive free market economy, infrastructure and its all round development holds the key so far the investment inflow to a city is concerned. As towns and cities are the chief production centres of economy, the development of infrastructure is nothing less than necessary and policy formulations seek to bridge the gap between demand and supply of urban infrastructure.

Here, in this chapter, maximum possible units of urban infrastructure have been attempted to analyse and the variation of such facilities among the towns are discussed. The temporal change in the level of urban infrastructure from 1971 to 2001 was also examined. The separate analysis of urban infrastructure units like civic amenities, medical facilities, educational facilities, recreational facilities, and credit facilities has been done here followed by examination of overall infrastructure development by taking all important indicators of each unit.

4.3.a. Civic and Other Amenities

The status of civic amenities and physical infrastructure are analysed under following heads.

4.3.a. (i) Road Density: To show the level of road network facility, the road density measured in terms of kilometres per area of one square kilometre was taken here. The road length in urban Orissa increased substantially from 1.88 km. per sq.km.in 1971 to 4.53 in 1981. However, the road length per sq. km area has decreased in 1991 in urban Orissa. This is partly caused by the fact that most of the newly added towns in 1991 had low road connectivity that contributed to the decrease of road length per sq. km. of all the towns taken together. If taken in terms of road length per thousand population, then continuous increase is discernible in each reference period from 1971 to 2001. Thus, in general, the improvement in road infrastructure in urban areas has noticed.

---

[6] World bank, (1994), 'World development Report 1991, *'Infrastructure for Development'*, Oxford University Press, New York, 1994

4.3.a. (ii) Protected Source of Water Supply: The source of water supply is another important of basic amenities in urban centres. In Orissa, the provision of protected water supply appears dismal. The share of towns having tap as their major source of water is increasing in Orissa with marginal decline in 1981-1991. The tap water is considered to be the safe and 74 per cent of towns in Orissa had the facility of this as major source of water in 1971 and the percentage of towns served by tap water in 1991 to 79 per cent. However, it is disheartening to note that the tap water facility decreased in 1991 as 77 per cent of towns had received their water from tap source. This decrease in the percentage of towns served by tap water in 1991 is explained by fact that most of the census towns newly added in 1991 had received water from other than tap sources. Tube well was the second most important source of water in towns of Orissa and in 1991 it served as the major source of water in 16 per cent of towns – all of them are small towns except Jatni (a medium town). The share of towns depending on well for their water requirements was 2 per cent of total towns in 1971 and it increased to 5 per cent in 1981, 7 per cent in 1991 and 2001.

Understandably, the towns having well as major source of water supply are small and interior towns located away from the large and medium towns. This generality is violated by the observation that district headquarters like Sonepur depended on well till 1981, and Jajpur in 1991. Still, well and tube well served as the major source of water supply in 14 per cent of towns in 2001 whereas this was 11 per cent in 1991.

4.3.a. (iii) System of Sewerage: The picture of sewerage system in towns of Orissa is grossly dismal. Majority of them are served by the open surface drains which is not at all desirable. In 1971, it has been found that in 93 per cent of towns system of sewerage was open surface drain (OSD). The increase in percentage of towns where system of sewerage is open surface drain from 71 per cent to 83 per cent highlights the very poor condition of sewerage in towns of Orissa. Sewer, which is considered to be best form of drainage system, is found in very few selected towns.

Table: 4.2
Levels of Infrastructure in Urban Orissa

Infrastructure facilities	Means of Measurement	1971	1981	1991	2001
Road	Length in km. per sq.km	1.88	4.53	3.82	5.53
Electricity	Domestic connections per 100 households	25	33	41	47
	Road Light Points per Sq.Km.	18	26	36	51
Percentage of Towns having Water Supply from:	Tap	74	79	77	86
	Tube well	7	16	4	7
	Well	2	5	7	7
	Others*	16	1	12	0
Fire Fighting Service	Percentage of Towns having this in own premises	28	46	55	62
System of Sewerage	Percentage of towns having Sewer facility	6	10	8	2

* Others included tanks and towns for which data is not available

Fertiliser Corporation of India Township, Talcher Thermal Power Station Township are the only two towns where waste water was disposed by sewer and in 1991 Rengali Dam Project Township had such facility. Apart from them, in few large cities like Bhubaneswar, Cuttack, Raurkela Industrial Township, Paradip, Bhawanipatna sewer was the second most important after open surface drains. Few small towns like Balimela, Barbil, Chitrakonda, and Sunabeda had partial sewer facility. However, it is surprising to observe that in the capital city of Bhubaneswar, open surface drain is the important means of waste water disposal followed by sewer. While it is always desired to have sewer facilities for waste water disposal towns like Paradip, Balimela, Barbil and Sunabeda had shed their partial existing sewer facilities in 1990s and in 2001 they are completely covered by open surface drain only.

4.3.a. (iii) Electricity Connections: Though the existing status is far below than the requirement level, the progress in the sector of electrification is clearly observed. The number of domestic electric connection per 100 households in urban Orissa has increased from 25 in 1971 to 47 in 2001. The highest increase of 31 per cent in number of domestic connections per 100 households was recorded in 1971-1981. In spite of continuous increase in the number of electric connections in Orissa, still less than 50 domestic

connections are available per one hundred households. The number of road light points per square kilometres has increased substantially from 18 in 1971 to 51 in 2001.

4.3.a. (iv) Fire Fighting Services: Many towns in the Orissa are devoid of this emergency service. In 1971, only 28 per cent of towns had the facility of fire fighting service. In the next decade, substantial improvement was recorded as fire station was available in 46 per cent of towns. Unlike rural areas, towns are expected to have this kind of higher order infrastructural facilities as they need this service more often than their counterparts. Fire fighting service was existent in 55 per cent of towns in 1991 and 62 per cent of towns in 2001. Maximum of small towns (Class IV, V, VI town), this service was not available and they had to depend on the nearest big cities. The poor status of this facility is further highlighted by the observation few Class II towns like Brajrajnagar, Barbil, Sunabeda did not have any fire fighting service and the nearest service centre was their respective district headquarters.

4.3.b. Medical facilities

Health is a very important socio-biological asset of everybody. The status of medical facilities is also in a poor state. In many small and medium towns the medical facilities are practically absent. In 1971, out of total 81 towns, there were no hospitals in 19 towns and most of them are served only by dispensary. In 12 per cent of towns, none of the medical facilities such as hospital, health centre or dispensary are found. Except few big cities, most of the towns are served by only one hospital irrespective of their population size. If thus medical facilities are analysed from the population point of view, the decline in medical status is clearly found. In 2001, the highest eight hospitals were found followed by Cuttack and Brahmapur both having six each, Baripada (5), Jharsuguda (4). However, given their large population base, this status seems to be inadequate.

Thus, the analysis of beds per thousand populations will provide better insights so far the availability of medical facilities is concerned. The number of beds in all medical institutions (that included hospitals, dispensary, health centre, family welfare centres, nursing homes, and other medical institutions) per 1000 population has decreased over

the years in urban Orissa. There were 3.65 numbers of beds per thousand urban population in 1971, and this decreased to 2.93 in 1981.

Table: 4.3

Medical and Educational Facilities in Urban Orissa

Year	No. of Towns	Urban Pop	Medical Beds/1000 pop**	Primary and Middle Schools/1000 pop
1971	81	1814147	3.65	0.68
1981	108	3110287	2.93	0.66
1991	124	4234983	2.76	0.63
2001	138	5517238	2.51	0.67

**It included all medical institutions hospitals, health centres, dispensaries, family welfare centres, TB Clinics, Nurshing Homes, and other medical institutions

Further decrease in medical beds per thousand population to 2.76 in 1991 and 2.51 in 2001 clearly indicates that the development of medical facilities has not been commensurate to that of population growth. The mere presence of one hospital or health centre with gross inadequacy of beds highlights the pitiable condition of medical facilities in the state.

4.3. c. Educational facilities

The basic educational facilities in terms of primary and middle schools per thousand population has been found to be low in urban Orissa and no much change has happened from 1971 to 2001. There number of primary and schools per thousand population decreased from 0.68 in 1971 to 0.66 in 1981 and further declined to 0.63 in 1991. This trend got departure in 2001 as the corresponding figure stood at 0.67. The number of colleges increased four times from 61 in 1971 to 243 in 2001. Here number of colleges included Arts College, arts and Science College, art, science and commerce colleges, science colleges. In the field of higher education, Bhubaneswar and Cuttack also know as the 'twin cities' have excelled way ahead and remained as the main educational centres in the state. In 2001, twenty four towns out of total 138 towns did not have any college where as the highest number of colleges was found in Bhubaneswar (18) followed by Cuttack (15) and Brahmapur and Rourkela having seven each. It is interesting to note that

the medium towns in inland region had more number of colleges than coastal towns. This is probably due to the fact that coastal medium towns like Choudwar, Jatni are located nearer to bigger cities.

4.4. Infrastructure Development of Towns

Here, it is attempted to estimate the overall infrastructure development in the towns of Orissa and the temporal change in the status of infrastructure facility. To gauge the infrastructure development of a town, one needs to consider various units of infrastructure like road density, electricity connections, medical facility, educational facility, cultural or recreation centres. Also, since towns perform more of economic functions, the credit facilities like banks should be considered. A composite index calculated by taking most representative and best possible indicators can serve this purpose of showing infrastructure development of towns. Considering various factors like data availability, the nature of towns and the variation of levels of infrastructure units, following indicators have been chosen to construct the 'Infrastructure Index'.

1.Weighted Road Length per square kilometre *

2.Electricity

- Number of Domestic Connections per 100 households
- Number of Road Lighting Points per square kilometre

3.Medical Facilities

- Number of Hospitals per 5000 population
- Number of Dispensaries and health Centres per 5000 population
- Number of beds in all medical institutions per 1000 population**

4.Educational facilities

- Number of Primary and middle schools per 5000 population
- Number of Secondary and Senior Secondary Schools per 5000 population
- Number of Colleges #

5.Recreational Facilities

- Number of Cinema Halls
- Number of Auditoriums

- Number of public Library and reading rooms

6.Credit Facilities

- Number of banks

* Pucca Road was given a weight of '3' and katcha road was given '1'

** It included number of beds in hospitals, health centres, dispensaries, TB clinics, Family health centres, nurshing homes, other medical institutions

It included Arts College, Science Colleges, Commerce Colleges, Arts and Science Colleges, Arts and Commerce Colleges and Arts, Science & Commerce Colleges

To, construct the infrastructure index of each town, the method of 'Z-Score' was applied. The summation of Z-score of all indicators of a town is considered as the infrastructure index of that town. The infrastructure development of towns was calculated separately in 1971, 1981, 1991 and 2001 and the temporal change has been analysed..

Table: 4.4

Categories of Infrastructure Development of Towns in Orissa, 1971-2001

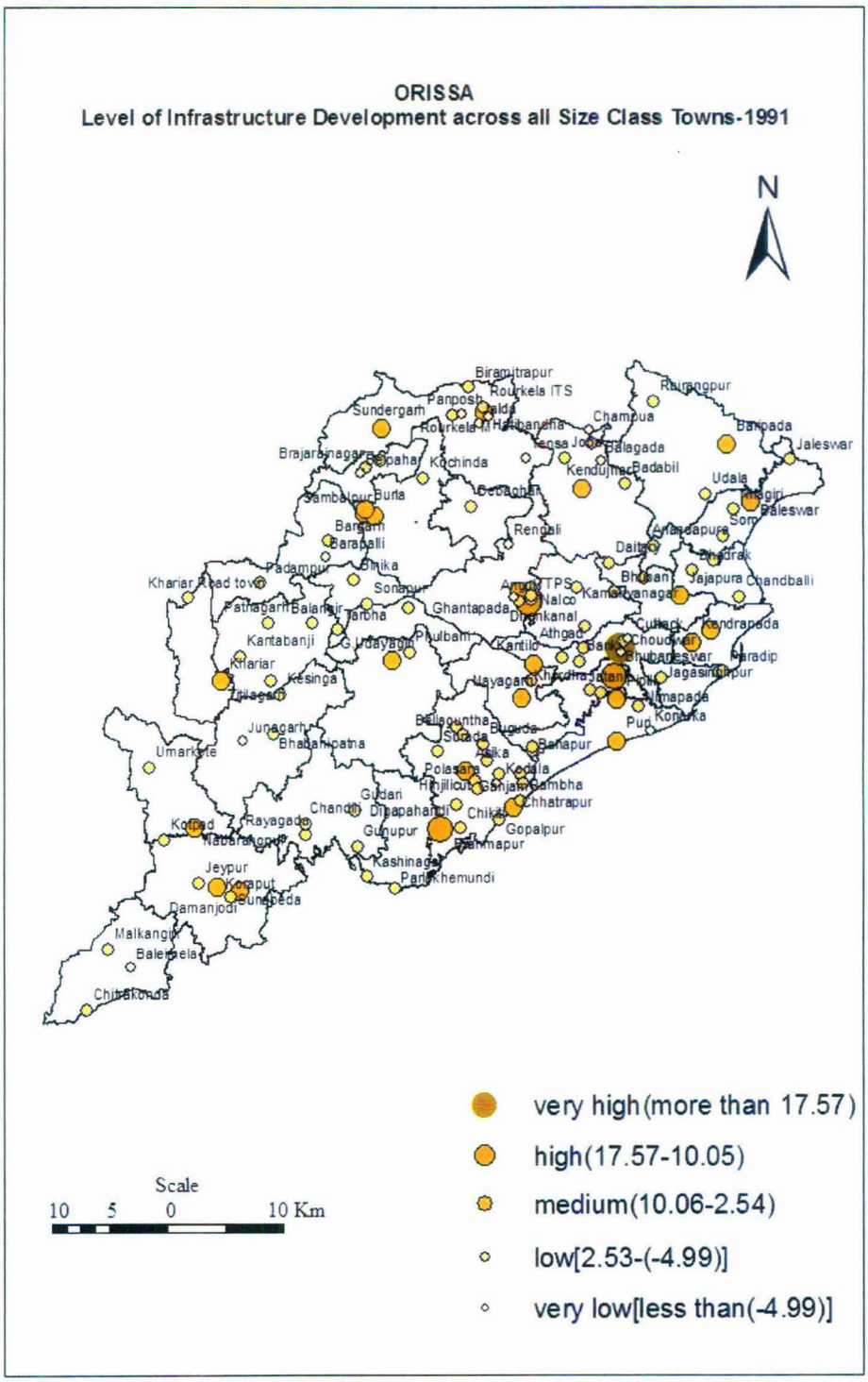
1971				1981			
Category	Values	No. of Towns	Percentage of Towns	Category	Values	No. of Towns	Percentage of Towns
very high	31.03 - 22.91	1	1.23	very high	more than 9.16	4	3.70
high	22.91-14.79	2	2.47	high	9.16-5.26	3	2.78
medium	14.494-6.673	6	7.41	medium	5.25-1.35	26	24.07
low	6.67-(-1.44)	27	33.33	low	1.35- (-2.55)	47	43.52
very low	less than (-1.45)	45	55.56	very low	less than (-2.55)	28	25.93
Total Towns		*81*	*100.00*	*Total Towns*		*108*	*100.00*
1991				2001			
very high	More than 17.57	1	0.81	very high	more than 21.63	1	0.72
high	17.57 - 10.05	3	2.42	high	21.63-14.34	2	1.45
medium	10.05 - 2.54	23	18.55	medium	14.34 - 7.05	11	7.97
low	2.53 - (-4.98)	81	65.32	low	7.050- (-0.24)	39	28.26
very low	less than (-4.98)	16	12.90	very low	less than (-0.25)	85	61.59
Total Towns		*124*	*100.00*	*Total Towns*		*138*	*100.00*

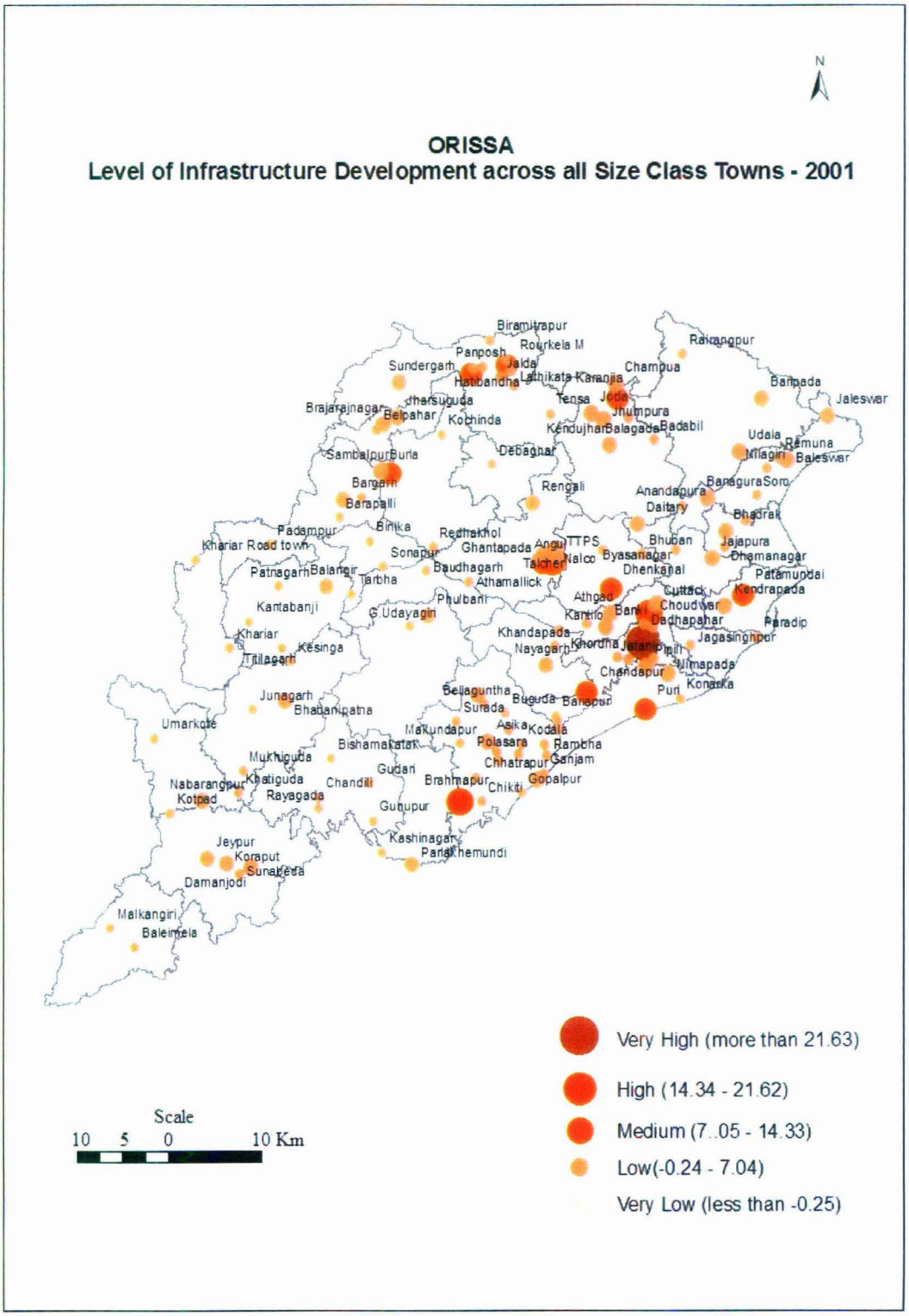
Based on the values of the infrastructure index five groups were made as very high, high, medium, low and very low. It has been found that the infrastructure development in towns of Orissa has increased from 1971 to 1981 and then onwards decline was marked. The number of towns placed under highly developed category has increased from just one in 1971 to four in 1981. Moreover, the percentage of towns in the medium development category has increased substantially from 7 per cent to 24 per cent, more than three times. Many of the towns with very low infrastructure facilities have moved one step up to 'low' category. The scores of infrastructure index of towns also indicate the presence of low variation in between the towns in 1981 compared to 1971.

The infrastructure development in towns decreased in 1991 as more number of towns were pushed to the category of low and further decline was observed in 2001. As high as 62 per cent of towns possessed very low infrastructure facility in 2001 and another 28 per cent of towns fell under the low development category. Now, it would be useful to analyse the status of infrastructure development in various category that will enable to identify which towns are experiencing improvement of infrastructure and towns placed at other end of the spectrum.

4.4.a. Very High Level

Cuttack was the only towns in 1971 which had very high level of infrastructure facilities. It is because of the fact that, Cuttack has been the single most important centre of business, education and other service till late 1970s and early 1980s. . In almost all the sectors Cuttack has excelled well ahead of others and its index was estimated to be 31 compared to the second most developed city of Bhubaneswar with an index of 18. Fertiliser Corporation of India Township and Talcher Thermal Power Station Township were the towns with very development which could be attributed to the fact that with their low population base these industrial towns had better physical infrastructure facilities in terms of road density, electricity connections, and street light points. Unexpectedly, Gopalpur and G.Udaygiri are the other two towns had been placed in this category as the physical infrastructure is well developed in the former and the school facilities are markedly high in the later along with reasonable facilities of other infrastructure elements. Cuttack and Bhubaneswar are only towns to be classified under


ORISSA
Level of Infrastructure Development across all Size Class Towns-1991
N
Biramitrapur
Rourkela ITS
Panposh
Sundergarh
Rourkela (M Hatibandha
Rajgangpur
Champua
Banspada
Jaleswar
Brajarajnagar
Bolpahar
Kochinda
Balagada
Kendujhar
Badabil
Udala
Baripada
Baleswar
Sambalpur
Burla
Deogarh
Bargarh
Barapalli
Rengali
Anandapura
Som
Padampur
Dhika
Daitary
Bhadrak
Khariar Road town
Sonepur
Bhubani
Jajapura
Chandbali
Patnagarh
Balangir
Titlagarh
Ghantapada
Angul TPS
Nalco
Kamakhyanagar
Dhenkanal
Cuttack
Kendrapada
Kantabanji
Gudvagarh
Phulbani
Athgad
Choudwar
Khariar
Kesinga
Kantilo
Bhubaneswar
Paradip
Jagasinghpur
Jajapur
Junagarh
Bhawanipatna
Umarkote
Bellaguntha
Sorada
Buguda
Banapur
Aska
Polasara
Kodala
Hinjilicut
Sonjari
Rambha
Gudari
Chandbali
Dharapahandi
Chikiti
Chhatrapur
Kodala
Rayagada
Gunupur
Gopalpur
Berhampur
Nabarangpur
Kashinagar
Jeypur
Parlakhemundi
Koraput
Damanjodi
Malkangiri
Balimela
Chitrakonda
very high (more than 17.57)
high (17.57-10.05)
medium (10.06-2.54)
low [2.53-(-4.99)]
very low [less than (-4.99)]
Scale
10 5 0 10 Km


N
ORISSA
Level of Infrastructure Development across all Size Class Towns - 2001
Biramitrapur
Rourkela M
Panposh
Sundergarh
Jalda
Hatibandha
Lathikata
Karanjia
Champua
Rairangpur
Bampada
Jaleswar
Brajarajnagar
Jharsuguda
Belpahar
Kochinda
Tensa
Joda
Jhumpura
Kendujhar
Balasore
Badabil
Udala
Remuna
Nilagiri
Baleswar
Sambalpur
Buria
Debagarh
Bargarh
Barapalli
Rengali
Anandapura
Banagura
Soro
Daitary
Bhadrak
Padampur
Binika
Redhakhol
Khariar Road town
Sonapur
Ghantapada
Angul
TTPS
Nalco
Talcher
Bhuban
Byasanagar
Jajapura
Dhamanagar
Patnagarh
Balangir
Tarbha
Baudhgarh
Athamallick
Dhenkanal
Patamundai
Kendrapada
Kantabanji
Phulbani
G.Udayagiri
Athgad
Cuttack
Choudwar
Kantilo
Banki
Dadhapahar
Paradip
Khariar
Khandapada
Nayagarh
Khordha
Jatani
Pipli
Jagasinghpur
Kesinga
Titlagarh
Chandapur
Nimapada
Konarka
Puri
Junagarh
Bellaguntha
Buguda
Balugaon
Surada
Bhabanipatna
Umarkote
Makundapur
Asika
Kodala
Bishamakatak
Polasara
Rambha
Mukhiguda
Chhatrapur
Ganjam
Gudari
Khatiguda
Chandili
Brahmapur
Gopalpur
Nabarangpur
Kotpad
Rayagada
Chikiti
Gunupur
Jeypur
Koraput
Kashinagar
Parlakhemundi
Sunabeda
Damanjodi
Malkangiri
Balimela
Very High (more than 21.63)
High (14.34 - 21.62)
Medium (7..05 - 14.33)
Low(-0.24 - 7.04)
Very Low (less than -0.25)
Scale
10 5 0 10 Km

this category in 1991 and 2001 respectively. In 2001, the state capital was the only town to be classified as the highly developed in infrastructure front. Well developed educational facilities with better road facilities and reasonably adequate medical facilities have earned it the very highly developed city. It may here be noted that it is the second most planned city in India after Chandigarh.

4.4.b. High Level

The holy city of Puri and Brahmapur, one of the oldest and major regional centres in south Orissa were the towns having high infrastructure development. Baleswar and other two small towns- Khariar, and Kantilo fell under this category. These small towns with less population and small area reported to be higher values in road density, street lights per sq. km. and other medical and educational facilities taken in terms of five thousand population. Brahmapur jumped from low category in 1981 to high development category in 1991. Bhubaneswar and Nalco an industrial town also improved their infrastructure level and qualified to be classified under this category. In 2001, the top spot was replaced by Bhubaneswar and Cuttack slipped to high development category from very high development category in 1991.

4.4.c. Medium Level

The towns having medium level of infrastructure facilities hold the key in the scene of urban development in Orissa as the high development category experienced little interchanges among bigger towns except in 1981. The share of moderately developed towns has increased till 1991 and most of them were pushed to low development category in 2001. Barring few big cities, most of the district headquarters were found to have infrastructure development of medium level. In 1971, Bhubaneswar, Sambalpur, Baleswar Baripada, Paralakhemundi were the towns with medium level of infrastructure development. In 1981, many medium and small towns were placed in this category. Raurkela Steel Township, Puri, Nayagarh, Keonjhar had modest infrastructure development. In 2001, out of total nine class I towns three fell in the category of medium infrastructure development category. Except big towns like Sambalpur, Raurkela, Puri and few other medium towns most of the towns having fair level of urban infrastructure

slipped to low category. The observation that gradual decrease of growth in number of medium towns and also the less per capita municipal finance expenditure have further been materialised here with the finding of diminishing level of infrastructure level.

4.4.d. Low Level

Along with small towns, many of the large and medium towns were also found to have low level of infrastructure facilities. Rourkela Steel Township in 1971, Bhadrak, Jharsuguda, Bolangir in 1991 and Baleswar, Brajrajnagar in 2001 were reported to have low infrastructure development. In 1991, 68 per cent of the towns had low infrastructure facilities. It is noteworthy to mention that out of total 10 class towns in 1991, nine had low level of infrastructure development. Furthermore, eight of them remained to be in the low level of infrastructure facilities. Baripada and Baleswar are two another class I cities which had low infrastructure development in 2001. These towns qualified to as the large only on the population size but other urban functions did not found to be of that order.

4.4.e Very Low Level

More than half of the towns have recorded very low level of infrastructure development in 1971. In the next two decades this has reduced substantially as the only 13 per cent of the towns in 1991 were found in this category. This trend was reversed in 2001 and as many as 62 per cent of towns had very low level of infrastructure facilities. In 1981, major towns like Bolangir Baripada, Jharsuguda had very low level of infrastructure. In 2001, few of the district headquarters like Deogarh, Sonepur, Rayagada, Jagatsinghpur, and Baudh fell under this category of low infrastructure facilities. Surprisingly, Raurkela Industrial Township, a class I city was found to have very low level of infrastructure indicating that it served mainly as the industrial town. A very low index value for this town was caused by the poor educational and medical facilities and majority of them depended on Raurkela civil township when such needs arose.

4.5. Infrastructure in relation to Municipal Finance and Size of Towns

Since municipal bodies are responsible for provision of infrastructure and basic amenities, their functioning largely indicates the level of urban infrastructure facilities.

Out of 31 census towns where urban local body is found 18 towns had very low level of infrastructure and another eight towns had been placed under the low level decided on the basis of composite development of infrastructure index. In 2001, the per capita expenditure was highest in class I cities and the infrastructure development in these towns was high except few towns like Baripada and Raurkela Industrial Township. Similarly, less spending on public works and public institutions in small and medium towns have resulted low physical infrastructure and educational facilities in those towns.

The clear positive relationship between size of a towns and overall infrastructure facilities has been found. Here, size of the town was referred to population size. The correlation between population size and infrastructure index was found to be high 0.689 with significance level at 0.01 level. The inequity in levels of infrastructure was found high across different size class towns. Also, barring two or three big cities like Bhubaneswar and Cuttack and Brahmapur, many other towns possessed low infrastructure facilities.

4.6. Conclusion

The comparatively high per capita receipt and expenditure in big cities could be due to better functioning of administrative tasks to help increase revenues from property tax. The increased dependence of small towns on external sources like grants and aids rendered them in an incapable position to provide basic urban amenities. Since the finances received from external sources are either ad hoc or specific, dependence on them does not augur well while aiming to provide better infrastructure.

The analysis has revealed that infrastructure development has been deteriorating fast after 1991. By saying so, it is here meant that though the infrastructure elements increased in absolute terms, the per capita availability has decreased especially in the case medical facilities. Therefore, one can argue that the infrastructure development has not kept pace with the growth of urban population. However, physical infrastructure like road length per square kilometre and number electric road light points per square kilometre has increased substantially from 1971 to 2001. The higher educational facilities like senior secondary schools and number of colleges have increased manifold but that is restricted to few large cities like Bhubaneswar, Cuttack, and Raurkela etc.

From the viewpoint of temporal changes in infrastructural development, Bhubaneswar have witnessed improvement of manifold post 1981 which can be attributed to the fact being the state capital, it received high attention of policy makers and investors enabling better finance management. In that process, other towns have seemingly been marginalised and post 1991 period pushed many towns having medium and low infrastructure to the category of very low infrastructure. Based on the observations of infrastructure development scenario in urban Orissa, one can argue that maximum of small and medium towns served much as the regional market centres without existence of much infrastructure facilities. Still many of the towns of higher small and few medium towns did not avail the hospitals within their premises and the low urban finance could be partly held responsible. The reasons of low receipt and consequent low expenditure could be many ranging from policy formulation to inefficient local body management in own tax collection. The growth in revenue has not been commensurate with the potential due to inadequate policies, legal problems and inefficient administration[7]. To provide better infrastructure facility, ULBs need adequate finances. The finances should match to the functions assigned to them. In recent years, the realisation of upgradation of infrastructure and basic amenities and more importantly the service delivery has unfolded among the domain of urban studies and research field.

[7] Vaidya.C., (2000) 'Seminar on Local Governance for Millennium- With Special Reference to Financial Reforms; Experience, Problems and Prospects' (2000): "Property Tax Reforms in India: Some Issues" Mumbai

Chapter V

Functional Classification of Towns

5.1. Introduction

Urbanisation, being strongly interlinked with economic development, is seemingly studied more as an economic process than any other process such as geographical, demographic, sociological or cultural. Today, the city is a focal point of productive activities. It exists and grows on the strength of the economic activities existing within itself.[1] Moreover, the towns and cities produce goods and services and to a large extent hinterland is dependent on them. It is the level and nature of economic activity in the city that generates growth and therefore, further urbanisation.[2]

Though urban centres perform more than one function and certain economic activities have greater significance than others. Everyone would agree that industrial activities are most important in Rourkela; likewise, the chief functions of a town can be traced using certain logistic method of classification. The functions performed in urban settlements are largely determined by site and situation characteristics while past history of development, recent policy initiatives also influence the growth and development of towns. The functional classification of towns enables a detailed investigation of the economic significance of the respective towns and their future growth potential in the present liberalised economy. Classification of towns by functions might lead to the formulation of generalisations about the location pattern of towns and the relationship between towns with particular functions and their hinterlands.[3] The functional classification of towns based on the preponderance of an activity facilitates an understanding of the urban growth process in the context of overall economic growth and development. Classification of towns by the dominant functions they perform is useful elementary technology on the basis of which their role in economic development can be analysed in depth.[4]

---

[1] Ramachandran,R (1989), *'Urbanisation and Urban Structure in India'* Oxford university Press, New Dlehi, pp.82

[2] Ibid. pp.83

[3] Smith. R.H.T. (1965): *'Method and Purpose in Functional Town Classification '* , Annals of the Association of American Geographers, Vol. 55, No. 3 (Sep., 1965), pp.539-548

[4] Pothana.V., 'Functional Classification of Towns in Andhra Pradesh' in Rao.M.K.(ed.), 'Urbanisation, Migration and Economic Development, Kanishka Publication Distributions, 1995. Pp.43-56

In this chapter, a functional classification of all towns has been worked out following Nelson's[5] method. The data on number of workers in different economic categories given by Census of India has been to assign the function of the towns. The economic activities the people engaged in are referred as functions and the proportion of workers in a certain category decides the function of a town.

5.2. a. Classification of Indian Workforce

Indian Census provides data on number of workers classified in nine industrial categories. The Census definition of workers and information has changed in different time periods that poses a serious problem in comparative analysis of functional classification. The persons whose main activity was participation in any economically productive work by his physical or mental activity were considered as the workers. The workers are classified into following nine categories.

Table: 5.1

Industrial Classification of Workers

Industrial Categories	Workers	Codes Used
I	Cultivation	CA
II	Agricultural Labourers	
III	Livestock, Forestry, Fishing, Plantation, Horticulture, Floriculture, Silviculture, and Apiculture	L
IV	Mining and Quarrying	Mq
Va	Manufacturing, Processing, Servicing, and Repair in household Industry	Mh
Vb	Manufacturing, Processing, Servicing, and Repair in non-	Mnh
VI	Construction	C
VII	Trade and Commerce	Tc
VIII	Transport, Storage, and Communication	Tsc
IX	Other Services	O

In 1981 and 2001, workers data was not given in separately in nine different categories at town level. Thus, functional classification of towns in those years could not be worked out and unavoidably, the same was calculated for 1971 and 1991 and a

[5] H.J nelson (1955), "*A Service Classification of American Cities*", Economic Geography, 1955, Vol, 31 No. 3, pp 189-210

comparative analysis capturing change and shift of functions in towns was conducted in this chapter. The extent of diversification and specialisation was also highlighted in later part of this chapter.

5.2. b. Work force structure in Orissa

It is evident from the table that around twenty per cent of workers were engaged in primary sector (includes categories I to IV as mentioned in table 5.1) in Urban Orissa in 1971 and this further increased in 1991. The general notion that urban areas have a very high percentage of their workers engaged in non-agricultural activities needs to be reconsidered while analysing the functional character of towns in Orissa. This is due to the fact that there are still many towns where agriculture, livestock, forestry and fishing absorb significant proportion of labour force

Table: 5.2

Percentage of Urban Workers in three Sectors of Economy

Sector	1971	1991
Primary	19.38	20.19
Secondary	20.22	21.17
Tertiary	60.39	58.64

Moreover, the decrease in percentage of workers absorbed by tertiary sector is not a very common phenomenon in urban areas. The percentage of workers engaged in secondary sector (includes manufacturing in household and non-household industry plus construction activities) marginally increased by one percentage points in two decades from 1971 to 1991.

Table: 5.3

Percentage Distribution of Total Urban Workers by Industrial Categories in Different Size Class Towns

Industrial Category	1971							1991						
	Class	Class II	Class III	Class IV	Class V	Class VI	Total	Class	Class II	Class III	Class IV	Class V	Class VI	Total
C+A	4.53	3.62	14.33	22.22	31.40	26.89	14.22	5.09	14.84	18.36	32.05	19.94	1.93	14.59
L	2.31	7.18	2.07	2.91	4.06	18.38	2.99	2.75	3.12	3.94	3.84	5.12	0.89	3.33
M	0.13	0.09	5.74	1.60	0.05	0.00	2.17	0.27	4.33	4.25	2.43	2.66	35.15	2.28
Mh	3.29	3.68	2.81	5.12	7.71	7.24	4.07	2.17	1.41	2.14	4.46	5.87	0.36	2.60
Mnh	18.12	9.75	16.40	8.27	6.34	5.67	13.71	17.67	14.37	13.48	8.60	19.57	26.60	14.83
C	2.89	2.41	2.30	2.58	1.71	0.99	2.45	4.49	3.02	3.09	3.15	4.17	5.52	3.74
Tc	20.22	24.12	16.99	16.62	17.42	18.79	18.48	22.73	20.35	17.34	18.02	13.32	6.61	20.00
Tsc	9.42	9.83	13.45	9.77	7.15	1.97	10.48	9.51	10.72	8.43	4.14	3.67	10.66	8.28
O	39.09	39.34	25.91	30.92	24.16	20.07	31.43	35.33	27.85	28.97	23.31	25.67	12.28	30.36

Source: Census of India, Primary Census Abstract of Town Directory Orissa, 1971(series16), 1991(Series 19),

Note: C+A- Cultivators +Agriculture Labourers; L-Livestock, Forestry, Fishing etc.; M-Mining and Quarrying; Mh- Manufacturing in Household Industry; Mnh- Manufacturing in Non-Household Industry, C-Construction; Tc-Trade and Commerce; Tsc- Transport, Storage and Communication and O- Other Services

The functional classification of towns done here is based on the data given by Indian Census. It provides the distribution of workers in nine industrial categories. It has been argued in some quarters of earlier similar studies that cultivation and agriculture are not urban functions and consequently got excluded from the array of functional classification of towns. Here it is preferred to include both these activities and both were clubbed together under the head of 'CA' (stands for cultivators and agricultural labourers). The table: 5 indicates that in 1971, significant proportion of workers were engaged in non-household manufacturing, trade and commerce, agriculture and others services categories. Eighteen per cent of total labour force worked in the sector of trade and commerce followed by 14 per cent in the sector of manufacturing other than household industry. Agriculture activities were third important occupation as in 1971, 14 per cent of total workers were either cultivators or agricultural labourers. And this was increased to 14.49 per cent in 2001.The proportion of workers participating in others category decreased from 31.43 per cent in 1991 to 30.36 per cent in 1991 whereas the percentage of workers affiliated with trade and commerce increased from 18 per cent in 1971 to 20 per cent in 2001. The percentage of workers in household industry and transport, storage and communication decreased during 1971-1991 while proportion of construction workers went up during the same period. The distribution of workers in different industrial categories varies across size class towns. Understandably, the percentage of workers engaged in primary sector is high in small and medium towns. In 1971, the class V towns accounted for 31 per cent of their total workers in agricultural activities and 27 per cent in class VI towns, 22 per cent in Class IV towns and 14 per cent in Class III towns. In 1991, the share of labour force engaged in agriculture further increased by 11 percentage points each in Class II and class IV towns, 4 percentage points in Class III towns. Surprisingly, in 1991 as high as 15 per cent of total workers participated in agriculture sector in Class II towns .Once again, the agrarian economy of Orissa and the importance of it even in urban centres is corroborated by the above observation. The dominance of tertiary sector is seen in cities and other big cities. In 1971, the workers engaged in secondary and tertiary sectors was as high as 93 per cent in Class I towns and 90 per cent in Class II towns. In class I towns, twenty per cent of total workers were engaged in trade and commerce followed by non-household industry (18 per cent). The workers in others category was significantly 39 per cent in 1971. Surprisingly, Class VI towns absorbed 19 per cent of total workers in the category of trade and commerce. This is explained

by the fact that Gopalpur was one of the two Class VI towns in Orissa and its port facilities made the presence of significant tertiary sector in the form of trade.

The non-household industry, one of the most important sectors from the 'industrialisation driven urbanisation' point of absorbed most workers in Class I towns followed by Class III towns and class II towns in 1971. Its share increased much in class II, V, VI towns in 1991. The class VI towns which recorded exceptionally 19 per cent of workers in trade and commerce in 1971 reduced to 7 per cent in 1991 and it is because of the fact that Gopalpur being the cause of state of affairs in 1971 shifted to class V category in 1991.

During 1971-1991, percentage of workers engaged in construction, trade moderate increased in class I towns whereas decline is observed in percentage share of workers in others category. To answer the unusual trends like drastic increase in percentage workers involved in Class II, III, IV towns and sharp increase in non-household industry workers in Class VI towns, it is necessary to conduct further detailed town wise analysis which can be enabled by a functional classification of towns done by adopting logical methodology.

5.3. Functional classification of Towns

The workers are distributed in total ten categories (manufacturing sector being subdivided into household and non-household). The percentage of workers in certain categories is disproportionately high. On the basis of this, the important function of town is assigned After assigning the function of each town in 1971 and 1991, their comparative analysis and the change is attempted here. However, this comparison becomes difficult as the number of towns has increased from 81 in 1971 to 124 in 1991. Moreover one town (Govindpur) was declassified in 1981 and did not qualify to be termed as a town in 1991 as well. All these limitations led to the decision that comparison of those towns be made that are present in both censuses. Thus, the functions of 80 towns (excluding Gopalpur) existing in 1971 was identified for both time periods of 1971 and 1991 and the change has been analysed. Nevertheless, the remaining 44 towns in 1991 were labelled their functions and examined their functional character in later part of this study.

5.3. a. Labelling of Towns

In order to assign the functions of towns Nelson's method employed in his article 'A service Classification of American Cities' has been used. The details of the methodology have been discussed in first chapter. The proportion of the labour force of a city engaged in performing a service is perhaps the best means of measuring the distribution of that activity.[6] A town's function was determined by the deviation of the percentage of workers in a category from the mean employment of that category for all the towns. For example, to assign the function of construction to a town, the deviation of percentage of labour force engaged in construction activities in that town from the percentage of workers engaged in construction sector taking all the towns together is checked. For this purpose, standard deviation was used here as Nelson did. Therefore, the deviation of a town from the mean in terms of standard deviation holds the key in the functional classification of towns. A town recording proportion of workers in construction more than one standard deviation plus the mean of the construction activities of all towns is given 'C1' and said to have specialisation in construction activities. Likewise a town falling between two standard deviation plus mean to three standard deviation plus mean is given a rating of 'C2'. Following this principle, the functions of towns are identified and four categories-mono-functional, bi-functional, multi-functional and diversified were made. The diversified towns are those which do not qualify to be classified under specialisation of any category.

In 1971, out of total 81 towns, 42 towns come under mono-functional category which implies specialisation in any one function. Again out of those 42 mono-functional towns, 17 are Class V towns, 12 are Class III towns and 10 are Class IV towns. The four Class I towns are equally distributed in mono-functional and bi-functional categories. There were 21 diversified towns where neither of the activities are found to be specialised. The diversified towns comprise of 9 class V, 8 class IV and four class III towns. Joda and Puri are the two towns where more than one specialisation of economic activities was

[6] Ibid. pp. 189

observed. In 1971, the number of bi-functional towns was 16 and two Class VI towns were in this category.

Table: 5.4

Functional Categories of Towns in Orissa, 1971 and 1991

Size Class	1971					1991				
	Mo.Fn.	Bi.Fn.	Multi.Fn.	D	Total	Mo.Fn.	Bi.Fn.	Multi.Fn	D	Total
Class I	2	2	0	0	4	5	1	0	2	8
Class II	1	0	1	0	2	8	0	0	2	10
Class III	12	4	0	4	20	20	3	0	6	29
Class IV	10	4	1	8	23	35	5	0	12	52
Class V	17	4	0	9	30	12	4	0	6	22
Class VI	0	2	0	0	2	2	0	1	0	3
Total	42	16	2	21	81	82	13	1	28	124

Source: Census of India, Primary Census Abstract of Town Directory Orissa, 1971(series16), 1991(Series 19)

Note: Mo.Fn. – Mono-functional; Bi.Fn. – Bi-functional; Multi.Fn. – Multi-functional; D-Diversified

The number of towns increased to 124 in 1991 from 81 in 1971. Among all the towns in 1991, 82 (66 per cent of total towns) towns were specialised in one economic function. The mono-functional towns comprised of 35 class IV towns, 20 class III towns, 12 class II towns, 8 class II town, five class I towns and two class VI towns. There were thirteen bi-functional, one multi-functional and twenty eight diversified towns in 1991. Maximum of diversified towns are Class IV towns. During 1971-1991, percentage of mono-functional towns increased while the percentage of all other category towns declined. Thus, many towns having specialisation in more than one functions lost their dominance and reduced to only specialised in one function and at the same time few diversified towns started to exhibit specialisation of any single economic activity. Two class I towns- Sambalpur and Balasore fell under the category of diversified towns whereas in 1991whereas there were no class I towns which did not have specialisation in any industrial activity 1971.

5.3. b. Agriculture (CA)

Out of total 81 towns in 1971, twelve towns had specialisation in agriculture. The number of towns specialised in this sector is second highest only to the towns specialised in 'others' category (13). Furthermore, the percentage of agricultural towns to total towns has increased from 15 per cent in 1971 to 22 per cent in 1991. Thus, the observation that more than one fifth of the towns in 1991 falling under this category further justifies the earlier proposition that agricultural activities should also be taken into consideration while analysing functional classification of towns. In three towns, agriculture sector absorbed more than two standard deviation from the mean of workers in that category in 1971. More than 70 per cent of total workers were engaged in agriculture sector in Jaleshwar followed by Polasara (69 per cent), Bhuban (57 per cent) and Banki (55 per cent). Out of total 124 towns in 1991, 27 came under the category of agriculture specialised towns. Those twenty seven towns comprised of 4 Class III towns, 22 Class IV towns and one Class V town. It may also be noted that 11 towns of them are new towns created between the two decades. Basudebpur recorded a very figure of 70 per cent of its total workers in agriculture activities followed by Kashinagara (63 per cent) and Kodala (58 per cent) in 1991 and these three towns were assigned 'CA2' label. There were seven towns where more than half of the workers got engaged in agriculture sector. Understandably, maximum of the agricultural towns are small towns. Out of four medium towns categorised as agriculture centres three (Basudebpur, Pattamundai, and Soro) are located in coastal agricultural belt and all of them are located nearer to their respective district headquarters. Though these have relatively large population base compared to other agricultural towns, the non agricultural activities were not significant and this is probably due to shadow effect of the nearest bigger district headquarter.

5.3.c. Livestock, Forestry, Fishing, Plantation, Horticulture, Floriculture, Silviculture, and Apiculture (L)

In most of the towns in Orissa located along the coast of the Bay of the Bengal, fishing is a very important economic activity of people. In 1971, six towns fell under this category and out those five are in coastal areas where fishing is the predominant economic activity of the people. In Angul, the lone interior town falling under this category, plantation,

floriculture and horticulture were chief functions performed as considerable proportion of orange production in the state come from Angul district. Gopalpur recorded outstandingly 36 per cent of its total workers in this industrial category in 1971 getting a rating of 'L8' meaning thereby the proportion of workers engaged in livestock, forestry etc. in Gopalpur is more than eight standard deviation from the mean of the workers of the same category. Interestingly out of six towns in this category (Buguda, Gopalpur, and Rambha) are located in Ganjam district alone which is explained by the fact that the Kaibarta tribe of Ganjam are mostly engaged in fishing activities The setting up of Orissa Shrimp Seed Production Centre in Ganjam further promoted pisciculture and prawn culture. Mackerel, S.Commerson, Catfish, Sciaenid, Carangid, and Perches are major types of fishes found in Gopalpur. Puri, one of the major coastal towns of Orissa also fell under this category and its 'Nodia' tribe population indulge mostly in fishing activities. The percentage of workers involving in fishing, forestry, livestock etc. has raised further in Paradip and Gopalpur in 1991. The other towns such as Balimela, Chitrakonda in Koraput district in 1971 engrossed considerable proportion of their workers in livestock, forestry, plantation etc.

5.3.d. Mining and Quarrying (Mq)

Orissa being one of the mineral richest states of India comprises of certain towns that have primarily sustained by mining and quarrying activities. The workers engaged in such towns are mostly unskilled and local people and immigrants from surrounding rural areas. In 1971, there were four towns in this category where the existing minerals and the activities related to its extraction are predominant. Biramitrapur located in Sundergarh district is the leading producer of limestone and dolomite in the state which absorbed 56 per cent of its total labour force. Other mining towns in the state are Barbil, Joda in Keonjhar district where maximum of iron ores are reserved. Daitari and Dera Colliery Township are two other important mining towns added in 1991 Census. Around 70 per cent of their total workers were engaged in this mining and quarrying sector in these towns which resulted their highest rating of 'Mq5'. Other towns specialised in mining and quarrying are located in the 'coal belt' of Orissa. Talcher, Dera Colliery Township, Ghantapada, are the centres of coal mining in Dhenkanal district (presently shifted to

Angul after bifurcation from Dhenkanal). Balagoda, one more mining town in Keonjhar district absorbed 56 per cent of its total workers in mining and quarrying got 'Mq4' label followed by Tensa (Mq3) where 45 per cent of total workers got engaged in the same category. The important minerals found in Tensa are iron ore, manganese and bauxite. Mining towns contained one class II and class V each, two class IV and VI each and four class III towns in 1991.

5.3.e. Manufacturing, Processing, Servicing, and Repair in household Industry (Mh)

A household industry is related to the production, processing, servicing, repairing, or making of goods and services on their own capacities within houses and these are not run as registered organisations providing economic activities. Manufacturing, processing, servicing and repair in household absorbed significant proportions of workers in the towns of Barpali, Baudh, Bellaguntha, Bhuban in 1971 and this activities continued to be the chief economic functions in 1991 as well in the mentioned towns. A very proportion of 60 per cent of workers were engaged in household industry sector in Nuapatna which got a rating of 'Mh9'. This can be explained by the fact that a large proportion of workers are engaged in handloom sector. Nuapatna, located in Cuttack district is very famous for its 'khandua' silk saree and this forms the chief source of income of its residents. Other small towns like Gudari, Kavisuryanagar, Hinjjili, Sonepur and Tarbha were labelled in this category in 1971 and in 1991 they witnessed a diversified distribution of all economic activities. Tarbha where around 20 per cent of workers were involved in this sector in 1971 recorded a sharp decline in the share of workers in the household industry to by 10 percentage points in 1991 which earned it a rating of diversified town. Barpali is one of the main centres of silk saree producing centres of western Orissa which has brought many laurels in handloom sector, locally known as *'Sambalpuri Saree'*.

5.3.f. Manufacturing in non-household industry (Mnh)

In Orissa, industrial activities are observed to be prominent mostly in the places where mineral resources are found. The towns having outstanding proportion of workers engaged in manufacturing sector other than household industry are Chowdwar, Rajgangpur, Rourkela Steel Township, Fertiliser Corporation of India Towhship, Nalco, Paradip phosphates, Panposh, Damanjodi and Chandili etc. The number of towns having

significant proportion of their workers in non-household industry sector increased from nine in 1971 to sixteen in 1991 though few towns like Brajrajnagar, Chandbali moved to other category. A high figure of 45 per cent of workers were working in non-household industry and maximum of them are certainly the part of the workers engaged in Orient paper mill in the town, the oldest industry to be set up in Orissa (established in 1939). The gradual decrease of significance in late 1980s and the final closure of the mills caused heavy loss to the economic livelihood of the town and consequently it became a diversified town in 1991. In Choudwar around 60 per cent of total labour force worked in industrial activity-primarily in the Orissa, Textile Mills established there. In fact, Chowdwar and its surrounding hinterland is one of the significant industrial zones of Orissa where other industries like Libra carpets, Indian Charge Chrome Limited(ICCL), Ballarpur Paper industry limited form the economic backbone of the industrial base of the town. The heavily industrial economy of the town enabled it to get the highest rank of 'Mnh4' in 1971 and it was reduced to the second specialisation category in the same sector of economy in 1991. Rourkela is the lone Class I city to fell under this category. Rourkela Steel Plant (RSP), one of the leading producers of steel in the country absorbed more than 40 per cent of total its workers in 1971 and it further rose to 52 per cent in 1991. Nalco and Damanjodi are the towns principally established on the footings of the existing aluminium company and these are indeed industrial enclave which had 67 per cent of their workers engaged in industrial activities. Panposh could be identified as a shadow industrial sub centre of Rourkela. Belpahar is another town in western Orissa where maximum of labour force were found in IB thermal power plant and Mahanadi Coal field. Hirakud, more known as its hydro-electric power production centre and Paradip phosphates are other important towns where non-household manufacturing sector holds the key in the economic base of the town. Apart of dam, few more industries like HINDALCO and National Aluminium Company are providing substantial work to labour force.

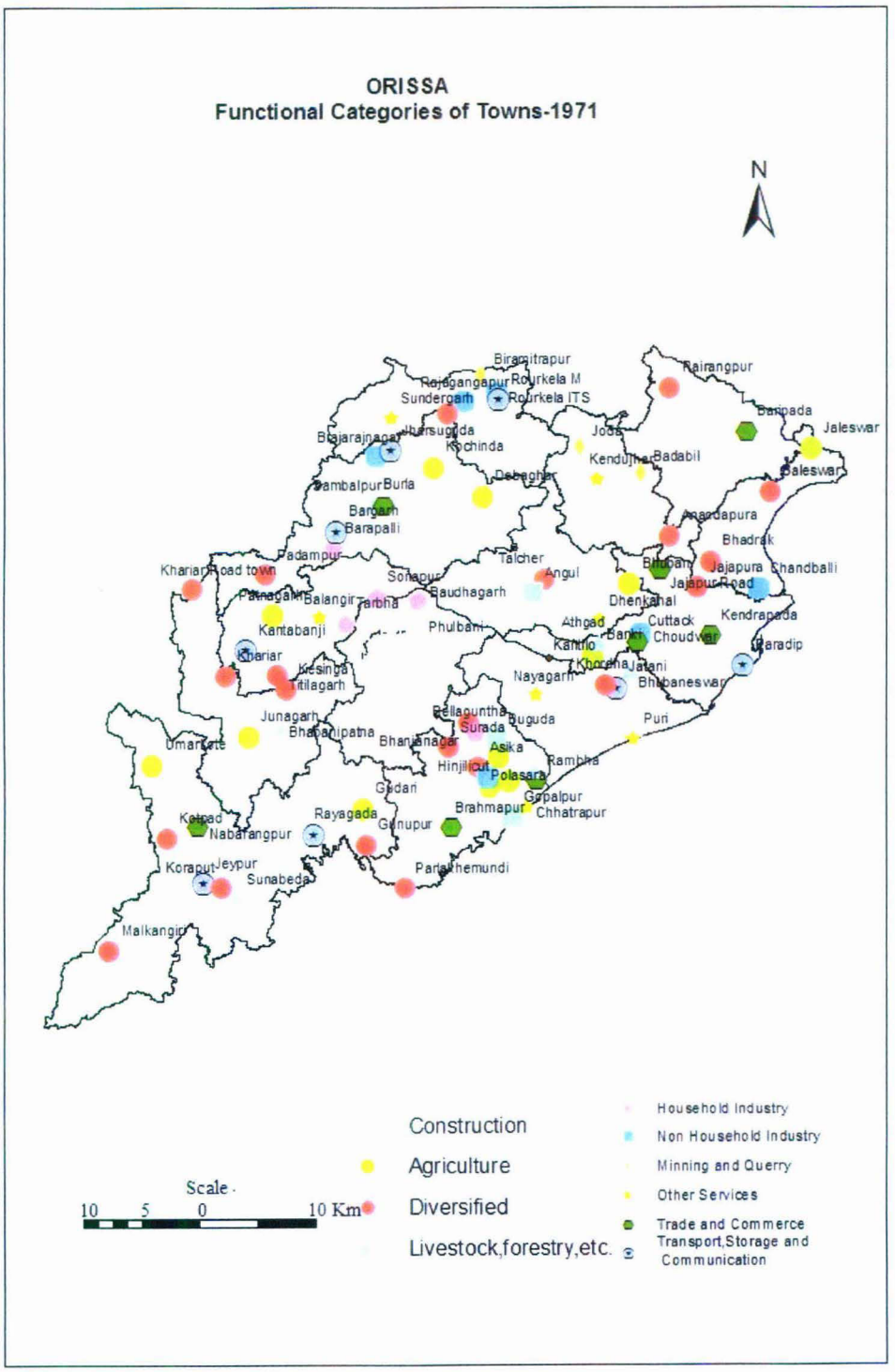
5.3.g. Construction (C)

This industrial category of workers had low proportion of workers compared to other categories in 1971. Bhawanipatna recorded highest of 7 per cent of total workers engaged

in this sector which includes construction and maintenance of buildings, roads, railways, waterways, water reservoirs, hydroelectric projects, setting of tiles, marbles etc. In 1971, the capital city fell under this category where the concentration of economic activities has shifted more to tertiary sector with passage of time and in 1991 it was specialised in 'others service' category. Most strikingly, in Rengali Dam Project Township more than 75 per cent of labour force was engaged in construction sector in 1991. Understandably, this very high share of its total workers engaged in construction earned it the rating of 'C10'. An extremely high rating was caused by the fact that this construction sector is generally comprised low share of labour force in towns of Orissa with relatively lower variation among them. Talcher Thermal Power Station Township is another town where significant proportion (18 per cent) of total workers was involved in construction activities.

5.3.g. Trade and Commerce

According to the definition of Census, this category includes workers employed in wholesale and retail trade of all kinds and other commercial activities like financing, insurance, real estate, business services and legal services. In general this sector has gained much significance in twenty years as the number of towns specialised in trade and commerce has increased from twelve in 1971 to eighteen in 1991. The towns which had significant proportion of workers engaged in trade and commerce are Cuttack, Jajpur road, Balugaon, Puri, Bargarh, Kantabaji, Brahmapur, Rambha. Among them, Cuttack, Kendrapara, Puri, Brahmapur are few of the oldest business and trading centres in Orissa and the increase of share of workers engaged in trade and commerce therein is in not uncommon. Among all towns specialising in trade and commerce, Balugaon had highest of 37 per cent of its total workers employed in this sector followed by Puri (33 per cent), Bargarh (30 per cent), Brahmapur (29 per cent). Though Cuttack is considered to be the business hub of the state, the share of workers in the trade and commerce in the town is relatively low compared to other highly specialised towns and this could be explained by the fact that Cuttack provides a multitude of employment providing activities ranging from administrative, service and others sector. On the other end of spectrum of specialisation, towns like Rambha, Jajpur road and Sambalpur witnessed decline in the


ORISSA
Functional Categories of Towns-1971
N
Biramitrapur
Rourkela M
Rajagangapur
Rourkela ITS
Sundergarh
Rairangpur
Baripada
Jaleswar
Bhojarajnagar
Jharsuguda
Kochinda
Joda
Kendujhar
Badabil
Baleswar
Sambalpur
Burla
Debagarh
Bargarh
Barapalli
Anandapura
Bhadrak
Padampur
Talcher
Khariar Road town
Sonapur
Angul
Bhupan
Jajapura Chandballi
Jajapur Road
Patnagarh
Balangir
Titlagarh
Baudhagarh
Dhenkanal
Kantabanji
Phulbani
Athgad
Cuttack
Kendrapada
Khariar
Kesinga
Kantilo
Choudwar
Paradip
Nayagarh
Khorda
Jatani
Bhubaneswar
Junagarh
Bellaguntha
Buguda
Puri
Bhawanipatna
Surada
Umarkote
Bhanjanagar
Asika
Rambha
Hinjilicut
Polasara
Gudari
Gopalpur
Brahmapur
Chhatrapur
Rayagada
Kotpad
Nabarangpur
Gunupur
Koraput
Jeypur
Sunabeda
Parlakhemundi
Malkangiri
Scale
10 5 0 10 Km
Construction
Agriculture
Diversified
Livestock,forestry,etc.
Household Industry
Non Household Industry
Minning and Querry
Other Services
Trade and Commerce
Transport,Storage and Communication

share of workers employed in trade and commerce and consequently the former was shifted to livestock category and later two labelled as diversified town in 1991. In the two decades time, Angul, Champua, Paralakhemundi, Rairangpur, increased the employment providing capacities in trade and commerce as these towns fell in this category with rating of 'Tc1' (meaning thereby specialised in trade and commerce with more than one standard deviation from the mean of the workers in this sector in all the towns). In 1971, out of total four class I towns two fell in this category and three out of total eight in 1991 had specialisation in trade and commerce.

5.3.h. Transport, Storage and Communication

The towns specialised in trade, storage and communication has increased in numbers in 1971-1991 and also this gradually shifted small to medium towns. The towns specialising in transport, storage and communication are Jatani, Paradip, Jharsuguda, Kantabaji, Raurkela, Rayagada, Paradip phosphates. In 1971, Paradip (Tsc4) recorded as high as 42 per cent of its total labour force was employed in this sector followed by Jatni (Tsc3) with a share of 36 per cent, Kantabaji (Tsc2) with 28 per cent, Rourkela (Tsc2) with 28 per cent. The persons employed in any form of transportation either by road, rail, water, or air and persons participating in storage, warehousing activities and communication such as postal telegraphs, telephone, broadcasting etc. are counted in the broad sector of transport, storage and communication as per definitio of Census. Jatni recorded considerable increase in the share of workers employed in this sector from 36 per cent in 1971 to 40 per cent in 1991 and it got a highest rating of 'Tsc6'. The dominance of this sector may be explained by the fact that it is situated near to the capital and its well connected transport link facilitated enhanced commercial activities in the large complementary area of Bhubaneswar. Paradip is another town where a significant proportion (33 per cent) of workers was employed in this category giving a rank of 'Tsc4'. Other way around, Joda, Jharsuguda, Rourkela and Rayagada are the towns where the share of workers in transport, storage and communication has decreased though they fell in this category in both time periods. Raurkela is the only class I city to be labelled in this category.

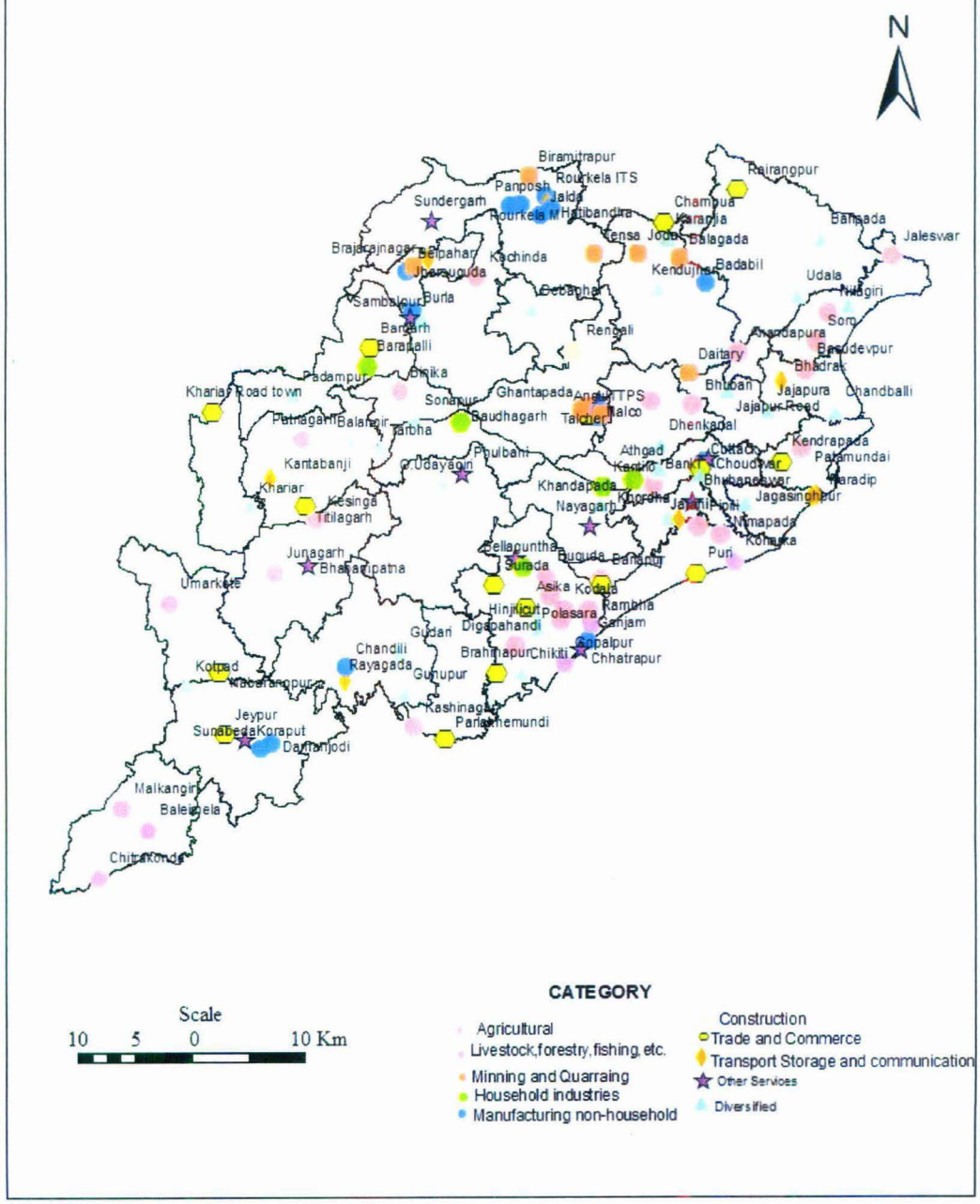
5.3.i. Other Services

This category includes all others workers engaged in services like electricity, gas, water, public administration, and research services, medical and health services, religious and welfare services, recreational and cultural services and personal services. Essentially, this sector covers all such workers who do not come under any of the industrial categories described above. Towns specialised in this sector is more than in any other category both in 1971 and 1991 in spite of the fact that a town must have at least 38 per cent of total workers engaged in this 'others services' in order to fall in this category. The towns specialised in this industrial category are Charibatia, Talcher Thermal power Station Township, Sundergarh, Nayagarh, Phulbani, Baripada, Bhawanipatna, Bolangir, Koraput, Bhubaneswar and Chatrapur. Maximum of these towns are district headquarters where no such specialisation in any specific secondary activities. In fact the occupational structure of workers in those towns varies in a wide range of services that is not typical of any of the eight above functional category. In the capital city of Bhubaneswar, 46 per cent of total workers were employed in this category.

5.3. j.Diversified Towns

The towns which did not qualify to fall in specialisation of any of the nine categories discussed above are labelled as diversified towns. In 1971, out of total 81 towns, twenty towns are not sufficiently high in proportion of their labour force in any categories and the functions appear to be distributed in all sectors. Such diversified towns increased to 28 in 1991. The towns which categorised as diversified in 1971 and continued the same label in 1991 as well are Balasore, Gunupur, Jajpur, Khariar. Khariar Road, Khordha, Padampur Kotpad etc. There were two class I towns (Balasore and Sambalpur), eight medium towns and 18 small towns among all diversified towns in 1991 whereas diversified towns in 1971 were small and medium towns. The decrease of agricultural sector dominance in few towns like Deogarh, Gudari, Hinjili as they moved from agricultural activities in 1971 to diversified in 1991.

ORISSA
Functional Category of Towns-1991



5.4. Functional Change in 1971-1991

An attempt has been made here to trace the changes in the functional characteristics of towns in a time period of two decades. A perusal at the table: 5.5 suggests that in 20 per cent of towns, the functional nature of the towns remained same in 1991 to that in 1971. Out of 16 towns recording no change in their functional characteristics, six are agricultural towns. This indicates the continuing presence of agricultural activities in the towns of Orissa. Bolangir, an old town in western Orissa, continued to be labelled as diversified town in 1991 whereas in Cuttack, the business hub of Orissa, trade and commerce activities were found to be dominant in both time periods. The towns retaining their same functions in 1991 to that of 1971 are either agricultural or diversified town except Cuttack and Kendrapara which were labelled as 'Tc1'.

Table: 5.5

Functional Change of Towns in Orissa (1971-1991)

Status	Number of Towns	Percentage of Towns
Unchanged	16	20
Changed	64	80
D - S	13	16.25
S -D	14	17.5
C - S	7	8.75
G - C	30	37.5
Total	**80**	**100.00**

Source: Census of India, Primary Census Abstract of Town Directory Orissa, 1971(series16), 1991(Series 19)

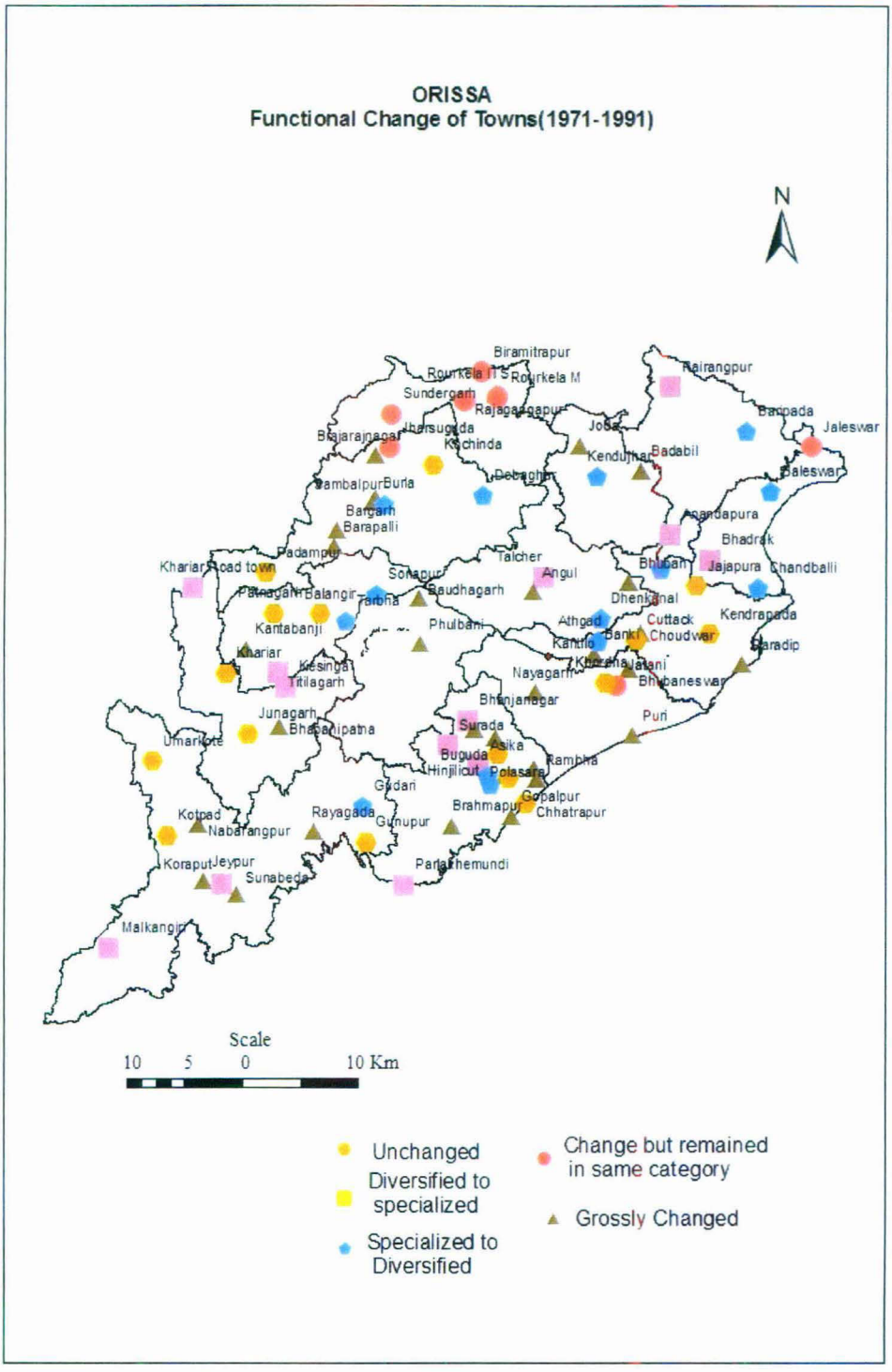
Note: D-S: Changed from diversified to specialised; S-D: Changed from specialised to diversified; C-S: Changed but remained in same category; G-C: Grossly changed

On the other hand, out of 80 taken for analysis 64 towns had undergone change in their functional nature. Again, the change was particularised in four categories namely, 'changed from diversified to specialised', 'changed from specialised to diversified', 'changed but remained in some category' and 'grossly changed'. More detailed analysis of these categories is presented in following paragraphs.

Out of 64 towns undergoing changes in 1971-2001, 13 towns shifted from diversified category to specialised category. Here, again, three towns namely, Anandpur, Kesinga, Malkangiri had recorded concentration of agricultural activities. The proposition taken earlier in this chapter that agricultural activities still form sizeable proportion of economic activities of urban people and could not be excluded from the study of functional classification of towns is supported by the following two observations. Six towns out of 16 towns undergoing changes continued their specialisation in agriculture and out of 13 towns of 'D-S' category, three towns shifted from diversified to specialised in agriculture. Understandably, Talcher moved from diversified to specialised in mining and quarrying because of the predominance of coal extraction activities. Titlagarh, Aska, Rairangpur, Khariar Road, Paralakhemundi were shifted to diversified category to specialised in trade and commerce.

Fourteen towns changed from specialised to diversified category. Out of them 36 per cent of towns were changed from the category of specialised in household industry to diversified towns indicating the diminishing significance of household industrial activities. All the towns changing from agriculture specialisation to diversified are located in coastal region indicating the continuance of significance of agricultural activities especially in the towns located in interior region of Orissa. Deogarh is the only exception to this generalisation.

Seven towns have only changed their degree of specialisation but remained in the same category. Few of them either moved higher in the degree of specialisation or shed their concentration of workers in specialised category. Biramitrapur, a leading producer of dolomite in Orissa has moved from the category of 'Mq7' to 'Mq2' as the percentage of workers engaged in mining and quarrying decreased from 56 per cent in 1971 to 37 per cent in 1991. Located nearer large town of Raurkela, considerable proportion of workers got involved also in tertiary sector activities. The percentage of workers employed in transport, storage and communication has markedly increased from 10 per cent in 1971 to 15 per cent in 1991. Jatni striking moved from the category of 'Tsc3' in 1971 to 'Tsc6'in 1991. In Raurkela, the relative concentration of workers in transport, storage and communication raised indicating the increasing dominance of tertiary activities therein.


ORISSA
Functional Change of Towns(1971-1991)
N
Biramitrapur
Rourkela I S
Rourkela M
Sundergarh
Rajagangapur
Rairangpur
Bangpada
Jaleswar
Bhojarajnagar
Jharsuguda
Kochinda
Joda
Kendujhar
Badabil
Baleswar
Debagarh
Sambalpur
Buria
Bargarh
Barapalli
Anandapura
Bhadrak
Padampur
Kharian Road town
Talcher
Bhubaneswar
Jajapura
Chandbali
Sohagpur
Angul
Patnagarh
Balangir
Saudhagarh
Dhenkanal
Kendrapada
Kantabanji
Phulbani
Athgad
Cuttack
Banki
Choudwar
Paradip
Kharian
Kesinga
Kantilo
Khurda
Jatani
Titilagarh
Nayagarh
Bhanjanagar
Junagarh
Bhawanipatna
Surada
Puri
Umarkote
Asika
Buguda
Hinjilicut
Polasara
Rambha
Gudari
Gopalpur
Brahmapur
Chhatrapur
Kotpad
Rayagada
Gunupur
Nabarangpur
Koraput
Jeypur
Sunabeda
Parlakhemundi
Malkangiri
Scale
10 5 0 10 Km
Unchanged
Diversified to specialized
Specialized to Diversified
Change but remained in same category
Grossly Changed

Sundergarh, which contained two big towns –Raurkela and Raurkela Steel Township and another mining town-Biramitrapur recorded maximum of its workers in 'others' industrial category and it shifted to 'O2' category.

The category of 'grossly changed' holds greater importance in the study of functional change of towns between 1971to 1991. Out of total 80 towns taken for study, 30 towns had undergone change from being specialised in one industrial category to a different industrial category. In two decades time, Angul, Bargarh, Bhawanipatna, Burla, Puri, Phulbani and Bhubaneswar shifted their specialisation from secondary sector to tertiary sector. The state capital shifted from being specialised in construction activities to 'others' industrial category. The increasing predominance of tertiary activities were found in Bhubaneswar, similarly Burla, Phulbani and Bhawanipatna also shed their specialisation in construction status and moved to 'O1' category. On the other hand in Khalikote agricultural activities became dominant in 1991 whereas construction activities employed major share of labour force. Baudh, Bellaguntha, Buguda, Gopalpur shifted witnessed more significance of secondary and primary activities. Also, in many cases the limited presence of secondary and tertiary activities could not continue to employ labour force and ultimately shifted to primary activities either in agriculture or household activities. Raurkela Steel Township moved from 'Tsc2' category to 'Mnh2' category indicating the rising of non-household manufacturing activities fuelled by Rourkela Steel Plant. In general, the bigger towns shifted from primary or secondary sector to tertiary sector dominance and the growth potential of small towns further declined as they moved in opposite direction. The low level infrastructure facilities found in these towns further justifies the decreasing significance of small and medium towns so far the urban productivity is concerned. Therefore, the study functional change of town's characteristics has revealed that small towns have been pushed more towards primary sector activities and many of the medium towns have just started to depend more on secondary sector while the big cities are specialising in tertiary sector and few fell in diversified category. Nevertheless, the agricultural sector still forms sizeable proportion of workers in all towns take together.

5.5. Extent of Diversification

After analysing the functional characteristics of different size class towns, the extent of diversification of different functions across towns has been examined in this section. Like different functions are performed variedly in a town, a function is also performed differently in towns. A clear distinction should be made here between angles of looking at the functional diversification of workers. To measure, which functions are spread out more in towns, 'Transformed Herfindahl index' (THI) was used. It is calculated by subtracting Herfindahl index from unity and details of this is given in the methodologies section of first chapter. It can be safely argued that mining and quarrying are more localised in the mineral centres and the places of locational advantage for such purposes. Certain functions are widely spread in all towns and certain others are less. A suitable quantitative technique measuring the diversity of function can serve this purpose.

The values of transformed Herfindahl Index for each category separately in 1971 and 1991 was calculated and based on that the extent of diversification was measured. From the table; 5.6 it is evident that the category the agriculture (I+II) was most diversified in 1971 across the towns. The agricultural activities continued to be performed widely across towns as it again got the first rank in 1991. It indicates that sizeable proportion of workers gets employed in the agriculture sector and that too well spread across the size class of towns.

Table: 5.6

Values of Herfindahl Index for different Industrial Categories

Industrial Category	THI_1971	Rank	THI_1991	Rank
I+II	0.9818	1	0.9857	1
III	0.9557	4	0.9708	3
IV	0.7277	9	0.8868	9
Va	0.9625	2	0.9709	2
Vb	0.9178	8	0.9399	7
VI	0.9530	7	0.9316	8
VII	0.9551	5	0.9548	4
VIII	0.9568	3	0.9513	5
IX	0.9531	6	0.9464	6

The second diversified function was the household industry sector both in 1971 and 1991. The increase in the index value of 'Va' category in 1991 suggested that the workers engaged in manufacturing sector were spread more across the towns. The transport, storage and communication (VIII) occupied the third position in 1971 so far the diversification of functions is concerned whereas it was replaced by the category of 'livestock, fishing, and forestry etc. in 1991. Here again, one more primary sector activities was relatively more diversified across the towns. This might have caused due to the increased fishing, plantations activities in coastal towns and the dominant livestock farming in the towns located inland region.

The mining and quarrying activities are less diversified in Orissa and it is easily understandable. Few centres of mineral resources and other raw materials like coal, iron, chromite, limestone are extracted in few selected towns and resultantly it secured a low index value. This industrial category was less specialised in 1991 as well.

The diversification pattern of other industrial categories has not undergone much change in two decades time from 1971 except little variation. The tertiary sector activities were found to be more diverse in 1991 than in 1971 and at the same time primary sector labour force was accentuated. The manufacturing sector workers were less diverse in 1991. Thus, to make it clearer, one can say that, the tertiary sector grew at the cost of manufacturing sector and those who could not survive was pushed towards less productive primary sector. The inequity in infrastructure facilities across size class towns can be correlated with the finding of increasing disparity in functional diversification across towns. It has earlier been established that the towns having major proportion of workers employed in non agricultural activities, especially the tertiary sector has shown better infrastructure development.

The general notion that diversified towns show better infrastructure and growth perspective did not hold true in our analysis. The correlation between them was found to be low. This could be attributed to the fact that many of the towns are specialised in one industrial category and majority of diversified towns are small owns. It should be looked from the angle of their inability to absorb fair proportion of workers in any industrial category and consequently they fell under diversified category. Nevertheless, few

exceptions are discernible as Sambalpur and Baleshwar (both class I town) were diversified towns in 1991. A moderate correlation of 3.96 has been found between per capita receipts of municipal finance and the diversity of the towns in 1991 with significance level at 0.01 level.

5.6. Conclusion

The analysis of functional nature of towns always helps to look into the underlying causes of the complex urban system in a region which is difficult to assess otherwise. The sustenance of towns and its growth potential has largely governed by its nature of functions performed and the infrastructure facilities available. In fact, the growth of a towns and the infrastructure development therein cannot be dissociated as they both complement each other and go hand in hand. A comparative analysis further broadens its scope as it facilitates to trace the change either in constructive way fuelling enhanced economic growth or deceleration of production capabilities. The functional classification of towns has revealed that the percentage of towns specialised in agriculture has increased from 15 per cent in 1971 to 22 per cent in 1991. Though towns are known considered as the chief centres of economic productive activities and they are known more for the non-agricultural activities, in Orissa it has not been found in its true rigour. The majority of agricultural towns in 1971 again found in the same category in 1991. On the other hand, the employment in secondary sector has reduced in 1991 and the tertiary sector moderate increased. Therefore, the secondary sector, especially construction and household industrial activities has taken backseat in the process of widening disparity across size class towns.

The continuation of diversification of agriculture sector in towns has corroborated the persistence of workers getting employed in primary activities. The big cities were found to be specialised in tertiary activities and majority of them were in the cate gory of trade and commerce except Bhubaneswar which was specialised in 'others' industrial category. The positive correlation between the diversification and municipal finance points towards the causes of low financial capabilities of ULBs in towns of Orissa which consequently affected infrastructure development. The presence of low diversified and multi functional towns suggests that the urban scene in Orissa seems to be dominated by very few big

cities and substantial low medium towns possessing low urban character in terms of economic productivity and infrastructure development. However, viewed from the angle of scope of functional classification, it is considered as a means rather than an end itself and can be subjected to further analysis which can help in policy formulation by identifying the functions performed by them.

Chapter VI

Summary and Conclusions

In general, urbanisation is seen as a positive change in the society. The process and the factors of urban growth are perceived more by their economic manifestations. Since urbanisation is being highly interlinked with economic development, its close association with the later has more often overshadowed the other changes induced by urbanisation. The changes in demographic characteristics are simply undeniable. The other way around, one can also argue that economic development and concentration of population at a place fosters urbanisation. However, urbanisation and urban development involves a multitude of causes and at the same time influences the various sectors of economy and alteration of other earlier traits in social, economic, cultural and political attributes of a region. The level of infrastructure facilities and urban development in towns affects its growth potential and in turn, gets affected by it. The urban local bodies entitled to provide infrastructure and basic amenities to the urban residents require adequate finances for maintenance and upgrading urban infrastructure service. The present study dealing with all these facets of urbanisation surfaced many findings that may help understand the nature of urbanisation, cause of low urban development, status of municipal finance and functional nature of towns.

6.1. Summary of Findings

The first chapter is an introductory part forming the base and conceptual framework of the entire study.

In the second chapter entitled '***Histogenesis and Spatio-temporal Trends and Patterns Of Urbanisation***', it has been found that in Orissa, the process of urbanisation was started long back but significant urban growth virtually started only after Independence. The number of towns has increased systematically in each census years. Town having a population of more than one lakh came into existence in 1951 and in a decade of time no addition of class I town has happened. Cuttack was the only one class I town in 1961. Cities of population one lakh or more increased to four in 1971 and the percentage of urban population residing in class I towns has gone up in each subsequent census years. On the other hand, the percentage of urban population inhabiting in class III declined during 1971-2001. The growth and accommodating capacity of medium towns decreased and small towns more or less continued their tempo. The population size of towns did not

follow the rank size rule in any of the reference time periods taken here. The largest two towns recorded less population than their respective estimated population by rank size rule. The medium towns approached nearer to the rank size pattern and small towns approached even closer. The spatial distribution of urban settlements as indicated by Nearest Neighbour Technique revealed that urban centres are distributed randomly in Orissa. In 1991, the spatial pattern started to approach towards uniformity and a further increase in 'R' value in 2001 made the distribution more uniform. The coastal region was found to have a denser pattern of urban settlement than the interior region. The growth of towns has been different across size class and the gradual abating of significance of medium towns was discernible. The urban growth was found to be high in Orissa in parallel to the country.

In third chapter named as, ***'Socioeconomic Characteristics of Towns and Cities'*** it has been revealed that, progress was made in all socioeconomic indicators taken for the study. The sex ratio, literacy rate – total, male and female, and work participation rate of persons, males and females separately have recorded positive change in almost all towns. The sex differential in literacy rate and work participation rate was found and they were in the favour of males. Nevertheless, the male-female disparity has also been reducing as in 2001, the sex disparity in literacy rate in urban Orissa declined to less than one third of that in 1971.The total work participation rate has not changed much in urban Orissa whereas, the female work participation rate has improved at a much rapid rate compared to that of total and male. The female work participation rate was found higher in small towns compared to big and medium towns. This is because of the more involvement of female workers in primary sector activities which absorbed major share of labour force in small towns. On the other hand, in large cities and medium towns secondary and tertiary activities were dominant and female proportion was less in such activities. The socioeconomic development was found to be highest again in small and medium towns which could be attributed to the fact that they had low sex disparity in literacy and work participation rate. The large towns like Bhubaneswar, Cuttack, Raurkela, and Angul had recorded either high or medium level of socioeconomic development level.

Chapter four entitled as, *'Municipal Finance and infrastructure facilities'* has dealt with the details of source of financial receipt of ULBs and the pattern of areas of expenditure in first section and the existing status of urban infrastructure facilities in the second section. Realising the importance of empowering urban local bodies, 74th Constitutional Amendment, 1992 was brought suggesting devolution of financial power of local governments. The analysis of different source of municipal finance indicated that the small and medium towns had no other way than depending on external sources for funding as they could not generate the required resources through their revenue taxes and municipal properties. The per capita receipt of finance has varied significantly across class size towns and the variation in their expenditure pattern too is not uncommon.

Many of the infrastructural facilities like hospitals, colleges or other recreational facilities were completely non-existent in most of the small towns and the depended on the nearest bigger urban centre. The inequity in infrastructural facilities across towns of different size class has been widening post 1991. Especially the medical and educational facilities were very poor in small towns. The variation in infrastructure index value of towns was much less in 1981 than that in 1971 but after 1981, it further increased till 2001. Thus, one can say that the infrastructure development has been deteriorating fast after 1991. The spending on public works, public institutions has increased in post 1991 period but that was found to be not sufficient enough for the population growth and demand of upgradation of infrastructure and basic amenities service provision. The physical and the most important infrastructure elements like water supply, system of sewerage etc. were found to be in a very poor condition. In 2001, the observation that more than 80 per cent of towns had to depend on open surface drains highlights the level of availability of infrastructure facilities. It is surprising to note that, the state capital's important system of sewerage was open surface drain in 2001. The overall infrastructure development status exhibited a positive relationship with the size of towns. The infrastructure development from the municipal finance point of view has revealed that the towns with less per capita receipt and expenditure has low or very low level of infrastructure development.

The temporal change in the infrastructure development in towns has again been found to be class specific. Few selected cities had undergone progress considerably while other

small towns stagnated. The Bhubaneswar, had witnessed all round improvement in the infrastructure facilities and others big towns like Brahmapur, Raurkela have faired in few elements of infrastructure. The low level of infrastructure development facilities in medium towns once again, justified the earlier finding that they are losing their significance in urban scene of the state. The decrease in the percentage of population they accommodate, finances received, per capita expenditure and low infrastructure development clearly indicates their diminishing significance.

In the fifth chapter entitled as ***'Functional Classification of Towns'***, the functional characteristics of towns in 1971 and in 1991 and the functional shift during two decades of time has been examined. It has been found that agricultural activities continue to be one of important economic functions in many towns. The number of towns specialised in agricultural sector has increased in 1991 from 1971. Understandably, maximum of them are small towns except few medium towns. Moreover, the number of towns having specialisation in other two segments of primary sector- livestock, forestry, plantation etc. and mining and quarrying has also increased. The number of towns in the category of specialisation in secondary economic activities has increased in two decades time. The towns specialised in trade and commerce was well distribute in Orissa and distantly located. It indicates that they generally served as the market centres serving their respective complementary areas.

Majority of towns have witnessed change in their functional specialisation and twenty per cent of towns remained unchanged. The major change was noticed in the form of shift of function from specialised to diversified. The positive correlation between the size of the population and the extent of diversity of towns has been unfolded. In many towns the important function was changed completely from one industrial category to another.

The extent of diversification of functions suggested that agriculture activities were more spread across towns. The household industry occupied the second position in diversity measure calculated by Herfindahl Index points towards agrarian economy of Orissa. Apart from primary sector activities trade and commerce activities were found to be more widespread across the towns in Orissa. The service sector was more localised in certain large towns and few district headquarters. Since mining and quarrying are the activities

develop in the places which have locational advantage over others, the value of diversity index was found to be lowest.

The positive correlation was found between the diversification and per capita receipt of municipal resources. Towns having diversified functions seemed to have in a better position in collecting resource through taxes and non-tax revenues. The relatively large towns recorded specialisation in tertiary activities and a large number of small towns were mono-functional which dominated the urban scene in Orissa.

6.2. Conclusions

The present research exploring the spatial distribution of urban settlements and dynamics of urban development has unfolded many findings that tell about the urban landscape of Orissa. As earlier it has been seen that urban population has been growing steadily but still it comes under the category of low urbanised states of India. This is due to the fact that urbanisation in Orissa received its tempo quite late in 1960s and the absence of wide spread industrialisation has led to the non-diversification of economy. In 2001, there were only nine class I cities and out of those six are in the coastal region. Out of rest three, Raurkela and Raurkela Industrial Township were located adjacent to each other. Sambalpur is the only class I town in western Orissa and the entire western region was dependent on it for higher order services. Brahmapur serves major part of south Orissa and the south western region of Orissa was dominated by few medium and many small towns. The absence of well served medium towns has caused the wide disparity across size class of towns. Thus, urban structure in Orissa was dominated by very few large towns and many small towns and medium category towns were absent which play the role of connecting large rural hinterland with large diversified towns. Therefore, promotion of creating medium towns should be encouraged in Orissa.

The weak municipal finance management coupled with very low infrastructure facilities are considered as the major causes of Orissa not being able to excel in urbanisation. The persistence of agricultural activities in many towns did not expand the growth potential of economic productivity. One more important point could be made that in the present market oriented competitive world, the towns of Orissa had not been able to compete

with many leading metropolitan cities of India. The lack of industrialisation is one of the major causes of low urbanisation Orissa.

However, recent urban reforms oriented initiatives can help develop better infrastructure facilities and promote sustainable urban governance. The inclusion of Bhubaneswar and Puri in the list of selected cities to undertake urban reforms funded by Jawaharlal Nehru national Urban Renewal Mission (JNNURM) is a welcome step so far the urban development in Orissa is concerned. The need of paying attention to other towns as well is increasingly realised among the informed research domain and policy makers. However, given the high urban growth of the state and the recent changes in Indian economy, the urban centres may become growth inducive in future. The growth potential of the state lies in the mineral rich hinterland and tourism sector. If the natural resources and the certain centres of locational advantage like Bhubaneswar, Cuttack, Angul and few others in western Orissa can be utilised with redistribution of fruits of development to large mass of poor in the state, then only the cities can act coherently in the development process of a region in general and Orissa in particular.

Bibliography

Articles and Books

Ahmed. Q , (1965), " Indian Cities : Characteristics and Correlates", Research paper No. 102, University of Chicago, Department of Geography, p. 114

Amitabh. A., (1984), 'Urban Planning at Crossroads', *Economic and Political Weekly*, Vol. 19, No. 35 (Sep. 1, 1984), pp. 1520-1521

Bagchi, S., (1999), 'Myth of Empowering Urban Local Bodies', *Economic and Political Weekly*, Vol. 34, No. 37 (Sep. 11-17, 1999), pp. 2637-2638

Barai and Vijaylakshmi (1997), 'Impact of Medium sized towns in the development of the Bangalore Metropolitan region', , *Economic and Political Weekly*, Vol.14, No. 2, pp.5 67-585

Behera , S.C. , (Ed.), Asurgarh Interim Excavation Reports , Sambalpur University, 1982 ,p. 7.

Bhagat R. B. (2002), "Challenges of Rural-Urban Classification for Decentralised Governance", *Economic and Political Weekly*, Vol. 37, No. 25 (Jun. 22-28, 2002), pp. 2413-2416

Bhagat R. B. and Das K. C. , (2008) , 'Levels, Trends and Structure of Workforce in India: Census Based Study 1981-2001

Bhagat, R.B. (1992) 'Components of Urban Growth in India with Reference to Haryana Findings from Recent Censuses' *Nagarlok*, Vol. 25, No.3, pp.10-14.

Breese. G. (1969) : 'Urbanisation in Newly Developing Countries' , Prentice hall, New Delhi

Brockerhoff, M. (1999) Urban Growth in Developing Countries: A review of projections and Predictions, *Population and development Review*, Vol. 25, No4, PP. 757-778.

Brockerhoff, M. and Brennam, E (1998) The poverty of cities in Developing Regions, *Populations and Development Review*, Vol. 24, No 1, pp. 75-114.

C.D. Harris 1943) , " A Functional Classification of Cities in the United States", *Geographical review*, 1943, Vol. 33, PP. 86-99

Chakravorty S. , (1996), "Too Little, in the Wrong Places? - Mega City Programme and Efficiency and Equity in Indian Urbanisation" *Economic and Political Weekly*, Vol. 31, No. 35/37, Special Number (Sep., 1996), pp.2565-2567+2569-2572

Chandoke N. (1991), "The Post-Colonial City", *Economic and Political Weekly*, Vol. 26, No. 50 (Dec. 14, 1991), pp. 2868-2873

Christaller W. (1933), ' The History of Central Places in Southern Germany', translated by C.baakin, 1966, (Englewood Cliffs: Prentice Hall)

Clark , G. , *Water In Antiquity* , Vol. XVII , 1944 , P. 69.

Clark P. J. and Evans F.C. : ' Distance to Nearest Neighbour as a measure of spatial Relationships in populations' , *Ecology*, 35:4 (1954), pp.445-53

Dacey M. P. , ' Analysis Of Central Place And Point Pattern By Nearest Neighbour Method' *Land Studies in Geography Series B, Human Geography* 24 (1962), 55-75 and King L. J. ' A Quantative Expression of the Pattern of Urban Settlements in the Selected Areas of United States', *Tijdsschrift voor Economische en Sociale Geografic*, Vol. 53, 1961, pp.1-7

Das.J. and Mukhopadhaya. S.C., (1999), " Water Supply and Drainage Status in S. Dum Dum Municipal of Calcutta" jn R.R.M. Rao and S. Shimadri (ed)," *Indian Cities: Towards Next Millennium*", Rawat Publication , Jaipur

Davis.K and Golden.H.H (1954) : 'Urbanisation and Development in pre-Industrial Areas', *Economic Development and Cultural Change*, Vol.3.No.1

Dehuri. Dinabandhu (2007), ' Cuttack City : Promotion of Education in Orissa in the Pre-Independence Era' *Orissa Review*, Feb-March, 2007, pp.48

Despande. S and Despande L. (1998): 'Impact of Liberalisation of Labour Market in India: What Do Facts from NSSO's 50th Round Show', *Economic and Political Weekly*, Vol33.No.22. pp21-31

Dutta.P (2006), 'Urbanisation in India', *Abstract of the paper at European Population Conference*, 21-24 June, 2006. Pp. 5

Harris.N, (2003), "Globalisation and the Management of Indian Cities' , *Economic and Political Weekly*, Vol. 38, No. 25 (Jun. 21-27, 2003), pp. 2535-2543

Kewalramani. Gita (1997), The role of medium towns in the spatial diffusion of development: the case study of Konkan region' in Jayamamla Dedee (ed), " *Indian medium Towns: An Appraisal of their Role As Growth Centres*", Rawat publication Jaipur

Kundu A. (1984), "Urban Planning at Crossroads", *Economic and Political Weekly*, Vol. 19, No. 35 (Sep. 1, 1984), pp. 1520-1521

Kundu A. (2003), "Urbanisation and Urban Governance: search for a perspective beyond Neo –Liberalism", *Economic and Political Weekly*, July 19, 2003: pp 3079-3087

Kundu A. , Bagchi S. Kundu D. (1999), "Regional Distribution of Infrastructure and Basic Amenities in Urban India: Issues concerning Empowerment of Local Bodies",*Economic and Political Weekly,* Vol. 34, No. 28 (Jul. 10-16, 1999), pp. 1893-1906

Kundu A. and Gupta S. , (1996) , 'Migration, Urbanisation and regional Inequality', *Economic and Political weekly*, Vol. 31, No. 52, pp. 3391-3398

Kundu, A. and Gupta, S.(2000) Declining population mobility, Liberalisation and rowing Regional Imbalances -- The Indian Case in Kundu, A. (ed) , '*Inequality, Mobility and urbanization'*, Indian Council of social Science Research, Manak Publications, New Delhi.

Kundu. Amitabh (2006) 'Trends and Patterns of Urbanisation and their Economic Implication' in *India Infrastructure Report*, 2006. pp. 32

Kurien C.T. and Joseph James (1975), "Urbanisation and Economic Change: A Pre-historic Investigation of Tamil Nadu", *Economic and Political Weekly*, Vol.10, No. 8, pp.359-370

Lal A. (1950), " Some Aspects of Functional Classification of Cities", *National Geographical Journal* of India's Office

Little K., (2004) , ' Urbanisation as a social Process: an essay on movement and change in contemporary Africa', *Routledge*, 2004.

Mahmood A. ' Statistical Methods in Geographical Analysis' , Rajesh Publications, New Delhi, 2002, pp.75

Markandey K. (1990), "Spatial-temporal Urbanisation", Rawat Publication, Jaipur

Minocha A. C. (1993), " Pattern of Urbanisation in Madhya Pradesh", *Economic and Political Weekly*, Vol. 18, No 37, pp. 1950-1961

Mishra and Mishra (ed.), (1998), " Million Cities in India" Growth Dynamics", Internal Structuring, Quality of Life and Planning Perspectives", Sustainable Development Foundation, New Delhi, Vol. I and II

Mitra A. (1973), " A functional Classification of Indian Towns" , An All India Seminar on Population, 12-14 March, *Institute of Economic Growth* at registrar general of India's office

Moonis Raza and Kundu A. (1978): 'Some aspects of Disfunctional Characteristics of Urbanisation. Socio-Economic Development Problems in South and South East Asi, Popular Prakashan, Bombay.

Nagabhusanam (1999), " Structural and Morphological Transformation of Tirupati Town", in R.R.M.Rao and S. Shimadri (ed)," *Indian Cities: Towards Next Millennium*", Rawat Publication , Jaipur

Nandy (1985), "'Development of small and medium towns: An Evaluation of Administrative Machinery in a Medium sized Town', *Economic and Political Weekly*, Vol.17, No. 2, pp.1 67-175

Nath V. (1986), 'Urbanisation in India: Review and Prospects'. *Economic and Political Weekly*. Vol 21. No.8,1.

Nelson H.J. (1955), "A Service Classification of American Cities", *Economic Geography*, 1955, Vol. 31 NO. 3, pp. 189-210

NIPFP (1995) 'Redefining State – Municipal Fiscal Relations – Options and Perspective for the State Finance Commissions', *National Institute of Public Finance and Policy*, New Delhi, Vol. I

NIUA (2000); 'First State Finance Commissions – Recommendations Regarding Transfers, Sharing and Devolution of Taxes, a background paper prepared for the National Meet on Approach to State – Municipal Fiscal Relations', organized by the *National Institute of Urban Affairs, National Institute of Public Finance and Policy* and Indo-US FIRE Project, New Delhi, 16 June.

Patra B. , ' Dhauli: An Historical Urban Centre of Orissa', *Orissa Review*, July- 2006, pp. 49

Pethe A and Ghedke M. (2002), "Funding Urban Infrastructure: From Government to Markets", Economic and Political Weekly June 22, 2002

Pothana V., 'Functional Classification of Towns in Andhra Pradesh' in Rao.M.K.(ed.), '*Urbanisation, Migration and Economic Development, Kanishka Publication Distributions*, 1995. Pp.43-56

Premi M. K. (1991): "India's Urban Scene and Its Future Implications", *Demography India*, 20(1)

Premi M. K. (2006), 'Population of India in the New Millennium : Census 2001' National Book Trust Of India, pp.229

Ramachandran R. (1989), 'Urbanisation and Urban Structure in India' Oxford university Press, New Delhi, pp.76

Ramachandran R. (1989), 'Urbanisation and Urban Structure in India' Oxford university Press, New Delhi, pp.82

Rao. Padmanabha ((19990, " Urbanisation in Telengana and its future Implications", in Ram Mohan Rao and S. Shimmardi (eds), " *Indian Cities: Towards next Millennium*", Rawat Publication , jaipur

Rao. V.L.S. P. 1964), " Towns of Mysore State", Indian Statistical Institute , Calcutta

Roy K. (1973), "A Functional Classification of Metrpoplitan Communities", Vol. 10, No 3, pp. 127-445

Savage D. and Dasgita. S (2006), 'Governance Framework for Delivery of Urban Services', in 3iNetwork (ed.), *India Infrastructure Report 2006:Urban Infrastructure*, New Delhi; Oxford University Press, pp 43-58

Sekhar S. and Bidarkar.S , (1999), " Municipal Budgets in India" Comparison across five Cities", *Economic and Political Weekly*, Vol. 34, No. 20 (May 15-21, 1999), pp. 1202-1208

Shaw. Annapurna (1999), "Emerging Patterns of Urban Growth in India", : *Economic and Political Weekly*, Vol. 34, No. 16/17 (Apr. 17-30, 1999), pp. 969-978

Singh H. K. (2010), 'Gender Imbalance in Socio-economic and Demographic Characteristics, 2001 Census', in '*Orissa Review*' , Dec, 2010, pp 224

Singh. P.K. , 'Asurgarh -an early urban centre of Orissa' , *Orissa Historical Research Journal*, Vol. XLVII, No.3. pp 49

Sinha B. N. 'Geography of Orissa' (1999), National Book Trust of India, pp. 185

Smith. R.H.T. (1965): 'Method and Purpose in Functional Town Classification' , *Annals of the Association of American Geographers*, Vol. 55, No. 3 (Sep., 1965), pp.539-548

Sovani N. V. (1966): Urbanisation and Urban India, Asia Publishing House, Bombay, United Nations (1993) *World Urbanisation Prospects- The 1992 Revision* ,United Nations. New Work.

Sridhar K. S. and Reddy.A.V. (2010), 'State of Urban Services in Indian Cities: Spending and Financing' , Oxford University Press, 2010. Pp. 1

Stobart John (2000) , " In search of casuality : A Regional approach to Urban Growth in Eighteenth –Century England", *Geografiska Annaler Series, Human Geography*, Vol. 82 , No. 3 (2000), pp. 149-163

Suri. K.B. (1999), "Growth of small towns in Gujarat" , *Economic and Political Weekly*, Vol.7, No. 2, pp. 67-70

Thakur B. 'Nearest Neighbour Analysis: As a Measure of Urban Place Patterns" Indian Geographical Studies, Res. Bull, 1, pp.58

Vaidya C. (2000) 'Seminar on Local Governance for Millennium- With Special Reference to Financial Reforms; Experience, Problems and Prospects' (2000): "Property Tax Reforms in India: Some Issues" Mumbai

Zachariah K. C. (1968) , 'Migrants in Greater Bombay' , Asia Publishing House.

Government Documents and Reports

Human Development Report, Orissa (2004), *Planning and Co-ordination Department*, Government Orissa

Registrar General (1991) Census of India , Emerging Trends of Urbanisation in India, Occasional paper No. 1 of 1993, Registrar General, New Delhi.

World bank, (1994), 'World development Report 1991, 'Infrastructure for Development', Oxford University Press, New York, 1994

World Bank, (2000), 'Policy and Research Bulletin', July–September, Vol. II, No. 3.

Appendix

Appendix-2.1

Rank Size Relationship in towns of Orissa, 1971

TOWN_NAME	Rank ®	*Pr*	*Log(R)= X*	X^2	*Log(Pr)=Y*	Y^2	*XY*
Cuttack City	1	194068	0.000	0.000	5.288	27.962	0.000
Rourkela Steel	2	125426	0.301	0.091	5.098	25.994	1.535
Berhampur City	3	117662	0.477	0.228	5.071	25.711	2.419
Bhubaneswar City	4	105491	0.602	0.362	5.023	25.233	3.024
Puri	5	72674	0.699	0.489	4.861	23.633	3.398
Sambalpur	6	64675	0.778	0.606	4.811	23.143	3.743
Rourkela Civil Township	7	47076	0.845	0.714	4.673	21.835	3.949
Balasore	8	46239	0.903	0.816	4.665	21.762	4.213
Bhadrak	9	40487	0.954	0.911	4.607	21.227	4.396
Balangir	10	35748	1.000	1.000	4.553	20.732	4.553
Jeypore	11	34319	1.041	1.084	4.536	20.571	4.723
Brajrajnagar	12	31817	1.079	1.165	4.503	20.274	4.859
Baripada	13	28725	1.114	1.241	4.458	19.876	4.966
Biramitrapur	14	28063	1.146	1.314	4.448	19.786	5.098
Sunabeda	15	27980	1.176	1.383	4.447	19.774	5.230
Paralakhemundi	16	26917	1.204	1.450	4.430	19.625	5.334
Jatni	17	25119	1.230	1.514	4.400	19.360	5.414
Rayagada	18	25064	1.255	1.576	4.399	19.352	5.522
Jharsuguda	19	24727	1.279	1.635	4.393	19.300	5.618
Barbil	20	24342	1.301	1.693	4.386	19.240	5.707
Chowdwar	21	24300	1.322	1.748	4.386	19.234	5.799
Bargarh	22	22865	1.342	1.802	4.359	19.002	5.852
Bhawanipatna	23	22808	1.362	1.854	4.358	18.993	5.935
Rajgangpur	24	21876	1.380	1.905	4.340	18.835	5.990
Koraput	25	21505	1.398	1.954	4.333	18.771	6.057
Kendrapara	26	20079	1.415	2.002	4.303	18.514	6.088
Dhenkanal	27	19615	1.431	2.049	4.293	18.426	6.144
Keonjhar	28	19340	1.447	2.094	4.286	18.374	6.203
Joda	29	17353	1.462	2.139	4.239	17.972	6.200
Sundargarh	30	17244	1.477	2.182	4.237	17.949	6.258
Jajpur	31	16707	1.491	2.224	4.223	17.833	6.298
Khurda	32	15879	1.505	2.265	4.201	17.647	6.323
Burla	33	15587	1.519	2.306	4.193	17.579	6.367
Hirakud	34	15040	1.531	2.345	4.177	17.449	6.397
Titlagarh	35	14504	1.544	2.384	4.161	17.318	6.426
Nabarangpur	36	13739	1.556	2.422	4.138	17.123	6.440
Aska	37	12954	1.568	2.459	4.112	16.912	6.449
Gunupur	38	12702	1.580	2.496	4.104	16.842	6.483
Bhanjanagar	39	12353	1.591	2.531	4.092	16.743	6.510
Talcher	40	11794	1.602	2.567	4.072	16.578	6.523
Bhuban	41	11350	1.613	2.601	4.055	16.443	6.540
Rairangpur	42	11226	1.623	2.635	4.050	16.404	6.575
Chatrapur	43	10835	1.633	2.668	4.035	16.280	6.591
Hinjili	44	10821	1.643	2.701	4.034	16.275	6.630

Jajpur Road	45	10805	1.653	2.733	4.034	16.270	6.668
Polasara	46	10579	1.663	2.765	4.024	16.196	6.692
Phulbani	47	10511	1.672	2.796	4.022	16.174	6.725
Kantabanji	48	10489	1.681	2.827	4.021	16.166	6.760
Patnagarh	49	10085	1.690	2.857	4.004	16.029	6.767
Kotpad	50	9856	1.699	2.886	3.994	15.950	6.785
Surada	51	9833	1.708	2.916	3.993	15.942	6.818
Umarkot	52	9826	1.716	2.945	3.992	15.939	6.851
Kavisuryanagar	53	9500	1.724	2.973	3.978	15.822	6.859
Banki	54	9296	1.732	3.001	3.968	15.747	6.875
Khariar Road	55	9226	1.740	3.029	3.965	15.721	6.901
Angul	56	9053	1.748	3.056	3.957	15.656	6.917
Barpali	57	9017	1.756	3.083	3.955	15.643	6.945
Athgarh	58	8931	1.763	3.110	3.951	15.610	6.967
Deogarh	59	8906	1.771	3.136	3.950	15.600	6.994
Purushottampur	60	8898	1.778	3.162	3.949	15.597	7.022
Baudh	61	8891	1.785	3.187	3.949	15.594	7.050
Kesinga	62	8536	1.792	3.213	3.931	15.455	7.046
Sonepur	63	8084	1.799	3.238	3.908	15.270	7.031
Junagarh	64	7876	1.806	3.262	3.896	15.181	7.037
Khariar	65	7651	1.813	3.287	3.884	15.083	7.041
Malkangiri	66	7494	1.820	3.311	3.875	15.013	7.050
Padampur	67	7349	1.826	3.335	3.866	14.948	7.060
Bellaguntha	68	7113	1.833	3.358	3.852	14.838	7.059
Khalikote	69	6889	1.839	3.381	3.838	14.731	7.058
Kuchinda	70	6838	1.845	3.404	3.835	14.707	7.076
Rambha	71	6771	1.851	3.427	3.831	14.674	7.092
Chandbali	72	6717	1.857	3.450	3.827	14.647	7.108
Jaleshwar	73	6711	1.863	3.472	3.827	14.644	7.131
Paradip	74	6705	1.869	3.494	3.826	14.641	7.152
Tarbha	75	6417	1.875	3.516	3.807	14.496	7.139
Anandpur	76	6312	1.881	3.537	3.800	14.441	7.147
Nayagarh	77	5209	1.886	3.559	3.717	13.814	7.012
Govindpur	78	5173	1.892	3.580	3.714	13.792	7.027
Buguda	79	5148	1.898	3.601	3.712	13.776	7.043
Gudari	80	4774	1.903	3.622	3.679	13.534	7.001
Gopalpur	81	3583	1.908	3.642	3.554	12.633	6.783

Appendix-2.2

Deviation of Towns from Rank Size Towns

TOWN_NAME	RANKS	Estimated pop	Actual pop	Difference	Percent Difference
Cuttack City	1	290742	194068	96674	33.25
Rourkela Steel Township	2	159293	125426	33867	21.26
Berhampur City	3	112031	117662	-5631	-5.03
Bhubaneswar City	4	87274	105491	-18217	-20.87
Puri	5	71905	72674	-769	-1.07
Sambalpur	6	61380	64675	-3295	-5.37
Rourkela Civil Township	7	53692	47076	6616	12.32
Balasore	8	47816	46239	1577	3.30
Bhadrak	9	43169	40487	2682	6.21
Balangir	10	39396	35748	3648	9.26
Jeypore	11	36267	34319	1948	5.37
Brajrajnagar	12	33629	31817	1812	5.39
Baripada	13	31372	28725	2647	8.44
Biramitrapur	14	29417	28063	1354	4.60
Sunabeda	15	27707	27980	-273	-0.99
Paralakhemundi	16	26197	26917	-720	-2.75
Jatni	17	24854	25119	-265	-1.06
Rayagada	18	23651	25064	-1413	-5.97
Jharsuguda	19	22567	24727	-2160	-9.57
Barbil	20	21584	24342	-2758	-12.78
Chowdwar	21	20689	24300	-3611	-17.45
Bargarh	22	19870	22865	-2995	-15.07
Bhawanipatna	23	19118	22808	-3690	-19.30
Rajgangpur	24	18425	21876	-3451	-18.73
Koraput	25	17783	21505	-3722	-20.93
Kendrapara	26	17188	20079	-2891	-16.82
Dhenkanal	27	16634	19615	-2981	-17.92
Keonjhar	28	16117	19340	-3223	-20.00
Joda	29	15634	17353	-1719	-11.00
Sundargarh	30	15180	17244	-2064	-13.60
Jajpur	31	14754	16707	-1953	-13.24
Khurda	32	14353	15879	-1526	-10.63
Burla	33	13975	15587	-1612	-11.54
Hirakud	34	13617	15040	-1423	-10.45
Titlagarh	35	13279	14504	-1225	-9.23
Nabarangpur	36	12958	13739	-781	-6.03
Aska	37	12654	12954	-300	-2.37
Gunupur	38	12364	12702	-338	-2.73
Bhanjanagar	39	12088	12353	-265	-2.19
Talcher	40	11826	11794	32	0.27
Bhuban	41	11575	11350	225	1.94
Rairangpur	42	11335	11226	109	0.96
Chatrapur	43	11106	10835	271	2.44
Hinjili	44	10887	10821	66	0.60
Jajpur Road	45	10676	10805	-129	-1.21

Polasara	46	10475	10579	-104	-1.00
Phulbani	47	10281	10511	-230	-2.24
Kantabanji	48	10095	10489	-394	-3.91
Patnagarh	49	9916	10085	-169	-1.71
Kotpad	50	9743	9856	-113	-1.16
Surada	51	9577	9833	-256	-2.67
Umarkot	52	9417	9826	-409	-4.34
Kavisuryanagar	53	9263	9500	-237	-2.56
Banki	54	9114	9296	-182	-2.00
Khariar Road	55	8970	9226	-256	-2.86
Angul	56	8830	9053	-223	-2.52
Barpali	57	8696	9017	-321	-3.70
Athgarh	58	8565	8931	-366	-4.27
Deogarh	59	8439	8906	-467	-5.53
Purushottampur	60	8317	8898	-581	-6.99
Baudh	61	8199	8891	-692	-8.45
Kesinga	62	8084	8536	-452	-5.60
Sonepur	63	7972	8084	-112	-1.40
Junagarh	64	7864	7876	-12	-0.15
Khariar	65	7759	7651	108	1.39
Malkangiri	66	7657	7494	163	2.12
Padampur	67	7557	7349	208	2.76
Bellaguntha	68	7461	7113	348	4.66
Khalikote	69	7367	6889	478	6.49
Kuchinda	70	7275	6838	437	6.01
Rambha	71	7186	6771	415	5.78
Chandbali	72	7100	6717	383	5.39
Jaleshwar	73	7015	6711	304	4.33
Paradip	74	6933	6705	228	3.28
Tarbha	75	6852	6417	435	6.35
Anandpur	76	6774	6312	462	6.82
Nayagarh	77	6698	5209	1489	22.23
Govindpur	78	6623	5173	1450	21.89
Buguda	79	6550	5148	1402	21.41
Gudari	80	6479	4774	1705	26.32
Gopalpur	81	6410	3583	2827	44.10

Appendix-2.3

Rank Size Relationship in towns of Orissa, 1981

TOWN_NAME	RANK	*Pr*	*Log(R)=X*	X^2	*Log(Pr)=Y*	Y^2	*XY*
Cuttack City	1	295268	0.000	0.000	5.470	29.923	0.000
Bhubaneswar City	2	219211	0.301	0.091	5.341	28.525	1.608
Rourkela Steel	3	214521	0.477	0.228	5.331	28.425	2.544
Brahmapur	4	162550	0.602	0.362	5.211	27.154	3.137
Sambalpur	5	112631	0.699	0.489	5.052	25.519	3.531
Puri	6	100942	0.778	0.606	5.004	25.041	3.894
Rourkela Civil	7	96000	0.845	0.714	4.982	24.823	4.211
Balasore	8	65779	0.903	0.816	4.818	23.214	4.351
Bhadrak	9	60600	0.954	0.911	4.782	22.872	4.564
Balangir	10	54943	1.000	1.000	4.740	22.467	4.740
Jharsuguda	11	54859	1.041	1.084	4.739	22.460	4.935
Brajrajnagar	12	54033	1.079	1.165	4.733	22.398	5.107
Jeypore	13	53981	1.114	1.241	4.732	22.394	5.271
Baripada	14	52989	1.146	1.314	4.724	22.318	5.415
Jatni	15	41755	1.176	1.383	4.621	21.351	5.434
Sunabeda	16	40375	1.204	1.450	4.606	21.216	5.546
Bhawanipatna	17	37821	1.230	1.514	4.578	20.956	5.633
Rayagada	18	35838	1.255	1.576	4.554	20.742	5.717
Dhenkanal	19	35653	1.279	1.635	4.552	20.722	5.821
Bargarh	20	35400	1.301	1.693	4.549	20.693	5.918
Paradip	21	33042	1.322	1.748	4.519	20.422	5.975
Barbil	22	33030	1.342	1.802	4.519	20.421	6.066
Paralakhemundi	23	32317	1.362	1.854	4.509	20.335	6.141
Chowdwar	24	32144	1.380	1.905	4.507	20.314	6.221
Rajgangpur	25	31925	1.398	1.954	4.504	20.287	6.297
Koraput	26	31665	1.415	2.002	4.501	20.255	6.368
Biramitrapur	27	31099	1.431	2.049	4.493	20.185	6.431
Keonjhar	28	28059	1.447	2.094	4.448	19.785	6.437
Burla	29	27882	1.462	2.139	4.445	19.761	6.501
Kendrapara	30	27564	1.477	2.182	4.440	19.717	6.559
Joda	31	26303	1.491	2.224	4.420	19.536	6.592
Anandpur	32	24605	1.505	2.265	4.391	19.281	6.609
Sundargarh	33	23699	1.519	2.306	4.375	19.138	6.643
Khurda	34	22386	1.531	2.345	4.350	18.922	6.662
Jajpur	35	22232	1.544	2.384	4.347	18.896	6.712
Hirakud	36	21701	1.556	2.422	4.336	18.805	6.749
Titlagarh	37	21486	1.568	2.459	4.332	18.768	6.794
Jagatsinghpur	38	21126	1.580	2.496	4.325	18.704	6.832
Jajpur Road	39	20935	1.591	2.531	4.321	18.670	6.875
Basudebpur	40	20031	1.602	2.567	4.302	18.505	6.892
Nabarangpur	41	19084	1.613	2.601	4.281	18.324	6.904
Soro	42	18599	1.623	2.635	4.269	18.229	6.930
Phulbani	43	18326	1.633	2.668	4.263	18.174	6.964
Angul	44	18060	1.643	2.701	4.257	18.120	6.996
Gunupur	45	16712	1.653	2.733	4.223	17.834	6.982
Aska	46	16394	1.663	2.765	4.215	17.764	7.008

Talcher	47	16227	1.672	2.796	4.210	17.726	7.040
Malkangiri	48	15575	1.681	2.827	4.192	17.576	7.048
Bhuban	49	15517	1.690	2.857	4.191	17.563	7.083
Rairangpur	50	15503	1.699	2.886	4.190	17.560	7.119
Bhanjanagar	51	15324	1.708	2.916	4.185	17.517	7.147
Karanjia	52	14910	1.716	2.945	4.173	17.418	7.162
Kantabanji	53	14818	1.724	2.973	4.171	17.395	7.192
Umarkot	54	14309	1.732	3.001	4.156	17.269	7.199
Chatrapur	55	14140	1.740	3.029	4.150	17.226	7.223
Hinjili	56	13761	1.748	3.056	4.139	17.128	7.235
Barapali	57	13639	1.756	3.083	4.135	17.096	7.260
Patnagarh	58	13597	1.763	3.110	4.133	17.085	7.289
Deogarh	59	13581	1.771	3.136	4.133	17.081	7.319
Rengali Dam	60	13213	1.778	3.162	4.121	16.983	7.328
Jaleshwar	61	13146	1.785	3.187	4.119	16.964	7.353
Polasara	62	13039	1.792	3.213	4.115	16.935	7.376
Banki	63	12595	1.799	3.238	4.100	16.812	7.378
Baudh	64	12589	1.806	3.262	4.100	16.810	7.405
Chandili	65	12487	1.813	3.287	4.096	16.781	7.427
Jalda	66	12089	1.820	3.311	4.082	16.666	7.428
Banapur	67	12003	1.826	3.335	4.079	16.641	7.449
Kavisuryanagar	68	11870	1.833	3.358	4.074	16.601	7.466
Kotpad	69	11604	1.839	3.381	4.065	16.521	7.474
Khariar Road	70	11448	1.845	3.404	4.059	16.473	7.489
Nimapada	71	11406	1.851	3.427	4.057	16.460	7.511
Surada	72	11269	1.857	3.450	4.052	16.418	7.526
Kesinga	73	11133	1.863	3.472	4.047	16.375	7.540
Athgarh	74	11087	1.869	3.494	4.045	16.361	7.561
Binika	75	11004	1.875	3.516	4.042	16.334	7.578
Purushottampur	76	10739	1.881	3.537	4.031	16.249	7.581
Sonepur	77	10451	1.886	3.559	4.019	16.154	7.582
Padampur	78	10337	1.892	3.580	4.014	16.115	7.596
Junagarh	79	10193	1.898	3.601	4.008	16.066	7.606
Kamakshyanagar	80	10154	1.903	3.622	4.007	16.053	7.625
Khariar	81	9946	1.908	3.642	3.998	15.981	7.629
Balagoda	82	9515	1.914	3.663	3.978	15.828	7.614
Balimelanagar	83	9454	1.919	3.683	3.976	15.806	7.630
Kochinda	84	9370	1.924	3.703	3.972	15.775	7.643
Kashinagar	85	9179	1.929	3.723	3.963	15.704	7.646
Pipili	86	8739	1.934	3.742	3.941	15.535	7.625
Buguda	87	8706	1.940	3.762	3.940	15.522	7.641
Kodala	88	8537	1.944	3.781	3.931	15.455	7.644
Khalikote	89	8340	1.949	3.800	3.921	15.376	7.644
Rambha	90	8196	1.954	3.819	3.914	15.316	7.648
Chikiti	91	8177	1.959	3.838	3.913	15.308	7.665
Bellaguntha	92	7915	1.964	3.856	3.898	15.198	7.656
Kantilo	93	7877	1.968	3.875	3.896	15.182	7.670
Digapahandi	94	7853	1.973	3.893	3.895	15.171	7.685
Chandbali	95	7808	1.978	3.911	3.893	15.152	7.698

Nayagarh	96	7760	1.982	3.929	3.890	15.131	7.711
Chitrakonda	97	7756	1.987	3.947	3.890	15.129	7.728
Ganjam	98	7580	1.991	3.965	3.880	15.052	7.725
Udala	99	7136	1.996	3.983	3.853	14.849	7.690
Tarbha	100	6926	2.000	4.000	3.840	14.749	7.681
G.Udayagiri	101	6846	2.004	4.017	3.835	14.711	7.687
Paparahandi	102	6424	2.009	4.034	3.808	14.499	7.648
Gudari	103	5698	2.013	4.052	3.756	14.105	7.560
Talcher Thermal	104	5371	2.017	4.068	3.730	13.913	7.524
Fertiliser	105	5067	2.021	4.085	3.705	13.725	7.488
Daitari	106	4844	2.025	4.102	3.685	13.581	7.464
Gopalpur	107	4503	2.029	4.118	3.654	13.348	7.414
Dera Colloery Township	108	4452	2.033	4.135	3.649	13.312	7.419

Appendix-2.4

Deviation of Towns from Rank Size Towns, 1981

TOWN_NAME	RANKS	Estimated pop	Actual pop	Difference	Percent Differenc
Cuttack City	1	520507	295268	225239	43.27
Bhubaneswar City	2	276768	219211	57557	20.80
Rourkela Steel Township	3	191273	214521	-23248	-12.15
Brahmapur	4	147165	162550	-15385	-10.45
Sambalpur	5	120087	112631	7456	6.21
Puri	6	101705	100942	763	0.75
Rourkela Civil Township	7	88377	96000	-7623	-8.63
Balasore	8	78252	65779	12473	15.94
Bhadrak	9	70288	60600	9688	13.78
Balangir	10	63854	54943	8911	13.96
Jharsuguda	11	58542	54859	3683	6.29
Brajrajnagar	12	54080	54033	47	0.09
Jeypore	13	50276	53981	-3705	-7.37
Baripada	14	46993	52989	-5996	-12.76
Jatni	15	44129	41755	2374	5.38
Sunabeda	16	41609	40375	1234	2.97
Bhawanipatna	17	39372	37821	1551	3.94
Rayagada	18	37374	35838	1536	4.11
Dhenkanal	19	35578	35653	-75	-0.21
Bargarh	20	33953	35400	-1447	-4.26
Paradip	21	32476	33042	-566	-1.74
Barbil	22	31128	33030	-1902	-6.11
Paralakhemundi	23	29893	32317	-2424	-8.11
Chowdwar	24	28756	32144	-3388	-11.78
Rajgangpur	25	27706	31925	-4219	-15.23
Koraput	26	26733	31665	-4932	-18.45
Biramitrapur	27	25829	31099	-5270	-20.40
Keonjhar	28	24987	28059	-3072	-12.29
Burla	29	24201	27882	-3681	-15.21
Kendrapara	30	23465	27564	-4099	-17.47
Joda	31	22774	26303	-3529	-15.50
Anandpur	32	22125	24605	-2480	-11.21
Sundargarh	33	21513	23699	-2186	-10.16
Khurda	34	20935	22386	-1451	-6.93
Jajpur	35	20390	22232	-1842	-9.04
Hirakud	36	19873	21701	-1828	-9.20
Titlagarh	37	19383	21486	-2103	-10.85
Jagatsinghpur	38	18918	21126	-2208	-11.67
Jajpur Road	39	18475	20935	-2460	-13.32
Basudebpur	40	18054	20031	-1977	-10.95
Nabarangpur	41	17652	19084	-1432	-8.11
Soro	42	17269	18599	-1330	-7.70
Phulbani	43	16902	18326	-1424	-8.42
Angul	44	16552	18060	-1508	-9.11
Gunupur	45	16216	16712	-496	-3.06

Aska	46	15895	16394	-499	-3.14
Talcher	47	15586	16227	-641	-4.11
Malkangiri	48	15290	15575	-285	-1.86
Bhuban	49	15006	15517	-511	-3.41
Rairangpur	50	14732	15503	-771	-5.23
Bhanjanagar	51	14468	15324	-856	-5.91
Karanjia	52	14215	14910	-695	-4.89
Kantabanji	53	13970	14818	-848	-6.07
Umarkot	54	13734	14309	-575	-4.19
Chatrapur	55	13506	14140	-634	-4.69
Hinjili	56	13286	13761	-475	-3.57
Barapali	57	13074	13639	-565	-4.32
Patnagarh	58	12868	13597	-729	-5.66
Deogarh	59	12669	13581	-912	-7.20
Rengali Dam Project Township	60	12477	13213	-736	-5.90
Jaleshwar	61	12290	13146	-856	-6.96
Polasara	62	12110	13039	-929	-7.68
Banki	63	11934	12595	-661	-5.54
Baudh	64	11764	12589	-825	-7.01
Chandili	65	11599	12487	-888	-7.65
Jalda	66	11439	12089	-650	-5.68
Banapur	67	11283	12003	-720	-6.38
Kavisuryanagar	68	11132	11870	-738	-6.63
Kotpad	69	10985	11604	-619	-5.64
Khariar Road	70	10842	11448	-606	-5.59
Nimapada	71	10703	11406	-703	-6.57
Surada	72	10567	11269	-702	-6.64
Kesinga	73	10435	11133	-698	-6.69
Athgarh	74	10306	11087	-781	-7.57
Binika	75	10181	11004	-823	-8.08
Purushottampur	76	10059	10739	-680	-6.76
Sonepur	77	9940	10451	-511	-5.14
Padampur	78	9824	10337	-513	-5.23
Junagarh	79	9710	10193	-483	-4.97
Kamakshyanagar	80	9600	10154	-554	-5.77
Khariar	81	9492	9946	-454	-4.79
Balagoda (Bolani)	82	9386	9515	-129	-1.37
Balimelanagar	83	9283	9454	-171	-1.84
Kochinda	84	9182	9370	-188	-2.05
Kashinagar	85	9084	9179	-95	-1.05
Pipili	86	8987	8739	248	2.76
Buguda	87	8893	8706	187	2.11
Kodala	88	8801	8537	264	3.00
Khalikote	89	8711	8340	371	4.26
Rambha	90	8623	8196	427	4.95
Chikiti	91	8536	8177	359	4.21
Bellaguntha	92	8452	7915	537	6.35
Kantilo	93	8369	7877	492	5.88
Digapahandi	94	8288	7853	435	5.25

Chandbali	95	8208	7808	400	4.88
Nayagarh	96	8130	7760	370	4.55
Chitrakonda	97	8054	7756	298	3.70
Ganjam	98	7979	7580	399	5.00
Udala	99	7905	7136	769	9.73
Tarbha	100	7833	6926	907	11.58
G.Udayagiri	101	7763	6846	917	11.81
Paparahandi	102	7693	6424	1269	16.50
Gudari	103	7625	5698	1927	25.27
Talcher Thermal Power Station	104	7558	5371	2187	28.94
Fertiliser Corporation of India	105	7493	5067	2426	32.37
Daitari	106	7428	4844	2584	34.79
Gopalpur	107	7365	4503	2862	38.86
Dera Colloery Township	108	7303	4452	2851	39.04

Appendix-2.5

Rank Size Relationship in towns of Orissa, 1991

TOWN_NAME	*R*	*Pr*	*Log(R)=*	X^2	*Log(Pr)=Y*	Y^2	*XY*
Bhubaneswar	1	411542	0.000	0.000	5.614	31.522	0.000
Cuttack	2	403418	0.301	0.091	5.606	31.424	1.688
Raurkela Steel Township	3	233058	0.477	0.228	5.367	28.810	2.561
Brahmapur	4	210418	0.602	0.362	5.323	28.335	3.205
Raurkela	5	152690	0.699	0.489	5.184	26.872	3.623
Sambalpur	6	134824	0.778	0.606	5.130	26.315	3.992
Puri	7	125199	0.845	0.714	5.098	25.986	4.308
Baleshwar	8	101829	0.903	0.816	5.008	25.079	4.523
Bhadrak	9	76435	0.954	0.911	4.883	23.847	4.660
Balangir	10	69920	1.000	1.000	4.845	23.470	4.845
Brajarajnagar	11	69667	1.041	1.084	4.843	23.455	5.043
Baripada	12	69240	1.079	1.165	4.840	23.429	5.224
Jeypur	13	65246	1.114	1.241	4.815	23.180	5.363
Jharsuguda	14	65054	1.146	1.314	4.813	23.168	5.517
Sunabeda	15	52507	1.176	1.383	4.720	22.280	5.551
Bargarh	16	51205	1.204	1.450	4.709	22.178	5.671
Bhawanipatna	17	51062	1.230	1.514	4.708	22.166	5.793
Jatani	18	50116	1.255	1.576	4.700	22.090	5.900
Rayagada	19	48247	1.279	1.635	4.683	21.935	5.989
Paradip	20	48104	1.301	1.693	4.682	21.923	6.092
Dhenkanal	21	46314	1.322	1.748	4.666	21.769	6.169
Barbil	22	42032	1.342	1.802	4.624	21.377	6.207
Kendujhar	23	41945	1.362	1.854	4.623	21.369	6.295
Rajagangapur	24	39549	1.380	1.905	4.597	21.134	6.345
Choudwar	25	36877	1.398	1.954	4.567	20.855	6.384
Parlakhemundi	26	36667	1.415	2.002	4.564	20.833	6.458
Kendrapara	27	35015	1.431	2.049	4.544	20.650	6.504
Koraput	28	34924	1.447	2.094	4.543	20.640	6.575
Burla	29	34640	1.462	2.139	4.540	20.608	6.639
Biramitrapur	30	33556	1.477	2.182	4.526	20.483	6.685
Joda	31	31069	1.491	2.224	4.492	20.181	6.700
Khordha	32	30591	1.505	2.265	4.486	20.121	6.751
Sundargarh	33	30352	1.519	2.306	4.482	20.090	6.806
Anandapur	34	30278	1.531	2.345	4.481	20.081	6.863
Pattamundai	35	28220	1.544	2.384	4.451	19.807	6.872
Jajapur	36	27312	1.556	2.422	4.436	19.681	6.904
Phulabani	37	27154	1.568	2.459	4.434	19.659	6.953
Talcher	38	26806	1.580	2.496	4.428	19.609	6.996
Jajapur Road	39	26119	1.591	2.531	4.417	19.510	7.028
Titlagarh	40	25719	1.602	2.567	4.410	19.450	7.065
Basudebpur	41	25236	1.613	2.601	4.402	19.378	7.100
Jagatsinghapur	42	25016	1.623	2.635	4.398	19.344	7.139
Anugul	43	24772	1.633	2.668	4.394	19.307	7.177
Belpahar	44	24607	1.643	2.701	4.391	19.281	7.216
Hirakud	45	23833	1.653	2.733	4.377	19.160	7.236

Nabarangapur	46	23513	1.663	2.765	4.371	19.108	7.268
Soro	47	22737	1.672	2.796	4.357	18.981	7.285
Asika	48	19363	1.681	2.827	4.287	18.378	7.207
Bhuban	49	18966	1.690	2.857	4.278	18.301	7.231
Umarkote	50	18604	1.699	2.886	4.270	18.230	7.254
Malkangiri	51	18351	1.708	2.916	4.264	18.179	7.280
Gunupur	52	18317	1.716	2.945	4.263	18.172	7.315
Rairangpur	53	18097	1.724	2.973	4.258	18.127	7.341
Chhatrapur	54	17950	1.732	3.001	4.254	18.097	7.370
Hinjili	55	17676	1.740	3.029	4.247	18.040	7.392
Karanjia	56	17623	1.748	3.056	4.246	18.029	7.423
Kantabanji	57	17535	1.756	3.083	4.244	18.011	7.452
Debagarh	58	17275	1.763	3.110	4.237	17.956	7.472
Bhanjanagar	59	17122	1.771	3.136	4.234	17.923	7.497
Polasara	60	16854	1.778	3.162	4.227	17.865	7.516
Jaleswar	61	16786	1.785	3.187	4.225	17.850	7.543
Barapali	62	16371	1.792	3.213	4.214	17.758	7.553
Patnagarh	63	16246	1.799	3.238	4.211	17.730	7.577
Chandili	64	16151	1.806	3.262	4.208	17.709	7.601
Baudh	65	15458	1.813	3.287	4.189	17.549	7.595
Sonapur	66	14409	1.820	3.311	4.159	17.294	7.567
Banki (Or)	67	14350	1.826	3.335	4.157	17.279	7.591
Kesinga	68	14127	1.833	3.358	4.150	17.223	7.605
Khariar Road	69	14027	1.839	3.381	4.147	17.197	7.626
Kavisurjyanagar	70	13938	1.845	3.404	4.144	17.174	7.646
Banapur	71	13702	1.851	3.427	4.137	17.113	7.658
Athagad	72	13661	1.857	3.450	4.135	17.102	7.681
Nimapada	73	13658	1.863	3.472	4.135	17.101	7.706
Kotpad	74	13309	1.869	3.494	4.124	17.009	7.709
Surada	75	13268	1.875	3.516	4.123	16.998	7.731
Jalda	76	13116	1.881	3.537	4.118	16.956	7.745
Dera Colliery	77	13096	1.886	3.559	4.117	16.951	7.767
Junagarh	78	12974	1.892	3.580	4.113	16.917	7.782
Padampur	79	12971	1.898	3.601	4.113	16.917	7.805
Binika	80	12955	1.903	3.622	4.112	16.912	7.826
Purusottampur	81	12904	1.908	3.642	4.111	16.898	7.845
Kamakshyanagar	82	12832	1.914	3.663	4.108	16.878	7.863
Nilagiri	83	12800	1.919	3.683	4.107	16.869	7.882
Balugaon	84	12404	1.924	3.703	4.094	16.757	7.877
Kochinda	85	12161	1.929	3.723	4.085	16.687	7.882
Khariar	86	11738	1.934	3.742	4.070	16.562	7.873
Pipili	87	11649	1.940	3.762	4.066	16.535	7.887
Balagoda[Bolani]	88	11370	1.944	3.781	4.056	16.449	7.886
Udala	89	11289	1.949	3.800	4.053	16.424	7.900
Konark	90	10899	1.954	3.819	4.037	16.300	7.890
Rengali Dam Project	91	10855	1.959	3.838	4.036	16.286	7.906
Ganjam	92	10847	1.964	3.856	4.035	16.284	7.924
Buguda	93	10664	1.968	3.875	4.028	16.224	7.929
Nayagarh	94	10464	1.973	3.893	4.020	16.158	7.931

Kodala	95	10187	1.978	3.911	4.008	16.064	7.927
Kashinagara	96	10102	1.982	3.929	4.004	16.035	7.938
Balimela	97	10096	1.987	3.947	4.004	16.033	7.955
Digapahandi	98	10032	1.991	3.965	4.001	16.011	7.968
Chikiti	99	10005	1.996	3.983	4.000	16.002	7.983
Ghantapada	100	9978	2.000	4.000	3.999	15.992	7.998
Panposh	101	9564	2.004	4.017	3.981	15.845	7.978
F.C.I.Township	102	9366	2.009	4.034	3.972	15.773	7.977
Rambha	103	9213	2.013	4.052	3.964	15.716	7.980
Khalikote	104	9071	2.017	4.068	3.958	15.663	7.983
Bellaguntha	105	8838	2.021	4.085	3.946	15.574	7.976
Hatibandha	106	8521	2.025	4.102	3.930	15.449	7.960
G.Udayagiri	107	8508	2.029	4.118	3.930	15.444	7.975
Kantilo	108	8258	2.033	4.135	3.917	15.342	7.965
Chandabali	109	8170	2.037	4.151	3.912	15.305	7.971
Nalco	110	8102	2.041	4.167	3.909	15.277	7.979
Khandapada	111	7522	2.045	4.183	3.876	15.026	7.928
Tarbha	112	7466	2.049	4.199	3.873	15.001	7.937
Talcher Thermal	113	7148	2.053	4.215	3.854	14.855	7.913
Gudari	114	6611	2.057	4.231	3.820	14.594	7.858
Nuapatna	115	6139	2.061	4.246	3.788	14.350	7.806
Chitrakonda	116	5981	2.064	4.262	3.777	14.264	7.797
Charibatia	117	5965	2.068	4.277	3.776	14.255	7.809
Champua	118	5746	2.072	4.293	3.759	14.133	7.789
Damanjodi	119	5719	2.076	4.308	3.757	14.117	7.798
Gopalpur (Or-2)	120	5451	2.079	4.323	3.736	13.961	7.769
Gopalpur (Or-1)	121	5403	2.083	4.338	3.733	13.933	7.774
Tensa	122	4599	2.086	4.353	3.663	13.415	7.642
Daitari	123	4434	2.090	4.368	3.647	13.299	7.621
Paradip Phosphates	124	2972	2.093	4.382	3.473	12.062	7.271

Appendix-2.7

Deviation of Towns from Rank Size Towns, 1991

TOWN_NAME	Estimated pop	Actual pop	Difference	Percentage Difference
Bhubaneswar	780926	411542	369384	47.30
Cuttack	401431	403418	-1987	-0.49
Raurkela Steel Township	271993	233058	38935	14.31
Brahmapur	206354	210418	-4064	-1.97
Raurkela	166562	152690	13872	8.33
Sambalpur	139817	134824	4993	3.57
Puri	120584	125199	-4615	-3.83
Baleshwar	106075	101829	4246	4.00
Bhadrak	94734	76435	18299	19.32
Balangir	85620	69920	15700	18.34
Brajarajnagar	78134	69667	8467	10.84
Baripada	71872	69240	2632	3.66
Jeypur	66556	65246	1310	1.97
Jharsuguda	61985	65054	-3069	-4.95
Sunabeda	58013	52507	5506	9.49
Bargarh	54527	51205	3322	6.09
Bhawanipatna	51444	51062	382	0.74
Jatani	48698	50116	-1418	-2.91
Rayagada	46234	48247	-2013	-4.35
Paradip	44013	48104	-4091	-9.30
Dhenkanal	41999	46314	-4315	-10.27
Barbil	40164	42032	-1868	-4.65
Kendujhar	38486	41945	-3459	-8.99
Rajagangapur	36946	39549	-2603	-7.05
Choudwar	35526	36877	-1351	-3.80
Parlakhemundi	34213	36667	-2454	-7.17
Kendrapara	32995	35015	-2020	-6.12
Koraput	31863	34924	-3061	-9.61
Burla	30808	34640	-3832	-12.44
Biramitrapur	29821	33556	-3735	-12.52
Joda	28897	31069	-2172	-7.52
Khordha	28030	30591	-2561	-9.14
Sundargarh	27214	30352	-3138	-11.53
Anandapur	26445	30278	-3833	-14.50
Pattamundai	25719	28220	-2501	-9.72
Jajapur	25033	27312	-2279	-9.11
Phulabani	24383	27154	-2771	-11.37
Talcher	23767	26806	-3039	-12.79
Jajapur Road	23181	26119	-2938	-12.67
Titlagarh	22625	25719	-3094	-13.68
Basudebpur	22095	25236	-3141	-14.22
Jagatsinghapur	21589	25016	-3427	-15.87
Anugul	21107	24772	-3665	-17.36
Belpahar	20646	24607	-3961	-19.18
Hirakud	20206	23833	-3627	-17.95
Nabarangapur	19784	23513	-3729	-18.85
Soro	19379	22737	-3358	-17.33
Asika	18992	19363	-371	-1.96
Bhuban	18619	18966	-347	-1.86

Umarkote	18262	18604	-342	-1.87
Malkangiri	17918	18351	-433	-2.42
Gunupur	17587	18317	-730	-4.15
Rairangpur	17268	18097	-829	-4.80
Chhatrapur	16961	17950	-989	-5.83
Hinjili	16665	17676	-1011	-6.07
Karanjia	16379	17623	-1244	-7.59
Kantabanji	16103	17535	-1432	-8.89
Debagarh	15837	17275	-1438	-9.08
Bhanjanagar	15579	17122	-1543	-9.91
Polasara	15329	16854	-1525	-9.95
Jaleswar	15088	16786	-1698	-11.25
Barapali	14854	16371	-1517	-10.21
Patnagarh	14628	16246	-1618	-11.06
Chandili	14408	16151	-1743	-12.09
Baudh	14196	15458	-1262	-8.89
Sonapur	13989	14409	-420	-3.00
Banki (Or)	13789	14350	-561	-4.07
Kesinga	13594	14127	-533	-3.92
Khariar Road	13405	14027	-622	-4.64
Kavisurjyanagar	13221	13938	-717	-5.43
Banapur	13042	13702	-660	-5.06
Athagad	12868	13661	-793	-6.16
Nimapada	12699	13658	-959	-7.55
Kotpad	12534	13309	-775	-6.18
Surada	12373	13268	-895	-7.23
Jalda	12217	13116	-899	-7.36
Dera Colliery Township	12065	13096	-1031	-8.55
Junagarh	11916	12974	-1058	-8.88
Padampur	11771	12971	-1200	-10.19
Binika	11630	12955	-1325	-11.39
Purusottampur	11492	12904	-1412	-12.29
Kamakshyanagar	11358	12832	-1474	-12.98
Nilagiri	11226	12800	-1574	-14.02
Balugaon	11098	12404	-1306	-11.77
Kochinda	10972	12161	-1189	-10.83
Khariar	10850	11738	-888	-8.18
Pipili	10730	11649	-919	-8.56
Balagoda	10613	11370	-757	-7.13
Udala	10499	11289	-790	-7.53
Konark	10387	10899	-512	-4.93
Rengali Dam Project Township	10277	10855	-578	-5.62
Ganjam	10170	10847	-677	-6.66
Buguda	10065	10664	-599	-5.95
Nayagarh	9962	10464	-502	-5.04
Kodala	9861	10187	-326	-3.30
Kashinagara	9763	10102	-339	-3.48
Balimela	9666	10096	-430	-4.45
Digapahandi	9571	10032	-461	-4.81
Chikiti	9478	10005	-527	-5.56
Ghantapada	9387	9978	-591	-6.29
Panposh	9298	9564	-266	-2.86
F.C.I.Township	9211	9366	-155	-1.69
Rambha	9125	9213	-88	-0.97

Khalikote	9040	9071	-31	-0.34
Bellaguntha	8958	8838	120	1.34
Hatibandha	8877	8521	356	4.01
G.Udayagiri	8797	8508	289	3.29
Kantilo	8719	8258	461	5.28
Chandabali	8642	8170	472	5.46
Nalco	8567	8102	465	5.42
Khandapada	8492	7522	970	11.43
Tarbha	8420	7466	954	11.33
Talcher Thermal Power Station	8348	7148	1200	14.38
Gudari	8278	6611	1667	20.14
Nuapatna	8209	6139	2070	25.21
Chitrakonda	8141	5981	2160	26.53
Charibatia	8074	5965	2109	26.12
Champua	8008	5746	2262	28.25
Damanjodi	7944	5719	2225	28.00
Gopalpur(CT)	7880	5451	2429	30.83
Gopalpur(NAC)	7817	5403	2414	30.89
Tensa	7756	4599	3157	40.70
Daitari	7695	4434	3261	42.38
Paradip Phosphates	7636	2972	4664	61.08

Appendix-2.8
Rank Size Relationship in towns of Orissa, 2001

TOWN NAME	*R*	*Pr*	*Log(R)=X*	X^2		Y^2	*XY*
BHUBANESWAR	1	658220	0.000	0.000	5.818	33.853	0.000
CUTTACK	2	534654	0.301	0.091	5.728	32.811	1.724
BRAHMAPUR	3	307792	0.477	0.228	5.488	30.121	2.619
RAURKELA	4	259553	0.602	0.362	5.414	29.314	3.260
RAURKELA	5	213360	0.699	0.489	5.329	28.399	3.725
PURI	6	157837	0.778	0.606	5.198	27.021	4.045
SAMBALPUR	7	157253	0.845	0.714	5.197	27.005	4.392
BALESHWAR	8	127358	0.903	0.816	5.105	26.061	4.610
BARIPADA	9	100651	0.954	0.911	5.003	25.028	4.774
BHADRAK	10	92515	1.000	1.000	4.966	24.663	4.966
BALANGIR	11	85261	1.041	1.084	4.931	24.312	5.135
BRAJARAJNAGAR	12	76959	1.079	1.165	4.886	23.876	5.273
JEYPUR	13	76625	1.114	1.241	4.884	23.857	5.441
JHARSUGUDA	14	76100	1.146	1.314	4.881	23.828	5.595
PARADIP	15	73625	1.176	1.383	4.867	23.688	5.724
BARGARH	16	63678	1.204	1.450	4.804	23.078	5.785
BHAWANIPATNA	17	60787	1.230	1.514	4.784	22.885	5.886
SUNABEDA	18	58884	1.255	1.576	4.770	22.753	5.988
JATANI	19	57957	1.279	1.635	4.763	22.687	6.091
RAYAGADA	20	57759	1.301	1.693	4.762	22.673	6.195
DHENKANAL	21	57677	1.322	1.748	4.761	22.667	6.295
BARBIL	22	52627	1.342	1.802	4.721	22.290	6.338
CHOUDWAR	23	52528	1.362	1.854	4.720	22.282	6.428
KENDUJHAR	24	51845	1.380	1.905	4.715	22.228	6.507
RAJAGANGAPUR	25	43594	1.398	1.954	4.639	21.524	6.486
PARLAKHEMUNDI	26	43097	1.415	2.002	4.634	21.478	6.558
BURLA	27	42822	1.431	2.049	4.632	21.452	6.630
KENDRAPARA	28	41407	1.447	2.094	4.617	21.317	6.682
BYASANAGAR	29	40741	1.462	2.139	4.610	21.252	6.742
KORAPUT	30	39548	1.477	2.182	4.597	21.134	6.791
KHORDHA	31	39054	1.491	2.224	4.592	21.083	6.848
JODA	32	38689	1.505	2.265	4.588	21.046	6.905
SUNDARGARH	33	38421	1.519	2.306	4.585	21.018	6.962
ANUGUL	34	38018	1.531	2.345	4.580	20.976	7.014
ANANDAPUR	35	35048	1.544	2.384	4.545	20.654	7.017
TALCHER	36	34998	1.556	2.422	4.544	20.648	7.072
PHULBANI	37	33890	1.568	2.459	4.530	20.522	7.104
BELPAHAR	38	32826	1.580	2.496	4.516	20.396	7.135
PATTAMUNDAI	39	32730	1.591	2.531	4.515	20.385	7.184
JAJAPUR	40	32239	1.602	2.567	4.508	20.326	7.223
JAGATSINGHPUR	41	30824	1.613	2.601	4.489	20.150	7.240
TITLAGARH	42	30273	1.623	2.635	4.481	20.080	7.274
BASUDEBPUR	43	30006	1.633	2.668	4.477	20.045	7.313
BIRAMITRAPUR	44	29447	1.643	2.701	4.469	19.972	7.345
REMUNA	45	29072	1.653	2.733	4.463	19.923	7.379

NABARANGAPUR	46	28005	1.663	2.765	4.447	19.778	7.395
SORO	47	27794	1.672	2.796	4.444	19.749	7.431
HIRAKUD	48	26394	1.681	2.827	4.422	19.550	7.434
UMARKOTE	49	24859	1.690	2.857	4.395	19.320	7.429
GUNUPUR	50	24706	1.699	2.886	4.393	19.297	7.463
MALKANGIRI	51	23114	1.708	2.916	4.364	19.043	7.452
RAIRANGPUR	52	21896	1.716	2.945	4.340	18.839	7.448
KARANJIA	53	21441	1.724	2.973	4.331	18.760	7.468
JALESWAR	54	21387	1.732	3.001	4.330	18.750	7.502
HINJILICUT	55	21347	1.740	3.029	4.329	18.743	7.535
ASIKA	56	20739	1.748	3.056	4.317	18.635	7.547
CHHATRAPUR	57	20289	1.756	3.083	4.307	18.552	7.563
BHUBAN	58	20234	1.763	3.110	4.306	18.542	7.593
DEBAGARH	59	20096	1.771	3.136	4.303	18.517	7.620
KANTABANJI	60	20095	1.778	3.162	4.303	18.517	7.652
BHANJANAGAR	61	19748	1.785	3.187	4.296	18.452	7.669
POLASARA	62	19568	1.792	3.213	4.292	18.417	7.692
BARAPALI	63	19157	1.799	3.238	4.282	18.338	7.705
PATNAGARH	64	18694	1.806	3.262	4.272	18.247	7.715
CHANDILI	65	18685	1.813	3.287	4.271	18.246	7.744
DERA COLLIERY	66	18592	1.820	3.311	4.269	18.227	7.768
DHAMANAGAR	67	18550	1.826	3.335	4.268	18.219	7.794
NALCO	68	18045	1.833	3.358	4.256	18.117	7.800
BAUDHGARH	69	18025	1.839	3.381	4.256	18.112	7.826
SONAPUR	70	17540	1.845	3.404	4.244	18.012	7.831
KESINGA	71	16917	1.851	3.427	4.228	17.879	7.828
NIMAPADA	72	16915	1.857	3.450	4.228	17.878	7.853
KHARIAR ROAD	73	16629	1.863	3.472	4.221	17.816	7.865
BANAPUR	74	16474	1.869	3.494	4.217	17.781	7.882
KAVISURJYANAGAR	75	16094	1.875	3.516	4.207	17.696	7.888
BANKI	76	15989	1.881	3.537	4.204	17.672	7.907
ATHAGAD	77	15848	1.886	3.559	4.200	17.640	7.923
BALUGAON	78	15823	1.892	3.580	4.199	17.634	7.945
JUNAGARH	79	15759	1.898	3.601	4.198	17.619	7.965
GHANTAPADA	80	15593	1.903	3.622	4.193	17.581	7.980
PADMAPUR	81	15442	1.908	3.642	4.189	17.545	7.994
KONARK	82	15013	1.914	3.663	4.176	17.443	7.993
KAMAKSHYANAGAR	83	15003	1.919	3.683	4.176	17.440	8.014
KOTPAD	84	14917	1.924	3.703	4.174	17.420	8.031
NILAGIRI	85	14757	1.929	3.723	4.169	17.381	8.044
SURADA	86	14648	1.934	3.742	4.166	17.354	8.059
BINIKA	87	14539	1.940	3.762	4.163	17.327	8.073
NAYAGARH	88	14314	1.944	3.781	4.156	17.270	8.081
PIPILI	89	14263	1.949	3.800	4.154	17.257	8.098
PURUSOTTAMPUR	90	14249	1.954	3.819	4.154	17.254	8.118
REDHAKHOL	91	13723	1.959	3.838	4.137	17.118	8.105
KOCHINDA	92	13586	1.964	3.856	4.133	17.082	8.117
KHARIAR	93	13409	1.968	3.875	4.127	17.035	8.125
BUGUDA	94	13257	1.973	3.893	4.122	16.995	8.134

KODALA	95	12345	1.978	3.911	4.091	16.740	8.092
PRATAPSASAN	96	11971	1.982	3.929	4.078	16.631	8.084
JALDA	97	11961	1.987	3.947	4.078	16.628	8.102
BALAGODA(BOLANI)	98	11833	1.991	3.965	4.073	16.590	8.110
UDALA	99	11712	1.996	3.983	4.069	16.554	8.120
BALIMELA	100	11502	2.000	4.000	4.061	16.490	8.122
ATHMALLIK	101	11376	2.004	4.017	4.056	16.451	8.130
GANJAM	102	11317	2.009	4.034	4.054	16.433	8.142
KHALIKOTE	103	10958	2.013	4.052	4.040	16.319	8.131
DIGAPAHANDI	104	10890	2.017	4.068	4.037	16.298	8.143
CHIKITI	105	10802	2.021	4.085	4.034	16.269	8.152
RAMBHA	106	10716	2.025	4.102	4.030	16.241	8.162
PANPOSH	107	10233	2.029	4.118	4.010	16.080	8.138
G.UDAYAGIRI	108	10204	2.033	4.135	4.009	16.070	8.152
BELLAGUNTHA	109	9962	2.037	4.151	3.998	15.987	8.146
KASHINAGARA	110	9791	2.041	4.167	3.991	15.927	8.147
HATIBANDHA	111	9297	2.045	4.183	3.968	15.748	8.117
KHANDAPADA	112	8757	2.049	4.199	3.942	15.542	8.079
KANTILO	113	8735	2.053	4.215	3.941	15.534	8.092
DAMANJODI	114	8475	2.057	4.231	3.928	15.430	8.080
CHAMPUA	115	8309	2.061	4.246	3.920	15.363	8.077
RENGALI DAM	116	8115	2.064	4.262	3.909	15.283	8.071
TARBHA	117	7989	2.068	4.277	3.902	15.229	8.071
NUAPATNA	118	7848	2.072	4.293	3.895	15.169	8.069
BISHAMKATAK	119	7408	2.076	4.308	3.870	14.975	8.032
Fertilizer Corporation of	120	7058	2.079	4.323	3.849	14.812	8.002
LATHIKATA	121	6896	2.083	4.338	3.839	14.735	7.995
GUDARI	122	6849	2.086	4.353	3.836	14.712	8.002
MUKHIGUDA	123	6756	2.090	4.368	3.830	14.667	8.004
GOPALPUR	124	6663	2.093	4.382	3.824	14.620	8.005
TALCHER THERMAL	125	6621	2.097	4.397	3.821	14.599	8.012
KHATIGUDA	126	6406	2.100	4.412	3.807	14.490	7.995
DUNGAMAL	127	6207	2.104	4.426	3.793	14.386	7.979
JHUMPURA	128	5265	2.107	4.440	3.721	13.849	7.842
KHALIAPALI	129	5264	2.111	4.455	3.721	13.848	7.854
CHANDAPUR	130	5260	2.114	4.469	3.721	13.846	7.866
CHARIBATIA	131	5234	2.117	4.483	3.719	13.830	7.874
BANGURA	132	5168	2.121	4.497	3.713	13.789	7.874
MAKUNDAPUR	133	4975	2.124	4.511	3.697	13.666	7.851
BELAGACHHIA	134	4612	2.127	4.525	3.664	13.424	7.793
DADHAPATNA	135	4417	2.130	4.538	3.645	13.287	7.765
DAITARI	136	4239	2.134	4.552	3.627	13.157	7.739
TENSA	137	4236	2.137	4.566	3.627	13.155	7.750
O.C.L.INDUSTRIAL	138	2196	2.140	4.579	3.342	11.167	7.151

Appendix-2.9

Deviation of Towns from Rank Size Towns, 2001

TOWN_NAME	Estimated pop	Actual pop	Difference	Percentage Difference
BHUBANESWAR	1209529	658220	551309	45.58
CUTTACK	591903	534654	57249	9.67
BRAHMAPUR	389671	307792	81879	21.01
RAURKELA	289657	259553	30104	10.39
RAURKELA INDUSTRIAL	230128	213360	16768	7.29
PURI	190692	157837	32855	17.23
SAMBALPUR	162670	157253	5417	3.33
BALESHWAR	141748	127358	14390	10.15
BARIPADA	125539	100651	24888	19.82
BHADRAK	112617	92515	20102	17.85
BALANGIR	102077	85261	16816	16.47
BRAJARAJNAGAR	93318	76959	16359	17.53
JEYPUR	85926	76625	9301	10.82
JHARSUGUDA	79605	76100	3505	4.40
PARADIP	74140	73625	515	0.69
BARGARH	69367	63678	5689	8.20
BHAWANIPATNA	65164	60787	4377	6.72
SUNABEDA	61435	58884	2551	4.15
JATANI	58104	57957	147	0.25
RAYAGADA	55111	57759	-2648	-4.81
DHENKANAL	52407	57677	-5270	-10.06
BARBIL	49953	52627	-2674	-5.35
CHOUDWAR	47715	52528	-4813	-10.09
KENDUJHAR	45667	51845	-6178	-13.53
RAJAGANGAPUR	43785	43594	191	0.44
PARLAKHEMUNDI	42049	43097	-1048	-2.49
BURLA	40445	42822	-2377	-5.88
KENDRAPARA	38956	41407	-2451	-6.29
BYASANAGAR	37572	40741	-3169	-8.43
KORAPUT	36281	39548	-3267	-9.00
KHORDHA	35075	39054	-3979	-11.34
JODA	33946	38689	-4743	-13.97
SUNDARGARH	32886	38421	-5535	-16.83
ANUGUL	31889	38018	-6129	-19.22
ANANDAPUR	30950	35048	-4098	-13.24
TALCHER	30064	34998	-4934	-16.41
PHULBANI	29227	33890	-4663	-15.96
BELPAHAR	28434	32826	-4392	-15.45
PATTAMUNDAI	27683	32730	-5047	-18.23
JAJAPUR	26969	32239	-5270	-19.54
JAGATSINGHPUR	26291	30824	-4533	-17.24
TITLAGARH	25646	30273	-4627	-18.04
BASUDEBPUR	25032	30006	-4974	-19.87
BIRAMITRAPUR	24445	29447	-5002	-20.46
REMUNA	23885	29072	-5187	-21.71

NABARANGAPUR	23350	28005	-4655	-19.93
SORO	22838	27794	-4956	-21.70
HIRAKUD	22348	26394	-4046	-18.11
UMARKOTE	21878	24859	-2981	-13.63
GUNUPUR	21427	24706	-3279	-15.30
MALKANGIRI	20994	23114	-2120	-10.10
RAIRANGPUR	20578	21896	-1318	-6.41
KARANJIA	20177	21441	-1264	-6.26
JALESWAR	19792	21387	-1595	-8.06
HINJILICUT	19421	21347	-1926	-9.92
ASIKA	19064	20739	-1675	-8.79
CHHATRAPUR	18719	20289	-1570	-8.39
BHUBAN	18386	20234	-1848	-10.05
DEBAGARH	18065	20096	-2031	-11.24
KANTABANJI	17755	20095	-2340	-13.18
BHANJANAGAR	17455	19748	-2293	-13.14
POLASARA	17165	19568	-2403	-14.00
BARAPALI	16884	19157	-2273	-13.46
PATNAGARH	16612	18694	-2082	-12.53
CHANDILI	16348	18685	-2337	-14.29
DERA COLLIERY TOWNSHIP	16093	18592	-2499	-15.53
DHAMANAGAR	15846	18550	-2704	-17.07
NALCO	15605	18045	-2440	-15.63
BAUDHGARH	15372	18025	-2653	-17.26
SONAPUR	15146	17540	-2394	-15.81
KESINGA	14926	16917	-1991	-13.34
NIMAPADA	14712	16915	-2203	-14.97
KHARIAR ROAD	14505	16629	-2124	-14.65
BANAPUR	14303	16474	-2171	-15.18
KAVISURJYANAGAR	14106	16094	-1988	-14.09
BANKI	13915	15989	-2074	-14.91
ATHAGAD	13728	15848	-2120	-15.44
BALUGAON	13547	15823	-2276	-16.80
JUNAGARH	13370	15759	-2389	-17.87
GHANTAPADA	13198	15593	-2395	-18.15
PADMAPUR	13030	15442	-2412	-18.51
KONARK	12866	15013	-2147	-16.69
KAMAKSHYANAGAR	12706	15003	-2297	-18.07
KOTPAD	12550	14917	-2367	-18.86
NILAGIRI	12398	14757	-2359	-19.03
SURADA	12250	14648	-2398	-19.58
BINIKA	12104	14539	-2435	-20.11
NAYAGARH	11963	14314	-2351	-19.66
PIPILI	11824	14263	-2439	-20.63
PURUSOTTAMPUR	11689	14249	-2560	-21.90
REDHAKHOL	11556	13723	-2167	-18.75
KOCHINDA	11427	13586	-2159	-18.90
KHARIAR	11300	13409	-2109	-18.66
BUGUDA	11176	13257	-2081	-18.62

KODALA	11055	12345	-1290	-11.67
PRATAPSASAN	10936	11971	-1035	-9.46
JALDA	10820	11961	-1141	-10.55
BALAGODA(BOLANI)	10706	11833	-1127	-10.52
UDALA	10595	11712	-1117	-10.55
BALIMELA	10485	11502	-1017	-9.69
ATHMALLIK	10378	11376	-998	-9.61
GANJAM	10274	11317	-1043	-10.16
KHALIKOTE	10171	10958	-787	-7.74
DIGAPAHANDI	10070	10890	-820	-8.14
CHIKITI	9971	10802	-831	-8.33
RAMBHA	9874	10716	-842	-8.53
PANPOSH	9779	10233	-454	-4.64
G.UDAYAGIRI	9686	10204	-518	-5.35
BELLAGUNTHA	9594	9962	-368	-3.84
KASHINAGARA	9504	9791	-287	-3.02
HATIBANDHA	9416	9297	119	1.26
KHANDAPADA	9329	8757	572	6.13
KANTILO	9244	8735	509	5.51
DAMANJODI	9160	8475	685	7.48
CHAMPUA	9078	8309	769	8.47
RENGALI DAM PROJECT	8998	8115	883	9.81
TARBHA	8918	7989	929	10.42
NUAPATNA	8841	7848	993	11.23
BISHAMKATAK	8764	7408	1356	15.47
Fertilizer Corporation of India	8689	7058	1631	18.77
LATHIKATA	8615	6896	1719	19.95
GUDARI	8542	6849	1693	19.82
MUKHIGUDA	8470	6756	1714	20.24
GOPALPUR	8400	6663	1737	20.68
TALCHER THERMAL POWER	8331	6621	1710	20.52
KHATIGUDA	8262	6406	1856	22.47
DUNGAMAL	8195	6207	1988	24.26
JHUMPURA	8129	5265	2864	35.23
KHALIAPALI	8064	5264	2800	34.73
CHANDAPUR	8000	5260	2740	34.25
CHARIBATIA	7937	5234	2703	34.06
BANGURA	7875	5168	2707	34.38
MAKUNDAPUR	7814	4975	2839	36.34
BELAGACHHIA	7754	4612	3142	40.52
DADHAPATNA	7695	4417	3278	42.60
DAITARI	7637	4239	3398	44.49
TENSA	7579	4236	3343	44.11
O.C.L.INDUSTRIAL	7523	2196	5327	70.81

Appendix: 2.10

Nearest Neighbour Analysis of Towns in Orissa, 1971

Town _Name	Nearest Town	Distance (in cm)	Distance (in k.m.)
ANANDAPUR (NAC)	JAJAPUR ROAD(N.A.C)	1.2	26.67
ANUGUL(NAC)	TALCHER(M)	0.9	20.00
ASIKA[NAC]	KAVISURJYANAGAR[NAC]	0.4	8.89
ATHAGAD (NAC)	DHENKANAL (M)	0.7	15.56
BALANGIR (M)	TARBHA (NAC)	0.9	20.00
Baleshwar (M)	JALESWAR (NAC)	2.0	44.44
BANKI (NAC)	ATHAGAD (NAC)	0.8	17.78
BARAPALI (NAC)	BARGARH (M)	0.8	17.78
BARBIL (M)	JODA(NAC)	0.4	8.89
BARGARH (M)	BARAPALI (NAC)	0.8	17.78
Baripada (M)	JALESWAR (NAC)	2.3	51.11
BAUDH (NAC)	PHULABANI (NAC)	1.8	40.00
BELLAGUNTHA[NAC]	BHANJANAGAR[NAC]	0.4	8.89
BHADRAK (M)	JAJAPUR (M)	1.3	28.89
BHANJANAGAR[NAC]	BELLAGUNTHA[NAC]	0.4	8.89
BHAWANIPATNA (M)	JUNAGARH (N.A.C.)	1.0	22.22
BHUBAN (NAC)	JAJAPUR ROAD(N.A.C)	1.2	26.67
BHUBANESWAR (M)	JATANI (NAC)	0.9	20.00
BIRAMITRAPUR [M]	RAURKELA (M)	1.2	26.67
BRAHMAPUR[M]	GOPALPUR[NAC]	0.5	11.11
BRAJARAJNAGAR (M)	JHARSUGUDA (M)	0.5	11.11
BUGUDA[NAC]	POLASARA[NAC]	0.4	8.89
BURLA (NAC)	HIRAKUD (NAC)	0.3	6.67
CHANDABALI (C.T.)	BHADRAK (M)	1.7	37.78
CHHATRAPUR[NAC]	GOPALPUR[NAC]	0.6	13.33
CHOUDWAR (M)	CUTTACK(M)	0.4	8.89
CUTTACK(M)	CHOUDWAR (M)	0.4	8.89
DEBAGARH (M)	KOCHINDA (NAC)	1.4	31.11
DHENKANAL (M)	ATHAGAD (NAC)	0.7	15.56
GOPALPUR[NAC]	BRAHMAPUR[M]	0.5	11.11
Govindpur	RAJAGANGAPUR [M]	0.9	20.00
GUDARI (NAC)	GUNUPUR (NAC)	1.2	26.67
GUNUPUR (NAC)	GUDARI (NAC)	1.2	26.67
HINJILI[NAC]	PURUSOTTAMPUR[NAC]	0.6	13.33
HIRAKUD (NAC)	BURLA (NAC)	0.3	6.67
JAJAPUR (M)	JAJAPUR ROAD(N.A.C)	1.0	22.22
JAJAPUR ROAD(N.A.C)	JAJAPUR (M)	1.0	22.22
JALESWAR (NAC)	Baleshwar (M)	2.0	44.44
JATANI (NAC)	KHORDHA (NAC)	0.5	11.11
JEYPUR (NAC)	KORAPUT (NAC)	0.7	15.56
JHARSUGUDA (M)	BRAJARAJNAGAR (M)	0.5	11.11

JODA(NAC)	BARBIL (M)	0.4	8.89
JUNAGARH (N.A.C.)	BHAWANIPATNA (M)	1.0	22.22
KANTABANJI (NAC)	KHARIAR (N.A.C.)	1.2	26.67
KAVISURJYANAGAR[NAC]	ASIKA[NAC]	0.4	8.89
KENDRAPARA (M)	JAJAPUR (M)	1.6	35.56
KENDUJHAR (M)	JODA(NAC)	2.2	48.89
KESINGA (NAC)	TITLAGARH [NAC]	0.6	13.33
KHALIKOTE[NAC]	RAMBHA[NAC]	0.4	8.89
KHARIAR (N.A.C.)	KANTABANJI (NAC)	1.2	26.67
KHARIAR ROAD (N.A.C.)	PADAMPUR (NAC)	2.3	51.11
KHORDHA (NAC)	JATANI (NAC)	0.5	11.11
KOCHINDA (NAC)	DEBAGARH (M)	1.4	31.11
KORAPUT (NAC)	JEYPUR (NAC)	0.7	15.56
KOTPAD (NAC)	NABARANGAPUR (M)	1.1	24.44
MALKANGIRI (NAC)	JEYPUR (NAC)	3.9	86.67
NABARANGAPUR (M)	KOTPAD (NAC)	1.1	24.44
NAYAGARH(NAC)	BUGUDA[NAC]	1.9	42.22
PADAMPUR (NAC)	PATNAGARH (NAC)	1.3	28.89
PARADIP (NAC)	KENDRAPARA (M)	1.7	37.78
PARLAKHEMUNDI[M]	GUNUPUR (NAC)	1.9	42.22
PATNAGARH (NAC)	PADAMPUR (NAC)	1.3	28.89
PHULABANI (NAC)	BAUDH (NAC)	1.8	40.00
POLASARA[NAC]	BUGUDA[NAC]	0.4	8.89
PURI -MUNICIPALITY	JATANI (NAC)	1.8	40.00
PURUSOTTAMPUR[NAC]	HINJILI[NAC]	0.6	13.33
RAIRANGPUR (NAC)	Baripada (M)	2.9	64.44
RAJAGANGAPUR [M]	Govindpur	0.9	20.00
RAMBHA[NAC]	KHALIKOTE[NAC]	0.4	8.89
RAURKELA (M)	RAURKELA STEEL TOWNSHIP	0.3	6.67
RAURKELA STEEL TOWNSHIP	RAURKELA (M)	0.3	6.67
RAYAGADA (M)	GUNUPUR (NAC)	1.8	40.00
Sambalpur (M)	BURLA (NAC)	0.5	11.11
SONAPUR (M)	TARBHA (NAC)	1.1	24.44
SUNABEDA (NAC)	KORAPUT (NAC)	0.8	17.78
SUNDARGARH(M)	Govindpur	1.0	22.22
SURADA[NAC]	BELLAGUNTHA[NAC]	0.8	17.78
TALCHER(M)	ANUGUL(NAC)	0.9	20.00
TARBHA (NAC)	BALANGIR (M)	0.9	20.00
TITLAGARH [NAC]	KESINGA (NAC)	0.6	13.33
UMARKOTE (NAC)	NABARANGAPUR (M)	2.6	57.78

Appendix: 2.11

Nearest Neighbour Analysis of Towns in Orissa, 1981

Town Name	Distance (in cm)	Nearest Town	Distance (in k.m.)
ANANDAPUR (NAC)	0.8	JAJAPUR ROAD(N.A.C)	26.67
ANUGUL(NAC)	0.3	F.C.I.TOWNSHIP (CT)	10.00
ASIKA[NAC]	0.3	PURUSOTTAMPUR[NAC]	10.00
ATHAGAD (NAC)	0.4	DHENKANAL (M)	13.33
BALAGODA[BOLANI] (C.T.)	0.3	BARBIL (M)	10.00
BALANGIR (M)	0.6	TARBHA (NAC)	20.00
Baleshwar (M)	1.0	SORO (N.A.C.)	33.33
BALIMELANAGAR [CT]	0.4	CHITRAKONDA (C.T.)	13.33
BANAPUR (NAC)	0.5	KHALIKOTE[NAC]	16.67
BANKI (NAC)	0.5	ATHAGAD (NAC)	16.67
BARAPALI (NAC)	0.5	BARGARH (M)	16.67
BARBIL (M)	0.3	BALAGODA[BOLANI] (C.T.)	10.00
BARGARH (M)	0.5	BARAPALI (NAC)	16.67
Baripada (M)	1.2	UDALA (NAC)	40.00
BASUDEBPUR (N.A.C.)	0.5	SORO (N.A.C.)	16.67
BAUDH (NAC)	1.1	PHULABANI (NAC)	36.67
BELLAGUNTHA[NAC]	0.3	BHANJANAGAR[NAC]	10.00
BHADRAK (M)	0.6	BASUDEBPUR (N.A.C.)	20.00
BHANJANAGAR[NAC]	0.3	BELLAGUNTHA[NAC]	10.00
BHAWANIPATNA (M)	0.7	JUNAGARH (N.A.C.)	23.33
BHUBAN (NAC)	0.8	JAJAPUR ROAD(N.A.C)	26.67
BHUBANESWAR (M)	0.5	PIPILI (NAC)	16.67
BINIKA (NAC)	0.6	SONAPUR (M)	20.00
BIRAMITRAPUR [M]	0.6	RAURKELA STEEL TOWNSHIP	20.00
BRAHMAPUR[M]	0.3	GOPALPUR[NAC]	10.00
BRAJARAJNAGAR (M)	0.3	JHARSUGUDA (M)	10.00
BUGUDA[NAC]	0.4	BELLAGUNTHA[NAC]	13.33
BURLA (NAC)	0.2	HIRAKUD (NAC)	6.67
CHANDABALI (C.T.)	1.0	BASUDEBPUR (N.A.C.)	33.33
CHANDILI (C.T.)	0.3	RAYAGADA (M)	10.00
CHHATRAPUR[NAC]	0.2	GAMJAM[NAC]	6.67
CHIKITI[NAC]	0.6	DIGAPAHANDI[NAC]	20.00
CHITRAKONDA (C.T.)	0.4	BALIMELANAGAR [CT]	13.33
CHOUDWAR (M)	0.3	CUTTACK(M)	10.00
CUTTACK(M)	0.3	CHOUDWAR (M)	10.00
DAITARI (C.T.)	0.8	BHUBAN (NAC)	26.67
DEBAGARH (M)	1.1	RENGALIDAMPROJECTTOWNSHIP (CT)	36.67
DERA COLLIERY TOWNSHIP (CT)	0.2	TALCHER(M)	6.67
DHENKANAL (M)	0.4	ATHAGAD (NAC)	13.33
DIGAPAHANDI[NAC]	0.6	CHIKITI[NAC]	20.00
F.C.I.TOWNSHIP (CT)	0.2	T.T.P.S.TOWNSHIP (CT)	6.67

G.UDAYAGIRI (NAC)	0.9	BHANJANAGAR[NAC]	30.00
GAMJAM[NAC]	0.2	CHHATRAPUR[NAC]	6.67
GOPALPUR[NAC]	0.3	BRAHMAPUR[M]	10.00
GUDARI (NAC)	0.9	GUNUPUR (NAC)	30.00
GUNUPUR (NAC)	0.6	KASHINAGARA[NAC]	20.00
HINJILI[NAC]	0.4	KAVISURJYANAGAR[NAC]	13.33
HIRAKUD (NAC)	0.2	BURLA (NAC)	6.67
JAGATSINGHAPUR (NAC)	0.8	NIMAPADA (NAC)	26.67
JAJAPUR (M)	0.7	JAJAPUR ROAD(N.A.C)	23.33
JAJAPUR ROAD(N.A.C)	0.7	JAJAPUR (M)	23.33
JALDA (C.T.)	0.3	RAURKELA (M)	10.00
JALESWAR (NAC)	1.1	Baleshwar (M)	36.67
JATANI (NAC)	0.3	KHORDHA (NAC)	10.00
JEYPUR (NAC)	0.4	KORAPUT (NAC)	13.33
JHARSUGUDA (M)	0.3	BRAJARAJNAGAR (M)	10.00
JODA(NAC)	0.4	BARBIL (M)	13.33
JUNAGARH (N.A.C.)	0.7	BHAWANIPATNA (M)	23.33
KAMAKSHYANAGAR (NAC)	0.9	BHUBAN (NAC)	30.00
KANTABANJI (NAC)	0.7	KHARIAR (N.A.C.)	23.33
KANTILO (CT)	0.8	NAYAGARH(NAC)	26.67
KARANJIA(N.A.C.)	1.2	KENDUJHAR (M)	40.00
KASHINAGARA[NAC]	0.6	GUNUPUR (NAC)	20.00
KAVISURJYANAGAR[NAC]	0.3	PURUSOTTAMPUR[NAC]	10.00
KENDRAPARA (M)	1.1	PARADIP (NAC)	36.67
KENDUJHAR (M)	1.2	KARANJIA(N.A.C.)	40.00
KESINGA (NAC)	0.4	TITLAGARH [NAC]	13.33
KHALIKOTE[NAC]	0.4	RAMBHA[NAC]	13.33
KHARIAR (N.A.C.)	0.7	KANTABANJI (NAC)	23.33
KHARIAR ROAD (N.A.C.)	1.6	PADAMPUR (NAC)	53.33
KHORDHA (NAC)	0.3	JATANI (NAC)	10.00
KOCHINDA (NAC)	1.0	JHARSUGUDA (M)	33.33
KODALA[NAC]	0.4	KHALIKOTE[NAC]	13.33
KORAPUT (NAC)	0.4	JEYPUR (NAC)	13.33
KOTPAD (NAC)	0.8	NABARANGAPUR (M)	26.67
MALKANGIRI (NAC)	0.8	BALIMELANAGAR [CT]	26.67
NABARANGAPUR (M)	0.3	PAPARAHANDI (NAC)	10.00
NAYAGARH(NAC)	0.8	KANTILO (CT)	26.67
NIMAPADA (NAC)	0.5	PIPILI (NAC)	16.67
PADAMPUR (NAC)	0.9	PATNAGARH (NAC)	30.00
PAPARAHANDI (NAC)	0.3	NABARANGAPUR (M)	10.00
PARADIP (NAC)	1.1	KENDRAPARA (M)	36.67
PARLAKHEMUNDI[M]	0.7	KASHINAGARA[NAC]	23.33
PATNAGARH (NAC)	0.9	PADAMPUR (NAC)	30.00
PHULABANI (NAC)	1.1	BAUDH (NAC)	36.67

PIPILI (NAC)	0.4	JATANI (NAC)	13.33
POLASARA[NAC]	0.3	PURUSOTTAMPUR[NAC]	10.00
PURI -MUNICIPALITY	0.9	NIMAPADA (NAC)	30.00
PURUSOTTAMPUR[NAC]	0.3	POLASARA[NAC]	10.00
RAIRANGPUR (NAC)	1.7	KARANJIA(N.A.C.)	56.67
RAJAGANGAPUR [M]	0.7	JALDA (C.T.)	23.33
RAMBHA[NAC]	0.4	GAMJAM[NAC]	13.33
RAURKELA (M)	0.2	RAURKELA STEEL TOWNSHIP	6.67
RAURKELA STEEL TOWNSHIP	0.2	RAURKELA (M)	6.67
RAYAGADA (M)	0.3	CHANDILI (C.T.)	10.00
RENGALIDAMPROJECTTOWNSHIP (CT)	1.1	T.T.P.S.TOWNSHIP (CT)	36.67
Sambalpur (M)	0.3	HIRAKUD (NAC)	10.00
SONAPUR (M)	0.6	BINIKA (NAC)	20.00
SORO (N.A.C.)	0.5	BASUDEBPUR (N.A.C.)	16.67
SUNABEDA (NAC)	0.5	KORAPUT (NAC)	16.67
SUNDARGARH(M)	0.9	JHARSUGUDA (M)	30.00
SURADA[NAC]	0.7	BELLAGUNTHA[NAC]	23.33
T.T.P.S.TOWNSHIP (CT)	0.2	F.C.I.TOWNSHIP (CT)	6.67
TALCHER(M)	0.2	DERA COLLIERY TOWNSHIP (CT)	6.67
TARBHA (NAC)	0.6	BALANGIR (M)	20.00
TITLAGARH [NAC]	0.4	KESINGA (NAC)	13.33
UDALA (NAC)	1.0	SORO (N.A.C.)	33.33
UMARKOTE (NAC)	1.4	PAPARAHANDI (NAC)	46.67

Appendix: 2.12

Nearest Neighbour Analysis of Towns in Orissa, 1991

TOWN_NAME	Distance (in cm)	Nearest Town	Distance in Km
PATNAGARH (NAC)	1	PADAMPUR (NAC)	33.33
KANTABANJI (NAC)	0.8	KHARIAR (N.A.C.)	26.67
TITLAGARH [NAC]	0.6	KESINGA (NAC)	20.00
BALANGIR (M)	0.8	TARBHA (NAC)	26.67
BINIKA (NAC)	0.7	SONAPUR (M)	23.33
SONAPUR (M)	0.7	TARBHA (NAC)	23.33
TARBHA (NAC)	0.7	SONAPUR (M)	23.33
JALESWAR (NAC)	1.4	Baleshwar (M)	46.67
SORO (N.A.C.)	0.7	BASUDEBPUR (N.A.C.)	23.33
BHADRAK (M)	0.6	BASUDEBPUR (N.A.C.)	20.00
BASUDEBPUR (N.A.C.)	0.6	BHADRAK (M)	20.00
CHANDABALI (C.T.)	0.9	BASUDEBPUR (N.A.C.)	30.00
NILAGIRI (NAC)	0.6	Baleshwar (M)	20.00
Baleshwar (M)	0.6	NILAGIRI (NAC)	20.00
JAJAPUR ROAD(N.A.C)	0.9	JAJAPUR (M)	30.00
JAJAPUR (M)	0.9	JAJAPUR ROAD(N.A.C)	30.00
KENDRAPARA (M)	0.6	PATTAMUNDAI (NAC)	20.00
PARADIP (NAC)	0.2	PARADIP PHOSPHATES (NAC)	6.67
JAGATSINGHAPUR (NAC)	0.9	NIMAPADA (NAC)	30.00
ATHAGAD (NAC)	0.4	BANKI (NAC)	13.33
BANKI (NAC)	0.3	NUAPATNA(C.T)	10.00
PATTAMUNDAI (NAC)	0.6	KENDRAPARA (M)	20.00
PARADIP PHOSPHATES (NAC)	0.2	PARADIP (NAC)	6.67
GOPALPUR (CT)	0.2	CUTTACK(M)	6.67
CHARIBATIA (CT)	0.2	CHOUDWAR (M)	6.67
NUAPATNA(C.T)	0.3	BANKI (NAC)	10.00
CUTTACK(M)	0.2	CHOUDWAR (M)	6.67
CHOUDWAR (M)	0.2	CUTTACK(M)	6.67
TALCHER(M)	0.3	GHANTAPADA(CT)	10.00
ANUGUL(NAC)	0.3	F.C.I.TOWNSHIP (CT)	10.00
DHENKANAL (M)	0.5	ATHAGAD (NAC)	16.67
BHUBAN (NAC)	0.9	KAMAKSHYANAGAR (NAC)	30.00
KAMAKSHYANAGAR (NAC)	0.9	BHUBAN (NAC)	30.00
T.T.P.S.TOWNSHIP (CT)	0.2	DERA COLLIERY TOWNSHIP (CT)	6.67
DERA COLLIERY TOWNSHIP (CT)	0.2	T.T.P.S.TOWNSHIP (CT)	6.67
F.C.I.TOWNSHIP (CT)	0.3	ANUGUL(NAC)	10.00
RENGALIDAMPROJECTTOWNSHIP (CT)	0.9	DERA COLLIERY TOWNSHIP (CT)	30.00
GHANTAPADA(CT)	0.2	DERA COLLIERY TOWNSHIP (CT)	6.67
NALCO(CT)	0.3	ANUGUL(NAC)	10.00

BHANJANAGAR[NAC]	0.3	BELLAGUNTHA[NAC]	10.00
BELLAGUNTHA[NAC]	0.3	BHANJANAGAR[NAC]	10.00
BUGUDA[NAC]	0.6	POLASARA[NAC]	20.00
SURADA[NAC]	0.7	BELLAGUNTHA[NAC]	23.33
ASIKA[NAC]	0.6	KAVISURJYANAGAR[NAC]	20.00
DIGAPAHANDI[NAC]	0.6	KAVISURJYANAGAR[NAC]	20.00
KASHINAGARA[NAC]	0.8	PARLAKHEMUNDI[M]	26.67
PARLAKHEMUNDI[M]	0.8	KASHINAGARA[NAC]	26.67
CHIKITI[NAC]	0.7	BRAHMAPUR[M]	23.33
GOPALPUR[NAC]	0.3	BRAHMAPUR[M]	10.00
HINJILI[NAC]	0.2	KAVISURJYANAGAR[NAC]	6.67
CHHATRAPUR[NAC]	0.3	GAMJAM[NAC]	10.00
RAMBHA[NAC]	0.3	GAMJAM[NAC]	10.00
KHALIKOTE[NAC]	0.4	RAMBHA[NAC]	13.33
PURUSOTTAMPUR[NAC]	0.4	KAVISURJYANAGAR[NAC]	13.33
KAVISURJYANAGAR[NAC]	0.2	HINJILI[NAC]	6.67
POLASARA[NAC]	0.3	KODALA[NAC]	10.00
KODALA[NAC]	0.3	POLASARA[NAC]	10.00
GAMJAM[NAC]	0.3	CHHATRAPUR[NAC]	10.00
BRAHMAPUR[M]	0.3	GOPALPUR[NAC]	10.00
KHARIAR ROAD (N.A.C.)	1.9	PADAMPUR (NAC)	63.33
KHARIAR (N.A.C.)	0.8	KANTABANJI (NAC)	26.67
JUNAGARH (N.A.C.)	0.8	BHAWANIPATNA (M)	26.67
BHAWANIPATNA (M)	0.8	JUNAGARH (N.A.C.)	26.67
KESINGA (NAC)	0.6	TITLAGARH [NAC]	20.00
BARBIL (M)	0.3	joda (NAC)	10.00
JODA (NAC)	0.3	barbil (M)	10.00
KENDUJHAR (M)	1.3	KARANJIA(N.A.C.)	43.33
ANANPUR (NAC)	0.9	JAJAPUR ROAD(N.A.C)	30.00
BALAGODA(C.T.)	0.4	barbil (M)	13.33
DAITARI(C.T.)	0.9	BHUBAN (NAC)	30.00
CHAMPUA (C.T.)	0.5	joda (NAC)	16.67
MALKANGIRI (NAC)	0.7	BALIMELA [N.A.C.]	23.33
JEYPUR (NAC)	0.6	KORAPUT (NAC)	20.00
SUNABEDA (NAC)	0.3	DAMANJODI (C.T.)	10.00
KORAPUT (NAC)	0.5	SUNABEDA (NAC)	16.67
KOTPAD (NAC)	0.9	NABARANGAPUR (M)	30.00
UMARKOTE (NAC)	1.7	NABARANGAPUR (M)	56.67
NABARANGAPUR (M)	0.9	KORAPUT (NAC)	30.00
RAYAGADA (M)	0.2	CHANDILI (C.T.)	6.67
GUNUPUR (NAC)	0.9	GUDARI (NAC)	30.00
GUDARI (NAC)	0.9	GUNUPUR (NAC)	30.00
CHITRAKONDA (C.T.)	0.6	BALIMELA [N.A.C.]	20.00
BALIMELA [N.A.C.]	0.6	CHITRAKONDA (C.T.)	20.00

CHANDILI (C.T.)	0.2	RAYAGADA (M)	6.67
DAMANJODI (C.T.)	0.3	SUNABEDA (NAC)	10.00
RAIRANGPUR (NAC)	1.8	KARANJIA(N.A.C.)	60.00
Baripada (M)	1.3	UDALA (NAC)	43.33
UDALA (NAC)	0.7	NILAGIRI (NAC)	23.33
KARANJIA(N.A.C.)	1.3	kendujhar (M)	43.33
BAUDH (NAC)	1.1	PHULABANI (NAC)	36.67
PHULABANI (NAC)	1.1	BAUDH (NAC)	36.67
G.UDAYAGIRI (NAC)	0.8	BHANJANAGAR[NAC]	26.67
NAYAGARH(NAC)	0.5	KHANDAPADA (NAC)	16.67
KHORDHA (NAC)	0.4	JATANI (NAC)	13.33
PIPILI (NAC)	0.5	NIMAPADA (NAC)	16.67
JATANI (NAC)	0.4	KHORDHA (NAC)	13.33
NIMAPADA (NAC)	0.5	PIPILI (NAC)	16.67
BANAPUR (NAC)	0.2	BALUGAON (NAC)	6.67
KANTILO (CT)	0.3	KHANDAPADA (NAC)	10.00
KHANDAPADA (NAC)	0.3	KANTILO (CT)	10.00
KONARK (NAC)	0.9	NIMAPADA (NAC)	30.00
BALUGAON (NAC)	0.2	BANAPUR (NAC)	6.67
BHUBANESWAR (M)	0.5	JATANI (NAC)	16.67
PURI -MUNICIPALITY	0.8	PIPILI (NAC)	26.67
PADAMPUR (NAC)	1	PATNAGARH (NAC)	33.33
BARAPALI (NAC)	0.6	BARGARH (M)	20.00
BARGARH (M)	0.6	BARAPALI (NAC)	20.00
BRAJARAJNAGAR (M)	0.3	BELPAHAR (CT)	10.00
JHARSUGUDA (M)	0.4	BRAJARAJNAGAR (M)	13.33
KOCHINDA (NAC)	1.3	DEBAGARH (M)	43.33
DEBAGARH (M)	1.3	KOCHINDA (NAC)	43.33
BELPAHAR (CT)	0.3	BRAJARAJNAGAR (M)	10.00
SAMBALPUR (M)	0.3	Burla	10.00
BURLA (NAC)	0.3	Sambalpur (M)	10.00
HIRAKUD (NAC)	0.4	BURLA (NAC)	13.33
SUNDARGARH(M)	0.9	JHARSUGUDA (M)	30.00
RAJAGANGAPUR [M]	0.6	HATIBANDHA (C.T)	20.00
BIRAMITRAPUR [M]	0.5	RAURKELA STEEL TOWNSHIP	16.67
PANPOSH (C.T.)	0.2	RAURKELA (M)	6.67
HATIBANDHA (C.T)	0.3	PANPOSH (C.T.)	10.00
TENSA [C.T]	0.9	PANPOSH (C.T.)	30.00
RAURKELA STEEL TOWNSHIP	0.2	RAURKELA (M)	6.67
RAURKELA (M)	0.2	PANPOSH (C.T.)	6.67
JALDA (C.T.)	0.2	RAURKELA (M)	6.67

Appendix: 2.13

Nearest Neighbour Analysis of Towns in Orissa, 2001

Town Name	Nearest Town	Distance (in c.m.)	Distance (in k.m)
Anandapur (NAC)	Bhuban (NAC)	0.6	20.00
Anugul (NAC)	Nalco (CT)	0.2	6.67
Asika (NAC)	Makundapur (CT)	0.3	10.00
Athagad (NAC)	Dhenkanal (M)	0.5	16.67
Athmallik (NAC)	Baudhgarh (NAC)	0.9	30.00
Balagoda(Bolani) (CT)	Barbil (M)	0.3	10.00
Balangir (M)	Tarbha (NAC)	0.8	26.67
Baleshwar (M)	Remuna (NAC)	0.3	10.00
Balimela (NAC)	Malkangiri (NAC)	0.9	30.00
Balugaon (NAC)	Dungamal (CT)	0.2	6.67
Banapur (NAC)	Balugaon (NAC)	0.3	10.00
Bangura (CT)	Anandapur (NAC)	0.7	23.33
Banki (NAC)	Nuapatna (CT)	0.4	13.33
Barapali (NAC)	Bargarh (M)	0.5	16.67
Barbil (M)	Balagoda(Bolani) (CT)	0.3	10.00
Bargarh (M)	Barapali (NAC)	0.5	16.67
Baripada (M)	Udala (NAC)	1.4	46.67
Basudebpur (NAC)	Soro (NAC)	0.6	20.00
Baudhgarh (NAC)	Redhakhol (NAC)	0.7	23.33
Belagachhia (CT)	Dadhapatna (CT)	0.1	3.33
Bellaguntha (NAC)	Bhanjanagar (NAC)	0.5	16.67
Belpahar (NAC)	Brajarajnagar (M)	0.4	13.33
Bhadrak (M)	Dhamanagar (NAC)	0.5	16.67
Bhanjanagar (NAC)	Bellaguntha (NAC)	0.5	16.67
Bhawanipatna (M)	Junagarh (NAC)	0.6	20.00
Bhuban (NAC)	Kamakshyanagar (NAC)	0.9	30.00
Bhubaneswar (M Corp.)	Pratapsasan (CT)	0.4	13.33
Binika (NAC)	Sonapur (M)	0.6	20.00
Biramitrapur (M)	Raurkela Industrial TS (ITS)	0.6	20.00
Bishama Katak (CT)	Gudari (NAC)	0.9	30.00
Brahmapur (M)	Gopalpur (NAC)	0.4	13.33
Brajarajnagar (M)	Jharsuguda (M)	0.2	6.67
Buguda (NAC)	Polasara (NAC)	0.5	16.67
Burla (NAC)	Hirakud (NAC)	0.3	10.00
Byasanagar (M)	Bhuban (NAC)	1.0	33.33
Champua (CT)	Joda (M)	0.8	26.67
Chandapur (CT)	Nayagarh (NAC)	0.9	30.00
Chandili (CT)	Rayagada (M)	0.3	10.00
Charibatia (CT)	Choudwar (M)	0.3	10.00
Chhatrapur (NAC)	Ganjam (NAC)	0.4	13.33
Chikiti (NAC)	Digapahandi (NAC)	0.6	20.00

Choudwar (M)	Cuttack (M Corp.)	0.2	6.67
Cuttack (M Corp.)	Choudwar (M)	0.2	6.67
Dadhapatna (CT)	Belagachhia (CT)	0.1	3.33
Daitari (CT)	Anandapur (NAC)	0.9	30.00
Damanjodi (CT)	Sunabeda (NAC)	0.2	6.67
Debagarh (M)	Rengali Dam Project TS(CT)	1.2	40.00
Dera Colliery TS (CT)	Talcher (M)	0.2	6.67
Dhamanagar (NAC)	Bhadrak (M)	0.5	16.67
Dhenkanal (M)	Athagad (NAC)	0.6	20.00
Digapahandi (NAC)	Chikiti (NAC)	0.6	20.00
Dungamal (CT)	Balugaon (NAC)	0.2	6.67
F.C.I Township (CT)	Nalco (CT)	0.2	6.67
G. Udayagiri (NAC)	Bhanjanagar (NAC)	0.8	26.67
Ganjam (NAC)	Chhatrapur (NAC)	0.4	13.33
Ghantapada (CT)	Dera Colliery Township (CT)	0.2	6.67
Gopalpur (NAC)	Brahmapur (M)	0.4	13.33
Gudari (NAC)	Gunupur (NAC)	0.9	30.00
Gunupur (NAC)	Gudari (NAC)	0.9	30.00
Hatibandha (CT)	Lathikata (CT)	0.2	6.67
Hinjilicut (NAC)	Kavisurjyanagar (NAC)	0.4	13.33
Hirakud (NAC)	Burla (NAC)	0.3	10.00
Jagatsinghapur (NAC)	Kendrapara (M)	1.1	36.67
Jajapur (M)	Dhamanagar (NAC)	0.7	23.33
Jalda (CT)	Hatibandha (CT)	0.2	6.67
Jaleswar (NAC)	Baleshwar (M)	1.4	46.67
Jatani (M)	Khordha (M)	0.4	13.33
Jeypur (M)	Koraput (NAC)	0.4	13.33
Jharsuguda (M)	Brajarajnagar (M)	0.2	6.67
Jhumpura (CT)	Kendujhar (M)	0.7	23.33
Joda (M)	Barbil (M)	0.4	13.33
Junagarh (NAC)	Bhawanipatna (M)	0.6	20.00
Kamakshyanagar (NAC)	Bhuban (NAC)	0.9	30.00
Kantabanji (NAC)	Titlagarh (NAC)	0.9	30.00
Kantilo (CT)	Khandapada (NAC)	0.4	13.33
Karanjia (NAC)	Jhumpura (CT)	1.3	43.33
Kashinagara (NAC)	Gunupur (NAC)	0.9	30.00
Kavisurjyanagar (NAC)	Hinjilicut (NAC)	0.4	13.33
Kendrapara (M)	Pattamundai (NAC)	0.4	13.33
Kendujhar (M)	Jhumpura (CT)	0.7	23.33
Kesinga (NAC)	Titlagarh (NAC)	0.3	10.00
Khaliapali (CT)	Bargarh (M)	0.6	20.00
Khalikote (NAC)	Rambha (NAC)	0.4	13.33
Khandapada (NAC)	Nayagarh (NAC)	0.3	10.00
Khariar (NAC)	Kantabanji (NAC)	1.0	33.33

Khariar Road (NAC)	Padmapur (NAC)	1.9	63.33
Khatiguda (CT)	Nabarangapur (M)	0.6	20.00
Khordha (M)	Jatani (M)	0.4	13.33
Kochinda (NAC)	Jharsuguda (M)	1.3	43.33
Kodala (NAC)	Purusottampur (NAC)	0.4	13.33
Konark (NAC)	Nimapada (NAC)	0.8	26.67
Koraput (NAC)	Jeypur (M)	0.4	13.33
Kotpad (NAC)	Nabarangapur (M)	1.1	36.67
Lathikata (CT)	Hatibandha (CT)	0.2	6.67
Makundapur (CT)	Asika (NAC)	0.3	10.00
Malkangiri (NAC)	Balimela (NAC)	0.9	30.00
Mukhiguda (CT)	Khatiguda (CT)	0.6	20.00
Nabarangapur (M)	Khatiguda (CT)	0.6	20.00
Nalco (CT)	F.C.I Township (CT)	0.2	6.67
Nayagarh (NAC)	Khandapada (NAC)	0.3	10.00
Nilagiri (NAC)	Remuna (NAC)	0.4	13.33
Nimapada (NAC)	Pipili (NAC)	0.6	20.00
Nuapatna (CT)	Banki (NAC)	0.4	13.33
O.C.L Industrial TS (ITS)	Rajagangapur (M)	0.3	10.00
Padmapur (NAC)	Patnagarh (NAC)	1.2	40.00
Panposh (CT)	O.C.L Industrial TS (ITS)	0.3	10.00
Paradip (NAC)	Pattamundai (NAC)	1.0	33.33
Parlakhemundi (M)	Kashinagara (NAC)	1.2	40.00
Patnagarh (NAC)	Padmapur (NAC)	1.2	40.00
Pattamundai (NAC)	Kendrapara (M)	0.4	13.33
Phulabani (NAC)	Athmallik (NAC)	1.4	46.67
Pipili (NAC)	Jatani (M)	0.5	16.67
Polasara (NAC)	Makundapur (CT)	0.4	13.33
Pratapsasan (CT)	Bhubaneswar (M Corp.)	0.4	13.33
Puri (M)	Konark (NAC)	1.0	33.33
Purusottampur (NAC)	Kodala (NAC)	0.4	13.33
Rairangpur (NAC)	Karanjia (NAC)	1.9	63.33
Rajagangapur (M)	O.C.L Industrial TS (ITS)	0.3	10.00
Rambha (NAC)	Khalikote (NAC)	0.4	13.33
Raurkela (M)	Raurkela Industrial TS (ITS)	0.2	6.67
Raurkela Industrial TS(ITS)	Raurkela (M)	0.2	6.67
Rayagada (M)	Chandili (CT)	0.3	10.00
Redhakhol (NAC)	Baudhgarh (NAC)	0.7	23.33
Remuna (NAC)	Baleshwar (M)	0.3	10.00
Rengali Dam Project TS (CT)	Talcher (M)	1.0	33.33
Sambalpur (M)	Hirakud (NAC)	0.4	13.33
Sonapur (M)	Binika (NAC)	0.6	20.00
Soro (NAC)	Basudebpur (NAC)	0.6	20.00
Sunabeda (NAC)	Damanjodi (CT)	0.2	6.67

Sundargarh (M)	Jharsuguda (M)	1.0	33.33
Surada (NAC)	Asika (NAC)	0.9	30.00
T.T.P.S Township (CT)	F.C.I Township (CT)	0.3	10.00
Talcher (M)	Dera Colliery Township (CT)	0.2	6.67
Tarbha (NAC)	Balangir (M)	0.8	26.67
Tensa (CT)	Balagoda(Bolani) (CT)	0.8	26.67
Titlagarh (NAC)	Kesinga (NAC)	0.3	10.00
Udala (NAC)	Nilagiri (NAC)	0.7	23.33
Umarkote (NAC)	Nabarangapur (M)	1.9	63.33

Appendix: 3.1

Socio-economic Index in Towns of Orissa, 1971, 1981, 1991 and 2001

Town_Name	1971		1981		1991		2001	
	Value	Category	Value	Category	Value	Category	Value	Category
Anandapur	-1.08	Low	-1.601	Low	-1.231	Low	-0.876	Low
Anugul	1.73	High	1.014	High	1.121	Medium	1.873	High
Asika	-0.65	Medium	-0.329	Medium	0.537	Medium	0.684	Medium
Athagad	-1.12	Low	-0.331	Medium	-0.331	Low	-0.927	Low
Athmallik	-	-	-	-	-	-	1.637	Medium
Balagoda	-	-	-1.072	Low	-0.623	Low	-2.890	Very Low
Balangir	-0.47	Medium	-0.877	Low	-0.418	Low	0.011	Medium
Baleshwar	0.03	Medium	0.046	Medium	-0.077	Low	-0.033	Medium
Balimela	-	-	-1.869	Very Low	-1.509	Low	-1.567	Low
Balugaon	-	-	-	-	-1.397	Low	-2.205	Very Low
Banapur	-	-	-2.217	Very Low	-1.718	Low	-2.063	Very Low
Bangura	-	-	-	-	-	-	0.654	Medium
Banki	-2.38	Very Low	-2.101	Very Low	-1.692	Low	0.091	Medium
Barapali	1.06	High	3.321	Very High	2.318	High	0.257	Medium
Barbil	2.19	Very High	0.154	Medium	-1.035	Low	-1.479	Low
Bargarh	-0.06	Medium	-1.103	Low	-0.898	Low	-0.281	Low
Baripada	0.36	Medium	0.628	Medium	1.178	Medium	1.024	Medium
Basudebpur	-	-	-3.231	Very Low	-3.589	Very Low	-3.867	Very Low
Baudhgarh	3.65	Very High	0.274	Medium	0.287	Medium	1.017	Medium
Belagachhia	-	-	-	-	-	-	-2.159	Very Low
Bellaguntha	-1.46	Low	0.610	Medium	0.983	Medium	0.318	Medium
Belpahar	-	-	-	-	-1.674	Low	-0.860	Low
Bhadrak	-2.42	Very Low	-2.208	Very Low	-2.350	Very Low	-1.748	Low
Bhanjanagar	-0.82	Low	-0.788	Low	0.517	Medium	0.059	Medium
Bhawanipatna	-0.75	Medium	-0.288	Medium	0.123	Medium	0.329	Medium
Bhuban	-3.67	Very Low	-1.961	Very Low	-2.613	Very Low	-3.158	Very Low
Bhubaneswar	1.54	High	1.361	High	2.226	High	2.109	High
Binika	-	-	2.178	High	5.016	Very High	2.593	High
Biramitrapur	3.22	Very High	0.887	Medium	1.675	Medium	0.569	Medium
Bishamkatak	-	-	-	-	-	-	2.975	High
Brahmapur	0.35	Medium	-0.177	Medium	0.234	Medium	0.350	Medium
Brajarajnagar	-0.22	Medium	-2.577	Very Low	-2.254	Very Low	-2.328	Very Low
Buguda	-0.10	Medium	0.461	Medium	-1.647	Low	-0.947	Low
Burla	1.50	High	0.412	Medium	0.695	Medium	0.913	Medium
Champua	-	-	-	-	-0.853	Low	-0.759	Low
Chandabali	1.96	High	0.143	Medium	-1.399	Low	D	
Chandapur	-	-	-	-	-	-	-0.792	Low
Chandili	-	-	-1.623	Low	-1.421	Low	-1.796	Low
Charibatia	-	-	-	-	2.075	High	1.068	Medium
Chhatrapur	0.59	Medium	0.831	Medium	0.631	Medium	0.189	Medium
Chikiti	-	-	1.301	High	1.754	Medium	2.166	High
Chitrakonda	-	-	-1.501	Low	-0.953	Low	D	
Choudwar	1.37	High	0.114	Medium	-0.880	Low	-1.101	Low
Cuttack	0.94	High	0.438	Medium	0.925	Medium	1.265	Medium
Dadhapatna	-	-	-	-	-	-	-0.374	Low
Daitari	-	-	0.120	Medium	-0.465	Low	-0.340	Low
Damanjodi	-	-	-	-	2.629	High	1.036	Medium
Debagarh	0.14	Medium	1.014	High	0.119	Medium	1.106	Medium
Dera colliery	-	-	-0.364	Medium	-0.467	Low	-0.715	Low

Dhamanagar	-	-	-	-	-	-	-2.932	Very Low
Dhenkanal	-0.66	Medium	-0.091	Medium	0.538	Medium	0.582	Medium
Digapahandi	-	-	-0.593	Low	-0.008	Low	0.113	Medium
Dungamal	-	-	-	-	-	-	3.476	High
F.C.I. Township	-	-	2.072	High	0.544	Medium	1.134	Medium
G.udayagiri	-	-	-0.083	Medium	0.681	Medium	2.616	High
Ganjam	-	-	-0.752	Low	-2.666	Very Low	-1.681	Low
Ghantapada	-	-	-	-	-1.946	Very Low	-0.645	Low
Gopalpur (CT)	-	-	-	-	-0.821	Low	D	
Gopalpur(NAC)	-0.15	Medium	-0.263	Medium	-1.356	Low	-0.31	Low
Govindpur	-0.69	Medium	D		-	-	-	-
Gudari	-0.71	Medium	3.459	Very High	1.789	Medium	0.676	Medium
Gunupur	-1.39	Low	1.626	High	1.980	High	1.421	Medium
Hatibandha	-	-	-	-	-1.123	Low	-2.007	Low
Hinjilicut	-1.32	Low	-0.633	Low	0.188	Medium	-0.686	Low
Hirakud	0.30	Medium	-0.353	Medium	0.097	Medium	-0.158	Medium
Jagatsinghpur	-	-	-0.239	Medium	0.234	Medium	2.190	High
Jajapur	-1.20	Low	-1.633	Low	-1.339	Low	-1.501	Low
Jajapur Road	1.95	High	0.087	Medium	-0.369	Low	-0.655	Low
Jalda	-	-	-2.507	Very Low	-1.847	Very Low	-2.331	Very Low
Jaleswar	-1.62	Low	-1.593	Low	-1.627	Low	-0.954	Low
Jatani	0.25	Medium	-1.054	Low	-0.772	Low	-1.137	Low
Jeypur	-0.14	Medium	0.624	Medium	1.501	Medium	1.758	High
Jharsuguda	0.26	Medium	-0.048	Medium	0.332	Medium	0.307	Medium
Jhumpura	-	-	-	-	-	-	-0.909	Low
Joda	1.69	High	1.862	High	1.592	Medium	1.323	Medium
Junagarh	-1.27	Low	-1.629	Low	-0.978	Low	-1.387	Low
Kamakshyanagar	-	-	-1.071	Low	-0.480	Low	-0.338	Low
Kantabanji	-1.71	Low	-1.143	Low	-1.031	Low	-2.517	Very Low
Kantilo	-	-	-1.451	Low	-1.550	Low	-1.094	Low
Karanjia	-	-	0.177	Medium	-0.808	Low	0.160	Medium
Kashinagara	-	-	2.857	Very High	1.837	High	5.401	Very High
Kavisurjyanagar	-0.75	Medium	-0.582	Low	-1.088	Low	-0.453	Low
Kendrapara	-2.40	Very Low	-1.857	Very Low	-1.574	Low	-0.914	Low
Kendujhar	-0.37	Medium	0.901	Medium	0.094	Medium	-0.162	Medium
Kesinga	-0.31	Medium	-2.274	Very Low	-1.381	Low	-1.331	Low
Khaliapali	-	-	-	-	-	-	-0.418	Low
Khalikote	0.60	Medium	0.222	Medium	-0.969	Low	-1.024	Low
Khandapada	-	-	-	-	-0.967	Low	-1.354	Low
Khariar	0.39	Medium	-1.206	Low	-0.411	Low	0.168	Medium
Khariar road	1.13	High	0.713	Medium	0.057	Medium	1.019	Medium
Khatiguda	-	-	-	-	-	-	-0.421	Low
Khordha	-1.50	Low	-0.706	Low	0.513	Medium	-0.217	Low
Kochinda	-0.08	Medium	-0.197	Medium	2.997	High	-0.171	Low
Kodala	-	-	-0.450	Low	-0.581	Low	2.154	High
Konark	-	-	-	-	-3.646	Very Low	-0.092	Medium
Koraput	-1.75	Low	1.217	High	0.620	Medium	1.543	Medium
Kotpad	1.87	High	3.211	Very High	2.026	High	2.868	High
Lathikata	-	-	-	-	-	-	-1.828	Low
Makundapur	-	-	-	-	-	-	-2.140	Very Low
Malkangiri	0.39	Medium	0.388	Medium	-0.174	Low	0.489	Medium
Mukhiguda	-	-	-	-	-	-	0.466	Medium
Nabarangapur	0.58	Medium	1.721	High	1.462	Medium	1.929	High
Nalco	-	-	-	-	2.569	High	4.467	Very High

Nayagarh	1.48	High	1.435	High	0.856	Medium	0.555	Medium
Nilagiri	-	-	-	-	1.680	Medium	-0.218	Low
Nimapada	-	-	-0.811	Low	0.632	Medium	0.739	Medium
Nuapatna	-	-	-	-	2.427	High	2.545	High
O.C.L.Industrial TS	-	-	-	-	-	-	3.000	High
Padmapur	0.66	Medium	-0.212	Medium	-0.443	Low	-0.620	Low
Panposh	-	-	-	-	-1.121	Low	-0.420	Low
Paparahandi	-	-	1.436	High	D		-	-
Paradip	2.48	Very High	1.244	High	-0.648	Low	0.52	Medium
Paradip Phosphates	-	-	-	-	5.468	Very High	D	
Parlakhemundi	0.72	High	1.363	High	-0.429	Low	1.474	Medium
Patnagarh	-0.38	Medium	-1.835	Low	-0.209	Low	-1.005	Low
Pattamundai	-	-	-	-	-3.085	Very Low	-1.875	Low
Phulbani	-0.18	Medium	0.054	Medium	0.741	Medium	1.088	Medium
Pipili	-	-	-1.219	Low	-0.207	Low	-0.855	Low
Polasara	-0.41	Medium	-1.166	Low	0.020	Medium	-1.273	Low
Pratapsasan	-	-	-	-	-	-	1.290	Medium
Puri	0.64	Medium	0.405	Medium	0.648	Medium	0.574	Medium
Purusottampur	-1.17	Low	-0.575	Low	-0.530	Low	-0.963	Low
Rairangpur	-0.98	Low	0.738	Medium	0.247	Medium	0.214	Medium
Rajagangapur	0.15	Medium	0.091	Medium	0.177	Medium	-1.350	Low
Rambha	0.26	Medium	2.381	Very High	1.890	High	-1.094	Low
Raurkela	0.58	Medium	1.836	High	0.151	Medium	-0.474	Low
Raurkela Industrial	1.30	High	2.187	High	-0.012	Low	0.818	Medium
Rayagada	-0.18	Medium	-1.114	Low	-0.258	Low	-0.801	Low
Redhakhol	-	-	-	-	-	-	0.946	Medium
Remuna	-	-	-	-	-	-	-1.220	Low
Rengali Dam project	-	-	3.738	Very High	0.582	Medium	-1.665	Low
Sambalpur	0.25	Medium	1.159	High	0.868	Medium	1.649	Medium
Sonapur	3.04	Very High	0.548	Medium	3.200	High	1.510	Medium
Soro	-	-	-2.630	Very Low	-1.520	Low	-1.884	Low
Sunabeda	-1.81	Low	0.126	Medium	-0.607	Low	0.405	Medium
Sundargarh	0.27	Medium	0.868	Medium	1.460	Medium	0.813	Medium
Surada	-1.12	Low	-0.277	Medium	-0.178	Low	0.273	Medium
T.T.P.S. Township	-	-	1.188	High	0.666	Medium	1.710	High
Talcher	-1.72	Low	-0.983	Low	-0.869	Low	-0.423	Low
Tarbha	0.27	Medium	1.688	High	1.885	High	-0.537	Low
Tensa	-	-	-	-	-0.422	Low	-0.426	Low
Titlagarh	-0.68	Medium	-1.168	Low	-0.543	Low	-0.786	Low
Udala	-	-	0.656	Medium	2.245	High	2.001	High
Umarkote	-0.28	Medium	1.029	High	-0.446	Low	0.254	Medium

*D – Declassified Town

Appendix: 4.1

Infrastructure Development Index in Towns of Orissa, 1971, 981, 1991 and 2001

Town Name	1971		1981		1991		2001	
	Value	Category	Value	Category	Value	Category	Value	Category
ANANDAPUR	-1.624	Very low	-1.851	Low	-0.959	Low	-1.978	very high
ANUGUL	5.413	Low	0.525	Low	2.235	Low	8.822	Medium
ASIKA	7.512	Medium	4.029	Medium	2.751	Medium	0.110	Low
ATHAGAD	-3.441	Very low	-0.988	Low	-1.658	Low	1.686	Low
ATHMALLIK	-	-	-	-	-	-	-3.858	Very low
BALAGODA	-	-	-3.022	Very Low	-8.077	Very Low	-3.098	Very low
BALANGIR	0.674	Low	-3.071	Very Low	-2.114	Low	3.864	Low
BALESHWAR	7.069	Medium	7.783	High	4.169	Medium	3.800	Low
BALIMELA	-	-	-0.669	Low	-5.426	Very Low	-2.391	Very low
BALUGAON	-	-	-	-	-2.148	Low	-4.047	Very low
BANAPUR	-	-	0.453	Low	-2.367	Low	-3.666	Very low
BANGURA	-	-	-	-	-	-	2.772	Low
BANKI	-0.260	Low	-0.483	Low	0.372	Low	1.395	Low
BARAPALI	-4.742	Very low	-2.704	Very Low	-5.324	Very Low	-2.494	Very low
BARBIL	-4.762	Very low	-1.647	Low	-4.168	Low	-2.918	Very low
BARGARH	-1.383	Very low	-1.499	Low	-1.867	Low	0.280	Low
BARIPADA	9.056	Medium	-4.129	Very Low	4.189	Medium	3.214	Low
BASUDEBPUR	-	-	-5.551	Very Low	-4.696	Low	-4.734	Very low
BAUDHGARH	-2.416	Very low	-1.581	Low	-0.834	Low	-3.413	Very low
BELAGACHHIA	-	-	-	-	-	-	-5.157	Very low
BELLAGUNTHA	-2.235	Very low	2.949	Medium	-1.222	Low	-1.312	Very low
BELPAHAR	-	-	-	-	-12.490	Very Low	-2.361	Very low
BHADRAK	-1.368	Very low	1.271	Low	1.282	Low	5.236	Low
BHANJANAGAR	3.816	Low	3.619	Medium	0.995	Low	3.640	Low
BHAWANIPATNA	1.054	Low	-1.307	Low	-0.267	Low	2.883	Low
BHUBAN	-0.881	Very low	-3.866	Very Low	-4.239	Low	-3.948	Very low
BHUBANESWAR	11.100	Medium	1.058	Low	11.722	High	28.923	High
BINIKA	-	-	-2.056	Low	-1.568	Low	-4.097	Very low
BIRAMITRAPUR	-7.457	Very low	-5.946	Very Low	-3.544	Low	-3.207	Very low
BISHAMKATAK	-	-	-	-	-	-	-1.106	Very low
BRAHMAPUR	18.196	High	-4.544	Very Low	15.317	High	15.047	Medium
BRAJARAJNAGAR	-4.621	Very low	-6.096	Very Low	-3.361	Low	0.349	Low
BUGUDA	-6.568	Very low	0.000	Low	0.550	Low	-2.919	Very low
BURLA	5.507	Low	-2.405	Low	8.823	Medium	2.599	Low
CHAMPUA	-	-	-	-	-12.490	Very Low	0.209	Low
CHANDABALI	-2.317	Very low	-1.129	Low	-3.081	Low		
CHANDAPUR	-	-	-	-	-	-	10.288	Medium
CHANDILI	-	-	-2.129	Low	-4.233	Low	-5.351	Very low
CHARIBATIA	-	-	-	-	-12.490	Very Low	1.115	Low
CHHATRAPUR	1.634	Low	2.859	Medium	3.340	Medium	3.218	Low
CHIKITI	-	-	3.021	Medium	-0.338	Low	-0.395	Very low
Chitrakonda	-	-	3.026	Medium	0.326	Low		
CHOUDWAR	-2.850	Very low	1.582	Medium	2.003	Low	-1.840	Very low

CUTTACK	31.038	Very high	1.442	Medium	25.087	Very High	16.511	High
DADHAPATNA	-	-	-	-	-	-	-5.956	Very low
DAITARI	-	-	-0.166	Low	-2.736	Low	3.308	Low
DAMANJODI	-	-	-	-	3.088	Medium	4.837	Low
DEBAGARH	-0.179	Low	0.065	Low	1.596	Low	-0.937	Very low
DERA COLLIERY TS	-	-	1.919	Medium	6.080	Medium	3.045	Low
DHAMANAGAR	-	-	-	-	-	-	-2.976	Very low
DHENKANAL	4.397	Low	-1.257	Low	1.038	Low	8.736	Medium
DIGAPAHANDI	-	-	1.952	Medium	-1.197	Low	-0.901	Very low
DUNGAMAL	-	-	-	-	-	-	-7.520	Very low
F.C.ITownship	-	-	13.076	Very High	-0.665	Low	3.664	Low
G.UDAYAGIRI	-	-	9.654	Very High	8.689	Medium	-2.672	Very low
GANJAM	-	-	4.221	Medium	-2.956	Low	-3.932	Very low
GHANTAPADA	-	-	-	-	-9.031	Very Low	-5.943	Very low
Gopalpur(CT)	-	-	-	-	-12.109	Very Low		
GOPALPUR	0.303	Low	9.575	Very High	1.058	Low	-2.268	Very low
Govindpur	-3.431	Very low	D		-	-		
GUDARI	-3.203	Very low	4.709	Medium	0.846	Low	-0.446	Very low
GUNUPUR	-2.388	Very low	-1.263	Low	0.862	Low	-0.889	Very low
HATIBANDHA	-	-	-	-	-11.146	Very Low	-7.367	Very low
HINJILICUT	-2.789	Very low	-2.372	Low	-3.850	Low	-3.450	Very low
HIRAKUD	-0.355	Low	-1.723	Low	3.512	Medium	-1.396	Very low
JAGATSINGHPUR	-	-	-1.911	Low	0.953	Low	-0.905	Very low
JAJAPUR	2.702	Low	3.307	Medium	2.564	Medium	-0.035	Low
Jajpur Road	-2.851	Very low	-4.759	Very Low	-2.483	Low	-0.371	Very low
JALDA	-	-	-6.463	Very Low	-9.237	Very Low	-5.217	Very low
JALESWAR	-2.238	Very low	0.163	Low	0.555	Low	-0.240	Low
JATANI	-3.791	Very low	-3.196	Very Low	-2.069	Low	-0.368	Very low
JEYPUR	5.272	Low	-2.002	Low	0.490	Low	2.206	Low
JHARSUGUDA	-0.081	Low	-5.783	Very Low	-1.225	Low	0.293	Low
JHUMPURA	-	-	-	-	-	-	0.320	Low
JODA	-4.206	Very low	-3.000	Very Low	0.393	Low	4.636	Low
JUNAGARH	-7.343	Very low	-3.114	Very Low	-5.376	Very Low	-3.315	Very low
KAMAKSHYANAGAR	-	-	-2.666	Very Low	0.654	Low	-2.067	Very low
KANTABANJI	-3.426	Very low	-2.067	Low	-1.021	Low	-1.699	Very low
KANTILO	-	-	6.181	High	4.450	Medium	-2.172	Very low
KARANJIA	-	-	-2.452	Low	-1.400	Low	13.435	Medium
KASHINAGARA	-	-	-3.992	Very Low	-4.910	Low	-1.592	Very low
KAVISURJYANAGAR	-6.539	Very low	-0.430	Low	0.251	Low	-3.437	Very low
KENDRAPARA	1.548	Low	3.776	Medium	3.775	Medium	1.453	Low
KENDUJHAR	4.043	Low	4.137	Medium	2.642	Medium	-0.002	Low
KESINGA	-7.897	Very low	-3.531	Very Low	-3.442	Low	-1.629	Very low
KHALIAPALI	-	-	-	-	-	-	-6.770	Very low
KHALIKOTE	-7.746	Very low	0.025	Low	0.352	Low	-3.354	Very low
KHANDAPADA	-	-	-	-	-4.721	Low	-1.496	Very low
KHARIAR	0.371	Low	7.049	High	9.411	Medium	-4.832	Very low
KHARIAR ROAD	-5.327	Very low	1.251	Low	-1.292	Low	-0.605	Very low
KHATIGUDA	-	-	-	-	-	-	-5.814	Very low

KHORDHA	2.798	Low	0.147	Low	-1.163	Low	-0.463	Very low
KOCHINDA	-2.811	Very low	0.714	Low	-1.912	Low	-1.927	Very low
KODALA	-	-	-0.331	Low	-3.613	Low	-2.908	Very low
KONARK	-	-	-	-	-6.925	Very Low	-2.829	Very low
KORAPUT	2.903	Low	3.187	Medium	6.928	Medium	3.519	Low
KOTPAD	-5.754	Very low	-1.631	Low	-3.432	Low	-3.724	Very low
LATHIKATA	-	-	-	-	-	-	-4.387	Very low
MAKUNDAPUR	-	-	-	-	-	-	-6.461	Very low
MALKANGIRI	-2.733	Very low	-0.308	Low	0.473	Low	-0.772	Very low
MUKHIGUDA	-	-	-	-	-	-	-7.127	Very low
NABARANGAPUR	0.135	Low	2.590	Medium	3.869	Medium	-0.097	Low
NALCO	-	-	-	-	14.632	High	13.166	Medium
NAYAGARH	1.992	Low	5.184	Medium	6.515	Medium	1.453	Low
NILAGIRI	-	-	-	-	-4.776	Low	-2.164	Very low
NIMAPADA	-	-	-0.740	Low	-2.766	Low	1.898	Low
NUAPATNA	-	-	-	-	0.985	Low	-1.217	Very low
O.C.L.INDUSTRIAL TS	-	-	-	-	-	-	7.730	Medium
PADMAPUR	-1.983	Very low	-2.167	Low	-2.025	Low	-1.914	Very low
PANPOSH	-	-	-	-	-8.898	Very Low	-5.627	Very low
Paparahandi	-	-	-3.457	Very Low	D			
PARADIP	-4.748	Very low	-3.631	Very Low	-4.383	Low	-2.085	Very low
Paradip Phosphates	-	-	-	-	1.613	Low		
PARLAKHEMUNDI	8.307	Medium	3.761	Medium	2.045	Low	6.025	Low
PATNAGARH	-3.088	Very low	-4.736	Very Low	-4.635	Low	-2.318	Very low
PATTAMUNDAI	-	-	-	-	2.880	Medium	8.969	Medium
PHULBANI	-0.568	Very low	1.243	Low	0.743	Low	1.087	Low
PIPILI	-	-	4.181	Medium	5.304	Medium	-0.133	Low
POLASARA	-8.039	Very low	-0.777	Low	-4.321	Low	-3.768	Very low
PRATAPSASAN	-	-	-	-	-	-	-4.632	Very low
PURI	15.004	High	4.855	Medium	4.610	Medium	9.076	Medium
PURUSOTTAMPUR	-7.435	Very low	-2.726	Very Low	-5.745	Very Low	-2.947	Very low
RAIRANGPUR	-0.893	Very low	1.443	Medium	0.617	Low	-0.821	Very low
RAJAGANGAPUR	-2.356	Very low	-3.452	Very Low	-2.538	Low	-1.939	Very low
RAMBHA	-2.383	Very low	-2.046	Low	-2.592	Low	-2.076	Very low
RAURKELA	3.057	Low	-4.493	Very Low	8.316	Medium	14.000	Medium
RAURKELA INDUSTRIAL TS	6.041	Low	4.521	Medium	-2.788	Low	-2.555	Very low
RAYAGADA	-0.554	Very low	-3.705	Very Low	-1.172	Low	-0.924	Very low
REDHAKHOL	-	-	-	-	-	-	-4.739	Very low
REMUNA	-	-	-	-	-	-	-6.674	Very low
RENGALI DAM PROJECT	-	-	-1.775	Low	-5.519	Very Low	-0.124	Low
SAMBALPUR	13.134	Medium	-3.542	Very Low	6.451	Medium	8.495	Medium
SONAPUR	0.226	Low	0.657	Low	-0.902	Low	-1.827	Very low
SORO	-	-	-4.897	Very Low	0.006	Low	-0.631	Very low
SUNABEDA	-6.163	Very low	0.166	Low	-0.951	Low	-0.496	Very low
SUNDARGARH	4.590	Low	0.123	Low	7.547	Medium	0.777	Low
SURADA	0.162	Low	2.510	Medium	-1.039	Low	-0.552	Very low
TALCHER	1.683	Low	2.019	Medium	-0.229	Low	0.350	Low
TALCHER THERMAL	-	-	11.364	Very High	1.400	Low	7.861	Medium

TARBHA	-9.565	Very low	2.961	Medium	2.344	Low	-4.502	Very low
TENSA	-	-	-	-	-7.337	Very Low	-3.071	Very low
TITLAGARH	-1.903	Very low	-2.640	Very Low	-1.806	Low	-0.482	Very low
UDALA	-	-	-0.434	Low	-1.859	Low	0.670	Low
UMARKOTE	-9.045	Very low	0.007	Low	-2.279	Low	-1.214	Very low

Appendix: 5.1

Functional Classification of Towns, 1971

Town Name	Percentage of Workers in Different Industrial Categories									Specialised Functions
	I+II	III	IV	Va	Vb	VI	VII	VIII	IX	
Anandpur	31.3	0.94	0.13	8.75	3.15	3.0	19.8	2.96	29.7	D
Angul	2.53	13.6	0.00	3.10	5.70	2.3	21.5	4.08	47.1	L2,O1
Aska	23.7	3.62	0.03	10.5	5.07	1.4	20.1	8.97	26.4	D
Athgarh	38.3	3.24	0.00	2.54	4.50	3.5	16.2	3.98	27.5	C1
Balasore	16.4	2.12	0.02	2.78	11.5	2.6	20.6	9.93	33.8	D
Banki	54.7	3.38	0.00	2.99	2.31	0.9	10.9	2.39	22.3	CA1
Barbil	5.86	1.29	16.7	1.28	14.5	1.7	15.6	20.9	21.9	Mq2,Tsc1
Bargarh	18.5	2.87	0.04	5.74	7.90	3.3	26.2	11.2	23.9	Tsc1
Baripada	9.12	2.56	0.24	4.72	9.92	2.4	20.3	7.41	43.2	O1
Barpali	37.9	2.61	0.19	24.6	5.34	0.8	13.4	4.30	10.6	Mh3
Baudh	31.2	5.02	0.00	24.1	3.32	1.1	12.0	2.59	20.5	Mh4
Bellaguntha	32.8	4.52	0.27	16.4	5.21	0.7	23.5	1.81	14.6	Mh2,Tc1
Berhampur	7.90	1.58	0.04	6.92	9.50	3.6	24.0	9.33	37.0	C1,Tc1
Bhadrak	24.5	1.19	0.01	2.54	8.94	2.1	20.9	15.0	24.5	D
Bhanjanagar	18.3	5.88	0.40	6.19	6.10	2.3	22.4	7.31	31.0	D
Bhawanipatna	18.0	4.53	0.05	2.97	5.07	7.0	14.4	8.11	39.7	C3,O1
Bhuban	57.1	5.72	0.07	17.2	2.76	0.6	7.83	0.30	8.22	CA2,Mh2
Bhubaneswar	10.6	4.01	0.46	1.23	5.55	5.1	16.6	7.56	48.7	C2,O1
Biramitrapur	10.3	1.12	55.6	1.76	3.44	1.1	10.5	7.30	8.76	Mq7
Bolangir	14.4	3.56	0.39	3.51	7.92	3.1	17.0	9.92	40.0	O1
Brajrajnagar	6.61	1.15	26.1	0.95	45.0	0.4	7.58	3.95	8.10	Mq3,Mnh3
Buguda	32.9	8.97	0.00	9.45	4.55	1.9	22.0	1.90	18.2	L1
Burla	11.1	4.74	2.06	1.71	4.97	6.3	11.5	8.91	48.6	C3,O1
Chandbali	30.4	2.00	0.00	0.87	26.8	0.4	18.8	4.83	15.6	Mnh1
Chatrapur	8.59	0.99	0.00	4.12	5.67	2.5	19.4	13.6	44.9	O1
Chowdwar	11.0	2.12	0.02	1.22	59.5	1.3	9.45	1.91	13.2	Mnh4
Cuttack City	1.31	2.14	0.03	4.63	14.0	2.4	26.0	12.9	36.4	Tc1
Deogarh	41.2	2.00	0.00	3.45	2.94	1.9	9.09	4.43	34.9	CA1
Dhenkanal	14.9	3.38	0.05	4.67	5.10	3.4	17.3	11.2	39.6	O1
Gopalpur	1.51	35.8	0.00	2.17	8.39	0.9	27.9	2.26	20.9	L8,Tc1
Govindpur	30.7	2.87	0.00	3.98	8.87	1.8	15.9	12.4	23.3	D
Gudari	46.5	4.89	0.00	11.1	3.57	1.0	11.6	1.75	19.4	CA1,Mh1
Gunupur	16.9	4.52	0.00	6.18	7.54	2.4	21.0	13.1	28.2	D
Hinjili	42.9	4.28	1.13	13.4	4.08	1.5	11.1	3.51	17.9	CA1,Mh1
Hirakud	15.2	2.08	0.00	2.63	19.0	4.3	12.6	11.3	32.7	C1
Jajpur	22.0	3.78	0.00	7.30	5.70	3.0	21.0	5.81	31.2	D
Jajpur Road	20.5	0.94	0.16	1.70	16.1	0.8	25.5	16.7	17.3	Tc1
Jaleshwar	70.6	0.42	0.00	2.16	3.91	0.2	9.82	1.95	10.8	CA2
Jatni	5.66	0.10	0.01	2.03	6.35	2.0	19.1	36.2	28.4	Tsc3
Jeypore	9.59	2.59	0.09	4.78	9.69	1.6	24.4	14.3	32.8	Tsc1
Jharsuguda	8.24	1.73	0.03	3.91	14.4	1.3	20.9	28.7	20.6	Tsc2
Joda	4.20	0.67	14.8	0.95	21.9	0.9	10.8	17.4	28.1	Mq2,Mnh1,Ts
Junagarh	40.4	3.35	0.00	3.06	5.03	2.0	15.2	12.0	18.8	CA1

Kantabanji	6.27	1.86	0.04	4.75	9.84	2.7	21.3	27.9	25.0	Tsc2
Kavisuryanag	32.7	3.77	0.22	14.3	4.05	0.6	18.8	1.90	23.4	Mnh1
Kendrapara	17.0	2.08	0.00	5.80	9.88	2.1	24.6	5.12	33.2	Tc1
Keonjhar	25.6	2.77	0.16	6.90	2.65	2.6	13.7	6.13	39.3	O1
Kesinga	32.5	1.96	0.00	1.78	13.4	1.5	17.2	9.12	22.3	D
Khalikote	34.4	1.85	0.00	4.26	3.75	3.8	18.6	1.90	31.3	C1
Khariar	31.9	4.52	0.00	2.39	8.09	2.6	15.3	2.26	32.7	D
Khariar Road	25.5	2.02	0.00	3.24	12.8	1.4	19.4	7.69	27.7	D
Khurda	32.5	3.39	0.86	4.74	6.81	1.8	16.5	5.69	27.5	D
Koraput	37.0	3.51	0.10	1.35	1.38	2.5	7.63	8.57	37.8	D
Kotpad	32.4	2.23	0.00	10.4	4.68	1.0	18.4	9.60	21.1	D
Kuchinda	53.9	2.49	0.00	2.45	4.67	1.3	11.6	3.07	20.4	CA1
Malkangiri	19.4	2.91	0.04	3.97	1.89	1.8	19.6	11.9	38.1	D
Nayagarh	5.80	3.83	0.07	3.76	5.80	0.4	19.3	2.37	58.5	O2
Nowrangpur	14.1	2.81	0.68	3.09	11.7	2.2	23.1	13.9	28.1	Tc1
Padampur	35.8	1.46	0.00	10.1	3.59	2.0	17.1	2.44	27.2	D
Paradip	0.69	10.0	0.30	1.77	2.22	2.0	22.7	42.2	17.9	L1,Tsc4
Paralakhemun	17.8	3.71	0.00	8.76	5.97	1.9	22.5	7.33	31.8	D
Patnagarh	46.6	2.23	0.54	5.40	8.41	1.5	13.6	2.23	19.3	CA1
Phulbani	11.7	3.91	0.00	2.02	4.29	6.4	14.8	7.67	49.0	C3,O1
Polasara	68.7	1.35	0.00	9.10	2.06	0.3	7.28	0.68	10.4	CA1
Puri	2.24	11.2	0.08	3.93	5.71	2.0	23.9	7.41	43.3	L1,Tc1,O1
Purushottamp	49.3	1.82	0.00	7.96	4.97	1.0	16.8	2.16	15.8	CA1
Rairangpur	27.6	2.50	0.26	2.07	6.48	1.6	21.6	4.24	33.4	D
Rajgangpur	15.6	2.03	0.01	1.86	42.1	1.6	13.8	7.30	15.4	Mnh3
Rambha	25.6	8.44	0.09	3.84	7.44	2.2	28.5	7.11	16.5	L1,Tc2
Rayagada	19.0	2.43	3.16	2.24	10.4	3.4	16.9	20.9	21.4	Tsc1
Rourkela Civil	2.77	1.08	1.14	1.46	14.4	1.8	21.4	28.0	27.7	Tsc2
Rourkela Steel	1.37	1.74	0.07	0.26	40.8	1.1	12.0	6.07	36.5	Mnh3
Sambalpur	5.19	2.51	0.09	3.40	14.3	2.8	24.2	12.6	34.7	Tc1
Sonepur	9.49	5.33	0.04	16.4	11.0	2.4	21.2	4.97	28.9	Mh2
Sunabeda	35.1	2.00	0.00	0.98	25.2	4.1	6.10	6.65	19.7	Mnh1,C1
Sundargarh	23.4	3.34	0.06	2.29	3.94	2.8	15.1	7.28	41.6	O1
Surada	18.9	6.69	0.00	10.3	5.35	2.3	21.9	13.3	21.0	D
Talcher	14.3	1.94	8.00	4.42	8.30	2.2	15.1	11.0	34.6	D
Tarbha	31.4	2.46	0.00	19.0	11.0	0.8	15.5	3.25	16.1	Mh2
Titlagarh	13.3	1.48	0.15	4.85	10.4	3.1	22.7	14.5	29.3	D
Umarkot	43.5	4.19	0.00	1.15	3.23	2.5	14.4	9.55	21.2	CA1

Appendix: 5.2

Functional Classification of Towns, 1991

Town Name	Percentage of workers in different categories									Specialised Functions
	I+II	III	IV	Va	Vb	VI	VII	VIII	IX	
ANANDAPUR	40.87	3.33	0.22	4.82	2.58	2.10	16.3	2.71	27.01	CA1
ANUGUL	6.79	6.98	0.18	1.43	11.6	3.60	25.8	6.63	36.92	Tc1
ASIKA	18.36	3.10	0.09	4.54	11.4	1.10	24.4	8.22	28.61	Tc2
ATHAGAD	28.25	2.95	0.30	1.35	5.10	1.71	22.0	5.02	33.30	D
BALAGODA	4.75	0.49	56.20	1.55	5.70	5.15	8.59	7.22	10.33	Mq4
BALANGIR	13.57	4.49	0.38	1.78	8.30	3.47	20.7	10.3	36.99	D
BALESWAR	15.42	3.97	0.13	4.01	9.16	4.21	20.8	6.83	35.46	D
BALIMELA	32.97	12.20	0.00	1.25	3.35	1.64	10.3	1.57	36.67	L1
BALUGAON	21.74	6.96	0.00	1.93	6.81	1.01	36.7	11.0	13.74	Tc2
BANAPUR	40.74	2.30	0.03	3.46	4.64	1.24	24.0	2.51	21.09	CA1
BANKI	44.34	2.99	0.06	0.62	5.26	0.92	14.9	4.70	26.21	CA1
BARAPALI	28.95	1.36	0.02	21.79	8.09	0.71	19.9	4.31	14.84	Mh2
BARBIL	2.53	1.94	23.32	1.27	27.9	2.80	12.7	9.74	17.75	Mq1,Mnh1
BARGARH	17.32	1.90	0.01	1.23	14.8	2.31	30.0	10.5	21.82	Tc1
BARIPADA	12.36	4.68	0.19	2.43	9.18	2.11	24.1	7.18	37.74	D
BASUDEBPUR	70.11	3.82	0.00	0.62	2.45	0.43	7.27	1.52	13.79	CA2
BAUDH	23.59	5.45	0.18	13.19	3.78	2.10	17.5	4.31	29.87	Mh1
BELLAGUNTHA	31.74	0.96	0.12	11.53	6.11	0.88	23.3	2.61	22.74	Mh1
BELPAHAR	20.13	0.80	8.23	2.47	39.0	3.04	11.1	5.86	9.25	Mnh1
BHADRAK	30.93	1.22	0.28	1.24	7.65	2.30	20.8	11.6	23.90	Tcs1
BHANJANAGAR	10.42	5.03	0.07	4.37	7.26	1.85	25.7	6.95	38.34	Tc1,O1
BHAWANIPATN	12.85	4.81	0.24	1.02	7.20	4.41	17.9	7.15	44.38	O1
BHUBAN	47.83	5.09	0.30	7.67	8.14	0.95	16.6	0.95	12.40	CA1
BHUBANESWAR	6.62	2.84	0.57	0.82	9.55	7.29	19.4	7.17	45.71	O1
BINIKA	52.71	4.39	0.33	15.93	4.70	0.31	9.86	1.31	10.47	CA1,Mh1
BIRAMITRAPUR	16.72	1.05	37.22	2.13	5.10	1.27	15.8	5.50	15.13	Mq2
BRAHMAPUR	6.01	2.92	0.21	4.58	11.4	3.14	29.3	10.2	32.14	Tc1
BRAJARAJNAGA	7.15	1.00	36.36	1.01	24.2	2.10	11.9	3.36	12.85	Mq2
BUGUDA	43.34	2.60	1.03	3.86	4.65	1.13	18.8	1.67	22.86	CA1
BURLA	18.75	2.55	0.20	1.02	5.05	8.62	11.6	4.17	47.97	O1
CHAMPUA	16.26	1.86	0.13	5.12	6.53	0.64	26.0	5.31	38.09	Tc1
CHANDABALI	36.82	5.86	0.00	1.16	7.07	1.26	20.4	5.47	21.85	D
CHANDILI	10.51	1.17	0.04	0.62	67.5	2.53	7.41	1.17	9.03	Mnh3
CHARIBATIA	0.06	1.88	0.00	0.00	0.65	0.24	0.65	0.29	96.23	O5
CHHATRAPUR	8.58	1.27	0.06	4.05	9.05	1.29	21.6	9.40	44.66	O1
CHIKITI	28.68	1.89	1.57	6.95	3.62	8.71	18.6	1.79	28.18	D
CHITRAKONDA	22.01	21.04	0.11	1.77	1.88	12.7	17.9	3.71	18.81	L3,C1
CHOUDWAR	13.42	0.95	0.04	1.35	44.0	1.72	13.2	2.34	22.85	Mnh2
CUTTACK	2.09	2.18	0.12	2.37	15.7	3.07	27.2	10.4	36.76	Tc1
DAITARI	5.70	2.30	69.28	0.55	0.48	1.11	8.87	0.95	10.77	Mq5
DAMANJODI	0.26	0.38	0.47	0.04	59.6	5.83	2.77	7.32	23.33	Mnh3
DEBAGARH	30.53	5.61	0.00	1.55	4.84	2.26	18.9	4.38	31.91	D
DERA COLLIERY	2.33	0.77	68.35	0.25	2.66	4.74	5.78	2.49	12.63	Mq5

DHENKANAL	17.11	4.38	0.24	0.93	12.6	2.61	20.6	9.45	31.98	D
DIGAPAHANDI	45.14	2.09	0.00	6.16	2.87	0.72	15.2	1.47	26.27	CA1
F.C.I.TOWNSHIP	8.60	0.52	2.56	0.93	56.3	9.60	6.22	1.93	13.34	Mnh3
G.UDAYAGIRI	28.27	8.64	0.05	1.82	4.55	1.27	19.5	4.05	31.82	D
GAMJAM	26.43	1.04	0.08	0.23	26.9	1.39	18.3	3.40	22.15	Mnh1
GHANTAPADA	16.18	0.21	40.73	1.22	7.91	4.01	9.31	11.4	8.98	Mq2,Tcs1
GOPALPUR	27.72	2.04	0.07	1.09	14.2	7.34	23.3	8.15	16.10	D
GOPALPUR	3.73	43.62	0.20	1.29	5.97	0.47	18.9	5.02	20.76	L7
GUDARI	39.57	6.33	0.09	5.54	4.89	2.65	15.1	1.91	23.84	D
GUNUPUR	23.60	6.86	0.00	3.16	7.44	3.63	18.9	3.85	32.49	D
HATIBANDHA	16.89	0.56	0.26	1.69	44.6	2.12	7.97	1.60	24.30	Mnh2
HINJILI	35.62	3.89	0.16	7.45	12.5	1.25	16.9	3.62	18.56	D
HIRAKUD	22.00	3.89	0.28	1.63	29.9	6.05	8.50	2.86	24.79	Mnh1
JAGATSINGHAP	38.87	2.44	0.03	5.51	5.91	2.06	14.9	4.03	26.25	D
JAJAPUR	27.65	3.42	0.10	4.80	4.52	2.81	22.2	5.39	29.08	D
JAJAPUR ROAD	22.58	2.61	6.40	2.41	9.55	1.70	18.9	9.54	26.28	D
JALDA	17.85	0.09	8.04	0.79	41.4	1.46	6.21	1.92	22.21	Mnh2
JALESWAR	52.48	1.58	0.00	2.59	3.69	0.88	15.2	4.50	19.07	CA1
JATANI	7.34	0.95	0.11	1.41	7.78	2.77	21.1	40.1	18.31	Tsc6
JEYPUR	4.86	6.49	0.50	1.48	11.1	5.38	26.3	9.52	34.30	Tc1
JHARSUGUDA	14.63	1.50	0.73	1.63	19.6	1.07	20.1	13.7	26.96	Tsc1
JODA	3.86	2.16	18.03	1.41	18.0	3.79	11.2	11.7	29.80	Mq1,Tsc1
JUNAGARH	48.20	2.65	0.23	1.10	5.96	1.53	18.5	3.46	18.38	CA1
KAMAKSHYANA	44.34	5.11	0.08	3.05	2.64	1.55	15.2	2.91	25.04	CA2
KANTABANJI	9.55	1.82	0.37	3.59	11.5	1.94	30.0	18.2	22.99	Tc1,Tsc2
KANTILO	13.44	9.57	0.25	21.78	9.87	3.17	15.6	2.38	23.91	L1,Mh2
KARANJIA	26.69	3.70	0.20	5.45	6.32	2.87	22.6	5.89	26.24	D
KASHINAGARA	63.41	3.16	0.05	2.53	3.85	0.92	9.94	2.06	14.08	CA2
KAVISURJYANA	33.56	2.34	2.05	9.57	4.97	0.74	23.1	2.66	20.94	D
KENDRAPARA	14.64	2.92	0.06	1.81	11.4	3.49	27.0	7.59	30.96	Tc1
KENDUJHAR	25.43	5.01	0.91	3.73	6.34	2.51	15.8	6.03	34.22	D
KESINGA	40.33	2.34	0.02	1.04	8.17	1.24	21.0	7.36	18.43	CA1
KHALIKOTE	42.97	3.23	0.08	2.52	4.20	3.02	14.4	2.39	27.17	CA1
KHANDAPADA	37.54	3.25	0.26	5.03	5.24	2.25	14.8	2.41	29.16	D
KHARIAR	30.42	4.98	0.71	1.84	7.75	1.87	19.6	5.07	27.67	D
KHARIAR ROAD	26.11	1.39	0.11	0.57	13.6	3.95	26.0	6.90	21.35	Tc1
KHORDHA	14.10	4.50	0.31	3.54	20.0	3.60	20.0	6.69	27.13	D
KOCHINDA	41.05	4.14	0.14	2.76	4.47	0.98	14.9	2.52	28.99	CA1
KODALA	57.68	2.25	0.14	5.35	4.12	0.37	14.5	1.70	13.86	CA2
KONARK	41.55	23.85	0.07	1.11	2.19	0.73	13.3	1.84	15.33	CA1,L3
KORAPUT	15.14	6.25	0.16	1.30	3.09	3.60	11.9	9.82	48.71	O1
KOTPAD	28.81	4.80	0.00	4.05	8.92	2.05	21.6	1.77	27.95	D
MALKANGIRI	44.88	4.71	0.10	1.90	3.21	2.96	17.6	2.18	22.43	CA1
NABARANGAPU	12.46	4.37	0.09	1.99	12.8	2.56	26.4	5.53	33.65	Tc1
NALCO	0.95	0.63	0.07	0.13	66.4	9.47	4.28	2.34	15.66	Mnh3
NAYAGARH	8.19	5.71	0.40	1.28	5.71	1.39	23.9	4.50	48.83	O1
NILAGIRI	53.05	1.36	4.38	4.58	3.91	0.62	5.49	2.60	24.00	CA1
NIMAPADA	42.74	3.85	0.10	2.45	4.10	2.06	17.8	3.19	23.70	CA1
NUAPATNA	7.04	2.48	0.10	60.14	9.63	0.05	11.0	1.09	8.44	Mh9

PADAMPUR	31.28	0.32	0.05	8.88	2.57	0.48	17.9	2.47	35.98	D
PANPOSH	21.49	1.06	0.08	0.74	51.3	1.35	2.78	1.51	19.65	Mnh2
PARADIP	2.43	14.27	0.63	0.49	7.63	3.32	18.3	32.8	20.06	L2,Tsc4
PARADIP	0.00	0.13	0.00	0.00	48.3	12.9	5.42	24.9	8.32	Mnh2,C1,Ts
PARLAKHEMUN	13.44	4.08	0.03	4.30	8.62	3.94	25.8	7.33	32.42	Tc1
PATNAGARH	40.37	3.33	0.31	4.75	7.25	1.89	16.8	3.33	21.98	CA1
PATTAMUNDAI	44.45	2.78	0.14	2.92	4.72	2.53	17.2	6.35	18.83	CA1
PHULABANI	14.54	6.95	0.14	1.17	6.02	3.67	17.1	5.40	44.98	O1
PIPILI	43.18	2.79	0.00	5.02	9.68	1.40	17.5	4.22	16.13	CA1
POLASARA	54.54	3.93	0.67	5.67	3.80	0.80	14.4	1.94	14.23	CA1
PURI	2.06	6.09	0.05	2.96	5.39	2.31	32.7	9.58	38.82	Tc2,O1
PURUSOTTAMPU	49.01	2.76	0.13	0.81	6.32	1.39	17.7	2.64	19.16	CA1
RAIRANGPUR	21.98	4.98	0.15	1.30	7.08	3.80	27.4	6.75	26.46	Tc1
RAJAGANGAPUR	7.74	1.15	0.22	1.79	33.6	2.72	18.0	5.09	29.59	Mnh1
RAMBHA	32.93	12.66	0.20	3.77	6.35	1.70	21.4	3.57	17.37	L1
RAURKELA	3.21	1.80	0.18	0.91	23.5	5.58	23.5	18.2	23.05	Tsc2
RAURKELA STEEL TOWNSHIP	2.65	1.39	0.15	0.98	52.2 9	3.50	10.4 7	5.73	22.83	Mnh2
RAYAGADA	23.41	2.79	0.10	1.75	13.5	3.04	17.3	12.5	25.44	Tsc1
RENGALI	1.38	2.78	0.03	0.30	0.84	75.4	8.49	0.81	9.92	C10
SAMBALPUR	8.89	3.37	0.38	4.01	15.8	3.57	21.7	10.9	31.31	D
SONAPUR	5.89	5.33	0.16	9.36	26.3	2.55	15.9	4.16	30.24	D
SORO	40.59	1.78	0.12	2.95	7.30	1.57	18.9	7.40	19.38	CA1
SUNABEDA	27.41	3.61	0.53	0.53	34.0	4.85	9.40	1.71	17.92	Mnh1
SUNDARGARH	13.08	3.95	0.21	3.23	5.21	2.94	16.8	3.86	50.64	O2
SURADA	12.99	13.72	0.15	5.24	5.59	2.78	24.2	5.03	30.30	L1,Tc1
T.T.P.S.TOWNSHI	0.99	0.19	0.99	0.19	2.22	18.3	4.53	1.46	71.07	C2,O3
TALCHER	10.00	2.74	17.28	2.36	8.51	3.59	19.3	5.60	30.59	Mq1
TARBHA	29.46	1.91	0.04	9.13	9.63	1.24	22.7	4.90	20.95	D
TENSA	0.36	0.36	45.31	0.63	26.0	0.27	5.72	1.88	19.48	Mq3
TITLAGARH	17.30	2.21	0.11	1.55	9.75	2.76	25.3	11.0	29.93	Tc1
UDALA	28.78	4.10	0.09	8.21	4.34	2.56	17.6	2.42	31.90	D
UMARKOTE	48.17	2.58	0.00	2.83	4.46	1.36	18.8	2.51	19.29	CA1