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List of Abbreviations

A.D.	Anno Domini
ACA	Additional Central Assistance
ADB	Asian Development Bank
ARC	Aviation Research Centre
ASI	Archeological Survey of India
ASP	Activated sludge process
ATM	Automated Teller Machine
ATO	Approved Tourism Operators
BCUC	Bhubaneswar – Cuttack Urban Complex
BDA	Bhubaneswar Development Authority
BDPA	Bhubaneswar Development Plan Area
BHK	Bedroom Hall Kitchen
BID	Business Improvement District
BIS	Bureau of Indian Standards
BMW	Bio-Medical Wastes
BNR	Bengal Nagpur Railway
BOD	Bio-chemical Oxygen Demand
BOLT	Built-Operate–Lease-Transfer
BOO	Built-Operate-Own
BOT	Built-Operate–Transfer
BPL	Below Poverty Line
BSY	Balika Samrudhi Yojana
CAA	Constitutional Amendment Act
CBD	Central Business District
CBO's	Community Based Organisation
CDA	Cuttack Development Authority
CDP	Comprehensive Development Plan
CDPA	Cuttack Development Plan Area
CDS	City Development Strategy
CEO's	Chief Electoral Officer
CESU	Central Electricity Supply Utility
CFIC	Canadian Food Information Council
CIDCO	City and Industrial Development Corporation
CISF	Central Industrial Security Force
CMC	Cuttack Municipality Corporation
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CPHEEO	Central Public Health and Environmental Engineering Organisation
CPCB	Central Pollution Control Board

CREDAI	Confederation of Real Estate Developers in India
CRR	Cash Reserve Ratio
CRRI	Central Rice Research Institute
CWR	Clear Water Reservoirs
dB	deciBel
DDT	Di-chloro di-phenyl tri- chloro ethane
DFID	Department for International Development
DLC	District Level Committee
DO	Dissolved Oxygen
DPR	Detailed Project Report
DPS	Delhi Public School
DRDO	Defence Research and Development Organisation
DU	Dwelling Unit
DU/Acre	Dwelling Unit per Acre
EWS	Economically Weaker Section
FAR	Floor Area Ratio
FC	Fecal Coliform
FDI	Foreign Direct Investment
FSI	Floor Space Index
GDP	Gross Domestic Product
GIS	Geographic Information System
GOI	Government of India
ha	Hectare
HDFC	Housing Development Finance Corporation
hh	house hold
HHW	Household Hazardous Waste
HIG	High Income Group
HP	Horse Power
HRD	Human Resources Development
HUD	Housing and Urban Development
HUDCO	Housing And Urban Development Corporation Ltd
HCV	Housing Choice Voucher
IDBI	Industrial Development Bank of India Limited
IDCO	Orissa Industrial Infrastructure Development Corporation
IMFA	Indian Metals & Ferro Alloys
INR	INdian Rupee
INTACH	Indian National Trust for Art and Cultural Heritage
IOC	Indian Oil Corporation Ltd.

IPICOL	Industrial Investment Promotion Corporation of Orissa Limited
IRC	Indian Road Congress
ISO	International Organisation for Standardization
IT	Information Technology
ITES	Information Technology Enabled Services
JBIC	Japan Bank for International Cooperation
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
kg/ha	Kilogram per Hectare
km	Kilometres
KVA	Kilo Volt Ampere
LIC	Life Insurance Corporation
LIG	Low Income Group
LIHTC	Low Income Housing Tax Credit programme
lpcd	litres per capita daily
LPG	Liquefied Petroleum Gas
LRTS	Light Railway Transit System
LT	Low Tension
m³/d	Cubic metre per Diameter
mm	Millimetre
M	Municipality
MAV	Multi Axle Vehicle
MFE	Multi Factor Europe
MGD	Million Gallons per Day
MIG	Medium Income Group
MIS	Main Interconnected System
MLD	Million Litres per Day
MNES	Ministry of Non-conventional Energy sources
MRTS	Mass Rapid Transit System
MSK	Medvedev-Sponheuer-Karnik
MSL	Metre above Sea Level
MSW	Municipal Solid Waste
MT	Million Tonnes
MT/d	Million Tonnes/Day
MTS	Mass Transit System
MVA	Mega Volt Ampere
NAAQS	National Ambient Air Quality Standard
NABARD	National Bank for Agriculture and Rural Development
NAC	Neighbourhood Advisory Council
NaREDCo	National Real Estate Developers Consortium

NGO	Non Governmental Organisation
NH	National Highway
NHB	National Housing Bank
NOx	Nitrogen Oxide
NPK	Nitrogen -Phosphorus-Potassium
NSDP	National Slum Development Programme
NTPC	National Thermal Power Corporation
O&M	Operation and Maintenance
OAP	Old Age Pension
OAT	Open Air Theatre
OBC	Other Backward Classes
ODA	Official Development Authority
ODP	Orissa Disability Pension
OHPC	Orissa Hydro Power Corporation
OHR	Over Head Reservoirs
OPGC	Orissa Power Generation Corporation
ORSAC	Orissa Remote Sensing Application Center
OSDMA	Orissa State Disaster Mitigation Authority
OSHB	Orissa State Housing Board
OTM	Orissa Textile Mills
OWSSB	Orissa Water Supply and Sewerage Board
pH	power of Hydrogen
popn.	Population
pp/sq.km.	Population/ Square Kilometre
PCB	Polychlorinated biphenyls
PCU	Passenger Car Unit
PESA Act	Panchayat Extension to Schedule Areas Act
PET	Polyethylene Terephthalate
PGCIL	Power Grid Corporation of India Ltd
PHAs	Public Housing Agencies
PHEO	Public Health Engineering Office
PPP	Public-Private-Partnership
PRIs	Panchayati Raj Institutions
PTIN	Property Tax Index Number
PV	Passenger Vehicle
PVC	Poly Vinyl Chloride
PWD	Public Works Department
QOL	Quality Of Life
ROW	Right Of Way
RPM	Respirable Particulate Matter

sq.ft.	Square Feet
sq.kms	Square Kilometre
sq.m.	Square Metre
sq.m./hh	Square Metre per house hold
SC	Schedule Caste
SDD	Special Development Districts
SEZ	Special Economic Zone
SGOC	State Government Office Complex
SHG	Self-Help Groups
SHZ	Special Housing Zone
SJSRY	Swarna Jayanti Sahari Rojgar Yojana
SPARC	Spatial Planning & Analysis Research Centre Pvt. Ltd.
SPC	Special Purpose Company
SPM	Suspended Particulate Matter
SQ	Square
SRC	Special Residential Corridors
SRZ	Special Residential Zone
ST	Schedule Tribe
STC	Sewage Treatment Plant
STD	Subscriber Trunk Dial
STP	Sewage Treatment Plant
SW	Solid Waste
SWM	Solid Waste Management
SWOT	Strength/Weakness/Opportunities/Threat
SWTP	Solid Waste Treatment Plant
T/d	Tonnes per day
T&D	Transmission & Distribution
TDR	Transfer of Development Right
UDPFI	Urban Development Plans Formulation and Implementation
UIDSSMT	Urban Infrastructure Development Scheme for Small & Medium Towns
ULB	Urban Local Bodies
UNCHS	United Nations Centre for Human Settlements
UNICEF	United Nations Children's Fund
UASB	Up-flow Anaerobic Sludge Blanket
USAID	United States Agency for International Development
UTI	Unit Trust of India
VAMBAY	Valmiki AMBedkar Awas Yojana
WTE	Waste To Energy

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BHUBANESWAR

Dated.....



The urban agglomeration of Cuttack, with its ancient history and culturally rich background is now making a transition into an investment rich center. Several factors that have pushed the area into its present state of transformation mode includes the rise of new economic activities along with its strong traditional economic activities, the need of the people and the governing bodies to reach a global standard, a change into outlook of its people and progressive and easily adaptive government policies.


To streamline and coordinate the development of the area, a vision has been perceived which has its blue print in the Vision-2030, the Perspective Plan. It considers the entire Bhubaneswar, Cuttack Urban Complex along with its neighbouring town as a whole. It has recommendations that clearly fast forwards the development of the urban regional into a world class millennium city.

To shape the visions and aspirations into a reality, it is of utmost important to translate the policies of the perspective Plan into an area specific Comprehensive Development Plan. Comprehensive Development Plan is an important document that translates the planning decisions and policies into local level implementation strategies. Comprehensive Development Plan when published for public viewing also incorporates the needs and expectations of the public as well.

The preparation of the Comprehensive Development Plan for Cuttack was entrusted to the Indian Institute of Technology Kharagpur. It has gone through all the necessary public review and participatory planning.

The hubs of specialized activities proposed for Cuttack hold the key to a successful and integrated development. These hubs give the urban agglomeration its unique character. With the active participation of all the stakeholders and concerned Departments the Comprehensive Development Plan is expected to bring about a balanced and integrated development in the region, open up greater investment opportunities, provide scope for employment and raise the quality of life of the people of Cuttack. This is a statutory document and an important tool for historic development.

I compliment Prof. B K Sengupta and his team Members of Indian Institute of Technology, Kharagpur, the Housing and Urban Development Department, Government of Orissa, the functionaries of Cuttack Development Authority, mayors and Chairpersons of Local Bodies and the citizens of this region for the completion of the Comprehensive Development Plan for Cuttack Development Plan Area for the successful realization of the Vision-2030.


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Historically urbanisation and economic growth have been seen to go hand in hand. With the current sustained economic growth in Orissa, especially over the past decade Cuttack too has seen rapid growth, in this period. Going forward the challenge is to harmoniously plan the future city with the rich heritage of this millennium old city.

To bring about an organized development of the entire area in the Bhubaneswar-Cuttack Urban Complex, the Government of Orissa entrusted the job of preparation of the Perspective Plan (Vision-2030) and the Comprehensive Development Plans for Bhubaneswar and Cuttack to IIT, Kharagpur. The Comprehensive Development Plan has been prepared by using GIS & Remote Sensing Technology and based on satellite imageries.

The Draft Comprehensive Development Plan for Cuttack was prepared in conformity with the statutory provisions of the Orissa Development Authority Act 1982 and was presented before all the stakeholders. Objections & suggestions thereby received were duly considered by the Board of Enquiry & submitted to the IIT, Kharagpur for necessary incorporation and to ultimately generate a pragmatic proposal for the "Final Comprehensive Development Plan" for the Cuttack Development Plan Area.

The development proposals in the comprehensive Development Plan for the Cuttack Development Plan Area will help open up various avenues of development, fulfill the aspirations of the people of the area and bring about a balanced and integrated growth of the entire region.

I compliment Prof. B.K. Sengupta and his team members of Indian Institute of Technology, Kharagpur, the functionaries of Cuttack Development Authority, Cuttack Municipal Corporation, Chaudwar Municipality and the citizens of this region for the completion of the Comprehensive Development Plan for Cuttack Development Plan Area for the successful realization of the Vision 2030.

Saurabh Garg
 (Saurabh Garg)

Preface

All settlements require a vision which can stir the imagination and motivate all segments of society to a greater effort. Cuttack Development Plan Area, with its natural resource endowments, emerging real estate business environment, cultural and built heritage, and above all proactive government policies must leap forward towards growth and development. It is essential to build consensus on a broad development strategy which encompasses, inter-alia, the roles and responsibilities of different agencies in the economy such as central, state and local government, the private corporate sector, people's organisations etc. It is clear, therefore, that to meet these objectives, already prepared vision plan for the State Capital Region provides an excellent background material to specify development at different levels.

It is heartening that planned development and the role of planners are increasingly being recognized in our country. The Department of Architecture and Planning, IIT Kharagpur, was assigned the task of preparing Vision-2030 for the Bhubaneswar Cuttack Urban Complex, as well as the preparation of the Comprehensive Development Plans for the Bhubaneswar and Cuttack Development Plan Areas. The consultant group examined many important issues, but to transform this area to a world class city region, the planning area needs to make a quantum leap on two major fronts: economic growth and quality of life.

To back these aspirations, however, a more streamlined and integrated developmental plan is essential as planning decisions and policies till now are more towards sectoral and local level solutions by various agencies like CMC and CDA for the Cuttack region or the BDA and BMC for the Bhubaneswar region.

Cuttack Development Plan Area (CDPA), with its current population of about 8.27 lakh (2008) and covering an area of 302.17 sq.kms. forms part of the Bhubaneswar–Cuttack Urban Complex (BCUC) having a total current population of about 19 lakh (2008), and stretching over 721.9 sq.kms. The CDPA, having 156 Mouzas is comprised of Cuttack Municipal Corporation, Choudwar Municipality and its adjoining 60 rural Mouzas.

The sequence of planning process has followed the preparation of

- (i) Socio Economic Survey Report for BCUC*
- (ii) Status Report: Perspective Plan for BCUC, November, 2006*
- (iii) Perspective Plan for BCUC, September, 2007*
- (iv) Draft Comprehensive Development Plan for Bhubaneswar Development Plan Area, August, 2008*
- (v) Draft Comprehensive Development Plan for Cuttack Development Plan Area, February, 2009*
- (vi) Final Comprehensive Development Plan for Bhubaneswar Development Plan Area, January, 2010*
- (vii) Final Comprehensive Development Plan for Cuttack Development Plan Area, May, 2011*

The Comprehensive Development Plan has been prepared in the background of all such documents and went into translating their provision in the Comprehensive Development Plan.

At the outset, the historical growth and genesis of the Cuttack Development Plan Area, along with its surrounding areas, were analysed. The trends were established with a critical evaluation of the ones that need to be pursued, and the ones that need to be altered. An overall vision for the region was next framed, keeping in mind that it must be contiguous with the strategies to be proposed for its twin/sister city, Bhubaneswar, which together form the entire Bhubaneswar-Cuttack Urban Complex.

Based on the systematic studies into various sectors of development, a spatial framework of growing settlement pattern has emerged, earmarking 11 Planning Zones for the Cuttack Development Plan Area. This document outlines holistic development proposals and guidelines for transportation, housing, physical infrastructure, social facilities, tourism, heritage and conservation, environment and also development management and finance for the CDPA.

The entire exercise has stressed the need for participatory planning and has been drawn giving due weightage to the priorities and aspirations of the stakeholders. With the active participation of all the concerned departments, the Comprehensive Development Plan, when implemented is expected to bring in balanced and holistic development in the region, open up major avenues of investment, trigger collateral growth, provide

opportunities of employment, raise the quality of life of the people and boost the image of the CDPA significantly. This can only be achieved through promotion of entrepreneurship and encouragement of innovations, leading to conscious social equity. There has to be improved infrastructure and services, shelter for all, health and hygiene, along with social amenities, encouraging development of the body and mind within an ecologically sustainable framework.

The Government and the Cuttack Development Authority has to fulfill the statutory obligation of holistic participation of one and all who matter in the development of the CDPA.

The Consultants would like to put on record that the entire exercise would not have been in its present form without the whole hearted support of functionaries of the Urban Development Dept., Govt. of Orissa, Cuttack Development Authority, Cuttack Municipal Corporation, Choudwar Municipality and all the concerned departments for collection of data and inputs from the experts, duly acknowledged elsewhere. We also recollect the excellent support extended by the Bhubaneswar Development Authority and the other constituent agencies of Bhubaneswar.

We deeply acknowledge the patronage and personal interest of Honorable Chief Minister of Orissa in the entire process of planning.

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Acknowledgement

The project team sincerely thanks the following organizations and persons, whose support and active cooperation have contributed towards the completion of the Final Proposal Report in its present form. The team also thanks all those who have contributed towards completion of this report directly or indirectly, whose names may not have been listed below.

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36. Orissa Space Application Centre (ORSAC)
37. Spatial Planning and Analysis Research Centre (SPARC)
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40. People of Orissa

INTRODUCTION

In the Perspective Plan, broad level strategies and policies on various aspects of urban development were provided. To translate these broad level strategies into implementable medium term planning proposals, Comprehensive Development Plans are formulated within the framework prescribed in the Perspective Plan document, conforming to the statutory requirements detailed out in 'The Orissa Development Authority Act, 1982', separately for Cuttack Development Plan Area (CDPA).

The main objectives of the CDP are:

- *To generate the up-to-date existing urban land use map of the area using revenue maps and recent period satellite imageries using GIS technology in 1:4000 scale.*
- *To formulate a meaningful physical development Plan to regulate and guide the urban growth in the region by 2030 A.D. in a planned and healthy manner as per the provisions indicated in ODA Act, 1982 and ODA Rule, 1983.*

The CDPA stands unique in the state of Orissa, as a major urban commercial complex and has always led the region as an economic exchange zone. Keeping this in mind, we have the following vision for the Cuttack Development Plan Area in its CDP:

- *Comprehensive Development Plan must capitalise on its unique setting as a hub of commercial activity as well as institutional functions like High Court, hospital, educational institutions along with modernization of industrial activities in and around Choudwar.*
- *Comprehensive Development Plan must show real commitment to providing equal opportunity to all its citizens and government partners to share in its livability.*
- *Comprehensive Development Plan must ensure that the CDPA continues to carefully preserve its historical heritage and its unique riverfront.*

The Purpose of CDP is also the basis for taking day to day decisions on land use conversion that follow an optimistic and hopeful long term vision. According to the Orissa Development Authority Act, 1982, the Comprehensive Development Plan shall define the various zones into which the land covered by the Comprehensive Development Plan may be divided for the purpose of development and indicate the manner in which the land in each zone is proposed to be used and the stages by which

any such development shall be carried out; and also serve as a basic pattern of framework within which the Zonal Development Plan of the various zones may be prepared.

The process of developing a CDP is an iteration of various steps starting with assessing the existing conditions, revising database, developing new vision, forming various management programmes, allocating budget and scheme implementation. All interested stakeholders have been involved to ensure incremental implementation of all the schemes for which the CDP addresses the following:

- *Demography*
- *Economy*
- *Traffic & Transportation*
- *Housing & Slums*
- *Physical Infrastructure*
- *Social Infrastructure*
- *Culture, Recreation and Tourism*
- *Heritage and Conservation*
- *Environment*
- *Development Management*

The formulation of the Comprehensive Development Plan for the development area under consideration has followed the six stages as stated below:

Stage-1: The Perspective Plan had delineated the CDPA into 11 planning zones. These 11 planning zones were then superimposed with the mouza boundaries and plot boundaries.

Stage-2: The study of existing land use of the 11 planning zones was carried out. This helped in the assessment of the type and quantum of the various central functions and land uses in the planning zones.

Stage-3: Subsequently identification of vacant land as well as plot wise ownership interpretation (Public & Private) of the planning zones was carried out.

Stage-4: The allocation of types, quantum and distribution of land uses and central functions was estimated in various planning zones as per the Perspective Plan.

Stage-5: Consisted of the implementation mechanism with respect to legal, administrative & financial aspects.

Stage-6: Prepared the future land use plan and their zone wise distribution.

STUDY AREA AND ITS CHARACTERISTICS

Cuttack Development Plan Area (CDPA) has been formed by a process of amalgamation and annexation of Cuttack Municipal Corporation, Choudwar Municipality and the CDPA Rural areas. The CDPA consists of 1 Municipal Corporation, namely Cuttack (48 wards) and the Choudwar Municipality (28 wards), besides 60 villages.

The maximum breadth from east to west is around 25 kms, while the maximum length from north to south is about 24 kms. The area is bounded by part of Tangi-Choudwar block on the north; Bhubaneswar block on the South; Athagarh and Dampara block on the west and Salepur and Cuttack Sadar block on the east. The Central area includes Old Cuttack bracketed between Kathajodi River towards its west & south and the Mahanadi River towards its east and north

Cuttack city is saucer-shaped in its geographical formation. In earlier times there were many ponds which use to retain & moderate storm water runoff into the drain. These ponds were eventually filled and became low lying areas with little scope for natural drainage.

The planning area experiences a hot and humid climate in summer, a dry and cold climate in winter, with the most ideal climate experienced between mid-January to mid-March. The annual average rainfall varies from 1557.20 mm over the planning area. During the south-west monsoon, the average wind speed is 15 kms per hour and it drops to only 5-10 kms per hour in October.

Different types of soil are observed in different topographical, hydrological as well as geological condition within the CDPA. The area near Kathajodi-Mahanadi flood plain is mostly alluvial in nature and unsuitable for large construction. The North western part of the Cuttack planning zone contains laterite soil, which is not very suitable for agriculture.

The river system in CDPA includes the Mahanadi, Kathajodi, Kuakhai and Birupa rivers. The Taldanda Canal and Puri Main Canal have been formed out of Mahanadi whereas, the Kendrapada Main Canal and

Pattamundai Main Canal from the Birupa River. Many natural drains in the area have now been converted to Nullahs.

Major findings of the Socio-Economic Survey (2006) are:

- 1. Majority of families in CDPA belong to joint family category (40%).*
- 2. Around 95% of households are Oriya speaking.*
- 3. Around 96% of the population is Hindu.*
- 4. 57% belong to general category, 27% to OBC, 15% SC and 1% ST category.*
- 5. 34% of migration into CDPA is from within the state of Orissa, the rest accounting from neighboring states and some even from Nepal and Bangladesh.*
- 6. About 78% of the households own their residences, and a huge majority reside in single storied houses (73%). There are some 240 slum pockets in CDPA.*
- 7. The urban area is largely electrified (92% hh) while 76% of household in rural areas have electricity.*
- 8. Around 27% household have own water supply taps.*
- 9. 8% areas of CDPA are covered by sewerage connection.*
- 10. Average sex ratio in CDPA is 902.*

The above findings indicate that the people of Cuttack are culturally rooted with the soil.

The slope of land is mostly away from the river making the natural drainage difficult. An overview of the region depicts that the utilization of planned infrastructure is pretty high in Cuttack compared to Choudwar municipality area. The population density in Cuttack city is very high and largely the planning area is rural in character.

The Cuttack Municipality was created in 1874. The city has passed through various stages of growth, from unorganized sector to the development in organized sector (1956-76) thereby reaching the present day development of vast urban agglomeration. Choudwar is the Industrial Hub-cum-Tehsil Headquarter. The main functions of the town are industrial, transport, communication, trade & commerce. It has enough scope for growth of other Governmental, Commercial, Institutional activities.

The two important life-lines of eastern India namely East-Coast Railway and National Highway No.5, connecting Kolkata directly with Chennai, pass through this region. The National Highway No.42 starting from NH-5 at Choudwar, is connecting this region with minerally rich and industrially advanced northern districts. The region is connected with Paradeep by rail, road and canal. Talcher is also connected by rail.

Joint families are predominant in the CDPA in general and CMC in particular. A floor space per persons in CDPA lies in the range of 100-200 Sq ft. It is expected that in the plan period, multi-storied apartment and condominium will have significant rate of growth in the CDPA area.

The present infrastructure facilities for water supply demand augmentation. Cuttack suffers badly from water logging due to the high flood and tide levels in the rivers. Cuttack's drainage, which includes wastewater transport and disposal, is entirely by open drains. It is felt that, though the city is growing at a rapid pace, the systems of sanitation and drainage are unable to keep pace with it. CDPA desperately is in need of a systematic solid waste collection and treatment system.

In spite of having a high literacy rate there exist a lot of disparity in terms of social infrastructure among the various constituent units of settlement in the CDPA region.

Some of the recreational areas of Cuttack are Naraj scenic spot, Deer Park, Barabati fort and stadium, Netaji birthplace museum, Gouri Sankar Park etc.

CDPA is endowed with varied historical and cultural resources from different historical periods.

LAND USE AND LAND OWNERSHIP

Cuttack, along with Bhubaneswar has been developed based on the Master Plan/ Interim Development Plan/ Comprehensive Development Plan for dynamic growth of economy, increased production of goods and services, etc.

Almost 58% of total land area 30217.34ha is found to be available for extensive development. Agriculture dominates the land use of the entire CDPA by 22%. A lot of wasteland, 19% is observed, followed by 18% of vegetation/forest land. Water bodies, i.e. the Mahanadi and the Kathajodi are a major chunk of CDPA, 13%. 10% of the land use is residential, with Old Cuttack, Sikharpur and Bidanasi being the most densely populated

Planning zones. Zone wise land use distribution exhibit varied concentration of land uses.

While preparing the Comprehensive Development Plan, it is necessary to gather information of plot wise land ownership. In CDPA, there are 156 revenue villages, and the plot by plot Ownership of the land, of all those villages has been categorized into five different Ownership groups. The followings are the five different ownership categories:

- 1. Government Land*
- 2. Temple/ Trustee*
- 3. Government Reserved*
- 4. Government forest*
- 5. Private*

The compilation of the ownership datas and their analysis is also summarized. It is very interesting to observe that there is almost equal distribution of ownership between public and privately owned land. This implies that renewal, re-development should start as a joint venture in near future to cater to all sorts of development.

CONCEPTUAL PLAN

The Comprehensive Development Plan of CDPA is based on a vision. It is a vision to create a world class cultural city that will not only have high end activities and centres of excellence but also a distinct identity based on it's rich cultural background and natural resources. It is also an area undergoing transformation to meet the demands of the future population and new upcoming activities. Hence the spatial distribution of the central functions has been done after analyzing the various complex parameters such as the morphology, connectivity, development potential of the region, the existing land use characteristics and the historical and cultural background of the CDPA region.

With an objective of achieving a balanced and integrated growth within the CDPA region, the Comprehensive Development Plan thus evolved gives rise to a unique concept of 8 major activity centres located within the CDPA that serve not only the CDPA, but the entire BCUC. Different functional hubs have also been identified to be located throughout the Northern Fringe, Central Millennium City and the Southern Fringe of the CDPA. The CDP has been framed with a focus on the following:

- i. *Creation of a well built North-South, as well as, East-West connection in the entire length and width of the CDPA on one hand and linking it to the rest of the BCUC on the other.*
- ii. *Emphasis on the augmentation of the existing physical links and their utilization up to the optimum levels.*
- iii. *Conservation of the natural, cultural and built heritage with emphasis on revitalisation.*
- iv. *A boost to economic development of the region has been given by enhancing the economic potential of the region through appropriate allocation of land uses and formation of policy guidelines to achieve the same.*

DEMOGRAPHIC & ECONOMIC PERSPECTIVE

CDPA, essentially being a developable capital region, the proper approach would be population allocation rather than population projection. Since different urban and rural centers within CDPA have been observed to have grown in different proportions, the trends have been examined and a set of anticipated populations for the newly developed areas for the future have been fixed up.

After careful investigation into all types of statistical projections using various methods, the estimated population in 2030 will be around 11,15,000; 1,25,000 and 2,60,000 (approx.) in Cuttack Municipal Corporation (CMC), Choudwar Municipality and CDPA Rural respectively.

Cuttack, thus, has all along been enjoying the unique privilege of being the administrative, cultural and commercial nerve center of Orissa. With the inception of modern communication facilities, the people of Cuttack have become even more progressive in their outlook. And, in today's context, it is expected that the CDPA region would be experiencing a paradigm shift in its economic activity and real estate scenario.

Significant changes have taken place in the urban economy which was once the administrative, cultural and business capital of the state. Though it still retains a strong business base, there is no doubt that its economic primacy in the state region has declined. On the other hand, rural parts have been predominantly agrarian – based on agriculture, animal husbandry and livestock farming.

The relative share of primary sector activities within the local economy in terms of employment and income is expected to come down - with

greater dependence on secondary and tertiary sector activities. Large scale conversion of land and change in work force absorption in high-wage non-primary activities will be the key reason for this structural transformation.

Economic activities proposed for future are therefore more complimentary in nature rather than competitive with Bhubaneswar – as both of these local economies are anticipated to act in synergy towards the unified goal of economic upliftment in the entire Bhubaneswar-Cuttack Urban Complex.

TRAFFIC AND TRANSPORTATION

Traffic and Transportation is one of the key factors which have dictated the urban structure of Cuttack, especially its intra-urban road network.

Excessive reliance on private transit options, especially two-wheelers has been observed for intra-urban travel which will further aggravate the traffic problems in future. This not only stresses the capacity of the already congested road network, but also compounds the parking problems. Further, a huge volume of regional traffic passes through the Cuttack town which leads to significant conflict between slow moving and fast moving vehicles not only slowing the movement along the regional corridors, but also increasing the accident risks.

Planning for mass transit facilities is the key step toward addressing these issues and correct the existing distortion in the urban transit sector.

Road based mass transit technologies have been recommended – particularly where adequate road space is available. However, within the Cuttack city, elevated alignment seems to be the only solution.

In case the elevated mass transit alignment across congested urban core cannot be implemented, high capacity road-based bus transit system is recommended as a feasible public transit alternative.

The existing transit terminal facilities (both rail and bus) are inadequate to cater to the present and anticipated demands. Within Cuttack, relocation of the existing regional bus terminal facilities from Badambadi has been proposed at Bidanasi.

Lack of adequate connectivity exists between some parts of the CDPA, like more all-weather roads to Choudwar and Charbatia, and the rural CDPA with the Cuttack town. The proposed road structure with hierarchy of roads has aimed at providing connectivity to the existing as well as the

future growth nodes. Two bypasses and new ring roads have also been proposed to reduce interference between regional and mixed traffic.

The traffic volume within the Cuttack town is growing at a rapid rate, evident from the growing congestion in many intersections and links. A detailed prescription for intersection traffic management measures as well as improvement of pedestrian and cyclist facilities has been recommended to increase the mobility and reduce the accident risk.

Goods transshipment facilities have been proposed at strategic locations along the bypasses and ring roads to improve the freight handling and storage functions within CDPA. This will also reduce the interference caused by the goods vehicle movement, parking, loading/unloading on the passenger movement.

HOUSING

By 2030, 28% of the population of BCUC will be residing in the Cuttack Development Plan Area (CDPA). The projected housing requirement for the BCUC by 2030 was computed to be 7,00,000 dwelling units in the Perspective Plan Vision 2030, while the housing requirement of CDPA is compounded to be 2,68,000 dwelling units(DU)s for the same period. This implies that about 38% of the future housing requirement for BCUC will be in the CDPA alone. This calls for careful planning and strategizing.

Trend analyses show that in the CDPA area as a whole, nuclear families form the largest component (48.49%) followed by joint (31.38%) and extended families (16.80%). In Choudwar municipality, extended and joint families are significant in number. It is expected that the CDPA will continue to see the growth of extended and nuclear families. An increased demand for rental housing in this area is thus envisaged. The CDP assumes new roles for the CDPA rural areas. This will see significant increase of pucca house construction. A sizable number of kutcha and semi-pucca will filter upwards, while new pucca construction will far outweigh the kutcha construction. It is anticipated that the CDPA will generate a significant demand for housing in the 750-1200 sq ft range. Overall, 77% of the households own their houses and only 15% live in rented accommodation. About 30 % of the households in stratum 10 live in office accommodation. This trend is likely to grow further with a larger share of institutional housing and rented accommodation. There will be significant growth of group housing, especially in the Nirgundi, Gopalpur, Barang and Bidanasi areas. Plotted development will pre-

dominate in areas like Nimapur, Sikharpur, Choudwar and Bidanasi. The plan period envisages larger roles for private sectors and the PPP model. The Government will continue to provide serviced land and provide finance under attractive schemes and focus less on building activity.

Future housing requirement in CDPA: The current housing backlog is 67,498 DUs which has been calculated by extrapolating the backlog trends of 1981-1991 with suitable adjustments. The qualitative housing shortage is 57890 DUs which has been computed from the slum population and the households occupying dilapidated houses as per the Socio-Economic Survey. The future housing requirement due to new household formation is 143371.

The total housing requirement for CDPA is thus the summation of the following:

$$\begin{aligned} & \text{Future housing requirement (143371)} \\ & + \text{existing housing backlog (67498)} \\ & + \text{obsolescence (dilapidated) (57890)} \\ & = 2,68,759 \text{ dwelling units (nearly 2,70,000 DUs.)} \end{aligned}$$

Distribution of income groups: This has been done keeping the current trend in mind and with the assumption that there will be significant improvement in the quality of life and income of the households. The HIG share is likely to rise from the present 16% to 30% and a significant proportion of households of the current MIG will enter this bracket of HIG. Thus the present share of 57% under MIG is likely to become 45%. The EWS will reduce from the present 8% to 5% and this will see an increase in the LIG category.

Land Requirement: The 11 Planning Zones have been classified into 4 major types namely, Intensive, Extensive, Sensitive and Restricted Development Zones. The maximum population that can be allotted to a specific Planning Zone is found by multiplying the maximum permissible density (persons/sq. km) of each Planning Zone with the area of the Planning Zone.

The total additional area required for the future population to be accommodated is computed to be 5560 acres.

Cost of Development: The principle of cross subsidization will be applied for pricing of land to bring it within the affordable limits of the EWS and LIG. The land acquisition cost per acre considering the prevailing market

conditions, varies in the different planning zones. The following assumptions have been made:

Average cost of development for the CDPA is as follows:

Acquisition Cost = Rs.76 lakhs/acre

Land Development Cost = Rs.10 lakhs /acre

Total Cost of Development = Rs.86 lakhs/acre

Housing Strategy: The existing population of CDPA of around 8.27 lakh will reach 15 lakh by the period 2030. This will mean an addition of around 6.73 lakh people. With an average household size of 4.5, this implies an addition of 1.5 lakh dwelling units. In addition, there is a current backlog of around 67,498 dwelling units. If the qualitative shortage and obsolescence factors are added to that, the total housing requirement for CDPA in 2030 is around 2.68 lakh (nearly 2.70 lakh) dwelling units.

The housing strategy envisages:

- i. Re-densification of the planning units for compact growth.*
- ii. Development of new housing colonies and new townships in the extensive development zones which will include apartments and gated colonies, high-rise apartments in areas with relaxed height norms and increase FAR provision.*
- iii. Augmentation of the existing housing schemes that are indicating slow growth.*
- iv. Special Housing Zones and Redensification*

Slums: There are 240 slums in Cuttack, occupying 571.25 acres of land, 28129 numbers of household and a total of 178817 population. It is also reported that basic facilities are grossly absent in these slums; viz. toilet facilities (60%), electricity (40%) and education facilities (30%).

A multicriteria approach is required to arrive at the best-fit solution for the slum pockets.

Slum upgrading approaches will include:

- Settlement Reconstruction*
- Settlement Relocation*
- Slum Networking*
- VAMBAY*

The Policies and Programmes under housing strategy envisage to:

- i. Increase housing availability and affordability.*

- ii. *Increase land under gross residential area from the existing 9.92% to about 23% in CDPA.*
- iii. *Create 12000 EWS houses to rehabilitate about 45% of existing slum households.*
- iv. *Move to market-based auctions to choose the developer:*
- v. *Build about 5,000 additional low-income housing units by creating “Special Housing Zones” (SHZs) through targeted incentives in Sikharpur zone.*
- vi. *Upgrade other infrastructure at community, neighbourhood and city levels.*
- vii. *Re-densify the identified intensive development zones such as Sikharpur.*
- viii. *Develop new housing colonies and new townships in the extensive development zones in Barang, Gopalpur and Nirgundi. This will include apartments and gated colonies, high-rise apartments in areas with relaxed height norms and increased FAR provision.*
- ix. *Augment the existing housing schemes that are indicating slow growth like those at Bidanasi.*

PHYSICAL INFRASTRUCTURE

The availability of safe drinking water, adequate in quantity to the complete population can be rated as one of the most critical issues of CDPA. The water supply system should cover the present ‘uncovered areas’ to have 100% water supply distribution coverage, which may reduce the operation and maintenance cost. The system should provide a continuous 24 hr supply system with adequate pressure in the distribution system even at the tail ends.

The general characteristics of water are satisfying the requirements of potable water, in many areas of Cuttack. Existing water distribution pipes of Cuttack are inadequate and are not functioning satisfactorily, demanding urgent interventions. Pipes are incrustated due to high iron content in the water, and therefore, unable to carry adequate discharge flow rate. In many places the groundwater is reported saline with high total dissolved solids and iron. In rural areas of CDPA, there is no provision of safe drinking water supply through pipelines and majority of the population are forced to depend on ground water sources only. The expected water demand in CDPA in 2030 will be 300 MLD. The capacity of the existing water supply systems will be insufficient for supplying water to the public even for the urban areas of CMC, suggesting the need

for additional water supply to cater to the growing demand. There is an urgent need of master plan for water supply and its implementation. The tentative cost of proposed water supply system for CDPA is Rs.541 crores.

Though, the Cuttack city is surrounded by embankments, it suffers badly from water logging due to the high flood levels in the rivers during monsoon. Cuttack gets inundated during heavy down pours due to inadequate drainage systems. There are also a number of lower pockets in the city, from where storm water does not get evacuated through the existing (drainage) system. Cuttack's drainage, which includes wastewater transport and disposal, is entirely by open drains. The two main drainage channels are throttled at many locations due to narrow culverts. Though the Cuttack city is growing at a rapid pace, the systems of sanitation and drainage are unable to keep pace with it. It is also observed that the natural depressions and ponds, which were instrumental in preventing excess storm run-off, are getting filled up at a rapid rate due to urbanization. This may further aggravate the existing problems of water logging. The natural drains in most of the CDPA seem to be functioning like sewers. The lack of proper sanitation and solid waste management, combined with indiscriminate dumping of solid waste in the drains. The reported cases of flooding in many areas due to diminished carrying capacity of drains deserve attention. More emphasis is to be given in the management of drains which involves the prevention of flooding and illegal encroachments, periodic maintenance, and provisions of adequate lands for future reconstruction and augmentation activities. An organized drainage system is invariably associated with the implementation of a systematic solid waste and wastewater collection and treatment system. It is proposed that the existing drainage alignment within the urban area be made permanent and also the natural drainage system be improved. Hence, the CDPA demands a full fledged drainage system. The drainage facilities provided are very poor in Choudwar Municipality and Rural areas of CDPA. A master plan for the drainage of these areas has not yet been prepared. The implementation of a master drainage plan for these areas appears much essential. The tentative cost of the proposed drainage system of CDPA is around 380 crores.

There is no systematic sewerage system in the city, with the discharge of domestic waste through storm drains directed to the river. As a result, the quality of water in Mahanadi and Kathajodi rivers shows deterioration in quality. The level of infrastructure available for sanitation and drainage is

to be drastically modified for effective management. The implementation of a proper wastewater management system is necessary to treat the huge quantities of wastewater generation in future.

Since it is necessary to provide sewage treatment facilities for 240 MLD of wastewater, a decentralized wastewater treatment system would be more appropriate. The centralized sewage treatment system appears inappropriate as it may end up with very huge sizes of sewers and various issues of conveyance in handling this huge quantity of wastewater. The possibilities of re-use of treated wastewater effluent for irrigation, gardening etc. should be looked into. The construction of treatment plants could be carried out in a phased manner on a modular/zonal basis in the planning area consistent with the future development/demand. The tentative cost of the proposed sewerage system of CDPA is around 687 crores.

The Cuttack city does not have an adequate garbage collection and disposal system. In general there is no systematic collection, segregation and disposal system for the solid waste generated in the city. The collection bins provided are ineffective in holding the huge amount of SW produced in the city daily and as a result, it is being dumped irregularly in many areas, open spaces, even in residential colonies, along highways, etc. Since Cuttack also does not have adequate land for waste disposal, 90% of the wastes are dumped in the river beds, low lying areas, and back yards of houses with only a very low percentage being taken to land fill sites.

It has been felt that the solid waste management in CDPA is not in tune with the rapid development of the area. The Municipal solid waste management remains a neglected area. The total solid waste generation expected in CDPA would be 750 MT/day as on 2030. It is always advisable to have decentralized compost plants for effective implementation and better efficiency and can be located as per local generation rates and availability of land. The situation demands a comprehensive and sustainable solid waste management strategy for effective implementation.

The Ministry of Environment and Forests issued the Bio-medical wastes (Management and Handling) Rules, 1998 which were amended subsequently. These rules provide for segregation, packaging, transportation, storage, treatment and disposal of wastes generated by hospitals, clinics and laboratories. Bio-medical wastes (BMW) have been classified into various categories. Even the biomedical wastes or

hazardous wastes collection and treatment are totally neglected. The present methods of open dumping, unsanitary land filling, and open incineration may enhance sub-soil and ground water pollution. It is advisable to have some hazardous/bio-medical facility for the entire CDPA. The Hazardous/Bio-medical wastes collected from spots can be stored in selective transfer stations and can be transported to this central treatment facility. The authorities can formulate an action plan for implementing this plant through some competent agencies and can be suitably charged for treatment and disposal of Hazardous/Bio-medical wastes.

The solid waste generation expected in CDPA is very high and providing compost treatment facilities for this huge quantum of waste, though essential, may not be practically possible in a single phase. The tentative cost for the proposed Solid Waste Management of CDPA is around 112 crores.

SOCIAL INFRASTRUCTURE

Social and community infrastructure and services are provided in response to the needs of communities. To ensure progress in promoting equality for all, it is essential to focus on the following aspects:

- *Providing basic human needs (including primary health care, basic education, power and telecommunication).*
- *Improving delivery of infrastructure services with emphasis on the poor and building their capacity for sustenance.*
- *Safe-guarding human rights and providing good governance.*
- *Seeking private sector participation in development of areas like tertiary education.*
- *Building a clean and healthy environment.*

In order to provide adequate educational facilities and infrastructure in all the zones, an assessment of the existing facilities has been done for the primary, secondary and specialised institutions in all the zones. It has been noticed that all the zones of CDPA, excluding Old Cuttack, will require additional educational facilities in primary and secondary level to provide for the future population.

To ensure the progress of any region, it is important that its citizens are healthy and have access to adequate health infrastructure. It has been noticed that, adequate health care facilities at primary level are available in all the zones of CDPA to cater to the present population. Also,

specialised hospitals to cater to the city and regional level populations already exist in the zones of Choudwar, Old Cuttack and Bidanasi. These health care facilities need to be augmented with increase in capacity and availability of trained man power. Additional hospital and health care facilities have been proposed in the new zones of Nirgundi, Nimapur, Mundali, Barang and Gopalpur to cater to the needs of the future population. The health infrastructure needs to be upgraded in the form of multi specialty hospitals, health complexes and also inviting the corporate sector to contribute to the development of this sector. Land allocations have been made for such specialised complexes in the newly developing zones of Barang and Nirgundi.

Other facilities which form an integral part of social infrastructure are Telecommunication, Financial Institutions, Postal Services, Fire Services, Recreation facilities, parks and playgrounds, etc.

Energy is the prime mover of economic growth and is vital to sustaining a modern economy and society. As per UDPFI Guidelines, based on the requirements of power supply, about 2 Kilo Volt Ampere (KVA) per household per day is required at the city level and includes domestic, commercial, industrial and other requirements. It is estimated that the total CDDA power demand would be about 670 MVA.

The capital investment requirements for the construction of various infrastructural facilities discussed here are based on ad hoc construction prices. The tentative cost estimate for educational facilities is rupees 148 crores; for health care facilities, rupees 330 crores, and for other infrastructures rupees 1842 crores.

CULTURE, RECREATION AND TOURISM

Community interest and enthusiasm may sometimes override economic realities while considering an area's tourism potential. Commercial issues related to tourism supply and demand, accessibility, financing options and environmental impact – all need to be taken into account along with community needs and available resources. Krippendorf (1987) developed a '**soft and humane tourism**' model which brings the greatest possible benefit to all the participants – the travellers, the host population and the tourism business without causing much ecological or social damage. **Balanced tourist development** has thus become a clear destination for the decision-makers. Tourism strategies today should always strengthen the following:

- *Decision-makers' supportive intervention*
- *Extensive citizen involvement*
- *Equity in participation*
- *Efficiency in achieving the goal*
- *Implementable projects*

Cuttack being one of the ancient towns of India and earlier capital of Orissa possesses unique development features which may be nourished in the mainframe of Context, Time and Technology. Excellent land-water interface, picturesque locales, rich historical landmarks, colourful festivals, traditional art and cultural ensemble – all make Cuttack Development Plan Area a strong magnet for tourist attraction. Every year lots of local, regional, national and international tourists arrive here to feel the vibrant culture of the place.

Existing scenario analyses reveal that the numbers of speciality resorts, quality tourists' accommodation are much less than the expected supply. Besides, road linkages, other facilities, safety and environmental concern are not well integrated towards tourists' convenience.

Planning for Cultural Development for CDPA, therefore, must be attended through the augmentation of traditional cultural facilities in distributed urban centres throughout the planning area, while also developing the manpower and skills of its rural population. Proposals such as the augmentation and development of Balijatra Cultural Festival ground at Cuttack with infrastructural development for round the year activities, Centre for Development of Ghora Naach (horse dance) and handicrafts at Choudwar for artisan skill development and tourism promotion, etc. will go a long way in preserving and propagating the rich cultural heritage of the region. Religious fair and festival grounds integrating famous Astha Shambhu (Eight Shiva) Temples in Choudwar, including scenic spot development, traditional mason training centre for stone art work for generating artistic interest are also envisaged.

Proposals for the augmentation of outdoor recreational facilities, such as creation of Urban Parkway System along Taldanda Canal with landscape continuity and hierarchy of various parks with defined uses at Cuttack are also suggested for the overall beautification of the cityscape. Development of green belts, plantations, parks, ghats, plazas along the riverfront abreast the Urban set up can also invite nature in the built environment through myriad ways. Further, Development of Barabati Fort Tourist Complex with museum / recreational area development, Barabati Haat and Balijatra Fair ground must be undertaken. The tip of landmass

at Bidanasi - Naraj Barrage, Cuttack can also be developed as a picnic spot with water based sports and recreation spaces etc. Also, 'Utkal Ratna Bhumi'- an area for the memorials of the great laureates of Orissa can be earmarked as a memoir de cite on the banks of the river Mahanadi. Choudwar Fort / Uttareswar Temple / Buddhalinga Temple (Tank) Complex and large tanks like Raja and Rani Pokhari may be developed with landscaping and environmental lighting with tourist day service facilities highlighting benefits of water bodies in habitat. Amusement Parks can also be developed in Chhatisa zone along with horticulture, pisciculture, herbal parks, etc. Further, a world class cultural hub - 'Kataka Kala Kosh' – a centre for performing art, entertainment plazas, media complexes, convention centres, multiplexes and high-end recreation, is proposed in the Gopalpur zone.

There is a scope for Religious Tourism with historically important temples and other outdoor worshipping areas in the Old Cuttack zone, Charbatia and Choudwar and other areas in the vicinity. Cultural and Heritage Tourism with annual / seasonal traditional village fairs and festivals, folk or tribal socio-cultural events with arts, crafts, music, dance etc, can be promoted in the region. Nature based outdoor recreation and Eco-tourism for hills, forest, riverfront / vast agricultural area/ village settlements with undulating landforms including picnic spots, sightseeing, camping sites, etc. is also possible. To this end, the development of eco-tourism with provision of water theme parks, lagoon resorts, weekend resorts and world class recreation centres such as club towns, golf clubs, spa resorts, etc. has been proposed for the Mundali planning zone. Presence of all these tourism products also calls for the growth of Adventure Tourism.

Since CDPA is surrounded by many places of tourist importance which can be covered in a one day trip, theme based Tourist Travel Circuits, that will result in not only the growth of commercial and recreational amenities, but also help in generating employment and improving the socio-economic condition of local people have been proposed. Main tourist travel circuits for CDPA and its vicinity can be categorized as either the Regional Circuits or the Day Travel Circuits.

The culture, recreation and tourism potential in various planning zones of the CDPA have thus been explored and proposed in a manner that will not only raise the potential of the region but also the economy on the whole.

The success of tourism planning depends on the service quality characteristics as described in the following:

- a) *Tangibles - attractive physical environment*
- b) *Reliability – Maintaining an enticed, clean and family-friendly set up.*
- c) *Responsiveness – catering to various customer service demands.*
- d) *Communication – Easy information for tourists – both, in advance or instantaneous.*
- e) *Credibility – Conservative and methodical approach that builds its legacy.*
- f) *Security – Safe experience and security support for tourists.*
- g) *Competence – Training of hospitality staff towards tourist care.*
- h) *Understanding – Extensive customer research and feedbacks.*
- i) *Access – Multimodal accessibility.*

New standards for tourism development have to be introduced with contextual frame in mind but with international perspective. Cuttack's rich cultural heritage has to be presented in a new appropriate tourist package embracing both co-cultural feeders and contemporary leisure standards.

HERITAGE AND CONSERVATION

The Cuttack Development Plan Area is endowed with varied historical and cultural resources from different historical periods. The Barabati Fort in Cuttack as well as numerous social and educational institutions of repute indicates a rich and diverse cultural heritage of the Cuttack city and its surrounding region. Cuttack has a rich tradition of intangible heritage. Traditional crafts and art form like filigree, textile, horn and brass work, Ghora Naach – a folk dance form, festivals like Balijatra have much potential. There were drama and Yatra groups which have lost their popularity. A distinctive feature of Cuttack is the Cantonment area with majestic colonial structures – churches, schools, bungalows from the colonial period located in a quiet green area along the riverfront.

Also important is a unique natural resource of long stretches of river fronts that are intricately related with rich traditions and cultural heritage of CDPA. The river fronts along with the cultural sites and built heritage offer an enormous potential for exclusive river front development to cater to local people as well as tourists and visitors.

All these heritage sites have immense historical and cultural values. Only a very few monuments and structures within CDPA region are protected

by ASI and State Archeology. Most are unlisted. Many structures, especially institutional and religious structures continue to be in active use and are taken care of by government organizations or private bodies. However, unsympathetic treatment and ad hoc modification often pose a serious problem. In absence of a systematic inventory and formal / legal tools to preserve living heritage, quite a few heritage structures have been demolished. In recent time, many old buildings - schools and churches have been demolished to give place to new structures.

Of the innumerable historical structures and cultural precincts, areas of cultural and natural significance, some areas and specific stretches of river front emerge as most outstanding and deserve special attention. Zone 2:Choudwar Fort, Zone 7:Barabati Fort, Cantonment Area, Judiciary Complex. These areas have been proposed as Special Heritage Zones.

Specific stretches of river front are delineated as special development areas. Activities proposed are city level open spaces, parks, fair ground, recreational areas, cultural complex, commercial development, institutional areas, resorts, hotels and residential complex. Specific urban design guidelines need to be formulated to develop the river banks into attractive zones.

The traditional crafts and art form such as filigree, textile, horn and brass work, Ghora Naach – a folk dance form, festivals like Balijatra, performing arts and theatre groups can be projected at national and international forums. An area in Bidanasi near Barabati Fort has been earmarked for Craft village as well as a Centre for promotion of filgree works at an international level.

To conserve the natural, built and cultural heritage resources of CDPA, focus should be on redevelopment and rejuvenation of the heritage resources in a holistic manner. CDPA is languishing behind the emerging eminence of Bhubaneswar as the major capital complex. Conservation and development policies must be geared towards reversal of this trend. CDPA, with its invaluable cultural and natural heritage resources, must develop a unique identity that complements BDPA in its path of future development.

ENVIRONMENT & DISASTER

The high concentrations of many air pollutants, mainly the Suspended Particulate Matter (SPM), deteriorate the quality of air environment in

Cuttack. It was reported that SPM concentrations in general are exceeding the prescribed standard limits. The Respirable Particulate Matter (RPM) concentrations at many places like Badambadi Chhak and Kanika Chhak exceeds the standard limits. It was reported that the vehicular front is the major contributor to the air pollution scenario. The noise levels in most of the areas are generally high indicating a noisy environment.

In general, the characteristics of ground water confirms to moderate quality. But the presence of iron and Coliforms are reported above permissible limit in many of the open and tube wells.

The quality of human life in the study area is impacted by the quality of air they breathe, water they drink, and the environment they live in. It is important to have meaningful interactions between the public, industries and the authorities to provide sustainable alternatives to reduce the industrial pollution and provide a clean air environment for healthy habitations. The results of water quality analysis of drinking water sources reveal that both surface and ground water requires treatment before supply. The water quality in the rivers shows a decreasing trend with lower quality levels at some points. In general, care should be taken to see that the river is not polluted above its carrying capacity. The open defecation in the rural and semi-urban areas may contribute to the surface water or well water pollution. So, necessary steps may be initiated to construct low cost community latrines in these areas, especially in the slums, to solve these problems. The control on industrial pollution and conservation of water resources of the area are equally critical in imparting the desired quality to human life.

The Cuttack Development Plan Area has been prone to both natural and man-made disasters. Natural disaster like wind hazard is a regular feature although cyclones are less frequent. The CDPA is also vulnerable to earthquakes. It comes under Moderate Damage Risk Zone- MSK VII of Earthquake. Though most of the areas are protected with embankment, the CDPA also has threats of floods in some of the areas.

It is therefore necessary, to reduce the consequences of natural disasters through Planning and subsequently preparing a list of guidelines for the major urban communities so that the local capacity is strengthened and they are prepared to respond to natural disasters.

Some of the proposals for disaster mitigation are:

- Soil sensitive design,

- Reinforcing basements,
- Real-time information updates in GIS,
- Proper utilization of open spaces,
- Setting up of disaster resistant shelters,
- A thick plantation belt along river fronts,
- Flood plain management,
- Flood forecasting and Warning,
- Rainwater harvesting to be made mandatory,
- Buildings designed on stilts, and
- Mapping of yearly flood pattern

DEVELOPMENT MANAGEMENT AND FINANCE

Implementation of Perspective Plan for Cuttack Development Plan Area (CDPA) would entail establishment of new infrastructure and upgradation of existing ones. Projects that include new construction, as well as, major improvement of existing roads and interchanges, installation or replacement of infrastructure (water, sewer, storm drainage, electrical, telephone) networks, re-development of slum areas including construction of large number of residential units for the growing population, provision of new industrial sites, regional and local commercial complexes, transport terminals, entertainment complexes, tourism facilities, provision of open spaces and solid waste management, fire services etc, need to be implemented and then managed properly for delivering services to beneficiaries.

The plan proposals are statements of intention, or at best, a guiding framework which need to be translated into a set of implementable projects. Then, the projects need to be prioritised, suitably packaged and the phasing of implementation determined.

The concerned agencies in the Cuttack Development Plan Area (CDPA) include Cuttack Development Authority (CDA), Cuttack Municipal Corporation (CMC), Choudwar Municipality and CDA Rural i.e. Panchayat Samitis. Coordination among various agencies for providing infrastructure and services in the urban areas requires consideration on a priority basis. Execution has to be done in a planned and coordinated manner. There is an evident need to streamline the responsibility of the functions of the participating agencies. There is no single organisation or body really accountable for the entire BCUC area. Therefore, it is proposed to create a single body, i.e., BCUC Metro Authority

encompassing both BDA's and CDA's areas. The Chief Minister (CM) of Orissa should play the key role as chairman of the BCUC Metro Authority.

The Proposed CDP should look into:

- Redefining the role and responsibilities of BCUC
- The Municipalities and other urban areas must augment their status of Governance and strengthen capacity building.
- It is expected that some of the non-municipal areas will attain municipal status.
- It is further expected that proposed distribution of development will also suggest creation of new municipalities.

The principals of high impact governance have been prioritized to:

- Create the right structure
- Streamline key processes
- Increase dialogue with citizens
- Institute a report card system for all agencies

The proposed Land Use Policy has evolved adhering to the requirements of the planning area in favor of flexible land use, which reaps the synergies between workplace, residence and transportation as well as between complementary vocations. Ideally, land use should be responsive to the dynamics of market.

The contents or proposals of the Comprehensive Development Plan outlining the development of various areas suggested through Land Use Zoning or Development Promotion Guidelines serves as a legal instrument for planning and execution.

It may be noted that while adopting the land use classification, the three major norms were reviewed i.e.

1. BDA guidelines adopted for Comprehensive Development Plan for Bhubaneswar Development Authority (Planning and Building Standards) Regulations-2008
2. Cuttack Development Authority (Planning and Building Standards) Regulations-2010
3. Urban Development Plans Formulation and Implementation (UDPFI) guidelines

After review and evaluation of the 3 sets of norms, norms have been adopted, with minor changes in the classification.

Infrastructure financing requires long-term lending, whereas the normal borrowing in the Indian capital and debt market is short-term only. Financial Institutions would need a mix of resources and a balanced combination of lending portfolio constituting both long and short-term fund. Some of such suggested mechanisms are listed below.

- i. Consortium Finances
- ii. Development Authority Bond or Municipal Bond
- iii. Project Initialisation Fund / Project Development Fund
- iv. Foreign Direct Investment
- v. Leveraging Insurance Sector Funds
- vi. Special Economic Zone
- vii. Public Private Partnership
- viii. BCUC Capital Infrastructure Fund

It is proposed to create a dedicated BCUC capital infrastructure fund with an annual funding of Rs.1000 crores to attract debt and private finance. This could mobilise about Rs.20, 000 crores during the next 20 years, of which Rs.5000 will be made for CDPA.

Property tax, being the single largest source of revenue, adequate efforts needs to be provided on this score. Special Development Districts (SDD)s should be created to make major investments in infrastructure and services and formulate different Development Control Regulations. There should also be imposition of User Charges i.e., cost recovery through direct charges to beneficiaries.

FUTURE LANDUSE PROPOSAL AND ZONING REGULATIONS

The Comprehensive Development Plan provides strategic framework for land use planning in the Cuttack Development Plan Area (CDPA), for shaping its future towards Vision-2030. It sets out the spatial strategy for 11 planning sub-zones, as identified in the Perspective Plan to address the different needs of each area. The priority set out for each planning zone is based on and supported by the policies in this plan. The common aim is to actively manage changes within CDPA limit to deliver a better quality of life and environment.

The land use proposal assumed that all the planning zones will be self sufficient with all social and physical infrastructural facilities to serve the future population.

To promote a balanced and integrated growth, the entire CDPA has been divided into 3 portions:

- *The Northern Fringe,*
- *The Central Millennium City, and*
- *The Southern Fringe.*

The allocation of activities in space has led to the concept of specialised activity 'Hubs' in the various zones. The different 'Hubs' are spread out throughout the CDPA and they are representative of the specialised activities with respect to CDPA as well as the BCUC region.

It has been observed that while analyzing the innumerable complex variables involved in the dynamic process of urban development, a unique and interesting phenomenon has evolved which has been pragmatically and physically interpreted while allocating the different land uses in the various zones. Thus, 10 different use areas have been identified formulating the future spatial structures with concentration of urban activities such as the Public/semi-public Areas, Residential Areas, Institutional Areas, Commercial Areas, Industrial Areas, Transportation Areas, Special Areas, Recreational Areas, Eco-sensitive Areas and Riverfront Areas.

It is important to remember that the future spatial structure recommended here can be achieved, as visualized, and realised through the combined effort of the public authority as well as the private sector. Therefore efforts are made through this CDP for the CDPA to;

- i. Indicate the needed direction of development in different parts of the CDPA in context of the BCUC region.*
- ii. Indicate future areas of employment, housing, heritage and recreation.*
- iii. Indicate the pattern of the spatial structure plan and to realise the vision for Cuttack as a world class cultural and commercial center of the eastern region.*
- iv. Indicate the areas of investment and also the heritage and cultural values, thereby making CDPA a complete package for varied kinds of investments within the various planning zones.*
- v. Envisage an overall balanced and integrated development for CDPA, making it an integral part of the entire BCUC State Capital Region.*

A study of spatial distribution of the proposed Comprehensive Development Plan reveals specialised use in various zones. However, the proposed aggregate land use distribution of CDPA shows Residential land use as 25.01%, Commercial land use as 4.28%, Industrial land use as 5.47%, Public and Semi-Public land use as 10.26%, Utilities and Services land use as 1.06%, Recreational land use as 4.81%, Transportation land use as 11.6%, Agriculture and Forest land use as 4.00%, Water Bodies use as 27.77%, Special Heritage use as 2.12% and Environmentally Sensitive use as 3.61% of the total 302.17 sq. km of land area of CDPA.

To promote public health, safety and the general social welfare of the community, it is necessary to apply reasonable limitation on the use of land and buildings. This is to ensure that the most appropriate economical and healthy development of the city takes place in accordance with the land use plan. For this purpose, the City is divided into a number of Use Zones.

Various use zones namely Residential, Commercial, Industrial, Public and Semi-Public, Utilities and Services, Recreational, Transportation, Agricultural, Water bodies and Special Areas having their location as indicated in the Comprehensive Development Plan for Cuttack Development Planning Area (CDPA) shall be regulated and guided.

Besides the Activities Permitted for each of the 10 land use zones, it also contains the buildings/premises which could be allowed upto 30% of the area on an application to the Competent Authority, if such sites do not form a part of the plan. Such use/activity is termed as Permissible on Application to Competent Authority (with conditions/on special consideration). The uses/activities which are otherwise not allowed in a particular use zone are termed as Activities/Uses Prohibited.

The draft Comprehensive Development Plan shall be finalised through the following procedures.

- a) Feedback from the stakeholders
- b) Statutory obligation (i.e. publication and hearing of objections/suggestions)

Government will constitute a 'Board of Enquiry' to hear all the objections and suggestions. After considering all objections/suggestions that may have been received by the authority and after giving reasonable opportunity of being heard, to any person, including representatives of government department and authorities who have made requests of

being so heard, the authority shall finally prepare the Comprehensive Development Plan and submit to the state government for approval.

The 'Board of Enquiry' report will be submitted to the government for review and approval.

The regulations governing minimum size of plot, maximum plot coverage, minimum set backs on four sides of the buildings, minimum road widths, maximum number of floors and maximum height of structures that could be permitted in various zones are set out in Annexure-I appended to these regulations.

The CDPA is comprised of 156 villages. Zone wise village list is described in Annexure II. The village wise proposed maps will form part of the CDP and will be sequentially numbered zone wise.

INVESTMENT PLAN

Sectoral plans for Cuttack Development Plan Area (CDPA) give a rough estimate of investment to be undertaken. Although this is just an indicative investment plan, it would be imperative to find out sources of enhanced capital finances to be able to carry out the required investment. Sustenance of capital expenditure in terms of operation and maintenance of assets created becomes all the more important and this calls for looking at the recurrent revenue options.

Sector-wise investment plan for all the sectors covering traffic and transportation, housing, physical infrastructure, social infrastructure, tourism and heritage have been estimated.

The CDPA Comprehensive Development Plan will require a total public and private sector investment of around Rs.18,940 crores during the next 25 years.

However, of this total tentative capital investment amount for all sectors, an approximate amount of Rs.5,000 crores will be public investment. This fund will be raised through a specially created BCUC Infrastructure Fund. Balance requirement will be met from long term Loan, Public Private Partnership Projects, Capital finance through devolution of fund, User Charges, increased and reformed Tax base and improved Collection.

1.1 Introduction

The Department of Architecture and Regional Planning, Indian Institute of Technology Kharagpur (IIT Kharagpur) submitted the long term Perspective Plan for Bhubaneswar–Cuttack Urban Complex and provide vision to the anticipated development for the target year 2030 in November 2006.

In the Perspective Plan, broad level strategies and policies on various aspects of urban development were provided. To translate these broad level strategies into implementable medium term planning proposals, Comprehensive Development Plans are formulated within the framework prescribed in the Perspective Plan document.

In this context Department of Architecture and Regional Planning, Indian Institute of Technology Kharagpur has also been requested to prepare Comprehensive Development Plan (CDP) conforming to the statutory requirements detailed out in 'The Orissa Development Authority Act, 1982', separately for Bhubaneswar Development Plan Area (BDPA) and Cuttack Development Plan Area (CDPA).

It should be noted that the Comprehensive Development Plan for the respective planning areas could only be initiated after receipt of the GIS based land use map in 1:4000 scale by the ORSAC and also after the interim framework of Perspective Plan for the Bhubaneswar - Cuttack Urban Complex was accepted by the Government of Orissa. This has led to the current Schedule of submission of the Draft Comprehensive Development Plan for Cuttack Development Plan Area.

1.2 Broad Objective of the Comprehensive Development Plan

The purpose of the Comprehensive Development Plan (CDP) is to provide further necessary details and intended actions in form of strategies and physical proposals for various policies given in the Perspective Plan depending upon the economic/social needs and aspirations of the people, available resources and priorities.

The main objectives of the CDP are:

1. To generate the up-to-date existing urban land use map of the area using revenue maps and recent period satellite imageries using GIS technology in 1:4000 scale.
2. To formulate a meaningful physical development Plan to regulate and guide the urban growth in the region by 2030 A.D. in a planned and healthy manner as per the provisions indicated in ODA Act, 1982 and ODA Rule, 1983.

1.3 The Vision

CDPA stands unique, in the state of Orissa, as a major urban commercial complex and has always led the region into an economic exchange zone. The Perspective Plan recommends a major thrust in the economic activity of this region, which essentially would open up avenues for investments, opportunities of employment. Keeping this in mind, we have the following vision for the CDPA area in its CDP:

1. A region that is focused on the cultural integrity for its entire people must be economically healthy, with a broad mix of employment opportunity.
2. Comprehensive Development Plan must capitalize on its unique setting as a hub of commercial activity as well as institutional functions like High Court, hospital, educational institutions along with modernization of industrial activities in and around Choudwar.
3. Comprehensive Development Plan must show real commitment to providing equal opportunity to all its citizens and government partners to share in its livability. This means that in the design of its built environment, priorities should be given to people's conveniences, safety, mobility etc.
4. Comprehensive Development Plan must ensure that the CDPA continues to carefully preserve its historical heritage and its unique riverfront.
5. The planning effort should make the most efficient use of the CDPA's abundant land resource in order to accommodate future population and employment growth.

1.4 Planning Area at a Glance (2001 Census)

Cuttack Development Plan Area (CDPA) comprising of Cuttack Municipal Corporation, Choudwar Municipality and its adjoining rural areas, has a population of 6.67 lakhs (according to the 2001 census) and stretches over 302.17 sq.kms.

Table 1.1: Planning Area at a Glance

	Orissa	BCUC	CDPA	% Share in BCUC
Total Population	36804660	1524108	666702	43.74
Urban Population	5517238	1346660	587788	43.65
%age of Urban Population	14.99	88.36	88.16	-
No. of House Holds				
Total	7738065	309757	126221	40.75
Urban	1119518	276760	111439	40.27
Rural	6618547	32997	14782	44.80
House Hold Size	4.8	4.9	5.28	-
Sex Ratio	972	850	877	-
Percentage of Child Population to total population	14.56	11.07	11.00	43.43
Literacy Rate (age 7+ years)	63.08	85.18	83.85	-
%age of Workforce	38.55	31.88	31.62	43.39
Area Under Jurisdiction (sq. km.)	155707	721.27	302.17	41.89
Density (person/sq. km.)	236	2113	2206	-

1.5 Planning Issues of CDPA

The Cuttack-Choudwar region of CDPA has been experiencing a consistent population growth rate (32%), higher population density (2206 pp/sq.km) and expanding workforce (31.62%) with high literacy rate (83.85%) having a large household size (5.28) all lending momentum for creation of an investment friendly environment. It is becoming a centre for all kinds of commercial activity, industrial activity and goods exchange with varied skilful employment.

However, CDPA is also experiencing the downside of its incredible success. High density urban sprawl has made its core urbanized area congested within its limited geographical area bounded between two rivers: Mahanadi and Kathajodi. The street system are getting choked with unauthorized encroachment and traffic congestions, the open drainage system appear to be non-functioning, especially during monsoons, water sources and storage capacity appear to be insufficient for all future demand, large part of the area having no sewerage system, requirement of about 2,68,759 dwelling units including current backlog, quantitative and qualitative shortage.

There is an often stark divide in the developmental pattern of growth between the northern part of CDPA, i.e. Nirgundi-Chowduar region with insufficiency in infrastructure, and part of Nimapur with slow growth and the central part of CDPA i.e. CMC area having high density, no growth, and the southern part of slow growth CDPA rural area, consisting of Mundali, Barang and Gopalpur. It is a problem of unbalanced growth between old and new township, partly planned and unplanned parts of the CDPA region. Moreover agricultural activities are still going on in the intervening spaces causing a lot of conflict between farmers and real estate developers. The challenges of unequal or imbalanced growth of CDPA are to be resolved. It is clear that the leapfrog growth trends in the CDPA region are creating impediments for transforming the villages to a planned township and thereby isolating the slow-growing communities from the regional accessibility. If left unchecked, the pattern of development in this region will permanently affect its environmental assets.

CDPA has one powerful tool to address its anomalous sprawl problem- i.e creation of a logistic hub, SEZ for industries, with a strong emphasis on all type of public institutions and recreational nodes as envisaged in the Perspective Plan. Therefore the CDP should address the following goals;

1. Promote a strong, sustainable economy
2. Provide quality housing for existing backlog and projected population
3. Improve mobility, accessibility and transportation alternatives to provide for the safe and efficient movement of people and goods
4. Provide adequate community facilities, services and utilities consistent with the future land use plan

5. Provide flexibility in development design and control guidelines that reflects the growing needs and desires of the community
6. Control the pace of development through availability of developable land and adequate infra-structure
7. Co-ordinate efficient and effective use of governmental and non-governmental resources at all levels to improve the quality of life for the citizens.

1.6 The Purpose of CDP

For Physical planning to be successful, it must develop a consensus on sound principles while balancing the visionary with the realistic. It is also the basis for taking day to day decisions on land use conversion that follow an optimistic and hopeful long term vision. More pragmatically, the CDP would create more job opportunity, raise aspiration, and contribute to the entrepreneurial spirit of the people of Cuttack-Choudwar.

According to the Orissa Development Authority Act, 1982, Comprehensive Development Plan;

1. shall define the various zones into which the land covered by the Comprehensive Development Plan may be divided for the purpose of development and indicate the manner in which the land in each zone is proposed to be used (whether by the carrying out thereon of development or otherwise) and the stages by which any such development shall be carried out;
2. Serve as a basic pattern of framework within which the Zonal Development Plan of the various zones may be prepared.

Using the provision of the act and the rule of ODA, these will comprise of:

1. Reports on physical and socio-economic aspects
2. Preparing sets of functional plans supported by maps, charts and diagrams on;
 - a. Land use
 - b. Traffic and Transportation
 - c. Housing
 - d. Public Utilities
 - e. Environmental Improvement
 - f. Education, Research and other community facilities
 - g. Plantations, city forests etc.
 - h. Heritage and Tourism
 - i. Management of water bodies
 - j. Financial aspect
 - k. Administrative structures.
 - l. Zoning Regulation with specific emphasis on natural hazard prone zone areas.
3. Investment Plan and Action Plan
4. Digital proposed land use plan translated over revenue map in GIS format.

1.7 The Planning Process

The process of developing a CDP required significant time to prepare and update the maps and information through discussion, research and public hearing. It is an iteration of various steps starting with assessing existing condition, revising data base, developing new vision, forming various management programmes, allocating budget and scheme implementation. All interested stakeholders have been involved to ensure incremental implementation of all the schemes for which the CDP address the following sectors of development within the CDPA limit:

- Demography
- Economy
- Traffic & Transportation
- Housing & Slums
- Physical Infrastructure
- Social Infrastructure
- Culture, Recreation and Tourism
- Heritage and Conservation
- Environment
- Development Management

The preparation of the Comprehensive Development Plan started with the assessment of the existing conditions and accounting for the potential resources and constraints. Thereafter, development priorities were set for the particular urban area taking into consideration of the socio-economic needs.

The formulation of the Comprehensive Development Plan for the development area started after status analysis and consideration of the prime issues as indicated in the following **six stages** as stated below:

Stage-1: The Perspective Plan had delineated CDPA into 11 planning zones considering mainly, drainage network, transportation network, ground water prospect, vegetable index, land use land cover, physical boundary and administrative boundary. These 11 planning zones were then superimposed with the mouza boundaries and plot boundaries.

Stage-2: The study of existing land use of the 11 planning zones was carried out. After the required land use study and analysis, the existing central functions in the various zones were identified. This helped in the assessment of the type and quantum of the various central functions and land uses in the planning zones.

Stage-3: Subsequently identification of vacant land as well as plot wise ownership (Public & Private) of the planning zones was carried out. Also the potential locations for distribution of land uses/central functions in the various planning zones were evaluated.

Stage-4: The allocation of types, quantum and distribution of land uses and central functions was estimated in various planning zones as per the Perspective Plan.

Stage-5: Consisted of the implementation mechanism with respect to legal, administrative & financial aspects. The aspects necessarily included Fiscal Planning, Implementation Agencies, and Administrative Planning reforms in the present setup/new administrative set-up for BCUC, development rules & regulations for future growth etc.

Stage-6: Prepared the future land use plan and their zone wise distribution and subsequently formulated zoning regulations for the 11 planning zones as per the ODA Act. Development cost of the CDP is organised through estimated investment plan.

1.8 Structure of the Report

The Comprehensive Development Plan document of Cuttack Development Plan Area has been divided into fifteen chapters and structured in a sequence to organize the Plan document.

The first chapter has explained the broad objectives, purpose and the process of the CDP in light of the vision for the development of the CDPA, with an overview of the planning issues in the area. The second chapter provides an overview of the Cuttack Development Plan Area with respect to administrative jurisdiction, geographical setting, topography, climate, soil, water resource, socio-economic characteristics, nature of development and landform, chronological growth of settlement, economy, traffic and transportation, housing, physical infrastructure, social infrastructure, cultural, recreation and tourism and heritage and conservation. The third chapter explains the existing land use & land ownership in CDPA of all the 11 delineated planning zones as per the Perspective Plan of CDPA. The fourth chapter outlines the Planning Strategy of the proposed plan and integrates the Functional Structure for the achievement of the same.

The chapters fifth to thirteenth give the policies of development and sectoral plans of the various aspects namely Population & economic perspective, Traffic & Transportation, Housing & Slums, Physical Infrastructure, Social Infrastructure, Culture, Recreation and Tourism, Heritage and Conservation, Environment and Development Management respectively, because development in a comprehensive sense requires improvement in socio-cultural, economic, administrative and physical dimensions of a society. The fourteenth chapter outlines the Future Land Use with the potential locations for distribution of population, land uses and central functions in the various planning zones through the assessment of the type and quantum of the various central functions and land uses in the planning zones. While the fifteenth chapter deliberates with the financial implication of the plan including suggested guidelines of resource mobilization in the form of Investment Plan.

2.1 Introduction

The planning process required an in-depth understanding of the study area. Various natural and man-made features, development trend and distribution, etc. are necessities that have adequate insight and magnitude to the planning issues.

During preparation of the Perspective Plan, consultants has carried out exhaustive survey and data compilation. The Socio-Economic Survey Report and the Status Report has deliberated on the study area in various forms and contexts.

In this chapter, we have avoided presentation and description of the study area to a greater extent. Only few basic information has been described here for an independent reading of the report. The Comprehensive Plan has largely relied on the Socio-Economic Survey Report and the Status Report with few new surveys being conducted..

2.2 Administrative Jurisdiction

Cuttack Development Plan Area (CDPA) is comprised within the Cuttack District of Orissa. Cuttack is one of the oldest cities in India and the commercial Capital of Orissa. The city of the Fort situated at the apex of a delta formed by the river Mahanadi on the north and its distributory, the Kathajodi on the south. It is the second largest city in Orissa. CDPA area includes other two distributaries like Birupa and Kuakhai surpassing through its adjoining rural areas. It lies on the western fringe of the mid-coastal plain of Orissa with an average elevation of 14.62 meters above the sea-level.

Cuttack Development Plan Area (CDPA), being a part of Orissa District Head-quarter, has been formed by a process of amalgamation and annexation of Cuttack Municipal Corporation (CMC), Choudwar Municipality and CDPA Rural areas.

There are 4 blocks in Cuttack district (**Table 2.1**). CDPA area consists of 1 Municipal Corporation, namely Cuttack (48 wards) and the Choudwar Municipality (28 wards) (**Table 2.2, Map 2.1**) besides 60 villages (**Map 2.2**).

The planning area is transforming towards a new identity apart from its cultural heritage, as a major centre for information technology, educational and research organisation and attracting millions of migrants both from its adjoining districts as well as from other parts of India.

Table 2.1: Tahsils and Police Stations in CDPA

District	Tahsil	Police Station	Villages	
Cuttack	Athagarh	Bidanasi	1	
	Cuttack	Cuttack	Bidanasi	8
			Cantonment	3
			Chauliaganj	4
			Cuttack Sadar	52
			Lalbagh	3
			Madhupatana	8
			Malgodam	2
			Mangalabagh	6
			Purighat	5
			Salepur	Salepur
	Tangi -Choudwar	Tangi -Choudwar	Choudwar	45
			Tangi	15
Total			156	

Source: www.bhulekh.ori.nic.in

Table 2.2: Municipalities and Wards in CDPA

Municipal Corp./Municipality	Revenue Villages	Wards	Area
Cuttack Municipal Corporation	70	48	118.70
Choudwar Municipality	25	28	35.82
CDPA Rural	60	-	147.65
Total	155	76	302.17

2.3 Geographical Setting

CDPA is situated in between 20°21'25" N to 20°34'35" N latitude and 85°43'58" E to 85°59'00" E longitude. The maximum breadth from east to west is around 25 kms, while the maximum length from north to south is about 24 kms. The area is bounded by part of Tangi-Choudwar block on the north; Bhubaneswar block on the South; Athagarh and Dampara block on the west and Salepur and Cuttack Sadar block on the east (**Map-2.3**). The Central area includes Old Cuttack bracketed between Kathajodi River towards its west & south; Mahanadi River towards its east and north.

Human settlements and activities are very much dependent on geomorphologic settings. Indeed, the nature of topographic features control land use. The development of various types of topographic features is strongly controlled by the lithologic composition of the ground, tectonic features developed in the rocks, climate & activity of many geological agents.

2.4 Topography

Cuttack city at the apex of the Mahanadi delta, bounded by Mahanadi in the north and by its tributary Kathjori in the south is saucer-shaped in its geographical formation. In earlier times there were many ponds which use to retain & moderate storm water runoff into the drain. These ponds were eventually filled and became low lying areas with little scope for natural drainage (**Fig 2.1**).

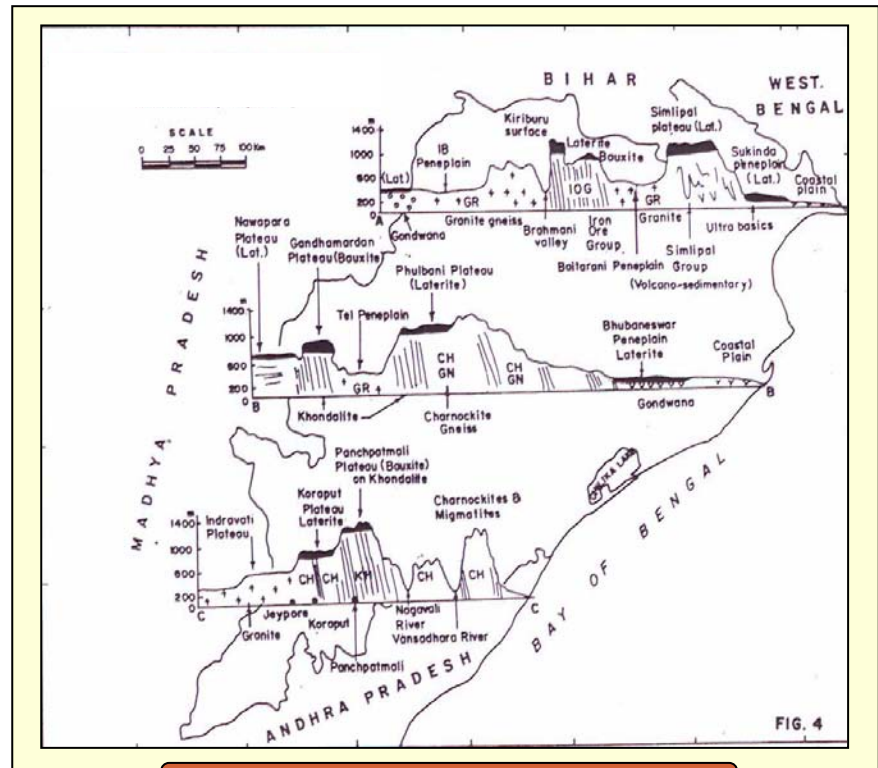


Fig-2.1: Topographic Profiles of Orissa

2.5 Climate

The CDPA is situated to the south of the Tropic of Cancer and is located in the coastal plains of Orissa for which it receives the moderating influence of Bay of Bengal. As it is situated in the monsoon belt, the climate of the planning area is mostly of monsoon type with slight variation because of a strong maritime influence.

2.5.1 Temperature

The planning area experiences a hot and humid climate in summer, characterized by temperature going up as high as above 42 °C. Summer starts at the end of March, the effect of which is felt till the middle of June when monsoon sets in.

A dry and cold climate in winter, with mercury dipping to as low as below 10 °C, is experienced between November and beginning of January.

The most ideal climate is experienced between middle of January to the middle of March, with temperatures ranging a minimum of 22.2 °C and a maximum of 33.4 °C.

2.5.2 Rainfall

The annual average rainfall varies from 1557.20 mm over the planning area. The rainfall distribution can broadly be divided into two main seasons viz. dry season (Nov-May) and wet season (Jun-Oct). It is observed that 80% of total rainfall occurs between months of Jun-Oct. The relative humidity is 74% which prevails almost throughout the year and which varies from more than 50% in rainy season to less than 35% during the month of December. During the rainy season most of the rainfall is cyclonic, when depressions originate in the Bay of Bengal & move towards the east coast of India and enter the landmass between Paradeep and Chandabali causing considerable rainfall and floods.

2.5.3 Wind

The wind velocity is moderate throughout the year and it becomes stronger during the south west monsoon. During the south-west monsoon, the average wind speed is 15 kms per hour and it drops to only 5-10 kms per hour in October. From October to January, the wind direction is from North East to South West and the direction is reversed during South West monsoon when it is from South West to North East. During November to February, the prevailing wind direction is from North-North East to South- South West.

2.6 Soil

Different types of soil are observed in different topographical, hydrological as well as geological condition within the CDPA. The texture of the soil is clay loam. The lithology of Cuttack zone is divided into alluvial formation, Laterite, granite gneiss and sandstone. This alluvial ground is not very suitable for large structures having very low bearing capacity (1 ton/sq.ft.). Mostly the levees are sandy soils where as the back swamps are of clayey soils.

The area near Kathajodi-Mahanadi flood plain is mostly alluvial in nature and not suitable for large construction. The North western part of the Cuttack planning zone contains laterite soil, which is not very suitable for agriculture purpose.

2.7 Water Resources

The river system in CDPA includes the Mahanadi, Kathajodi, Kuakhai and Birupa rivers. The other rivers, practically, dry up in the hot months.

Flora and Fauna

There are also many tanks, wells, and swamps found all over the area. Besides, there are innumerable Canals of Mahanadi and its tributaries cutting across the area. Taldanda Canal and Puri Main Canal has been formed out of Mahanadi whereas, Kendrapara Main Canal and Pattamundai Main Canal from Birupa River. Many natural drains in the area have now been converted to Nullah. The iron content in ground water is quite high in the whole area rendering it unfit for daily consumption.

2.8 Flora and Fauna

Sal, Babul, Acasia, Bel, Siris, Tinia, Tenta, Dharua, Kanchan, Arakh Sunari, Chankunda, Jhaun, Amba, Babula, Karanja, Debadaru, Amla, Sijju, Dimiri, Pipal, Saguan, Tentuli, Barakoli, Jack Fruit, Neem are the plan species of the study area. Tulsi, Bel, Amla, Babool, etc. are the medicinal plants found in the study area. Common birds, mammals, rodents, reptiles and fishes area also found in the area. No endangered species of plants and animals has been found in the study area.

2.9 Socio-Economic Characteristics

The purpose of Socio-Economic Survey (2006) is to arise at a socio-economic profile for the CDPA based on a household survey. This profile of statistical information aids in the preparation of the Comprehensive Development Plan. Major findings considered include, demography, infrastructure, environment, socio-economic profile and other benchmark information in the household sector in detail. It is not a study on merely facts and figures alone but a need-driven and result oriented approach.

Major findings of the Survey are:

1. Majority of families in CDPA belong to joint family (40%).
2. Around 95% of household are Oriya speaking.
3. Around 96% of the populations are Hindu.
4. 57% belong to general category, 27% to OBC, 15% SC and 1% ST category.
5. 34% of migration in CDPA is from within the state of Orissa, rest account for migration from neighboring states and some even from Nepal and Bangladesh.
6. About 78% household own their residences, and a huge majority reside in single storied houses (73%). There are some 240 slum pockets in CDPA.

7. The urban area is largely electrified (92% hh) while 76% of household in rural areas have electricity.
8. Around 27% household have own water supply taps.
9. 8% areas of CDPA are covered by sewerage connection.
10. Average sex ratio in CDPA is 902.

The above findings indicate that the people of Cuttack are culturally rooted with the soil.

2.10 Nature of Development and Land form

There are several factors that explain the east-west sporadic growth of CDPA. The land in CDPA is formed under a distinct geomorphology and soil condition consisting of alluvial soil, thereby restricting large scale high-rise structure at every place. The slope of land is mostly away from the river making the natural drainage difficult. An overview of the region depicts that the utilization of planned infrastructure is pretty high in Cuttack compared to Choudwar municipality area. The population density in Cuttack city is very high and largely the planning area is rural in character. The broad land use map of CDPA reveals that the densely built up urban areas exist only in older part of Cuttack, with built concentration getting thinned down along the transport corridors.

2.11 Chronological growth of settlement

In 989 A.D., Raja Nirupa Keshori first located his capital on the site of existing Cuttack town. King Ananga Bhima Deva III (1211-1238) also chose this place as his capital and built a new town on the left bank of Mahanadi and named it "Baranasi Kataka" owing to its location between the rivers Mahanadi and its distributary Kathajodi. He constructed the Barabati Fort and converted it into a Military cantonment. Thus, Cuttack started as military cantonment and then developed into a city as a result of the sprawl of seven villages. Cuttack continued to be the capital of different Hindu dynasty till the reign of the last independent King of Orissa, Mukunda Deva. During the rule of the Marahattas (1747-1802) Cuttack greatly prospered as an emporium of trade and become the central market of exchange between the Marahattas of Nagpur territory and the English merchants of Bengal and northern India. In 1855-56 the famous famine and flood brought misery to the people of Cuttack. After the famine, the Government gave serious thought to improve communications and to open up Cuttack with its hinterland by means of roads and canals. The Taldanda canal, the Kendrapara canal, the Machgaon canal, the Gobari and the Pattamundai canals were

constructed. A number of important roads like Jagannath Trunk Road, Cuttack-Sambalpur, Cuttack-Chandabali, Cuttack Taldanda and Cuttack-Sonepur road were also constructed about this time. The Cuttack Municipality was constructed in 1874.

The city has been growing slowly during the last decade, due to its spatial constriction on its future growth directions as well as its unplanned city structure. The city has passed through various stages of growth, from unorganized sector to the development in organized sector (1956-76) thereby reaching the present day development of vast urban agglomeration. Each of the phases of growth has left a distinct mark on the city's profile. Apart from Cuttack, few Class II towns have also flourished in this region having strategic importance in the functioning of Urban Complex, namely Choudwar municipality. All of them grew with mono functions over the time. Apart from above two urban centers, there are large numbers of rural settlements in the intervening areas having scanty agricultural activities are slowly getting engulfed by the real estate developers.

Choudwar is the Industrial Hub-cum-Tehsil Headquarter. Prior to 1951, Choudwar was a small village on the north bank of the river Birupa, opposite to Cuttack. It contains the ruins of an ancient fort, the walls of which are still traceable. It has achieved the status of Municipality. Before hand, it was an N.A.C from 1961. In the post-independence period, established numbers of large scale industries like Orissa Textile Mills (OTM) Ltd., Titagarh Paper Mills Ltd., Kalinga Tubes etc. The main functions of the town are industrial, transport, communication, trade & commerce. It has enough scope for growth of other Governmental, Commercial, Institutional activities.

2.12 Economy

Previously in Cuttack, communities were mostly isolated and they had to produce within itself all the goods needed. Their rigid concept of economic base has undergone many a change. Owing to the rapid development in transportation, they started to produce consumer goods for the local consumption as well as for others.

The Cuttack has rich tradition of handicrafts and cottage industries. The industrial culture on manufacture of handicraft goods has been evolved since seventeenth century. Particularly silver filigree, horn works, pata chitra and dokra casting are famous throughout the country.

Choudwar got locational advantage for industrial growth. Kalinga Tubes Ltd, Orissa Textile Mills Ltd., Titagarha Paper Mill Ltd., IDC Tile factory

Ltd. were established here though all are dying. A medium scale glass industry was established at Barang inspired by Choudwar.

2.13 Traffic and Transportation

The two important life-lines of eastern India namely East-Coast Railway and National Highway No.5, connecting Kolkata directly with Chennai, pass through this region. The National Highway No.42 starting from NH-5 at Choudwar, is connecting this region with mineral rich and industrially advanced northern districts. The region is connected with Paradeep by rail, road and canal. Talcher is also connected by rail.

2.14 Housing

Joint families are predominant in the CDPA in general and CMC in particular. Similarly, in the smaller urban areas of Choudwar, extended and joint families are still a significant component. In urban area, over 82% of the households live in pucca houses, but in rural areas, almost 31% households live in kutcha houses and hutment. A floor space per persons in CDPA lies in the range of 100-200 sq ft. Almost 78% of households own their houses. Demand for rental housing is significant only in CMC areas; in future this trend may further rise. Most people still prefer low-rise housing, though the trend towards multi-storied apartment is very slowly catching. It is expected that in the plan period, multi-storied apartment and condominium will have significant rate of growth in the CDPA area. There is a growing trend of PPP in housing with major public agencies like CMC and OSHB, this trend will continue, the role of private developers in housing will significantly increase in near future. The CMC have some 240 slum pockets each where QOL is most deplorable. A major scheme for upward filtering of these pockets in lines with slum networking approaches VAMBAY, Site n Services schemes needs to be chalked out.

2.15 Physical Infrastructure

Though the per capita supply of water in CMC is sufficient compared to the stipulated drinking water supply guidelines, the present system of supply could feed only a maximum of 92% households. So, the present infrastructure facilities for water supply demands augmentation. Since 40% of the populations are using ground water, and that its quality is reported 'at stake' at many locations, it becomes necessary to have a monitoring of tube well waters to have a water quality assurance.

Cuttack suffers badly from water logging due to the high flood and tide levels in the rivers. Existing water distribution pipes are inadequate and ill managed, demanding urgent interventions. In many places the groundwater is reported saline with high total dissolved solids and iron. In rural areas of CDPA, there is no provision of safe drinking water supply through pipelines and majority of the population are forced to depend on ground water sources only.

Cuttack's drainage, which includes wastewater transport and disposal, is entirely by open drains. The two main drainage channels are throttled at many locations due to narrow culverts. It is felt that, though the city is growing at a rapid pace, the systems of sanitation and drainage are unable to keep pace with it.

It is also observed that the natural depressions and ponds, which were instrumental in preventing excess storm run-off, are getting filled up at a rapid rate due to urbanization. This may further aggravates the existing problems of water logging.

The drainage facilities demands management of drains involving the prevention of flooding and illegal encroachments, periodic maintenance, and provisions of adequate land for future reconstruction and augmentation activity.

Since Cuttack also does not have adequate land for waste disposal, 90% of the wastes are dumped in the river beds, low lying areas, and back yards of houses with only very low percentage being taken to land fill sites. CDPA desperately is in need of a systematic solid waste collection and treatment system.

2.16 Social Infrastructure

In spite of having a high literacy rate there exist a lot of disparity in terms of social infrastructure among the various constituent units of settlement in the CDPA region.

1. Educational facilities at primary and middle school level, both quantitatively and qualitatively, are too meager compare to secondary level onwards and hence far from satisfactory.
2. Most of the health care facilities are located in CMC, leaving the remaining area of CDPA suffer from health care facilities.
3. Choudwar and CDPA rural areas are long neglected from all kind of Social infrastructure.
4. Large numbers of villages in CDPA areas have very little facilities and hence rely heavily on CMC for day-to-day needs.
5. There is a dire need of higher order educational training centres to cater for the future youth population.

2.17 Culture, Recreation and Tourism

This place has rich art work heritage like 'silver filigree'. These work cum living centre for traditional craftsmen have also been developed as areas of artistic and tourist interest both for cultural pleasure and commerce.

Balijatra Utsav is one of the important fair and festivals of Cuttack. It is a fair of classical dance, music, folkdances, handicrafts, handlooms and multi cuisine.

Some of the recreational areas of Cuttack are Naraj scenic spot, Deer Park, Barabati fort and stadium, Netaji birthplace museum, Gouri Sankar Park etc.

2.18 Heritage and Conservation

CDPA area is endowed with varied historical and cultural resources from different historical periods. Also important is a unique natural resource of long stretches of river fronts that are intricately related with rich traditions and cultural richness of CDPA. Formed in 989 A.D., Cuttack was the capital of Orissa for almost nine centuries, before Bhubaneswar was made the capital city in 1948. During 1211-1238 A.D. Cuttack was also the nerve centre in Orissa for the cultural and educational renaissance during 19th and early 20th century and has a special place for its role in the freedom movement of India. The unique heritage of Cuttack region is the natural heritage of rivers and extensive river fronts. Mahanadi, Kathajodi and Birupa rivers along with their tributaries have formed a network of rivers in and around this region. The area needs a holistic approach and sensitive revitalization strategies. Preservation and redevelopment measures need to be guided by a policy of integrating conservation of natural, cultural and built heritage with future development of this region.

3.1 Introduction

Urban areas depict the spatial structure through organization and inter-relationships of their use. Various parcels of the land put to different activities are known as Land Use. At any given point of time, Land Use study will communicate a reasonable understanding of the city structure and its characteristics. It is essential to study the existing land use of any urban area for assessing and evaluating its problems and prospects in order to initiate necessary planning decisions.

3.2 Existing Land use Distribution

The land use classification has been adopted from the supplied maps and data by the ORSAC. It may also be kept in mind that this classification has been amended or modified in the future land use planning as explained in the zoning regulation of the CDP.

3.2.1 Land use/ Land cover of BCUC

The Bhubaneswar-Cuttack Urban Complex is essentially two city nodes, Bhubaneswar - bounded by the river Kuakhai in the east, and the Chandaka forest in its west and Cuttack - bounded by two rivers, the Mahanadi and the Kathajodi to its north and south respectively. The intermediate and peripheral areas are forest, agricultural, rural or vacant lands. (Table 3.1, Fig 3.1 & Map 3.1)

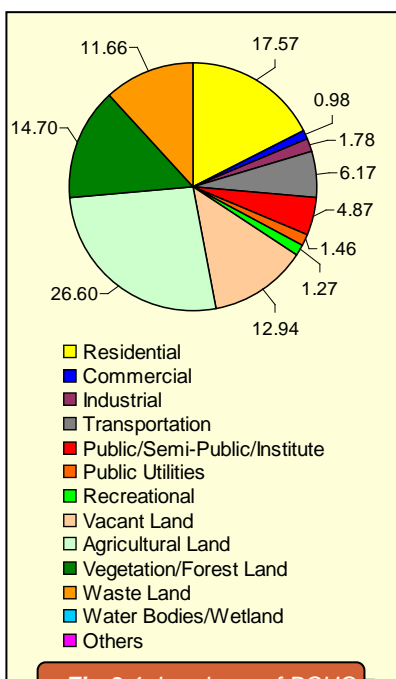


Fig-3.1: Land use of BCUC

Table 3.1: Percentage share of Land use in BCUC

Sl. No.	Land use	% Area
1	Residential	17.57
2	Commercial	0.98
3	Industrial	1.78
4	Traffic & Transportation	6.17
5	Public/Semi-public/Institutional	4.87
6	Utility & services	1.46
7	Recreational	1.27
8	Vacant Land	12.94
9	Agricultural Land	26.60
10	Vegetation/Forest Land	14.70
11	Water bodies/ Wet land	11.66
Total		100.00

Source: ORSAC 2006

In BCUC, agriculture is the largest land-use category with approximately 26.6% under it, followed by 17.57% of residential land use. A good percentage, about 14.7%, is under vegetation/forest land while 12.94% is vacant land. Being part of the riverine watershed, the entire BCUC loses 11.66% of its land to water bodies/ wet land. Traffic and transportation takes up 6.17%. This region has a significant amount of land under public/semi-public/ institutional land use (4.87%) further fuelled by its recent rise as a major institutional hub in eastern India.

3.2.2 Land use/ Land cover of CMC

1971 onwards Cuttack along with Bhubaneswar has been developed based on the Master Plan/ Interim Development Plan/ Comprehensive Development Plan for dynamic growth of economy, increased production of goods and services, etc.

Owing to its existence of over a thousand years, this region has largely grown as an urban village; characteristic of dense low rise settlements laid out into self-sufficient 'Sahis', or neighborhoods, with mixed commercial and residential activities as a dominant feature in most parts of the planning region. **(Table 3.2, Fig 3.2 & Map 3.2)**

Except for the grid-road layout after the formation of the CDA and IDP 1964 there has been no guiding master plan ever during last few decades. Thus, the entire land use pattern of Cuttack Municipal Corporation presents an urban clutter. Industries exist side by side with residence. The largest share of 25.68% of CMC area is occupied by waste area. The residential area having majority of houses in substandard condition occupies only 14.99%. Dense development has taken place in the central city around the main bus terminal. The eastern part of the CMC, excepting some development on Paradeep Road and Industrial Estate Complex, is occupied by hamlets, villages and agricultural land. The western part is gradually being developed as a new township at Bidanasi for proper utilization of land. Some part of the wholesale trade, especially the Malgodown area could be shifted elsewhere to bring about planned market development. Cuttack is the district's headquarter and all the district level offices are located here occupying 1.93% of total CMC area. Majority of the south-eastern part of CMC along the Kuakhai River is under agricultural land use occupying almost 5.80% of CMC area. While formulating the proposal on land use plan, the following principles have to be kept in view:

- To curb the misuse of land in order to avoid injury to the interest of the community.
- To wisely regulate the use of land for appropriate purpose and so as to maximize benefits to the user, as well as, the development authority.

Existing Land use Distribution

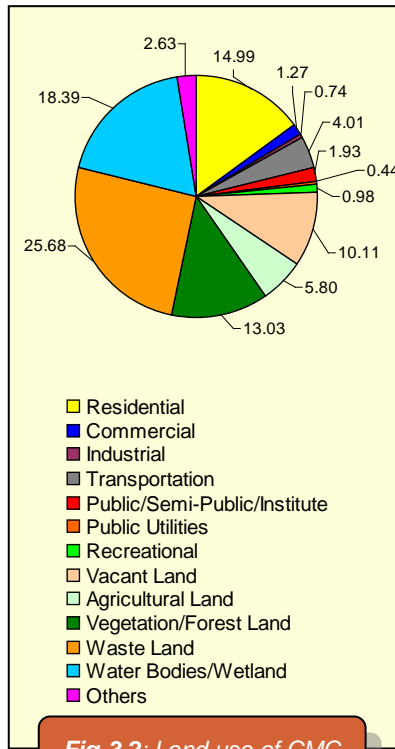


Fig-3.2: Land use of CMC

Table 3.2: Percentage share of Land use in CMC

Sl. No.	Land use	% Area
1	Residential	14.99
2	Commercial	1.27
3	Industrial	0.74
4	Traffic & Transportation	4.01
5	Public/Semi-public/Institutional	1.93
6	Utility & services	0.44
7	Recreational	0.98
8	Vacant Land	10.11
9	Agricultural Land	5.80
10	Vegetation/Forest Land	13.03
11	Waste Land	25.68
12	Water bodies/ Wet land	18.39
13	Others	2.63
Total		100.00

Source: ORSAC 2008

3.2.3 Land use/ Land cover of Choudwar Municipality

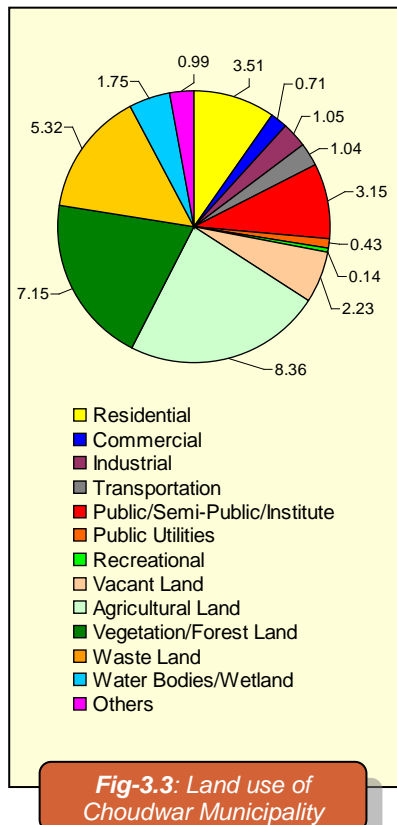


Fig-3.3: Land use of Choudwar Municipality

Table 3.3: Percentage share of Land use in Choudwar Municipality

Sl. No.	Land use	% Area
1	Residential	3.51
2	Commercial	0.71
3	Industrial	1.05
4	Traffic & Transportation	1.04
5	Public/Semi-public/Institutional	3.15
6	Utility & services	0.43
7	Recreational	0.14
8	Vacant Land	2.23
9	Agricultural Land	8.36
10	Vegetation/Forest Land	7.15
11	Waste Land	5.32
12	Water bodies/ Wet land	1.75
13	Others	0.99
Total		100.00

Source: ORSAC 2008

The physical development in Choudwar exhibits a predominantly rural character. The developments have been scattered, leapfrog, locally compact and in the form of hamlets. The physical factors responsible for

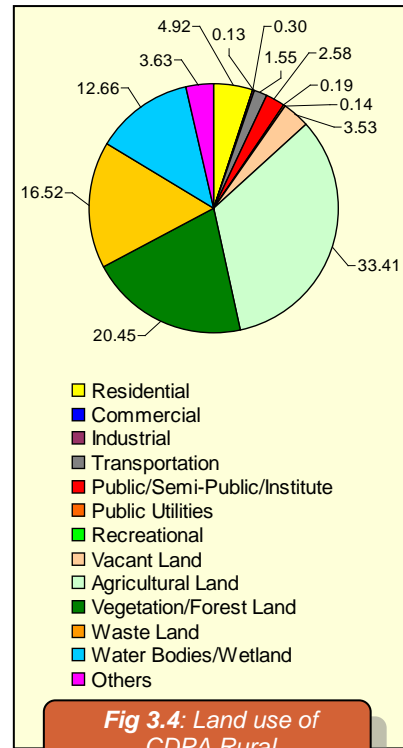
the emergence of the present land use structure have been the undulating nature of land and the presence of low lying swamp and water bodies. Developments are mainly on alluvial soil with low lands remain in water. From the **Table 3.3, Fig 3.3** it can be seen that a substantial percentage of the municipal area is occupied by industries. The developments in all the above zones are limited to horizontal sprawl. The existing land use pattern can be seen in **Map 3.3**.

3.2.4 Land use/ Land cover of CDPA Rural

Table 3.4: Percentage share of Land use in CDPA Rural

Sl. No.	Land use	% Area
1	Residential	4.92
2	Commercial	0.13
3	Industrial	0.30
4	Traffic & Transportation	1.55
5	Public/Semi-public/Institutional	2.58
6	Utility & services	0.19
7	Recreational	0.14
8	Vacant Land	3.53
9	Agricultural Land	33.41
10	Vegetation/Forest Land	20.45
11	Waste Land	16.52
12	Water bodies/ Wet land	12.66
13	Others	3.63
Total		100.00

Source: ORSAC 2008



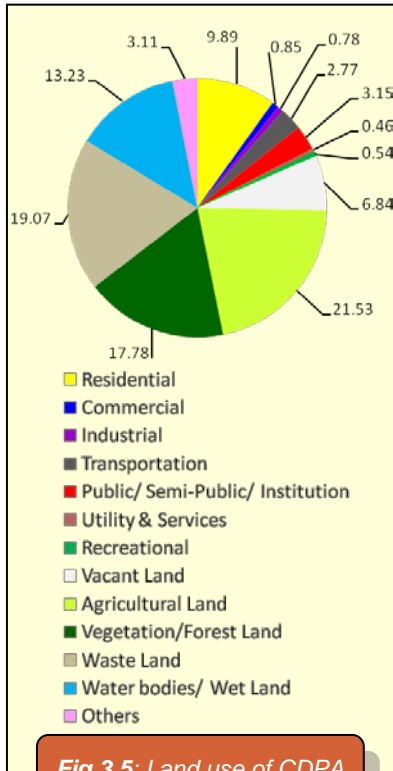
The area covered by the CDPA Rural land, as shown in **Map 3.4**, gives a clear indication that CDPA is essentially an agriculture based urban area. Predominant land area is covered by agricultural land, measuring 33.41%. An addition to the greenery strip, is the vegetation or the forest land, which occupies a major portion of the land area, i.e., 20.45%. 16.52% of the total land area is waste land, particularly due to the flood-prone areas. (**Table 3.4 & Fig 3.4**)

3.2.5 Land use/ Land cover of CDPA

Almost 58% of total land area 30217.34ha is found to be available for extensive development. Agriculture dominates the land use of the entire CDPA by 22%. A lot of wasteland, 19% is observed, followed by 18% of vegetation/forest land. Water bodies, i.e. the Mahanadi and the Kathajodi are a major chunk of CDPA, 13%. 10% of the land use is residential, with Old Cuttack, Sikharpur and Bidanasi being the most densely populated Planning zones. (**Table 3.5, Fig 3.5 & Map 3.5**)

Zone wise Land use Pattern

Table 3.5: Percentage share of Land use in CDPA



Sl. No.	Land use	% Area
1	Residential	9.89
2	Commercial	0.85
3	Industrial	0.78
4	Traffic & Transportation	2.77
5	Public/Semi-public/Institution	3.15
6	Utility & services	0.46
7	Recreational	0.54
8	Vacant Land	6.84
9	Agricultural Land	21.53
10	Vegetation/Forest Land	17.78
11	Waste Land	19.07
12	Water bodies/ Wet land	13.23
13	Others	3.11
Total		100.00

Source: ORSAC 2008

3.3 Zone wise Land use Pattern

The spatial distribution of activities or Land use can be observed through the zone wise information. It is interesting to find variation in the concentration and specialization of activities in different zones.

A close study of this is summarised in the following text as well as **Table 3.6**.

Description of Zone wise Land use

- i. **Nirgundi (Zone No. - 01):** Most part of this Planning Zone, i.e. **58.51%** of the total area of **2925.00 ha** is under agricultural land use, with the diagonally running **High Level Irrigation Canal** dividing it into two near-equal parts. The upper portion is dotted with small and large ponds; while the central portion has streams meandering towards the **Mahanadi**, bringing a sizable amount of land under swampy and scrub cover. Most of the settlements in the upper portion of this zone are concentrated in **Nakhara**, **Badachancho** and **Sanachancho**. There exist large strips of wholesale godowns towards the south-west (**Manguli**, **Palasa Nelia**, and **Bilteruan**) along the rail track and **NH-5** that runs almost parallel to the afore mentioned canal from the south-west to the north-east. There is an existing truck terminal at **Manguli**, along the **NH-42**. The strategic location and connectivity makes it ideal for a logistic hub, serving both the region's inter and intra

freight/transport activities. To further its efficacy, an Eastern bypass is proposed to cut across this planning zone from the north-west to the south-east, somewhat close to the existing **Nirgundi Railway Station**. Currently, only **2.02%** is taken up for transportation. **Hatisua, Palasa, Sainito** and **Sanakesarpur** villages in the lower portion have small inhabited patches, bounding the **Birupa**. Thus, there is very little residential land use observed in this region, only **5.17%**. (Map 3.6).

- ii. **Charbatia (Zone No. - 02):** Being the **Aviation Research Centre** operating base, more than two-fifths of **Charbatia** is a high-security zone. Thus **19.98%** of total area is under public/semi-public use. To its east are the ancillary social infrastructural facilities and utilities/services for ARC staff including a large dumping ground located towards the north of **Chhatisa**. Similar industrial-residential nodes exist at **Choudwar (Kapaleswar-Chhatisa)** around the industrial patch of **Indian Charge Chrome Limited**, and the other of the **Orissa Textile Mills** at **Kedareswar**. A major land use in this zone is agriculture, covering approximately **29%** of the total area of **2961.27 ha**. Large area of plantation is seen on the north of **ARC Charbatia**. The rest of the land is either sparse bush/scrub cover or lateritic area without scrub cover, as in **Kedareswar** and **Banipara**. The remaining are mostly patches of Village/Old Settlements/Basti such as at **Agarhat, Mundamal**, etc. (Map- 3.7). The ARC being located here creates potential for developing this zone as a heritage and cantonment area.
- iii. **Chhatisa (Zone No. - 03):** More than half of this planning zone (**1746.08 ha**) i.e. of **Chhatisa No.1** and **Nuagan**, being low-lying remains waterlogged throughout the year, rendering it unsuitable for most formal land use categories. i.e. **31.34%** under wasteland and **20.93%** under wetland/ water bodies. There is, however, great potential for the riverside development and a plethora of 'water based' and recreational activities. Beyond the waterlogged areas is the highly fertile agricultural land of **Similihand, Kayalapara** and **Jhatia (34.67%)**. Most of **Bhabadeipur** are stone quarries and lateritic patches without scrub cover. The southern portions of **Kayalapara** and **Similihand**, bordered by the **Mahanadi** has some Village/Old settlements/Basti, possibly the only inhabited patches in the entire zone (**1.87%**) (Map-3.8). The Western Bypass has been proposed to cut across **Chatissa No.1** from South-West to North-East.
- iv. **Choudwar (Zone No. - 04):** More than one-fifth of this zone is under vegetation/forest cover while agriculture takes up **19.4%** of it. The **Mahanadi**, bounding Choudwar in the South has **17.27%** of the land under water body, and also contributes to the existence of

- 15.25% of wasteland, with more than half of **Kapaleswar**, **Haranathpur** and **Sultanpur** as waterlogged areas. About 9% area of this zone is under residential and commercial use. **Indranipatana Aliash Gaukhanapatana**, the lower part of **Chhatisa No.2** and **Jeninpurarasinpur** are regions dotted with stone quarries. (Map-3.9)
- v. **Nimapur (Zone No. - 05)**: Most of the area of **Nimapur zone** is under Water bodies/Wet Land (24.24%), or Wasteland (18.97%) largely due to it being bounded by the **Mahanadi** towards the south, and **Birupa** on the north. Large patches of agricultural land are seen in this region (20.92%). Further, vegetation/forest land takes up about 11.48%. Residential land use is 9.09% while the total vacant lands both under development and within developed areas amounts to 7.79%. Some industrial activity (3.09%) is seen in this zone, towards the **Mahanadi**. Transportation takes up about 2.68% of the total land area 2823.45 ha. There is very little commercial activity in this zone. (Map-3.10)
- vi. **Bidanasi (Zone No. - 06)**: This zone being bounded by **Mahanadi** in the North and **Kathajodi** to the South has about 40.18% under waste land and 11.57% under water bodies/wetland use. A lot of speculated land holdings are also observed in this region. Vegetation/forest covers nearly 18% of this zone while 12% is under residential land use. About 10.87% are vacant land. There are no Industrial areas in this zone. (Map-3.11)
- vii. **Old Cuttack (Zone No. - 07)**: The largest population density in the entire CDPA is exhibited here, with a total of 28.95% under urban or other residential land use. A major chunk of land is under Water bodies/Wetland or as Waste land (about 36%) a major reason for this being its adjacency to the rivers **Mahanadi** and **Kathajodi**. Some orchard/ scattered trees are found towards the north of this zone, along the **Mahanadi**, contributing to the total of 9.37% of land under vegetation/ forest land. Transportation, a crucial aspect in such a dense area takes up 6.57% of land. There is 4% commercial land use in this zone. (Map-3.12)
- viii. **Sikharpur (Zone No. - 08)**: Water bodies/ Wetland and Vegetation/Forest land take up about 19% each in the **Sikharpur** planning zone. 14.1% is wasteland, while all vacant lands add up to 10.34%. 7.12% is under agricultural land use. A lot of residential activity is seen in this zone, about 16.36%, the second highest zone in the entire CDPA, with transportation taking up a reasonable 4.45% of the total area. 1.24% is dedicated to commercial activity. (Map-3.13)

- ix. **Mundali (Zone No. - 09):** This Planning Zone is dense with approximately **37%** of vegetation/forest cover and is the carbon sink for the CDPA. Agriculture forms the second most important category (**28.96%**). **16.27%** and **5.45%** of the total land is taken by waste land and the **Mahanadi** as wet land/ water body respectively. Small scattered patches of settlement are seen at **Mundali, Narajmarathapur, Chandiprasad**, etc. and amount to only **3.25%** of the total land use. Thus the preferred developmental activities for this region are resorts and village tourism. **(Map-3.14)**
- x. **Barang (Zone No. - 10):** Approximately **47%** of the total land use of **3788.29 ha** in this planning zone is taken up either by agriculture (**23.28%**) or wasteland (**24.17%**). Also, due to being bounded by **Kathajodi** on the north and **Kuakhai** in the south-east, **13.34%** of land is under water bodies/ wetland. Again, vegetation/forest land covers **15.51%** of the total zone area. Residential (urban and others) take up a total of **5.9%**, while **1.68%** of Sikharpur's total land area is criss-crossed by transport links. **(Map-3.15)**
- xi. **Gopalpur (Zone No. - 11):** About **24%** of land, the large area in this planning zone is under wasteland category, followed by vegetation/forest land taking up **16.62%**. Agriculture is a major activity in this region, with approximately **13%** dedicated to it. Residential land use, both urban as well as others amount to a total of **10.43%**. While about **14%** of total area is under vacant land. Large patches are seen to be under speculated land holdings, and many brick kilns are to be found towards the north and south of this zone. With **Kathajori** in the north and **Kuakahi** in the west, **7.32%** is under water bodies, or as wet land. About **3%** is taken up by transportation. **(Map-3.16)**

3.4 Zone wise Ownership Pattern

While preparing the Comprehensive Development Plan, it is necessary to gather information of plot wise land ownership. The land ownership record is very much important to the planners as it is the basis for good administration, aimed at social justice through better implementation of plans and proposals. The general theme underlying the content of all plan documents has emphasized that land is an asset, which provides the primary and secondary needs of the people. As most of the problems of the people in the villages as well as in the cities are due to land related issues, so to avoid those we have taken utmost care in creating the land ownership database.

3.4.1 Source and Classification of Ownership

Under Act 11 of Orissa Survey and Settlement Act, 1958, it is stated about the Power of Government to order preparations of record-of-right in respect of lands in any local area in the state. The Naveen Patnaik Government of Orissa has developed a site named 'Bhulekh Orissa land records Web Portal' www.bhulekh.ori.nic.in for all people to view the Record-of-Rights.

In CDPA, there are 155 revenue villages, and the plot by plot Ownership of the land, of all those villages have been categorized into five different Ownership groups. The followings are the five different ownership categories:

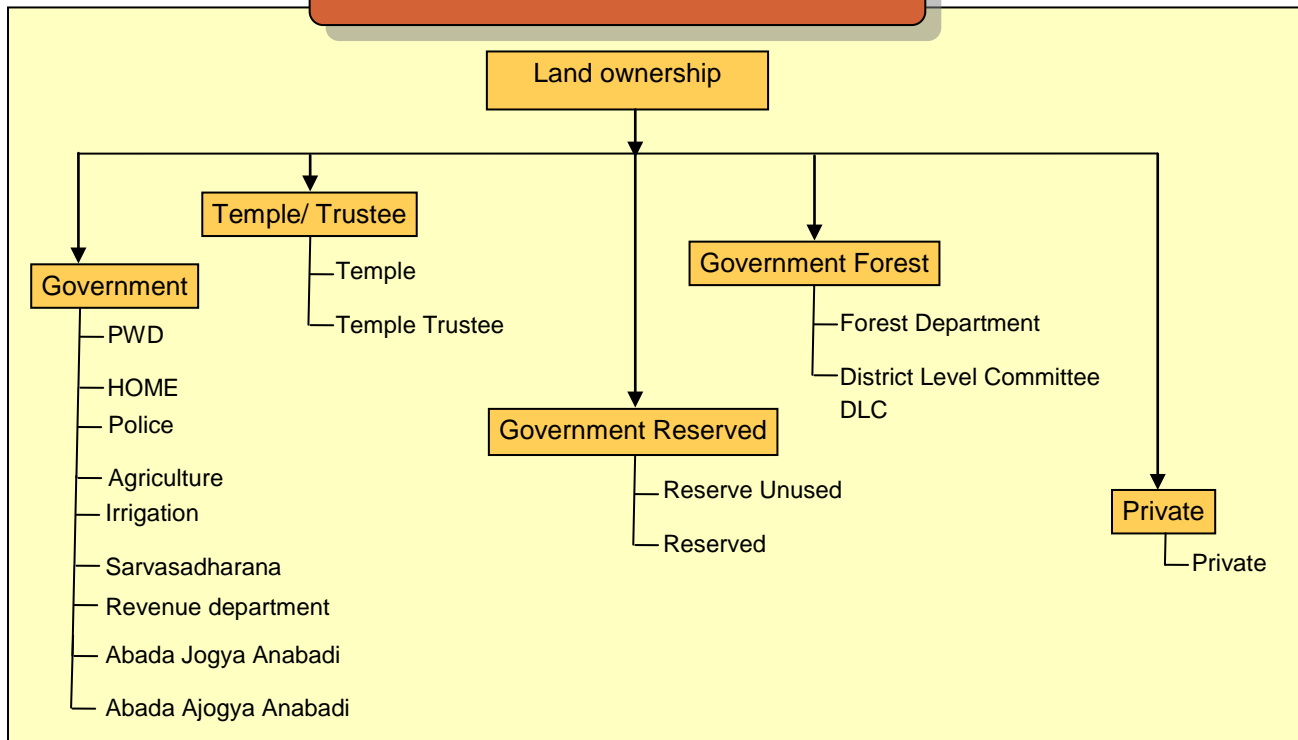
1. Government Land
2. Temple/ Trustee
3. Government Reserved
4. Government forest
5. Private

The Government land category includes all those land owned by various Government departments like; revenue, PWD, Irrigation, Agriculture, Home, etc and Abada Jogya Anabadi, Abada Ajogya Anabadi and Sarvesadharana. The Temple and Trustee category includes the land owned by Temple, Temple trustee. The Government Reserved category includes the lands Reserved and Reserved Unused of whose kissam is mostly Bagayat (1) & (2), Basti yogya, Urban development in future, Patita, Gochara etc; which excludes the Chhota Jungle and Patra Jungle. The land owned by Forest Department and the land in the District Level Committee (DLC) report.

Fig 3.7 exhibits a better understanding of the Land Ownership Records.

The compilation of the ownership datas and their analysis is also summarised in the subsequent text. It is very interesting to observe that there is almost equal distribution of ownership between public and privately ownder land. This implies that renewal, re-development should start as a joint venture in near future to cater to all sort of development.

Fig 3.7: Break up of Land Ownership of CDPA



A close study of this is summarised in the following text as well as **Table 3.7**. The diversity in the ownership pattern is also reflected in the graphical presentation (**Fig 3.8 & Map 3.17**).

3.4.2 Description of Zone wise Ownership

- i. **CDPA:** The overall Planning Zone **CDPA**, is Private Ownership dominated, covering an area **39.54%** of the total area. **43.39%** is under the Govt. Ownership. Followed by **6.99%** under the Govt. Reserved Ownership.
- ii. **Nirgundi (Zone No. - 01):** The Planning Zone **Nirgundi** is Private Ownership dominated, comprising an area of **51.1%** of the total land though ownership is not available for **25.84%** of the area. The Commercial complexes and industries are lined along the **NH-5** and **NH-42**. Many of the small water bodies are under the Private Ownership. The whole of the Planning area is not much developed. Less developed areas of **Charbatia** are also under Private Ownership. **High Level Irrigation Canal** originated from **Birupa River** runs parallel to the railway line. It is further accompanied with swampy grounds spread out along the **NH's** and Railway track towards **Howrah**. Govt. and Govt. Reserved Ownership appears to be scattered everywhere, consuming only **19%** of the land. There is **no land** under the Govt. Forest Ownership. Ample of area is found under Temple/Trustee category ownership.

- iii. **Charbatia (Zone No. - 02):** An exclusive influence of the Govt. Ownership, Private Ownership and all other ownerships are seen in the Planning Zone **Charbatia**. The dominance of the Private Ownership is seen mostly in the peripheral areas of the Planning Zone, occupying **48.35%** of the total land area. Furthermore, the surplus percentage addition is due to the commercial complexes and industries like **IMFA, Charge Chrome, OTM** etc. The area covered by **ARC Charbatia** and its vicinity areas are brought under the Govt. Ownership. For more protection to the secured region, the Govt. Reserved Ownership is imposed in the areas around the **ARC Charbatia**. The Plantation on the North and South-East of the ARC Charbatia is brought under the Govt. Forest Ownership. **4.87%** of the Temple Ownership is concentrated in the **Kedareswar** and North of **Gopalpur** villages.
- iv. **Chhatisa (Zone No. - 03):** The Planning Zone **Chhatisa** is one of the 11 Planning Zones under the Private Ownership dominance. Most of the villages largely are agriculture dependent. The villages **Chhatisa No.1** and **Udaynagar** (comprising of the **Mahanadi River** existing to the South of the Planning Zone) is under the Govt. Ownership. These areas are comprised of marshy areas. The Govt. Reserved Ownership spreads out in different villages. Temple/Trustee Ownership mainly concentrates over in the North and Central part of the **Bhabadeipur** and in some portion of the North of **Nuagan** village. The **NH-42** runs through the Planning Zone.
- v. **Choudwar (Zone No. - 04):** Similar to the previously studied ownership patterns, this Planning Zone **Choudwar** is too dominated by Private Ownership, comprising an area of **54.47%** of land. The Govt. and Govt. Reserved Ownership is concentrated over **39%**, mainly containing the areas of **Mahanadi River**, whole of **Daulatabad**, East of **Kapeleswar**, parts of **Gobindjiupatana** and **Choudwar**. The Choudwar Govt. ownership mainly consists of the schools, **Thermal Colony** and **Grid Colony**. The Govt. Reserved Ownership spreads its wings non-uniformly in most of the villages. The Temple/Trustee Ownership concentrates in the Choudwar area containing the **OTM, Choudwar Women's College** and the vicinity components. **High Level Irrigation Canal** originated from **Birupa River** runs through the Planning Zone.
- vi. **Nimapur (Zone No. - 05):** The Private Ownership hoists its dominance in this Planning Zone. Govt. and Govt. Reserved Ownership concentrates in the Northern most and Southern most regions of the total zone, occupying **36%**. Other ownerships are also spreaded out in different villages.

- vii. **Bidanasi (Zone No. - 06):** Bidanasi is bordered upon with **Old Cuttack**. The zone is mainly reclaimed area; therefore most of the villages are under the occupation of the Govt. Ownership almost 74% of the area. The Govt. Ownership is pre-dominated over the areas of **Mahanadi River, Kathajodi River** and **Brajabiharipur** Village. The Private Ownership covers up to **15.64%**, spreading out in different areas like the housing complexes in **Brajabihari**. There is a Mixed Ownership featured in the East and Central portion of the Planning Zone, particularly in **Tulsipur, Chandinichouk** and **Deuliasahi**. The Govt. Reserved Ownership spreads itself non-uniformly in most of the villages, occupying **8.36%** of the area. The areas included within the govt. reserved ownership include north of **Bentakarpara** and **Tangarhuda**; parts of **Bidyadharpur** which includes housing, schools and speculated development areas.
- viii. **Old Cuttack (Zone No. - 07):** This portion of the CDPA is supposed to be the oldest of the many cities existed in the history of Orissa, as well as, that of India. The **Old Cuttack** was the **First Capital city of Orissa** for almost nine centuries, before **Bhubaneswar** was made the capital city in 1948. People here have settled here since generations. Therefore, primarily joint families are most common to be seen in this Planning Zone. The Govt. Ownership has occupation over here measuring a clear **62.36%** land share. The influence is seen in the regions near the **Mahanadi River, Barabatikila, Cantonment** and **Mangalabag** villages. The **Taladanda Canal** runs through the Planning Zone, originating from the **Jobra**.
- The Private Ownership is also seen in most of the villages, measuring a total of **31.4%**. It particularly includes Housing complexes, Commercial buildings, Govt. buildings, etc. The Temple/Trustees Ownership are scattered everywhere within the Planning Zone, interestingly owning the land on which the **Barabati Stadium** stands. The Govt. Reserved Ownership consumes around **2.11%** of the land.
- ix. **Sikharpur (Zone No. - 08):** In the **Sikharpur** Planning Zone, the Private Ownership found up to **43%**. The village of **Bidhyadharpur** is almost completely under its hold. Almost **50% plus** of the area of some of the villages are completely under the Private Ownership, namely, **Sikharpur, Chauliaganj, Paisa, Dianrajhansa, Kantilo, Poparada, Sartol, Andarpur, Gunadol, Arundayanagar, Gandharpur** and **Gateirautpatana**. The Govt. Reserved Ownership spreads to **5%** and is mostly seen in the **Nuagan** village. **44.54%** land is under the Govt. Ownership, comprising of the **National Highway** and **Railway Lines** passing through the

Planning Zone; and the river bank of the **Mahandi**. The Ownership of the village of **Shilpapuri** is not known.

- x. **Mundali (Zone No. - 09):** The Planning Zone **Mundali** is Govt. Ownership dominated area, calculating to around **43%** of the total land. The regions influenced are the **Kathajodi River, Mundali Barrage**, the whole stretch of the **Puri Canal, Naraj Railway Line**; and some parts of the villages namely, **Talaghar**, South-west of **Mundali**, **CISF** group spreaded in **Chakradharpur** and **Ramdaspur**; and scattered around in **Ramdaspur, Ratagharlenkasahi** and **Chandiprasad**. The **Puri Main Canal** originates from the **Kathajodi River** runs through the Planning Zone. The Private Ownership and Temple/Trustee scatters around, consuming **38.45%** and **1.4%** of the total area. The Govt. Reserved Ownership dominates **16.51%** seen as a huge patch near the **CISF Group in Chakradharpur**. Govt. Reserved Ownership is also seen around in different villages, particularly in **Ratagharlenkasahi, Ramdaspur** and **Chandiprasad**.
- xi. **Barang (Zone No. - 10):** The share of the Govt. Ownership and the Private Ownership is almost equal in this zone, **47.61%** and **45.17%** respectively. Most of the villages on the Northern Borders found under Govt. Ownership; the villages on the Southern borders found under Private Ownership. The Govt. Ownership is mostly seen over the **Kathajodi River, Kuakhai River** and the **Puri Main Canal** running through the Planning Zone. Otherwise, the all other types of Ownerships are scattered around within the Planning Zone.
- xii. **Gopalpur (Zone No. - 11):** Around **50%** of the total area of the Planning Zone **Gopalpur** is under the Govt. Ownership. The predominance is found over the banks of **Kathajodi** and **Kuakhai** rivers, the **Puri Main Canal** passing through the Planning Zone, some parts of different villages like **Pratapnagari, Nuahat** and **Bandhachhara Alias Kacharamal**. The Private Ownership is found around **43%**, Govt. Reserved is **3.58%** and Temple/Trustee Ownership is **1.5%**.

3.4.3 Zone-wise Developable Government Land:

Bidanasi contains almost 19% of the total zone area under developable Government land, covering 617.8 hectares of land. This planning zone has, and will also be experiencing an increase in the development of government plotted housing projects. Mundali is another planning zone with a major percentage of developable Government land of 33.53% (1109.69 hectares). It contains the institutions which have already come up and are also proposed to come in near future. **(Table 3.8 & Map 3.18)**

Table 3.8: Zone-wise Developable Government & Govt. Reserved Land

Sl. No.	Zone name	Zone Area (in hectares)	Developable Govt. & Govt. Reserved Land Area (in hectares)	% Area of total zone area
1	Nirgundi	2925.00	292.53	10.00
2	Charbatia	2961.27	439.51	14.84
3	Chhatisa	1746.08	332.42	19.04
4	Choudwar	1831.05	228.93	12.50
5	Nimapur	2823.45	199.08	7.05
6	Bidanasi	3317.62	617.80	18.62
7	Old Cuttack	2337.21	154.05	6.59
8	Sikharpur	2699.02	245.35	9.09
9	Mundali	3309.87	1109.69	33.53
10	Barang	3788.29	544.06	14.36
11	Gopalpur	2478.48	372.79	15.04
Total CDPA		30217.34	4536.21	15.01

4.1 Introduction

The Comprehensive Development Plan (CDP) for Cuttack Development Plan Area hereby prepared should not be seen in isolation. Rather, it is a natural, logical extension, detailing out and culmination of the vision outlined by the consultants in their Perspective Plan for BCUC Vision 2030.

The CDPA is zoned into four broad categories based on a multi-criteria analysis. These zones are:

1. **Extensive Development Zone (6 nos.)** – Essentially areas of new development of varying density using the vacant land, agricultural land and govt. land etc;
2. **Intensive Development Zone (1 no.)** – Existing development may be re-densified for new urban functions, through a process of urban renewal and transformation.
3. **Sensitive Development Zone (2 nos.)** – To protect the vegetation/forest/hill areas and swampy/wetlands of ecological importance.
4. **Restrictive Development Zone (2 nos.)** – To protect the rich cultural heritage zones

An extensive study of the Cuttack Development Plan Area (CDPA) through primary and secondary sources was done to identify the prospects and potentials of the region, its weak links in terms of physical connectivity, the possibility of economic revitalization, the rejuvenation of the cultural heritage and also address the issue of sporadic and haphazard growth.

4.2 Structure of the Comprehensive Development Plan

The Comprehensive Development Plan of CDPA is based on a vision. It is a vision to create a world class cultural city that will not only have high end activities and centres of excellence but also will have a distinct identity based on it's rich cultural background and natural resources. With this vision and within the framework of the proposed Perspective Plan for the entire BCUC area, the CDP has outlined a spatial structure that will enable conceptualization of this vision.

The CDPA forms an important and an integral part of the BCUC and is dubbed as the Cultural-Commercial and Industrial Centre of the BCUC. It is also an area undergoing transformation to meet the demands of the future population and new upcoming activities. Hence the spatial distribution of the central functions has been done after analyzing the various complex parameters such as the morphology, connectivity,

development potential of the region, the existing land use characteristics and the historical and cultural background of the CDPA region.

4.3 Concept of the CDPA

The CDPA region basically comprises three distinct landmasses segregated by mainly the two rivers of Mahanadi and Kathajodi thereby dividing the entire CDPA into three portions viz.

- i. The Northern Fringe
- ii. The Central Millennium City
- iii. The Southern Fringe

The Northern and Southern Fringes are further divided into parcels of landmasses by the tributaries Birupa and Kuakhai of the Mahanadi and Kathajodi rivers, respectively.

The concept plan focuses on careful distribution of activities with an objective of achieving a balanced and integrated growth within the CDPA region. The dream perceived by the consultants to transform the CDPA into a world class centre of excellence is realized through the combination of two factors:

- i. Introduction of innovative ideas found elsewhere in similar national and international urban centres.
- ii. Continuation of certain basic functions of the city keeping abreast the various land use characteristics and trends identified in the region.

The Comprehensive Development Plan thus evolved, gives rise to a unique concept of 8 major activity centres located within the CDPA that serve not only the CDPA but the entire BCUC. The activity centres and their locations as mentioned below (**Map 4.1**):

1) Industrial Centre –	Zones:	Charbatia, Chhatisa, Choudwar, Nirgundi, Nimapur	}	Northern Fringe
2) Logistic Centre –	Zone:	Nirgundi		
3) Residential Centre –	Zone:	Bidanasi	}	Central Millennium City
4) Multiple Activity Centre –	Zone:	Old Cuttack		
5) Commercial Centre –	Zone:	Sikharpur		
6) Specialised Activity Centre –	Zone:	Barang	}	Southern Fringe
7) Cultural Centre -	Zone:	Gopalpur		
8) Recreational Centre -	Zone:	Mundali		

8 different functional hubs have been identified to be located throughout the Northern Fringe, Central Millennium City and the Southern Fringe of

the CDPA. The location, type and quantum of these activities proposed in the various planning zones have been discussed in detail in Future Land Use and Zoning Regulations (Chapter 14).

4.4 Salient features of the CDP

4.4.1 Physical Linkages:

The proposed linkage pattern comprehends a bypass system on the western and the eastern periphery that will encircle the CDPA thereby defining its boundary and will ensure that the urban areas will become free from heavy freight traffic.

It is being proposed to connect the bypasses with transverse east-west and north-south connections in the form of railways, national highways, state highways, and the ring roads.

Connectivity of the CDPA within the BCUC region is strengthened through a system of north-south metro-corridor, the NH-5 and the east coast railways, running parallel to each other. The ring roads have been proposed all along the embankments of the three land masses of the CDPA and to improve the connectivity with the national highways, state highways and the other major roads.

Thus the internal as well as the regional connectivity is carefully planned in order to boost the potential as an urban centre of the eastern zone.

4.4.2 Development Proposals:

Connectivity and natural factors have formed the backbone of allocating major activities in future. Availability of land has been a decisive factor. Land in public ownership and uncultivable and less fertile fallow land have primarily been identified for locating new activity centres.

The upcoming projects and the existing land use have also been given due importance while distributing the major functions and activities within the CDPA. The three portions of the CDPA have distinct functions to perform with respect to the entire BCUC Region.

The Northern Fringe comprising of the 5 zones viz: Nirgundi, Charbatia, Chhatisa, Choudwar and Nirgundi are envisaged as essentially the Industrial Centres of the region. Hence, keeping abreast the existing land use, new SEZs have been proposed in these zones to gear up the economy of the Northern Fringe and CDPA as well. The Nirgundi zone by virtue of its regional connectivity has been designated as the "Logistic Centre" of the region thereby, boosting its importance at a regional level.

The Central Millennium City comprising of the 3 zones viz: Bidanasi, Old Cuttack and Sikharpur is primarily a residential, administrative, commercial and cultural centre of the region. New development has been

proposed in this portion with great emphasis on conservation of the natural, built and cultural heritage of the CDPA. Bidanasi zone houses the maximum residential population and hence, acts as the residential centre of the CDPA.

The Old Cuttack zone performs multiple functions such as administrative, commercial, residential, etc and hence, it is termed as the “Multiple Activity Centre”. Relocation of the wholesale commerce to Sikharpur due to its proximity to the eastern by-pass is likely to transform the Sikharpur zone into a ‘commercial centre’ of the CDPA.

The Southern Fringe comprising of 3 zones viz: Mundali, Barang and Gopalpur is gifted with the abundance of natural resources on one side and uninterrupted vacant land on the other. Hence, new activities such as public/ semi-public, institutional, commercial and recreational, etc. have been proposed in these areas.

The Barang zone has been conceptualized as a ‘Special Activity Centre’ with all specialised commercial, institutional, administrative and industrial activities in this zone.

The Gopalpur zone has been also perceived as the new ‘Cultural Centre’ of the CDPA simultaneously housing various activities such as commercial, residential and mixed land use.

The eco-sensitive zone of Mundali with its varied topography has been rightly proposed as the “Recreational Centre” of the CDPA.

4.4.3 Heritage and Conservation:

Since this CDPA area has a rich and strong historical and cultural background with numerous examples of built, natural and cultural heritage, a special emphasis has been laid on exploring the various aspects and framing various proposals for their conservation and preservation.

Besides this, the development proposals also includes special emphasis on the River front areas with provision of recreational activities at different levels , creation of buffer areas, plantations, ghats, etc. along the various stretches of the river front. It also includes special guidelines for the development along the river front areas in terms of urban design inputs.

Thus, through the conservation of the built, natural and cultural heritage an attempt has been made to give a unique identity to the CDPA region.

4.5 Conclusion

Thus to summarize the CDP has been framed with a focus on the following:

- i. To create a well built North-South, as well as, East-West connection in the entire length and width of the CDPA on one hand and linking it to the rest of the BCUC on the other.
- ii. Stress has been laid on the augmentation of the existing physical links and their utilization upto the optimum levels. New connections where proposed are done with due regards to natural drainage, contours and built forms.
- iii. To check the disparity of growth in the CDPA, a concept of balanced and integrated growth has been principally followed.
- iv. Conservation of the natural, cultural and built heritage with emphasis on revitalisation. Rejuvenation and re-development proposals for the new areas of the CDPA are outlined in such a manner to promote a sustainable development of the entire region.
- v. A boost to economic development of the region has been given by enhancing the economic potential of the region through appropriate allocation of land uses and formation of policy guidelines to achieve the same.

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6.1 Introduction

Traffic and Transportation is one of the key factors which has dictated the urban structure of Cuttack. It has also guided the urban pattern within CDPA itself. In this chapter, we will first provide an overview of the travel characteristics observed in CDPA and then proceed to analyse the connectivity issues – for road/rail based movement including passenger and freight. This will be followed by a brief discussion of the existing transit and terminal facilities. Parking characteristics acquires an increasing importance in urban planning as the vehicle ownership and inclination for private transit options rises. This aspect has been addressed in detail to identify the issues relevant for planning future needs. Finally, a set of actions and recommendations has been given to meet the future mobility requirements.

It is important to note that this exercise is based on the vision outline provided in the Perspective Plan for Bhubaneswar-Cuttack Urban Complex: Vision -2030. It will be better if these recommendations are read in conjunction with the Vision – 2030 document, especially with the proposals for Traffic and Transportation as well as the spatio-economic allocation of future urban functions. Moreover, this work should not be interpreted as Traffic and Transportation Plan for CDPA, but rather as a certain set of recommendations to upgrade the existing transport infrastructure to realize the goals of Vision-2030 made for BCUC.

A great deal of information presented in this chapter has been based on the surveys conducted by IIT, Kharagpur and data provided by RITES collected for preparation of Mass Transit System for Cuttack and Bhubaneswar.

6.2 Overview of travel characteristics

6.2.1 Vehicle ownership pattern

Nearly 3/4th of the vehicle stock in Cuttack comprises of two-wheelers. The absolute number of two wheelers in Cuttack is very high and the growth in these figures has been phenomenal in the past few years. The average growth rate of all types of vehicles is around 19 percent (in 2000-2003). The vehicle registration records are represented in **Table 6.1**.

Table 6.1: Vehicle registration records for Cuttack

Sl. No.	Mode	Total Registered up to	Registered in	Registered in	Registered in
		31st March, 2004	2000-01	2001-02	2002-03
1	Two-wheeler	181232	13961	14239	17324
2	Car	15104	793	997	1268
3	Taxi	2297	112	122	138
4	Jeep	6673	222	113	135
5	Auto-rickshaw	3509	259	213	232
6	Bus	2765	58	65	70
6a	Stage carriage	1984	53	65	70
6b	Contract carriage	781	5	0	0
7	Goods vehicle	17634	692	690	812
8	Tractor & Trailer	11638	1849	973	658
9	Others	3453	165	138	194
	Total	244305	18111	17550	20831

Source: Mass Transit System for Cuttack and Bhubaneswar, RITES 2008.

The growth of 2-wheelers has been rapid and steadily increasing – especially in comparison to car. This is clearly evident from **Figure 6.1** which presents the share of total vehicular stock being added in the last four years – both for two-wheelers and cars.

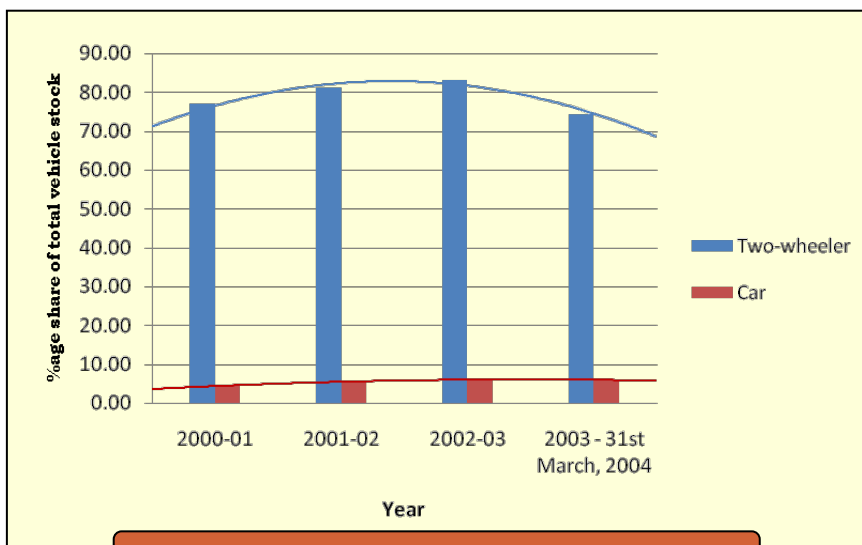


Figure 6.1: Growth of two-wheeler and car in Cuttack

Nearly 9.67 percent of the households have owned a car whereas two-wheelers are owned by 42.92 percent of the households. Bicycle ownership is 44.75 percent, indicating short trip lengths and less affordability of motorised means of transport.

Table 6.2: Vehicle ownership level (per capita and household level)

Sl. No.	Mode	Vehicle ownership levels of HHs (%)	Vehicle ownership per 1000 population
1	Car	9.67	11
2	Two-wheeler	42.92	59
3	Bicycle	44.75	70
4	Cycle-rickshaw	1.87	2
5	Auto-rickshaw	0.35	0
6	Taxi	0	0
7	Bus	0.22	0
8	LCV/Truck	0.22	1
9	Others	0	0
	Total	100	143

Source: Mass Transit System for Cuttack and Bhubaneswar, RITES 2008.

6.2.2 Travel characteristics

It has been observed that the dependence on private transit for household travel is considerably high - nearly 55 percent as represented in **Table 6.3**. Out of this, 60 percent is motorised and the rest non-motorised in nature. The share of para-transit and public transit is low and contributes to only 11 percent of the total mode choice made. On the other hand, a considerable volume of walking trips are observed, which account for more than 1/6th of the total trips. Lack of adequate and appropriate public transit system has led to proliferation of private mode vehicles, especially two-wheelers. Growth in para transit modes have stagnated over the years which coupled with the rise in private transit mode and inadequate road space and parking infrastructure hints towards the pitiable state of transportation in Cuttack.

Table 6.3: Mode choice for travel in Cuttack

Sl. No.	Mode	Share of Household trips (%)	Modal split
1	Car	6.03	55.01%
2	Two-wheeler	30.85	Private Transit
3	Bicycle	24.53	(including motorised and non-motorised)
4	Cycle-rickshaw	4.29	11.61%
5	Auto-rickshaw	2.44	Intermediate Public Transit/Para-transit
6	Shared Auto-rickshaw	3.7	(including motorised and non-motorised)
7	Taxi	0.36	
8	Bus	8.22	11.84%
9	Train	0.43	Public Transit
10	Chartered Bus	1.32	
11	Walk	17.85	
	Total	100	

Source: Mass Transit System for Cuttack and Bhubaneswar, RITES 2008.

The trip characteristics for work trips, education trips, shopping trips and medical trips are represented in **Tables 6.4 – 6.7**. The overall work trip distances in CDPA are comparable; however, the travel time within CMC is on the higher side. The mode transfer rate is also observed to be low for all type of trips. The predominant mode for work and shopping trips is two wheelers in CMC and bicycles in adjoining urban areas of Choudwar and Charbatia, and rural areas of CDPA. Predominant mode for education trips is walking in all of CDPA. Medical trip distances in Choudwar and Charbatia are higher compared to other areas in CDPA.

Table 6.4: Work trip characteristics for Cuttack

Type	Stratum			
	CMC		CDPA Rural	Choudwar (M) and Charbatia C.T
	4	5	7	10
Avg. No. of Modes	1.02	1.05	1.07	1.13
Predominant Mode	8(56.36%)	8(60%)	9(38.36%)	9(52.83%)
Average Trip Distance in km	4.64	6.31	6.27	6.92
Average Travel time in minutes	16.6	19.5	17.4	14.6
Average Expenditure in INR	5.32	12.93	10.09	22.93

Source: Socio-Economic survey, 2006, IIT Kharagpur, in Collaboration with SPARC, Bhubaneswar

Mode of Transportation: Walk = 1, Public Bus = 2, Institutional Transport = 3, Train = 4, Taxi = 5, Auto-rickshaw = 6, Own Car = 7, Scooter / Motor Bike = 8, Cycle = 9, Other = 10.

Table 6.5: Education trip characteristics for Cuttack

Type	Stratum			
	CMC		CDPA Rural	Choudwar (M) and Charbatia C.T
	4	5	7	10
Avg. No. of Modes	1.01	1.02	1.03	1.41
Predominant Mode	1(51.18%)	1(55.86%)	1(76.88%)	1(57.29%)
Average Trip Distance in km	2	1.53	1.9	3.57
Average Travel time in minutes	16.6	19.5	17.4	14.6
Average Expenditure in INR	5.01	4.46	6.82	6.32

Source: Socio-Economic survey, 2006, IIT Kharagpur, in Collaboration with SPARC, Bhubaneswar

Mode of Transportation: Walk = 1, Public Bus = 2, Institutional Transport = 3, Train = 4, Taxi = 5, Auto-rickshaw = 6, Own Car = 7, Scooter / Motor Bike = 8, Cycle = 9, Other = 10.

Table 6.6: Shopping trip characteristics for Cuttack

Type	Stratum			
	CMC		CDPA Rural	Choudwar (M) and Charbatia C.T
	4	5	7	10
Avg. No. of Modes	1.01	1.04	1.05	1.07
Predominant Mode	8(47.03%)	8(46.3%)	9(49.23%)	1(51.33%)
Average Trip Distance in km	2.63	3.43	4.19	2.18
Average Travel time in minutes	12.2	15.4	16.8	6.4
Average Expenditure in INR	3.92	6.61	8.7	4.09

Source: Socio-Economic survey, 2006, IIT Kharagpur, in Collaboration with SPARC, Bhubaneswar

Mode of Transportation: Walk = 1, Public Bus = 2, Institutional Transport = 3, Train = 4, Taxi = 5, Auto-rickshaw = 6, Own Car = 7, Scooter / Motor Bike = 8, Cycle = 9, Other = 10

Table 6.7: Medical trip characteristics for Cuttack

Type	Stratum			
	CMC		CDPA Rural	Choudwar (M) and Charbatia C.T
	4	5	7	10
Avg. No. of Modes	1.02	1.1	1.29	1.82
Predominant Mode	8(33.25%)	1(36.53%)	1(29.8%)	9(27.55%)
Average Trip Distance in km	2.78	4.99	8.3	12
Average Travel time in minutes	12.5	19	24.4	28.8
Average Expenditure in INR	10.81	16.31	26.38	27.22

Source: Socio-Economic survey, 2006, IIT Kharagpur, in Collaboration with SPARC, Bhubaneswar

Mode of Transportation: Walk = 1, Public Bus = 2, Institutional Transport = 3, Train = 4, Taxi = 5, Auto-rickshaw = 6, Own Car = 7, Scooter / Motor Bike = 8, Cycle = 9, Other = 10

6.3 Road transportation

6.3.1 Regional level and local level linkages

The regional road linkages from CDPA are mainly NH-5, NH-42 and the Cuttack-Paradeep Road. NH-5 connects CDPA with BDA as well as all the important settlements i.e. Vijaywada, Rajahmundry, Warangal, Vishakhapatnam along with Hyderabad in the south and Balasore, Kharagpur and Kolkata in the north. It also provides access to Puri via NH-203 (i.e. Cuttack-Puri Road). NH-42 provides crucial linkage to

central India via Rourkela. Cuttack-Paradeep links provides connectivity to the Paradeep port.

Regional freight movement passes through NH-5 which lies at the heart of the Cuttack urban area. This has caused serious interference with the intra-urban movement - resulting in intermixing of the local traffic with the regional traffic, reduction in travel speed and high accident rates. A greater bypass alignment from Nirgundi to Kuradmal via Athagarh has been identified to alleviate this problem through diversion of the regional freight movement from NH-5.

BCUC region enjoys pivotal location between two most significant freight corridors, viz., the Nagpur – Rourkela – Paradeep route in the east-west alignment and the Kolkata – Vishakhapatnam – Chennai/Hyderabad route in the north-south alignment. The Cuttack region within BCUC is positioned with excellent comparative advantage to emerge as a regional level freight transshipment hub.

Most of the inter-urban interaction between Bhubaneswar and Cuttack takes place via NH-5 (four lane carriageway) with limited interaction through Nandankanan Road (intermediate/double lane) mostly due to poor road condition and rail-road conflicts.

The share of interaction between these two cities is roughly 60 % for passenger movement from Cuttack to Bhubaneswar and 40 % from Bhubaneswar to Cuttack. This indicates the growing primacy of Bhubaneswar in the region. However, this intensity of inter-urban interaction is expected to be growing as some important state level functions, such as the High Court, are still located in Cuttack.

Choudwar is connected to Cuttack via NH-5 and NH-42. Interaction of Choudwar is mostly with Cuttack for purposes of work and education trips. The passenger interaction is mainly via public transit – primarily provided by the Rourkela-Sambalpur bound regional bus services. However, they are inadequate to cater to the growing demand for interaction. Paratransit facilities have come up to meet this supply gap – however, higher fare structures inhibit interaction to some extent. The regional corridor i.e. NH-42 on which the regional passenger and freight vehicles are passing through the Choudwar town – causing high accident rate and interference with the regional traffic movement. There is a strong public opinion to address this issue by diversion of the freight movement. This will be addressed to a certain extent after the proposed western bypass comes up from Nirgundi.

The accessibility to the rural parts of the CDPA is mostly through the regional connectors as public transit options are mainly available in these linkages. The emerging urban pattern shows that population allocation within rural parts of CDPA has been clearly determined by

accessibility to larger order urban centres i.e. Cuttack, Choudwar, Bhubaneswar etc.

The intra-urban road network of Cuttack has played a key role in evolution of the city structure and will continue to do so. The expansion of Cuttack is restricted by rivers on all three sides. The town is not as wide as it is long (the proportion being almost 1:4). Due to cumulative trip loading on the urban arterials in such a linear urban arterial network, the core always gets congested, especially during peak hours of traffic operation. The city is now subject to expansion on either side of the old core. On the east side along Cuttack-Paradeep road on the other half of the NH-5 - and on the west side, towards Bidanasi, over the area reclaimed from Mahanadi River. This will make the urban structure more linear in nature and hence increase the traffic bottleneck in the midsection (Badambadi Bus stand area and the College Square area).

Moreover, the layout of internal roads in Cuttack is organic in nature – evolved entirely on incremental basis. Most of the internal urban links are either single lane or intermediate lane –with limited scope of capacity augmentation, both horizontal and vertical. Poor surface quality and poor geometry of intersections as well as the road links further reduces the capacity of the roads and increases vehicular accident rates. To alleviate the growing congestion on the internal road links, Ring Roads all along the banks of the Mahanadi and Kathajodi rivers have been constructed.

The NH-5 and the Kolkata-Chennai Railway link bisect Cuttack into two halves. The rail line poses a physical barrier to the road based movement as grade separated intersections are few. On the other hand, local traffic with considerable share of slow moving vehicles has to cross the NH-5 to make a trip to the other half of the town. Interference with the regional traffic by the local traffic, results in a low level of service as well as high accident rates. Moreover, this has caused an impediment to the growth of the other half, the Naya Bazaar Area – creating distinct division in the urban structure.

The location of the wholesale trading zone within the central part of the town (Malgodown area) creates major hindrances to free movement owing to on street parking by the goods vehicles and loading/unloading activities on the carriageway. Growing demand for on-street parking due to rapid proliferation of two-wheeler population makes the situation worse.

The capacity of the Bus Stand at Badambadi is insufficient, as a result of which, many long-distances vehicles plying through the region often park in the crossing of the national highway and the town roads, clogging the regional traffic corridor.

Cuttack has a high population density, which generates a significant amount of trip density and makes it suitable for public and para-transit options. However, in absence of planned terminal facilities (due to space constraint) encroachment of the existing road carriageway space is observed – further lowering the capacity of the roads.

The trip distances within Cuttack are fairly negotiable (average trip distance being 1 – 1.5 km) and the gentle contour of the town facilitates slow vehicular and pedestrian movement. Thus, there is a higher reliance on walking, bicycles, rickshaws. These slow moving vehicles move along the vehicular carriageway and significantly interfere with the vehicular traffic operations - lowering the vehicular travel speed.

Trade and commerce being a prime driver of the local economy, it generates a huge influx of people from the surrounding hinterland to the CBD of Cuttack. This leads to a huge flow of pedestrian traffic and creates significant vehicular-pedestrian conflict. Absence of proper signaling and signage, zebra crossing, missing road side railings indicate that inadequate attention has been paid to the pedestrian movement within the city. This increases pedestrian vehicular conflict and lowers the level of service for pedestrian movement.

An inventory of all types of roads including the regional and local linkages has been prepared with the help of Satellite images and ground verification. A summary of distribution of roads according to type has been presented in **Table 6.8 and Map 6.1**.

Table 6.8: Distribution of roads according to type

Road Type	Length (km)	%age share
10 Ft. Concrete Road	0.29	0.04
10 Ft. Road	82.96	10.75
20 Ft. Concrete Road	0.09	0.01
20 Ft. Road	165.45	21.45
30 Ft. Road	95.56	12.39
4-LANE Road	31.11	4.03
Canal Road	43.40	5.63
Canal Road (Earthen)	10.87	1.41
Double Road	68.66	8.90
Institutional/Private Road	16.45	2.13
National Highway	10.65	1.38
National Highway (6-Lane)	27.56	3.57
Other Road (Earthen)	35.15	4.56
State Highway	11.94	1.55
Wide Moorum Road	171.20	22.20
Total	771.33	100.00

6.3.2 Connectivity

To assess the level of connectivity enjoyed by various villages and wards within the planning area, **Table 6.9** represents the distribution of

connectivity through various types of road. A brief glance at the table has elements of surprise as the urban areas of Choudwar and Charbatia have poorer connectivity compared to rural areas of CDPA in terms of all weather roads. However, the rural areas have less fair weather roads and higher percentage of cart tracks compared to Choudwar and Charbatia leaving significant scope for upgradation in rural road infrastructure.

Table 6.9: Percentage distribution of villages/wards by availability of approach road

Type	Stratum			
	Cuttack MC	CDPA Rural	Choudwar (M) and Charbatia C.T.	
	4	5	7	10
All Weather	94.29	76.92	32.2	29.41
Fair Weather	5.71	23.08	40.68	58.82
Cart Track	0	0	20.34	5.88
Other	0	0	1.69	0
Not Responded	0	0	5.08	5.88
Total	100	100	100	100

Source: Socio-Economic survey, 2006, IIT Kharagpur, in Collaboration with SPARC, Bhubaneswar

6.3.3 Network performance

The performance of the road network has been appraised based on extensive traffic survey of selected intersections. The summary results and findings of this have been presented in the following section.

6.3.3.1 Intersection analysis

Intersection analysis has been carried out for 65 selected intersections, as shown in **Map 6.2**. **Table 6.10** provides comparative understanding of the traffic characteristics in terms of freight and passenger vehicle mix along with share of slow moving and fast moving traffic. A large number of the intersections along NH-5 have very high share of freight vehicles. Moreover, the share of slow moving traffic is also very high in the links with considerable fast moving traffic. The pedestrian count in many intersections is very high, coupled with high approaching vehicular traffic volume.

Table 6.10: Summary of intersection traffic volume analysis

Intersection No.	Name of Intersection		Total Approaching Volume (PCU)	Share of Total Slow Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)				
						Share of Total Passenger Carrying Vehicles (%)	Public Vehicle	Private Vehicle	Para Transit	Freight
1	Manguli Chhak	Morning Peak	5042.4	2.74	97.26	30.68	41.19	56.42	2.39	69.32
		Evening Peak	6252.9	1.30	98.70	25.39	40.55	54.09	5.36	74.61
2	Mundamala Chhak	Morning Peak	2234.1	12.62	87.38	43.32	29.94	64.38	5.68	56.68
		Evening Peak	2157.9	10.70	89.30	30.81	22.44	75.54	2.02	69.19
3	OTM Chhak	Morning Peak	2754.6	11.11	88.89	32.71	21.35	77.15	1.50	67.29
		Evening Peak	3135	8.13	91.87	24.27	24.46	70.39	5.15	75.73
4	Gandhi Chhak	Morning Peak	3107.4	10.04	89.96	41.66	16.02	78.83	5.15	58.34
		Evening Peak	3000.9	11.40	88.60	38.87	33.96	60.23	5.81	61.13
5	Kalinga Chhak	Morning Peak	3303.3	9.81	90.19	36.72	11.57	87.33	1.10	63.28
		Evening Peak	3105.6	14.88	85.12	47.09	13.73	81.45	4.82	52.91
6	Chudakhia	Morning Peak	914.4	33.79	66.21	81.47	4.50	93.07	2.43	18.53
		Evening Peak	945.9	45.67	54.33	91.36	0.00	92.33	7.67	8.64
7	Choudwar Tinkonia Chhak	Morning Peak	473.1	46.92	53.08	73.48	0.00	100.00	0.00	26.52
		Evening Peak	393.9	60.17	39.83	71.70	0.00	100.00	0.00	28.30
8	Jagatpur Golei Chhak	Morning Peak	6560.7	7.54	92.46	50.31	19.54	65.91	14.55	49.69
		Evening Peak	6630.6	3.76	96.24	45.62	23.12	66.98	9.89	54.38
9	IPICOL Sq.	Morning Peak	2195.4	24.60	75.40	70.28	19.29	71.43	9.28	29.72
		Evening Peak	1286.4	18.66	81.34	46.73	12.27	82.82	4.91	53.27
10	Sikharpur Sq.	Morning Peak	4962.9	6.23	93.77	52.54	38.84	57.72	3.44	47.46
		Evening Peak	5232.9	3.44	96.56	45.16	23.56	65.40	11.04	54.84
11	O.M.P. Chhak	Morning Peak	9998.4	9.51	90.49	66.27	14.19	67.00	18.81	33.73
		Evening Peak	8281.8	7.24	92.76	64.72	13.05	66.92	20.03	35.28
12	Naya Bazaar Chhak	Morning Peak	3576.3	29.11	70.89	83.17	7.74	80.88	11.38	16.83
		Evening Peak	2868.6	29.07	70.93	73.25	2.98	86.55	10.47	26.75
13	Madhupatana Chhak	Morning Peak	8983.2	3.94	96.06	75.75	20.97	61.23	17.81	24.25
		Evening Peak	8629.2	4.35	95.65	63.25	29.15	54.30	16.55	36.75
14	Press Chhak	Morning Peak	7035.6	4.26	95.74	73.52	14.76	75.55	9.69	26.48
		Evening Peak	7848.6	3.02	96.98	61.27	16.51	70.89	12.61	38.73
15	Balikuda Level Crossing	Morning Peak	1662.6	6.32	93.68	27.89	17.13	74.59	8.29	72.11
		Evening Peak	879.3	6.82	93.18	48.88	0.00	82.02	17.98	51.12
16	Balikuda Chhak	Morning Peak	5994.6	2.35	97.65	64.29	10.71	77.17	12.12	35.71
		Evening Peak	6260.1	2.78	97.22	56.42	12.84	70.73	16.43	43.58
17	Pratapnagari Bridge	Morning Peak	5578.8	1.72	98.28	58.19	17.62	68.08	14.29	41.81
		Evening Peak	5954.4	1.61	98.39	59.33	20.68	65.16	14.16	40.67

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Intersection No.	Name of Intersection		Total Approaching Volume (PCU)	Share of Total Slow Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)				
						Share of Total Passenger Carrying Vehicles (%)	Passenger			Freight
							Public Vehicle	Private Vehicle	Para Transit	
18	Trishulia Chhak	Morning Peak	1553.7	11.01	88.99	43.59	8.66	81.38	9.96	56.41
		Evening Peak	2321.4	7.88	92.12	35.52	32.46	56.48	11.06	64.48
19	Madhuban Chhak	Morning Peak	869.7	12.07	87.93	34.33	0.00	100.00	0.00	65.67
		Evening Peak	1258.2	12.64	87.36	25.11	0.00	95.65	4.35	74.89
20	Gobindpur Chhak	Morning Peak	465	9.68	90.32	64.57	8.19	82.96	8.85	35.43
		Evening Peak	286.5	6.28	93.72	55.31	0.00	75.76	24.24	44.69
21	Chhatra Bazaar Chhak	Morning Peak	1431	38.57	61.43	83.96	0.00	98.37	1.63	16.04
		Evening Peak	1527.3	38.89	61.11	90.49	0.00	94.32	5.68	9.51
22	College Sq.	Morning Peak	5771.4	39.19	60.81	84.75	0.75	70.20	29.05	15.25
		Evening Peak	5384.1	34.10	65.90	83.07	0.00	85.75	14.25	16.93
23	Ranihat Chhak	Morning Peak	6109.2	51.07	48.93	95.28	0.78	79.84	19.38	4.72
		Evening Peak	5515.8	51.62	48.38	88.89	1.87	83.97	14.16	11.11
23A	Ranihat Chhak	Morning Peak	7557.6	47.87	52.13	93.24	0.60	67.38	32.02	6.76
		Evening Peak	7095.6	49.42	50.58	91.96	0.00	75.27	24.73	8.04
24	Bajrakabati Chhak	Morning Peak	8455.8	46.19	53.81	92.51	0.00	72.63	27.37	7.49
		Evening Peak	6918.6	45.01	54.99	89.50	0.00	83.44	16.56	10.50
25	Dolamundei Chhak	Morning Peak	7253.7	42.56	57.44	90.57	0.59	75.88	23.53	9.43
		Evening Peak	5806.5	43.30	56.70	92.35	0.00	77.11	22.89	7.65
25A	Dolamundei Chhak	Morning Peak	4450.2	60.27	39.73	92.47	0.00	89.72	10.28	7.53
		Evening Peak	5096.1	59.93	40.07	91.30	0.00	92.28	7.72	8.70
26	Badambadi Sq.	Morning Peak	9182.4	34.21	65.79	92.28	9.38	54.46	36.16	7.72
		Evening Peak	7659.6	36.46	63.54	94.21	10.42	57.13	32.46	5.79
27	Khannagar Chhak	Morning Peak	6696.6	17.74	82.26	91.90	0.44	71.59	27.97	8.10
		Evening Peak	5211.9	14.45	85.55	92.68	2.69	70.60	26.72	7.32
28	High Court Chhak River Side	Morning Peak	4560.6	10.39	89.61	93.10	1.75	70.18	28.07	6.90
		Evening Peak	3289.8	8.85	91.15	90.30	5.50	69.24	25.26	9.70
29	High Court Chhak	Morning Peak	3291	40.84	59.16	100.00	0.00	89.52	10.48	0.00
		Evening Peak	2756.7	44.62	55.38	98.55	0.00	81.66	18.34	1.45
30	Naya Sadak	Morning Peak	3956.1	64.31	35.69	95.28	0.00	97.32	2.68	4.72
		Evening Peak	2889	64.38	35.62	100.00	0.00	93.00	7.00	0.00
31	Jail Road	Morning Peak	3644.1	62.48	37.52	95.13	0.00	92.62	7.38	4.87
		Evening Peak	3133.2	58.79	41.21	98.28	0.00	91.49	8.51	1.72
32	Seminary Chhak	Morning Peak	3302.1	63.41	36.59	94.49	0.00	90.54	9.46	5.51
		Evening Peak	3267.3	60.78	39.22	90.73	0.00	88.65	11.35	9.27

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Intersection No.	Name of Intersection		Total Approaching Volume (PCU)	Share of Total Slow Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)				
						Share of Total Passenger Carrying Vehicles (%)	Passenger			Freight
							Public Vehicle	Private Vehicle	Para Transit	
33	Buxi Bazaar Chhak	Morning Peak	4685.7	58.33	41.67	98.86	0.00	91.92	8.08	1.14
		Evening Peak	4262.4	50.68	49.32	97.89	0.00	92.42	7.58	2.11
34	Mani Sahu Chhak	Morning Peak	1701.6	50.25	49.75	92.13	0.00	96.92	3.08	7.87
		Evening Peak	2307.3	40.57	59.43	91.34	0.00	97.13	2.87	8.66
35	Howrah Motors Chhak	Morning Peak	2004.9	39.35	60.65	86.58	2.11	89.91	7.98	13.42
		Evening Peak	3171.9	34.05	65.95	97.88	0.00	87.69	12.31	2.12
35A	Howrah Motors Chhak	Morning Peak	2339.1	43.09	56.91	87.74	3.80	83.87	12.33	12.26
		Evening Peak	2993.4	28.16	71.84	97.94	0.00	81.77	18.23	2.06
36	Mangalabag Sq.	Morning Peak	7449.6	51.10	48.90	98.17	0.00	66.78	33.22	1.83
		Evening Peak	5137.5	50.10	49.90	91.34	0.00	78.48	21.52	8.66
37	Howrah Motors River Side	Morning Peak	1662.6	24.00	76.00	78.21	2.25	90.47	7.29	21.79
		Evening Peak	2197.2	17.75	82.25	85.19	6.27	84.37	9.35	14.81
38	Medical Chhak	Morning Peak	2115.9	22.97	77.03	95.44	0.00	86.89	13.11	4.56
		Evening Peak	2173.8	12.28	87.72	86.38	1.82	90.89	7.29	13.62
39	Matha Chhak	Morning Peak	1763.7	13.95	86.05	70.94	4.85	92.92	2.23	29.06
		Evening Peak	1102.2	11.98	88.02	83.06	14.74	77.81	7.45	16.94
40	Stadium Chhak	Morning Peak	2253.3	42.34	57.66	83.93	2.75	77.44	19.81	16.07
		Evening Peak	1745.4	34.55	65.45	96.11	0.00	93.44	6.56	3.89
41	Chandi Chhak	Morning Peak	4640.4	45.13	54.87	97.08	0.00	95.15	4.85	2.92
		Evening Peak	3780.9	45.23	54.77	97.86	0.00	94.08	5.92	2.14
42	Chandni Chowk	Morning Peak	3731.1	44.22	55.78	95.36	0.00	86.70	13.30	4.64
		Evening Peak	3101.7	45.07	54.93	98.70	0.00	81.45	18.55	1.30
43	Belle view Point	Morning Peak	4083.6	10.51	89.49	90.82	0.67	72.94	26.39	9.18
		Evening Peak	3685.2	14.16	85.84	88.90	4.74	73.93	21.34	11.10
44	Sector - 6 Gada	Morning Peak	1469.7	12.45	87.55	68.66	0.00	89.13	10.87	31.34
		Evening Peak	1487.7	11.09	88.91	76.82	6.55	84.00	9.45	23.18
45	Satichoura Sq.	Morning Peak	3960	14.32	85.68	87.07	1.50	62.35	36.15	12.93
		Evening Peak	3260.7	19.23	80.77	89.29	0.94	72.52	26.53	10.71
46	Kafila Chhak	Morning Peak	2460.9	21.46	78.54	92.71	2.48	73.41	24.11	7.29
		Evening Peak	2473.8	29.35	70.65	96.19	1.32	77.27	21.41	3.81
47	Shelter Chhak	Morning Peak	3714	29.64	70.36	96.30	1.76	86.31	11.92	3.70
		Evening Peak	2809.5	40.36	59.64	93.38	0.00	81.59	18.41	6.62
48	Biju Pattnaik Chhak	Morning Peak	2532	28.67	71.33	98.34	0.00	84.46	15.54	1.66
		Evening Peak	2668.2	32.49	67.51	100.00	1.23	87.44	11.33	0.00

Continued...

Road Transportation

Intersection No.	Name of Intersection		Total Approaching Volume (PCU)	Share of Total Slow Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)	Share of Total Fast Moving Vehicles (%)				
						Share of Total Passenger Carrying Vehicles (%)	Passenger			Freight
							Public Vehicle	Private Vehicle	Para Transit	
49	Panchamukhi Chhak	Morning Peak	1497	49.30	50.70	100.00	0.00	90.51	9.49	0.00
		Evening Peak	1186.5	53.10	46.90	100.00	0.00	89.22	10.78	0.00
50	Deula Sahi Chhak	Morning Peak	1878.6	44.55	55.45	100.00	6.39	80.93	12.67	0.00
		Evening Peak	1456.5	39.13	60.87	96.62	0.00	70.58	29.42	3.38
51	Bandha Chhak	Morning Peak	1791.6	41.53	58.47	95.76	2.21	71.47	26.32	4.24
		Evening Peak	1336.8	35.01	64.99	91.44	5.59	70.24	24.17	8.56
52	Chahata Sq.	Morning Peak	615.6	19.98	80.02	60.54	17.51	82.49	0.00	39.46
		Evening Peak	385.5	25.68	74.32	79.06	13.25	86.75	0.00	20.94
53	Bidanasi Baul Chhak	Morning Peak	930	34.84	65.16	85.35	4.29	70.19	25.52	14.65
		Evening Peak	1128	45.21	54.79	100.00	0.00	70.87	29.13	0.00
54	Bentakapara Chhak	Morning Peak	1157.4	24.62	75.38	91.47	0.00	69.92	30.08	8.53
		Evening Peak	897	27.76	72.24	100.00	0.00	68.52	31.48	0.00
55	Sector - 9 Gada	Morning Peak	701.1	22.68	77.32	82.18	0.00	83.84	16.16	17.82
		Evening Peak	808.2	8.91	91.09	53.38	0.00	93.89	6.11	46.62
56	Sector - 12A Gada	Morning Peak	502.2	16.73	83.27	73.17	0.00	64.71	35.29	26.83
		Evening Peak	395.4	15.17	84.83	48.66	13.60	86.40	0.00	51.34
57	Naraj Point (N)	Morning Peak	354	30.51	69.49	75.61	0.00	80.65	19.35	24.39
		Evening Peak	373.8	15.25	84.75	62.50	0.00	100.00	0.00	37.50
58	Naraj Point (S)	Morning Peak	657.9	40.13	59.87	58.26	0.00	89.54	10.46	41.74
		Evening Peak	526.5	18.23	81.77	44.25	0.00	74.80	25.20	55.75
59	Sector - 12B Gada	Morning Peak	243	11.11	88.89	30.56	0.00	63.64	36.36	69.44
		Evening Peak	185.7	25.85	74.15	40.31	0.00	78.38	21.62	59.69
60	Sector - 10 Gada	Morning Peak	190.2	17.35	82.65	66.79	0.00	88.57	11.43	33.21
		Evening Peak	214.5	8.39	91.61	54.20	0.00	100.00	0.00	45.80
61	Baimundinagar Chhak	Morning Peak	299.7	22.02	77.98	77.66	0.00	86.78	13.22	22.34
		Evening Peak	181.5	24.79	75.21	56.04	0.00	84.31	15.69	43.96
62	Jobra Chhak	Morning Peak	2925.3	28.30	71.70	88.24	4.44	83.89	11.67	11.76
		Evening Peak	2660.4	18.27	81.73	88.41	3.87	89.89	6.24	11.59

6.4 Rail Connectivity

South-eastern and East-Coast railways link Cuttack with Kolkata, Ranchi, Tata, Asansol – Durgapur and the rest of North India via Balasore and Kharagpur. This also provides rail connectivity to the important urban centers down South such as Vijaywada, Rajahmundry, Warangal, and Vishakhapatnam along with Hyderabad. Khurda Road and Bhubaneswar are the two important stations along this route. This region also enjoys rail connectivity to Paradeep, Rourkela, Nagpur and other parts of central and western India via Cuttack.

6.5 Transit and Terminal facilities

The private mode of transit is around 55 percent - way above the public and para transit modes. The high usage of private mode of transit can be attributed to the overwhelming use of two wheelers and bicycles. Walking as a mode of transit is close to 18 percent - mostly due to flat terrain and short trip lengths in CDPA. Para transit contributes to only 11.61 percent of the total trips, the majority of which is made by cycle rickshaws (close to 37 percent). Public transit facilities contribute only 11.84 percent and the majority of which can be attributed to bus trips. The trends for the transit modes usage in CDPA shows that slow moving vehicles (private as well as para transit modes) is preferred due to narrow winding roads and poor road geometry, where motorised modes have maneuvering difficulties. The public mode of transportation is limited to bus services due to limited rail service – catering mostly at inter-regional level.

Table 6.11: Percentage distribution of Villages/Wards by availability of local transport

Type	Stratum			
	CMC		CDPA Rural	Choudwar (M) and Charbatia C.T.
	4	5	7	10
Town Bus	22.86	15.38	10.17	41.18
Auto	31.43	69.23	11.86	5.88
Rickshaw	42.86	7.69	3.39	29.41
Other	2.86	0	55.93	11.76
Not Responded	0	7.69	18.64	11.76
Total	100	100	100	100

Source: Socio-Economic survey, 2006, IIT Kharagpur, in Collaboration with SPARC, Bhubaneswar

Table 6.11 presents the accessibility via various public/para-transit modes for villages and wards within the planning area. Public transit within CMC is lower compared to Choudwar and Charbatia indicating

limited road space in CMC area. However, auto and cycle rickshaws are predominant in the Cuttack MC area as the prevalent modes of para transit. However, this share diminishes considerably in rural CDPA and adjoining urban areas. The choice of transit is conditioned by the prevalent road infrastructure. The high patronage of two wheelers can be attributed to the inadequate road infrastructure and parking problems. The higher shares of slow moving vehicles aggravate the problems for motorised modes like cars and buses.

City bus services are not a popular public transit mode. There are only 3 routes with fleet size less than 20 – managed by private operators. Most of the busses operate along the Ring Road serving peripheral areas of the town and nearby settlements.

The routing and scheduling is primarily guided by commuter demand and the official operating schedules is frequently flouted. The deficiency of bus services has led to rapid proliferation of auto-rickshaws. Nearly 3500 auto-rickshaws cater to the intra-urban travel demand. The route and fare structure is flexible to commuter demand. Flat terrain and shorter trip length also lead to huge patronage for cycle-rickshaw movement.

The terminal facilities for bus and rail transit are not up to the mark. The Badambadi bus stand does not have the capacity to accommodate the existing bus parking demand. It also does not have any scope for capacity augmentation. Moreover, spill of bus parking from this terminal facility to the adjoining road linkages creates significant interference to the intra-urban movement. Relocation of this regional level bus terminal facility away from the congested core is an immediate necessity – not only to improve the terminal infrastructure but also to reduce the negative externalities generated from the regional level bus movement on the congested urban road network. Moreover, very low patronage for intra-urban and inter-urban (within BCUC) travel by train has resulted in neglect of rail passenger transport infrastructure. The passenger boarding/alighting volume at selected railway stations represented in **Table 6.12** point out that nearly 86 percent of the rail passenger interaction takes place via the Cuttack main railway station, followed by Jagatpur (5-6 percent) railway station.

Table 6.12: Passenger interaction at selected railway stations

Sl no.	Name of the station	Total daily volume (no.s)	Peak hour volume (no.s)
1	Cuttack Main	19065	1862
2	Kathajodi	1077	304
3	Jagatpur	1169	218
4	Manguli-Choudwar	612	134
	Total/Average	21923 (Total)	630 (Average)

Source: Mass Transit System for Cuttack and Bhubaneswar, RITES 2008.

Table 6.13 presents the boarding/alighting volume at the major passenger transshipment locations. Bus stoppages are located along the NH-5 and Ring Road.

Table 6.13: Passenger interaction at selected bus stoppages

Sl no.	Location of the stoppage	Total daily volume (no.s)	Peak hour volume (no.s)
1	Kendrapada Roundabout (Jagatpur) NH-5	4299	284
2	OMP Square NH-5	3814	267
3	Link Road NH-5	3256	249
4	Bidanasi Embankment Road	916	123
5	Link Road (Near ROB) NH-5	1371	104
6	Khapuria (Press Chhak) NH-5	450	59
7	Choudwar Bus Stop NH-5	1167	58
8	Telengapentha NH-5	623	40
9	High Court Embankment Road	643	33

Source: Mass Transit System for Cuttack and Bhubaneswar, RITES 2008.

Organised freight terminal/transshipment facilities are almost non-existent in Cuttack. Huge volume of on-street parking of truck and multi-axle vehicles are observed near Malgodown area – due to inadequate off-street truck terminal facilities. Wholesale functions located in this zone attract large freight vehicles creating hindrance to intra-urban movement. Freight vehicle parking is also observed along the NH-5 and NH-42 – mostly due to lack of any organised terminal or transshipment facility.

6.6 Parking characteristics

Nearly 95 percent of the parking demand in Cuttack is on-street in nature. Parking surveys have been carried out in 64 stretches within the town where parking accumulation is observed to be significant. The details of the parking survey results have been provided in **Table 6.14 and 6.15** and represent the parking accumulation of private and para-transit vehicles in Bhubaneswar. The locations with highest level of parking accumulation are also indicated in these tables.

Some locations i.e. College Sq, Ranihat Chhak, Bajrakabati Chhak, Dolamunde Chhak, Badambadi Sq, Madhupatana Chhak, High Court Chhak, Naya Sadak, Stadium Chhak, Chandi Chhak have very high parking of bicycles, two-wheelers and cars. Most of these parking are for the commercial activities along these links. Lack of off-street parking facilities (either within building premises or outside) force them to park along the street.

Table 6.14: Parking accumulation of bicycle, two-wheelers and car/jeep

Location No.	Stretch	Bicycle		2-wheeler		Car/jeep	
		Morning	Evening	Morning	Evening	Morning	Evening
1	Intersection 1 to 2	22	32	16	23	0	2
2	Intersection 2 to 3	6	4	0	0	1	0
3	Intersection 3 to 4	12	6	0	0	1	2
4	Intersection 4 to 5	10	12	12	14	2	1
5	Intersection 5 to 6	51	31	50	34	2	1
6	Intersection 4 to 7	29	23	19	14		
7	Intersection 7 to 3	32	23	8	3		
8	Intersection 1 to 8	12	8	3	2		
9	Intersection 8 to 9	51	122	57	91	2	11
10	Intersection 8 to 10	11	12	13	12	1	2
11	Intersection 8 to 62	57	34	31	23	4	5
12	Intersection 10 to 11	12	9	23	12	2	1
13	Intersection 11 to 12	58	65	62	52	9	2
14	Intersection 11 to 13	10	8	12	11	4	1
15	Intersection 13 to 14	20	7	29	19	2	1
16	Intersection 13 to 26	130	80	145	115	35	29
17	Intersection 14 to 27	12	10	5	6	2	1
18	Intersection 14 to 16	14	11	23	14	2	2
19	Intersection 15 to 16	11	7	5	6	1	1
20	Intersection 16 to 17	17	12	12	9	2	1
21	Intersection 16 to 18	9	12	13	7	4	1
22	Intersection 8 to 19	9	12	15	7	3	1
23	Intersection 19 to 20	17	13	34	15	1	3
24	Intersection 27 to 26	98	76	92	99	10	10
25	Intersection 26 to 25	179	142	166	115	7	5
26	Intersection 25 to 24	140	150	200	160	11	5
27	Intersection 24 to 23	186	150	222	132	17	14
28	Intersection 23 to 22	121	176	133	219	10	18
29	Intersection 28 to 43	6	4	6	7	2	1
30	Intersection 45 to 43	32	32	35	35	5	5
31	Intersection 44 to 45	19	4	12	8	2	
32	Intersection 55 to 44	8	9	8	5		
33	Intersection 54 to 55	23	20	30	23	6	8
34	Intersection 53 to 54	26	33	22	23	4	
35	Intersection 51 to 53	54	34	46	30	2	9
36	Intersection 51 to 52	26	21	20	23	5	3
37	Intersection 51 to 50	56	62	44	42	9	3
38	Intersection 45 to 51	13	31	13	10	7	
39	Intersection 46 to 45	37	13	32	11	7	7
40	Intersection 47 to 46	22	13	23	12	3	1
41	Intersection 50 to 47	119	85	101	94	12	9
42	Intersection 49 to 50	77	47	51	40	7	7
43	Intersection 48 to 49	56	32	32	21	2	
44	Intersection 40 to 48	65	70	51	56	4	9

Continued...

Location No.	Stretch	Bicycle		2-wheeler		Car/jeep	
		Morning	Evening	Morning	Evening	Morning	Evening
45	Intersection 39 to 40	31	12	14	10	2	1
46	Intersection 37 to 39	9	5	13	10		
47	Intersection 40 to 35	43	23	43	33	5	3
48	Intersection 41 to 40	99	151	101	106	14	16
49	Intersection 42 to 41	223	251	168	224	7	7
50	Intersection 43 to 42	37	15	37	15		2
51	Intersection 28 to 43	12	14	11	4	2	2
52	Intersection 29 to 28	54	88	41	105	4	26
53	Intersection 29 to 42	119	45	76	34	8	4
54	Intersection 30 to 29	197	367	176	309	14	26
55	Intersection 30 to 25	219	374	222	350	6	12
56	Intersection 31 to 30	43	34	70	50	3	1
57	Intersection 32 to 25	118	171	79	167	5	8
58	Intersection 31 to 32	103	74	49	64	3	3
59	Intersection 33 to 31	124	58	83	66	3	5
60	Intersection 34 to 33	88	98	78	98	7	1
61	Intersection 35 to 43	31	52	30	80	13	3
62	Intersection 37 to 35	7	25	5	33	3	6
63	Intersection 38 to 37	41	43	48	37	12	4
64	Intersection 62 to 38	22	14	10	12	4	1

*Coloured cells indicate top 10 parking accumulation locations for each mode for a particular time

Para transit is one of the dominant modes of movement in CMC and parking of these para transit vehicles (particularly at the intersections) creates a lot of interference to the traffic flow operations. Locations i.e. Press Chhak, Balikuda Crossing, Pratapnagari Bridge, Ranihat Chhak, Bajrakabati Chhak, Buxi Bazaar Chhak, Medical Chhak, Bandha Chhak have very high level of cycle-rickshaw parking. Kalinga Chhak, Chudakhia, Choudwar Tinkonia Chhak, Jagatpur Golei Chhak, IPICOL Sq, Sikharpur Sq, Naya bazaar Chhak, Press Chhak, Balikuda Chhak, etc. have high levels of on street auto rickshaw parking.

Table 6.15: Parking accumulation of para-transit vehicles

Location No.	Stretch	Cycle Rickshaw		Auto Rickshaw	
		Morning	Evening	Morning	Evening
1	Intersection 1 to 2	2	6	7	5
2	Intersection 2 to 3	0	0	5	3
3	Intersection 3 to 4	2	1	12	10
4	Intersection 4 to 5	1	0	3	1
5	Intersection 5 to 6	2	3	0	1
6	Intersection 4 to 7	2	1	0	1
7	Intersection 7 to 3	1	2	0	0
8	Intersection 1 to 8	1	0	0	0
9	Intersection 8 to 9	11	5	1	3
10	Intersection 8 to 10	3	2	1	0
11	Intersection 8 to 62	3	2	3	2
12	Intersection 10 to 11	3	2	5	3
13	Intersection 11 to 12	5	11	3	9
14	Intersection 11 to 13	0	0	3	2
15	Intersection 13 to 14	3	1	4	3
16	Intersection 13 to 26	55	14	25	14
17	Intersection 14 to 27	21	17	4	3
18	Intersection 14 to 16	2	2	1	1
19	Intersection 15 to 16	2	1	2	1
20	Intersection 16 to 17	2	4	1	1
21	Intersection 16 to 18	5	7	1	1
22	Intersection 8 to 19	3	5	1	2
23	Intersection 19 to 20	11	9	2	1
24	Intersection 27 to 26	11	1	4	6
25	Intersection 26 to 25	23	10	8	10
26	Intersection 25 to 24	12	17	5	7
27	Intersection 24 to 23	13	7	2	3
28	Intersection 23 to 22	19	17	6	16
29	Intersection 28 to 43	2	1	4	0
30	Intersection 45 to 43	9	3	4	0
31	Intersection 44 to 45	3	4	3	5
32	Intersection 55 to 44	1	1	0	0
33	Intersection 54 to 55	1	0	3	0
34	Intersection 53 to 54	2	4	5	3
35	Intersection 51 to 53	5	4	1	0
36	Intersection 51 to 52	5	3	1	0
37	Intersection 51 to 50	6	1	5	9
38	Intersection 45 to 51	10	15	1	1
39	Intersection 46 to 45	8	3	2	1
40	Intersection 47 to 46	6	6	2	2
41	Intersection 50 to 47	10	3	2	2
42	Intersection 49 to 50	10	6	3	0
43	Intersection 48 to 49	8	6	3	2
44	Intersection 40 to 48	10	14	5	4
45	Intersection 39 to 40	1	1	0	0

Continued...

Location No.	Stretch	Cycle Rickshaw		Auto Rickshaw	
		Morning	Evening	Morning	Evening
46	Intersection 37 to 39	2	1	0	0
47	Intersection 40 to 35	7	3	0	0
48	Intersection 41 to 40	21	13	0	0
49	Intersection 42 to 41	16	4	7	0
50	Intersection 43 to 42	4	1	1	0
51	Intersection 28 to 43	1	1	1	0
52	Intersection 29 to 28	2	11	0	2
53	Intersection 29 to 42	9	6	2	1
54	Intersection 30 to 29	24	51	5	2
55	Intersection 30 to 25	55	15	2	0
56	Intersection 31 to 30	18	11	6	2
57	Intersection 32 to 25	38	43	1	3
58	Intersection 31 to 32	24	13	1	4
59	Intersection 33 to 31	32	8	0	1
60	Intersection 34 to 33	15	9	0	3
61	Intersection 35 to 43	3	5	0	2
62	Intersection 37 to 35	4	2	2	0
63	Intersection 38 to 37	23	21	3	0
64	Intersection 62 to 38	17	11	0	0

*Coloured cells indicate top 10 parking accumulation locations for each mode for a particular time

Apart from these private and para-transit vehicles, large volume of truck/trailer and bus parking (on-street) has been observed at various stretches.

Significant volume of truck parking is observed along the NH-5 and other important road links near Manguli Chhak, Mundamala Chhak, Kalinga Chhak, Jagatpur Golei Chhak, IPICOL Sq, Sikharpur Sq, OMP Chhak, etc. Nearly 285 trucks and Multi Axle Vehicles (MAV)s are observed to park along the street during the morning peak hours.

6.7 Road accident and safety

Huge volume of regional traffic passes through the Cuttack town which leads to significant conflict between slow moving and fast moving vehicles. Mixing of slow and fast moving vehicles not only slow the movement along the regional corridors but also increases the accident risks. Nearly 41 percent of the road accidents take place along the NH-5. Truck/MAVs contribute to 43 percent of the road accidents (**Refer Table 6.16**). Pedestrian-vehicular conflict is one of the most important contributors to the increasing accident risks. The busiest crossings in terms of vehicular traffic volume within Cuttack also have the highest volume of pedestrian traffic (along/crossing the road) and slow moving vehicles such as Jail Road, Buxi Bazaar Chhak, Mangalabag Sq. Other

critical intersections are Naya Sadak, Mani Sahu Chhak, Panchamukhi Chhak, Choudwar Tinkonia Chhak, to name a few. The pedestrian facilities are non-existent in most of these intersections – which increases the intensity of pedestrian-vehicular conflict.

Table 6.16: Road accident records in Cuttack

Sl. No.	Parameters	Value
1	Deaths per 100 accidents	30
2	Injuries per 100 accidents	110
3	Accident per 1000 vehicles	2.7
4	Fatalities by Mode	
4a	Truck/MAV	43 percent
4b	Two-wheeler	20 percent
4c	Bus	14 percent
5	Incidence of accident	
5a	Along National Highway	41 percent
5b	State Highway	30 percent
6	Cause of accident	
6a	Human error	72 percent
6b	Involvement of old vehicles	42 percent

Source: Mass Transit System for Cuttack and Bhubaneswar, RITES 2008.

6.8 Recommended actions

6.8.1 Improvement of Transit facilities

The existing transit pattern is highly reliant on private modes (mostly 2-wheelers) compared to public transit modes. In many cases para-transit is replacing the public transit system. This imposes a huge burden on the existing transport infrastructure of the city, which is nearing virtual collapse unless some radical measures are taken to address it.

Keeping this in mind, Department of Commerce and Transport, Government of Orissa had commissioned RITES Ltd. to carry out a study on Mass Transit System in Cuttack and Bhubaneswar. Based on an extensive data base, it has concluded that there is an immediate need for high capacity mass transit corridors with improved level of service. They have recommended alignments after evaluating several alternative alignments. The alignment passing through the Cuttack city starts from Bidanasi and stretches up to CRRl campus near Sikharpur area passing through Buxi Bazaar and Malgodown area. This alignment is mainly to cater to the intra-urban mobility needs. This proposed alignment will also have connections to the inter-urban component of the MRTS alignment. From Bidanasi it will have a direct link to Bhubaneswar via Chandaka industrial estate. The internal MRTS alignment will also cross the Bhubaneswar-Choudwar link near OMP Chhak area.

Road based mass transit technologies have been recommended – particularly where adequate road space is available. In most parts of the recommended alignment, ROW of 300 ft has been reserved to accommodate any type of mass transit technology option. However, within the Cuttack city, elevated alignment seems to be the only solution. A detailed techno-economic feasibility study will be needed to decide upon the appropriate type of technology addressing a wide range of issues i.e. land availability, local urban environment, urban design issues, heritage and built environment, financial implications etc.

In case the elevated mass transit alignment across congested urban core cannot be implemented, high capacity road-based bus transit system is recommended as a feasible public transit alternative. A brief look at the projected Peak Hour Peak Direction Transit Trip demand for Year 2031 along the elevated alignment suggested by RITES indicates that bus transit facility along the ring road on both side of the Cuttack city will be able to provide similar form of mass transit options. Bus transit facilities along the ring roads and some important cross links through the town combined with para transit feeder services on the internal road links seem to be the most responsive public transit system for the old and congested city structure of Cuttack.

The existing terminal at Badambadi creates huge interference to the intra-urban traffic movement due to ingress and egress of large passenger busses on narrow and capacity constrained urban arterials. Moreover, spillover parking of busses outside the terminal has made the condition worse. There is an immediate need to relocate the regional bus terminal facility from the city core and restrict the movement of busses on selected urban arterials. Looking at the ROW available in the existing road network, it would be appropriate to restrict most of the bus/minibus movement along the Ring Road with some access routed to the core. A large part of the city road links need to be restricted from access of large vehicles (both passenger and freight). In some locations, smaller para-transit vehicles can operate as they will be more suitable to negotiate narrow and winding lanes of the old city core. A traffic management plan indicating circulation pattern for various types of modes with temporal variation is very much needed in Cuttack. This plan will indicate the links reserved for pedestrian and slow moving vehicular movement, links where entry of large vehicles are not to be allowed, parking plan, transit stoppage and terminal location (for bus stops, auto-rickshaw dropping zones, cycle-rickshaw stands etc.) – all integrated to efficiently manage the burgeoning traffic demand of the city on a road network which has limited scope for physical capacity augmentation.

6.8.2 Augmentation of road network capacity

Based on the existing traffic volume and proposed allocation of economic and residential functions, there is a need to augment the network – primarily to extend accessibility to the newly proposed areas as well as to reduce the growing congestion in the existing links.

Some of the proposed links aim to increase regional level as well as inter-urban level connectivity. They are:

- i) Direct link from Nandankanan Road to Cuttack (at Bidanasi) through construction of a new bridge on River Kathajodi – This will create an alternative and shorter approach to Cuttack via Naraj Barrage from Bhubaneswar.
- ii) Direct link from Bidanasi to NH-42 via a proposed bridge over Mahanadi – This link will also provide direct access from Cuttack to the proposed western bypass.
- iii) Eastern bypass starting from Nirgundi and connecting the Cuttack-Puri link Road near Pipili – Some linkages from CDPA have been connected to this proposed bypass.
- iv) Direct link between NH-5 and the Nandankanan Road via a proposed bridge over River Kuakhai.

Apart from these, a lot of internal linkages have been proposed in Nimapur, Nirgundi, Choudwar, Barang and Mundali area. Two bridges have been proposed over River Birupa to improve connectivity between Nimapur and Nirgundi as well as Choudwar.

Two ring roads have been proposed on the eastern part of the Cuttack town – starting from NH-5, along the river banks and meeting the Cuttack-Paradeep Road at the end of Sikharpur zone. Apart from these roads, existing ring roads on the western part of the Cuttack town (Bidanasi and newly reclaimed areas) have been proposed for augmentation. These proposed linkages will complete the Ring Road system in Cuttack along the periphery of the adjoining rivers and provide faster access to any part of the city.

The detailed road structure along with the hierarchy of the links is shown in **Map 6.3**. The ROW of these links has been decided by the existing land availability, augmentation potential and the connectivity required by activities proposed in abutting areas. The length of proposed road hierarchy is shown in **Table 6.17**.

Most of the internal urban links within Cuttack do not offer any scope for horizontal expansion. The options for grade separated movement are also restricted. In this context, the only way to improve the network capacity is efficient traffic circulation and management plan.

Some of the congested retail trading zones need to be restricted from vehicular access and completely pedestrianised. However, pedestrian zones have to be identified in such way that vehicular access is available within 0.5km. Some of the links require complete restriction to access for large vehicles. Any urban arterials which are intermediate lane or less than that should have some restriction for ingress and egress for large vehicles – at least temporally. Parking for private transit modes as well as para transit modes has to be managed by creating a parking management plan which will earmark links for complete/partial/temporal restriction of on-street parking. Apart from that a host of traffic management interventions are required to improve the network capacity, especially at the intersections.

Intersection capacity improvement and other recommendations to improve pedestrian/cyclist safety are based on the peak hour vehicular volume observed in 2008. For future projections, the vehicular growth rate has been assumed to be 4 percent per annum whereas pedestrian volume is assumed to increase by 5 percent per annum.

Table 6.17: Proposed road width, length and percentage share

Road Type (according to ROW)	Length (in km)	Percentage share
300 ft ROW	39.19	8.3
200 ft ROW	115.98	24.57
150 ft ROW	73.68	15.61
100 ft ROW	121.74	25.79
80 ft ROW	116.42	24.67
60 ft ROW	4.98	1.06
Total	471.99	100.0

Table 6.18: Recommended actions for intersection traffic management

	Facility	Remarks	IRC Code	Warrant
Intersection 1:				
Manguli Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11 1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 2:				
Mundamala Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	

Continued...

Recommended Actions

	Facility	Remarks	IRC Code	Warrant
Intersection 3:				
OTM Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 4:				
Gandhi Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 5:				
Kalinga Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 6:				
Chudakhia	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 7:				
Choudwar Tinkonia Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 8:				
Jagatpur Golei Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 9:				
IPICOL Sq.	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 10:				
Sikharpur Sq.	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU

Continued...

	Facility	Remarks	IRC Code	Warrant
Intersection 11:				
O.M.P. Chhak	Grade separated Pedestrian Facilities	Advisable in 2015	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2015	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 12:				
Naya Bazaar Chhak	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 13:				
Madhupatana Chhak	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2015	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 14:				
Press Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2015	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 15:				
Balikuda Level Crossing	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 16:				
Balikuda Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 17:				
Pratapnagari Bridge	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU

Continued...

Recommended Actions

	Facility	Remarks	IRC Code	Warrant
Intersection 18:				
Trishulia Chhvak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 19:				
Madhuban Chhvak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 20:				
Gobindpur Chhvak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Not Advisable	IRC:11-1962	
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume < 500 vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 21:				
Chhatra Bazaar Chhvak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 22:				
College Sq.	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	($PV^2 > 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 23:				
Ranihat Chhvak	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	($PV^2 > 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 23A:				
Ranihat Chhvak	Grade separated Pedestrian Facilities	Advisable in 2015	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU

Continued...

	Facility	Remarks	IRC Code	Warrant
Intersection 24:				
Bajrakabati Chhok	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2015	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 25:				
Dolamundei Chhok	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 25A:				
Dolamundei Chhok	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 26:				
Badambadi Sq.	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2015	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 27:				
Khananagar Chhok	Grade separated Pedestrian Facilities	Advisable in 2030	IRC:103-1988	$(PV^2 > 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 28:				
High Court Chhok River Side	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 29:				
High Court Chhok	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	

Continued...

Recommended Actions

	Facility	Remarks	IRC Code	Warrant
Intersection 30:				
Naya Sadak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 31:				
Jail Road	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 32:				
Seminary Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 33:				
Buxi Bazaar Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 34:				
Mani Sahu Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 35:				
Howrah Motor Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 35A:				
Howrah Motors Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 36:				
Mangalabag Sq.	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU

Continued...

	Facility	Remarks	IRC Code	Warrant
Intersection 37:				
Howrah Motor River Side	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 38:				
Medical Chhok	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 39:				
Mattha Chhok	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 40:				
Stadium Chhok	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 41:				
Chandi Chhok	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Advisable in 2030	IRC:92-1985	Peak Hour Traffic Volume > 10000 PCU
Intersection 42:				
Chandni Chowk	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 43:				
Belle view Point	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 44:				
Sector - 6 Gada	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I
	Interchanges	Not Advisable	IRC:92-1985	

Continued...

Recommended Actions

	Facility	Remarks	IRC Code	Warrant
Intersection 45:				
Satichoura Sq.	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 46:				
Kafila Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 47:				
Shelter Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 48:				
Biju Pattnaik Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume > 3000 vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 49:				
Panchamukhi Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 50:				
Deula Sahi Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Advisable	IRC:93-1985	Warrant I
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 51:				
Bandha Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 52:				
Chahata Sq.	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	($PV^2 < 10^{11}$)
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	

Continued...

	Facility	Remarks	IRC Code	Warrant
Intersection 53:				
Bidanasi Baul Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 54:				
Bentakapara Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 55:				
Sector-9 Gada	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 56:				
Sector-12A Gada	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Advisable	IRC:65-1976	
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 57:				
Naraj Point (N)	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1988	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume < 500 vehicles
	Traffic Signals	Not Advisable	IRC:93-1985	
	Interchanges	Not Advisable	IRC:92-1985	
Intersection 58:				
Naraj Point (S)	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1989	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Advisable	IRC:65-1977	
	Traffic Signals	Not Advisable	IRC:93-1986	
	Interchanges	Not Advisable	IRC:92-1986	
Intersection 59:				
Sector-12B Gada	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1990	$(PV^2 < 10^{11})$
	Cycle Tracks	Not Advisable	IRC:11-1964	
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1987	
	Interchanges	Not Advisable	IRC:92-1987	
Intersection 60:				
Sector-10 Gada	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1991	$(PV^2 < 10^{11})$
	Cycle Tracks	Not Advisable	IRC:11-1965	
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Traffic Volume < 500 vehicles
	Traffic Signals	Not Advisable	IRC:93-1988	
	Interchanges	Not Advisable	IRC:92-1988	

Continued...

Recommended Actions

	Facility	Remarks	IRC Code	Warrant
Intersection 61:				
Baimundinagar Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1992	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Not Advisable	IRC:93-1989	
	Interchanges	Not Advisable	IRC:92-1989	
Intersection 62:				
Jobra Chhak	Grade separated Pedestrian Facilities	Not Advisable	IRC:103-1993	$(PV^2 < 10^{11})$
	Cycle Tracks	Advisable	IRC:11-1962	Warrant I/II
	Traffic Rotaries	Not Advisable	IRC:65-1976	Peak Hour Volume of Right Turning Vehicles < 30% of the total motorised vehicles
	Traffic Signals	Advisable	IRC:93-1985	Warrant I/II
	Interchanges	Not Advisable	IRC:92-1990	

Rotaries are not advisable within the urban area as they are very much land intensive in nature. It is better to replace them with signalised intersections which have higher traffic handling capacity compared to rotaries. Only when two intersections come very close and queuing from one signal can affect the other even if synchronised signals are used, rotaries can be justified. On the other hand, intersections along high speed corridors can have signalised intersection even if the traffic volume does not warrant. This is mainly to reduce the accident risk in these locations.

Grade separated interchanges are recommended in at least 5 locations by year 2015 and 15 locations by the year 2030. The five locations are OMP Chhak, Madhupatana Chhak, Press Chhak, Bajrakabati Chhak and Badambadi Square.

6.8.3 Creation of parking facilities

Parking demand will stress the transport infrastructure in a significant way in the coming future. Most of the demand will be from two-wheelers which are increasing at a very high rate. On the other hand though car ownership is growing less rapidly, it takes more space for parking. It has been estimated from various studies that a car/two-wheeler requires 2-3 parking spaces excluding one at the place of residence.

Most of present parking demand is met by on-street parking. On-street parking occupies a lane of vehicular carriageway on one or either side and creates interference to abutting flow during ingress/egress from the parking lot.

Most of the road links within the city are either single lane or intermediate lane - where complete/partial restriction on on-street parking of four-wheelers is urgently required. Some off-street parking spaces – either at-grade or grade separated will be needed to meet the future parking demand. As land parcels available with the old core area for such parking facility is hard to find, some facilities along the peripheral ring road can be provided. Due to proximity most parts of the CBD is accessible from the ring road by walking. Innovative parking arrangements i.e. TDR, granting extra FAR etc. can be applied to create off-street parking infrastructure within the city itself.

The existing traffic volume in some of the links are high and large accumulation of on-street parking due to commercial activities interfere with the traffic operations and lower the level of service in these important arterials.

As per the recommendations of the study on Mass Transit System for Cuttack and Bhubaneswar, prepared by RITES in 2008, parking volume and the resultant negative impacts warrant complete ban of on-street parking on the following stretches -

- i. NH-5 stretch from within the Cuttack town
- ii. Bajrakabati Road (Badambadi to Dolamunde)
- iii. Chhatra Bazaar
- iv. College Road (College Chhak to Ranihat Chhak)
- v. Mangalabag Road (Telephone Bhawan to Ranihat Chhak)
- vi. Nuapatna Road
- vii. Jail Road (Buxi Bazaar to Jail Road Chhak)
- viii. High Court Road
- ix. Haripur Road
- x. Pithapur Road
- xi. Naya Bazaar Road
- xii. Cuttack-Paradeep Road

Partial ban is recommended for the following stretches.

- i. Kathajodi embankment Road
- ii. North Bidanasi embankment Road
- iii. Mahanadi stone revetment Road
- iv. Bajrakabati Road
- v. Jail Road (Fire Station to Buxi Bazaar Chhak)
- vi. Cantonment Road
- vii. Cuttack-Chandi Road
- viii. Mission Road (Chandi Mandir Chhak to Buxi Bazaar Chhak)
- ix. College Road (Railway station to College Chhak)
- x. Old Jagannath Road

The entire parking demand in these links has to be made by the parking supply within building premises or through creation of off-street parking facility – either at surface or multi-level.

Based on the availability of space and concurrence of parking demand, certain locations have also been identified for major off-street parking facility locations. The findings of the study on Mass Transit System for Cuttack and Bhubaneswar, prepared by RITES in 2008 also corroborate with the outcome.

Table 6.19: Selected off-street parking locations

Location	Preferred type of parking	Equivalent Car Parking space (no.s)*
Railway station	Surface/Multi-level	500
Kathajodi Passenger Halt	Surface	200
Badambadi bus stand	Surface	100
Puri bus stand	Surface	50
Paradeep bus stand	Surface	50

* Estimated for Year 2015

Table 6.20: Expected off-street parking demand at selected locations

Private Transit Modes	Exhibited demand (in no.s) Year 2008	Expected Demand (in no.s) Year 2015
<i>Bicycle</i>		
High Court Chhak to Naya Sadak	860	1300
Dolamundei Chhak	500	750
Stadium Chhak to Chandhi Chhak	406	600
College Square	362	550
Jagatpur Golei Chhak to IPICOL Chhak	122	180
Assumed CAGR @ 6percent per annum		
<i>Two-wheeler</i>		
Dolamundei Chhak	366	630
High Court Chhak to Naya Sadak	826	1420
College Square to Ranihat Chhak	441	750
Stadium Chhak to Chandhi Chhak	330	560
Assumed CAGR @ 8percent per annum		
<i>Car</i>		
Dolamundei Chhak to Badambadi Sq.	56	75
College Sq.	35	45
Naya Sadak	64	85
Howrah Motor to Riverside	25	35
Stadium Chhak to Chandhi Chhak	25	35
Assumed CAGR @ 4percent per annum		

Demand for para-transit vehicles is comparable to the demand for public transit facilities. Cycle-rickshaw is the most prevalent form of para-transit mode as motorized modes finds it difficult to negotiate the inadequate road space and poor road geometry. The locations which have been identified along with required parking space is listed in **Tables 6.21 and 6.22**. The management of these para-transit terminal facilities also requires attention as often parking takes place in an

undisciplined and unorganized manner – reducing the capacity of the parking facility. Additional facilities like pre-paid booking and passenger waiting facilities needs to be incorporated in these para-transit terminal locations. It must be kept in mind that the list provides only a selected few of the locations which are deemed important. However, additional para-transit parking spaces have to be developed at various other locations as per the growing demand.

Table 6.21: Cycle-rickshaw parking demand at selected terminal locations

Node/Location	Exhibited demand (in no.s) Year 2008	Proposed off-street facilities (in no.s) Year 2010
Dolamundei Chhak to Badambadi Sq.	40	50 at various locations
College Sq.	17	20
Stadium Chhak to Chandi Chhak	35	40 at various locations
Madhupatana Chhak to Badambadi Sq.	55	50 at various locations
Dolamundei to Buxi Bazaar via High Court Chhak	149	150 at various locations
Jail road	56	60 at various locations
Howrah Motor to Medical Chhak	23	25

Table 6.22: Auto-rickshaw parking demand at selected terminal locations

Node/Location	Exhibited demand (in no.s) Year 2008	Proposed off-street facilities (in no.s) Year 2010
Mundamala Chhak	19	20 at various locations
Sikharpur Sq.	14	15
Dolamundei Chhak to Badambadi Sq.	48	50 at various locations
Ranihat Chhak	16	15
Naya Sadak	11	15
Bandha Chhak to Bidanasi Baul Chhak	14	15

It has to be realized that parking facility management cannot be undertaken in an isolated manner. Rather, an integrated approach has to be adopted in locating the off-street facilities, selection of stretches for partial/complete restriction, setting of parking fees and their collection mechanism, along with the organizational framework to implement it.

6.8.4 Improvement of passenger terminal facilities

Passenger terminal facilities for rail-based and road-based passenger traffic require large scale augmentation in capacity and quality to meet the future needs.

Construction of new rail passenger terminal facilities at Barang is proposed to accommodate the regional level rail passenger transshipment demand which is expected to cross 4 lakh passengers per day by 2030.

Regional level bus passenger terminal is also proposed in close proximity to the proposed regional rail terminal facilities at Barang. It will provide greater patronage to the bus transit facilities through easy and seamless mode-transfer opportunity. Moreover, the proposed augmentation of the Nandankanan Road up to Cuttack via Mundali and its connection to the NH-5 near Barang will place this facility on the north – south transportation spine of the BCUC.

Within Cuttack, relocation of the existing regional bus terminal facilities from Badambadi has been proposed at Bidanasi. Another smaller level intra-city bus terminal facility is proposed near Sikharpur (in proximity to the proposed wholesale trading zone). Bus terminal facilities at both end points of the Cuttack city will be able to provide improved level of bus transit accessibility for intra-urban movement.

Similar smaller scale bus terminal facilities have also been proposed in Choudwar and Nirgundi area.

6.8.5 Improvement of freight terminal facilities

Huge volume of freight traffic enters BCUC Complex via CDPA – as it enjoys a pivotal location between two most significant freight corridors, viz., the Nagpur – Rourkela – Paradeep route in the east-west alignment and the Kolkata – Vishakhapatnam – Chennai/Hyderabad route in the north-south alignment. It is positioned with excellent comparative advantage to emerge as a regional level freight transshipment hub. With the Western Bypass coming up from Nirgundi area – Nirgundi planning zone has been chosen for development of integrated multi-modal freight transshipment and logistic functions. A lot of ancillary processing activities will agglomerate in this location, providing boost to the declining local economy of the Nirgundi and Choudwar urban area.

Phase I (2007-2015) will have truck parking facilities for 2000 freight containers along with at least 10 million sq.ft of warehousing and storage facility.

This includes integrated multimodal transshipment hub with mechanized container handling capacity. Provision of developed land (approximately 500 ha) for processing and packaging industries,

automobile assembly units and other non-polluting downstream ancillary industries) is also recommended.

Phase II (2015-2030) will have additional parking facility and storage space as per the exhibited demand.

Construction of a whole sale trading hub is recommended near Sikharpur area for relocating the existing facilities from Malgodown area. Movement of perishable commodities catering to BCUC is observed from the Puri side via NH-203 and Balasore side via NH-5. Linkage to the proposed Eastern Bypass to the BCUC complex (starting from Nirgundi and connecting Pipili) will obviate the need for freight movement through the urban arterials as well as the NH-5 stretch (within Cuttack town). Moreover, movement of freight from this wholesale hub to the Cuttack town can be via wider ring roads obviating the need to ply on narrow internal city links.

In Phase I (2007-2015), truck parking facility for 200 trucks is to be planned along with 2 million sq.ft. of warehousing and cold storage space. Additional parking facility and storage space can be added as per the exhibited demand.

6.9 Cost Estimates

The capital investment requirements for the construction of various infrastructural facilities discussed here are based on adhoc construction prices. Thus, tentative figures for the capital investment requirement have been computed. However, this may not reflect the actual fund outlays required in the next three decades. The tentative cost estimate for proposed traffic and transportation facilities is rupees 4690 crores.

Table 6.23: Tentative cost estimate for proposed actions

Sl.No.	Proposed actions	Cost in (Crores)
1	Road network capacity improvement i. Creation of new road links ii. Capacity augmentation of existing links iii. Up-gradation and improvement of existing link iv. Improvement of intersections v. Provision of pedestrian and cyclist facilities	1430
2	New bridges (1 no.s) i. On Kathajodi (1 no.s) ii. On Mahanadi (1 no.s) iii. On Birupa (2 no.s) iv. On Kuakhai (1 no.s)	1240
3	Creation of bus terminal facilities i. Bidanasi ii. Sikharpur iii. Choudwar iv. Nirgundi	110
4	Creation of freight terminal and transshipment facilities i. Logistic hub facilities in Nirgundi ii. Truck terminal and whole sale trading zone in Sikharpur	350
5	Provision of mass transit facilities (High Capacity Bus Transit System) for inter-urban movement in CDPA	720
6	Provision of elevated mass transit option for intra-urban movement in Cuttack	800
7	Construction of parking facilities (provision of grade separated off-street facilities along with improvement of on-street facilities)	40
	Total	4690

7.1 Introduction

The CDPA is a major part of the BCUC. The BCUC was divided into 25 planning units in the Perspective Plan Vision 2030. Out of these 25 planning units, 11 planning units comprise the CDPA area. The Administrative Areas that make up the CDPA jurisdiction; viz. CMC, Choudwar Municipality and CDPA Rural, are shown in **Table 7.1** below.

7.2 CDPA : Area and Population

The CDPA constitutes around 42% of the BCUC area. It extends over 302.80 sq.km. against 721.90 sq.km. of the BCUC area. The **Table 7.2** below shows the 11 planning zones with their areas, populations in 2001, as well as, the projected population of 2030. It is noteworthy that the projected population of CDPA in 2030 is 15,00,000 while the projected population of the entire BCUC for 2030 is 41,70,000, which implies that about 28% of the population of BCUC will be residing in the CDPA. This illustrates the significance of this area as well as the magnitude of the problem.

Table-7.1: Projected Population of Administrative Areas in CDPA

Administrative Area	Area (Sq.Km)	Population 2001	Population 2008	Population 2030	Density 2001 (Popn./SqKm)	Density 2008 (Popn./SqKm)	Density 2030 (Popn./SqKm)
CMC	118.7	535260	655000	1115000	4509	5518	9393
Choudwar Municipality	35.82	52528	70000	125000	1466	1954	3490
CDPA Rural	147.65	78914	102000	260000	534	691	1761
Total CDPA	302.17	666702	827000	1500000	2207	2737	4964

Table-7.2: Expected Population of Planning Zones in CDPA

Zone No.	Zone Name	Area (Sqkm)	Population 2001	Population Density 2001 (Popn./Sqkm)	Population 2008	Population Density 2008 (Popn./Sqkm)	Population 2030	Population Density 2030 (Popn./Sqkm)
1	Nirgundi	29.25	16583	567	25000	850	85000	2900
2	Charbatia	29.61	34032	1149	45000	1520	80000	2700
3	Chhatisa	17.46	4370	250	6000	350	12000	700
4	Choudwar	18.31	25942	1417	34000	1860	56000	3100
5	Nimapur	28.24	23515	833	40000	1420	115000	4100
6	Bidanasi	33.18	75928	2289	110000	3300	250000	7500
7	Old Cuttack	23.37	314166	13442	317000	13570	350000	15000
8	Sikharpur	26.99	103484	3834	138000	5110	220000	8150
9	Mundali	33.10	13881	419	22000	665	42000	1250
10	Barang	37.88	24623	650	40000	1060	110000	2900
11	Gopalpur	24.78	30178	1218	50000	2020	180000	7300
Total CDPA	302.17	666702	2206	827000	2737	1500000	4964	

Source: Census of India, 2001

7.3 Ground Checking of Existing Housing Conditions

An extensive ground checking was done in the various housing pockets as well as along major spines, to understand the nature, trend and condition of housing in the entire CDPA area. **(Map 7.1)**

7.3.1 Bidanasi Triangle

- i. Growing at a sluggish pace.
- ii. Lack of infrastructure and neighbourhood level facilities, coupled with the fact that the area is flood prone, attributes to this slow pace of development. **(Fig 7.1)**
- iii. Primarily Residential character; pockets of scattered commercial land use primarily to cater to the needs of the residents. Ground floors of some of the residences show commercial use. **(Fig 7.2)**
- iv. Plotted development is observed.
- v. Authorized municipal sanction limit for the individual private residential buildings in the aforesaid areas within Bidanasi Triangle is upto 3 storeys. So, upto G+2 storied residential buildings have come up.
- vi. Depending upon the size of their respective plots, row-housing or semi-detached housing has been laid. Group housing estates for L.I.C. and P & T Staff Quarters, private co-operative housing, etc., two-storied housing complex under construction by the Housing Board are coming up in Sector 6 & 7, G+2 housing complex for employees of Judiciary, a 4-storied gated and walled Govt. housing complex in Sector 8 & 9. Housing complex (G+2 storied) developed by the private Kathajodi group is under construction. **(Fig 7.3)**
- vii. Incidental open spaces between plots, as well as, large expanse of vacant lands exist. Some of these are now showing progress of construction activities. **(Fig 7.4)**
- viii. Less numbers of organized open spaces in the form of parks are found.
- ix. Roads – kuchcha & pucca – are there in a more or less grid iron pattern of layout.
- x. Existence of open drains on both sides of the roads.
- xi. Under utilization of housing activities. Development with respect to housing activities seems to have taken start more recently, as buildings here look newly constructed.
- xii. Infrastructural developments have not taken place with respect to internal roads, street lighting, etc. in some areas of the sectors.



Fig 7.1: LIC Housing at Bidanasi Sector, Cuttack



Fig 7.2: Ground Floor of residences converted to commercial use



Fig 7.3: Group Housing



Fig 7.4: Incidental open spaces between plots

Ground checking of Existing Housing Conditions



Fig 7.5: Open drains alongside the roads



Fig 7.6: Housing varying from G+1 to G+3



Fig 7.7: CDA Market



Fig 7.8: Occupied Staff Quarters

- xiii. Apparent reasons of failure for this Bidanasi Triangle to gain momentum of growth or popularity in Housing sector is that this large area is situated on one corner of the city. Only means of road connection to the CBD is through the ring road encircling it, thus making travel longer and more time consuming. Through roads are less and in bad shape.

7.3.2 Mahanadi Vihar

- i. Planned area densely populated residential district in CDPA.
- ii. Well laid grid-iron internal road layout.
- iii. Faster development of residential occupancy and its importance with respect to growth of residential land use density
- iv. Shorter distance from C.B.D.
- v. Located closer to the NH 5.
- vi. Open drains on both sides of most roads. **(Fig 7.5)**
- vii. Plotted development is observed.
- viii. Row, as well as detached housing, is seen depending on the size of plots. Heights of residential buildings vary from 1 to 4 storeys. **(Fig 7.6)**
- ix. Incidental open spaces are also found here and there in the midst of plotted development.
- x. Ground Floors of many residences – especially at important crossings, show commercial activities.
- xi. Large market bldg. (2-storeyed) is also seen here which is known as the CDA Market. **(Fig 7.7)**
- xii. Recent vertical extension is quite prevalent, proving increase in the importance of the area with respect to residential character and demand.

7.3.3 Choudwar

- i. Experiencing land use conversions, mostly industries and institutions.
- ii. The OTM Colony has dilapidated at Choudwar. This housing scheme spreads on a land of around 150 acres. This housing scheme has a high potential to be developed as future housing by augmenting it since the existing basic infrastructure is under-utilised.

- iii. Total number of staff quarters is 1200 dwelling units. Few staff quarters are occupied by people now opting for alternative means of livelihood as a result of closing down of production in the textile mill. **(Fig 7.8)**
- iv. Vast expanses of open and unused/ill-maintained lands exist. **(Fig 7.9)**
- v. Vast area lying beside NH-42 waving on to encourage development of housing facilities for the people of Cuttack.
- vi. Availability of allied infrastructural facilities (internal roads, markets, school and some other commercial facilities) within the campus can further give necessary impetus to the same. **(Fig 7.10)**
- vii. Housing needs for the adjacent existing industrial sector can be tackled by carefully developing residential facilities within this O.T.M. Township through proper planning.

7.3.4 Sahi's in Old Cuttack

- i. Transition in the design and layout lies from organic form to a more organized, uniform and geometric pattern.
- ii. Basically evolved from the basic agglomeration of small villages.
- iii. People are habituated to living within closely packed low-height houses by the sides of narrow meandering roads (with open drains at most of the stretches) and bye-lanes within the core of the city.
- iv. Few numbers of houses have been re-modeled to look modern buildings with the application of recent and expensive building materials. **(Fig 7.11)**
- v. Houses designed keeping in view the professional requirements and the sociable nature of the olden people of Cuttack and are evident from the presence of extended plinth of most of the buildings. **(Fig 7.12)**
- vi. Few areas are dominated by specific communities like the Muslim, Christian, Marwari, Oriya, etc. communities.
- vii. Housing developed around institutions like Ravenshaw College, S.C.B Medical College and other work centres like the Judiciary complex etc.
- viii. The basic trend of low height (upto 3 storied) structures laid as row-housing basically still persists like the ones in the past.
- ix. Some of the areas have been transformed into the old city slums due to multiplication of households and lack of sanitation and maintenance. **(Fig 7.13)**



Fig 7.9: Vast expanses of open land



Fig 7.10: Commercial activities in O.T.M Area



Fig 7.11: Re-modeled houses within the Sahi



Fig 7.12: Extended plinth- A typicality of the houses

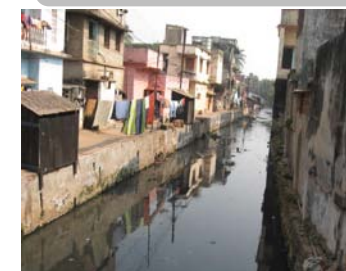


Fig 7.13: Drain passing through the Sahi of Old Cuttack

7.4 Existing Scenario and Trends

The existing scenario is analysed in the following section to arrive at likely trends.

7.4.1 Household Distribution

It is evident from the **table 7.3** that in the CDPA area as a whole, nuclear families form the largest component (48.49%) followed by joint (31.38%) and extended families (16.80%). In Choudwar municipality, extended and joint families are a significant number. It is expected that the CDPA area will continue to see the growth of extended and nuclear families. An increased demand for rental housing in this area is thus envisaged.

Table 7.3: Distribution of Households by Family type in CDPA

Type	Stratum				Total
	C MC		CDPA Rural	Choudwar(M)	
	4	5	7	10	
Single Member	3.73	2.57	2.92	0.66	3.08
Nuclear	58.10	49.52	34.12	2.63	48.49
Extended	12.85	18.65	19.16	33.55	16.80
Joint	24.94	29.26	43.43	63.16	31.38
Mess/Boarding	0.26	0.00	0.18	0.00	0.16
Not Reported	0.13	0.00	0.18	0.00	0.09
Total	100.00	100.00	100.00	100.00	100.00

Source: Socio economic survey IIT-2006

Several measures will have to be taken to make rental housing an acceptable proposition and also to make rental housing affordable. Reverse mortgage will help increase the rental housing stock, while narrowing the supply-demand gap will bring down the rent. Rent that is 15-20% of income will be considered as economic rent. New dwelling units will also be made available for the prospective home buyers. The housing cost as a multiple of annual household income has to be brought to 3-4 times, to make housing affordable and attractive.

7.4.2 Distribution of Household by type of Dwelling Unit

Table 7.4 shows that over 79% of the households in CDPA area live in pucca houses, while about 11% and 7% of the households occupy the kuchha and semi-pucca houses, respectively. While about 78.57% of the households in the Cuttack Municipal Corporation area occupy pucca houses, the rural component of Cuttack has only 51% of the households in pucca houses. The CDP assumes new roles to the CDPA rural areas. This will generate a new scenario with a drastic increase in the pucca

houses. A sizable number of kuchcha and semi-pucca will filter upwards, while new pucca construction will far outweigh the kuchha construction.

Table 7.4: Distribution of Households by type of dwelling unit in CDPA

Type	Stratum				Total
	Cuttack MC		CDPA Rural	Choudwar(M)	
	4	5	7	10	
Pucca	81.62	83.60	50.55	80.26	78.57
Kuchha	9.38	11.58	18.25	8.55	10.84
Semi-pucca	6.04	3.86	17.15	10.53	7.11
Hut	2.96	0.96	14.05	0.66	3.48
Total	100.00	100.00	100.00	100.00	100.00

Source: Socio economic survey IIT-2006

7.4.3 Floor Area per Household/Person

In the CDPA about 23% of the households occupy 751-1200 sq.ft. of covered area and another 16% live in areas above 1200sq.ft. In Choudwar & Charbatia urban areas, about 61% of the households live in areas more than 1200 sq.ft. which is much higher than the percentage of households occupying the same areas in CMC (14%).

Table 7.5: Distribution of Households by total area covered of dwelling units

Stratum	Cuttack MC		CDPA Rural	Choudwar(M)	CDPA Total
	4	5	7	10	
101-150	4.77		8.30	0.00	4.75
151-250	6.05		21.99	3.29	7.57
251-500	29.37		35.27	10.53	28.39
501-750	18.45		15.77	5.26	17.01
751-1200	25.33		10.79	15.79	22.90
>1200	13.21		4.15	53.95	15.72
Not Reported	2.84		3.73	11.18	3.66
Total	100.00		100.00	100.00	100.00

Source: Socio economic survey IIT-2006

It is anticipated that the CDPA area will generate a significant demand for housing in the 750-1200 sq ft range.

7.4.4 Ownership Pattern

Table 7.6 above shows the house ownership pattern in the CDPA area. Overall, 77% of the households own their houses and only 15% live in rented accommodation. The rural areas of CDPA show that almost 98% of the households own their houses. The stratum 4 and 5 falling in the CMC show the maximum (about 18%) of households in rented accommodation. About 30 % of the households in stratum 10, live in

office accommodation. This trend is likely to grow further with a larger share of Institutional housing and rented accommodation.

Table 7.6: Households by type of possession of dwelling units

Type	Stratum				CDPA Total
	Cuttack MC		CDPA Rural	Choudwar(M)	
	4	5	7	10	
Owned	73.65	78.78	98.36	63.16	76.76
Owned by relatives	0.13	0.32	0.00	0.00	0.15
Office Quarter	7.46	5.14	0.18	30.26	8.04
Owned Flat	0.13	0.00	0.00	0.00	0.07
Rented House	18.64	15.76	1.28	6.58	14.96
Rented Flat	0.00	0.00	0.00	0.00	0.00
Others	0.00	0.00	0.18	0.00	0.02
Total	100.00	100.00	100.00	100.00	100.00

Source: Socio economic survey IIT-2006

7.4.5 Nature of Dwelling Units

The **Table 7.7** shows that about 78% of the households reside in one storied houses in CDPA, and 11.04% in the two storied category. About 2.79% households are living in multi-storied and apartment building. There is a significant rise in multi-storied and apartment buildings in stratum 10, amounting to about 23.03. About 7.39% of the households live in slums.

There will be significant growth of group housing, especially in the Nirgundi, Gopalpur, Barang, Bidanasi areas. Plotted development will pre-dominate the areas like Nimapur, Sikharpur, Choudwar and Bidanasi.

Table 7.7: Households by nature of dwelling units

Type	Stratum				CDPA Total
	Cuttack MC		CDPA Rural	Choudwar(M)	
	4	5	7	10	
One storied	78.66	86.82	68.43	58.55	77.83
Two Storied	14.01	10.93	2.01	3.95	11.04
Multi Storied	1.03	0.00	2.01	23.03	2.79
Flat	0.90	0.96	0.00	0.00	0.74
Slum Hut	5.40	1.29	26.64	13.16	7.39
Others	0.00	0.00	0.91	1.32	0.21
Total	100.00	100.00	100.00	100.00	100.00

Source: Socio economic survey IIT-2006

7.4.6 Major Housing Providers

The major institutional housing in the CDPA is undertaken by the Orissa State Housing Board (OSHB), and the Cuttack Development Authority (CDA). The various housing typologies are shown in the **Table 7.8** below:

Table 7.8: Institutional Housing

	<i>EWS</i>	<i>LIG</i>	<i>MIG</i>	<i>HIG</i>	<i>Others</i>	<i>Total</i>
<i>CMC</i>	27	100	0	316	0	443
<i>Choudwar</i>	9	248	182	0	9	448
<i>CDPA Rural</i>	-	-	-	-	-	-
<i>CDPA Total</i>	36	348	182	316	9	891

The Table shows that the major thrust of the housing authorities have been towards providing EWS, LIG and MIG housing schemes.

The govt. housing schemes and PPP housing schemes should continue to provide affordable housing and generate cross subsidy arrangement to offset the cost reduction.

7.4.7 Housing Trend in CDPA

The 70's-80's decade saw an emphasis on group housing schemes including govt. quarters, bungalows and single dwelling units. The 80's-90's decade continued the emphasis on walk-ups and included group housing and plotted development schemes. Slum upgradation schemes were also undertaken considering the growing number of slums in this period. The late 80's and early 90's saw the development of high, multi-storied dwelling units and apartments which ranged upto 7-8 storied. The 90's-2000's emphasized on plotted housing schemes including group housing and core housing for various income groups. Slum upgradation schemes also continued. This period till date looks onto a shift towards joint venture schemes in the public-private-partnership (PPP) mode.

The plan period envisages larger roles for private sectors and PPP model. Government will continue to provide serviced land and finance at attractive schemes and less of building activity.

7.5 New Townships in the Pipeline

The new townships in the pipeline as outlined by the CDA in their VISION 2020 proposals, with reference to the Perspective Plan of IIT Kharagpur has been mentioned below:

7.5.1 Future Housing Project of CDA (next ten years)

Table 7.9: Future Housing Projects of CDA

Sl. No.	Location	Predominant development purpose
1.	Choudwar	Housing including Industrial housing
2.	Nimapur	Large scale Housing to accommodate spill over population
3.	Bidanasi	Extension of Bidanasi Housing Project
4.	Bidanasi	Development of Housing near Naraj
5.	Sikharpur	Development of plotted scheme for housing project
6.	Barang	Development of Farm Housing Project
7.	Gopalpur	Development of Housing Project

Source: CDA

7.5.2 Future Housing Project of Orissa State Housing Board (OSHB)

Table 7.10: Future Housing Project of OSHB

Sl. No.	Location	Predominant development purpose
1.	Choudwar	Housing including Industrial housing
2.	Nimapur	Large scale Housing

7.6 Future Housing Requirement in CDPA

The projected housing requirement for the BCUC by 2030 was compounded to be 7,00,000 dwelling units in the Perspective Plan Vision 2030. The housing requirement of CDPA is compounded to be **2,68,759** dwelling units for the same period. This implies that about 38% of the future housing requirement for BCUC will be in the CDPA alone. This calls for careful planning and strategizing.

The future housing requirement for the CDPA has been done considering both, the quantitative housing shortage and the qualitative housing shortage. The future household formation, including natural growth and in-migration have been considered, the current housing backlog as well the obsolescence component, have also been considered.

Table 7.11 below shows the projected population and the quantitative housing requirement for the CDPA in 2030 as a whole as well as the constituent planning units individually.

Table 7.11: Future Dwelling Unit Requirement in CDPA

Planning Zone No.	Name of the Planning Zone	Type	Area (sq.Km)	Population 2001	Proposed Population 2008	Proposed Population 2030	Total No. of Household 2008 (Avg. HH Size=5.28)	Total No. of Household 2030 (Avg. HH Size=5)	Grand Total Future DU Req.
1	Nirgundi	Extensive	29.25	16583	25000	85000	4735	17000	12265
5	Nimapur	Extensive	28.24	23515	40000	115000	7576	23000	15424
6	Bidanasi	Extensive	33.18	75928	110000	250000	20833	50000	29167
8	Sikharpur	Extensive	26.99	103484	138000	220000	26136	44000	17864
10	Barang	Extensive	37.88	24623	40000	110000	7576	22000	14424
11	Gopalpur	Extensive	24.78	30178	50000	180000	9470	36000	26530
	Total		180.32	274311	403000	960000	76326	192000	115674
4	Choudwar	Intensive	18.31	25942	34000	56000	6439	11200	4761
	Total		18.31	25942	34000	56000	6439	11200	4761
(Sensitive and Restricted Zones)			103.54	366449	390000	484000	73864	96800	22936
Current backlog + Dilapidated stock							67498 + 57890		125388
Grand Total			302.17	666702	827000	1500000	156629	300000	268759

It is evident from the **Table 7.11** that the total future housing requirement, including quantitative and qualitative housing shortage in CDPA region is **2,68,759**.

The current housing backlog is **67,498** which have been calculated by extrapolating the backlog trends of 1981-1991 with suitable adjustments.

The qualitative housing shortage is **57890** of the total planning area. The qualitative housing shortage has been computed from the slum population and the households occupying dilapidated houses as per the Socio-Economic Survey.

The total housing requirement for CDPA is thus the summation of the following:

Future housing requirement (143371) + existing housing backlog (67498) + obsolescence (dilapidated) (57890) = **2,68,759** dwelling units

7.7 Distribution of Income Groups

The entire population has been distributed into four major income categories. The distribution of income categories for 2030 is adapted from Socio-Economic & Demographic Survey in CDPA, 2000-2001 (**Table 7.12**).

Table 7.12: Distribution of Households by monthly income of Households in CDPA

Income Group	Income Range (Rs.)	Existing% Distribution Pattern - 2006	% Distribution Pattern - 2030	HH Distribution Pattern - 2030
HIG	Above 12500	16.66	30	90000
MIG	5,000-12500	57.24	45	135000
LIG	2,500-4,999	18.54	20	60000
EWS	Below 2500	7.56	5	15000
Total		100.00	100	300000

(Source: Adapted from Socio-Economic Survey Report of BCUC, 2006)

7.8 Land Requirement

The future land requirement in the identified planning units has been computed considering their present population density and apportionment of future population density based on population projection for 2030. Population forecast for CDPA is 15 lakh in the year 2030. The population has been calculated for each planning units individually. The planning units have been classified into 4 major types namely, Intensive, Extensive, Sensitive and Restricted Development Zones. The maximum population that can be allotted to a specific planning unit is found by multiplying the maximum permissible density (persons/sq. km) of each planning unit with the area of the planning unit.

Table 7.13: Area requirement for new housing in CDPA

Planning Zone No.	Name of the Planning Zone	Type	Total DU Requirement	2008 Housing Area (in acres)	2008 Housing Density (DU/Acre)	2030 Housing Density (DU/Acre)	2030 Housing Area (in acres)
1	Nirgundi	Extensive	12265	374.92	33	30	409
5	Nimapur	Extensive	15424	638.54	24	40	386
6	Bidanasi	Extensive	29167	990.10	30	40	729
8	Sikharpur	Extensive	17864	1090.60	16	35	510
10	Barang	Extensive	14424	552.79	26	40	361
11	Gopalpur	Extensive	26530	638.54	42	40	663
4	Choudwar	Intensive	4761	385.07	12	15	317
(Sensitive and Restricted Zones)			22936				1101
Current backlog + Dilapidated stock			125388				1084
Grand Total			268759				5560

The land requirement under housing in different planning units has been computed assuming the residential density for different planning zones (Table 7.13).

7.9 Cost of Development

The aim is to provide serviced land with essential infrastructural facilities like, road, water supply, drainage-sanitation, and electricity. It however does not include any social infrastructure. The principle of cross subsidization will be applied for pricing of land to bring it within the affordable limits of the EWS and LIG. However, the cost of development depends upon the level of infrastructure provided. Thus, the housing development cost assumed, as per current market prices is subject to change.

The land acquisition cost per acre considering the prevailing market conditions, varies in the different planning zones. The following assumptions have been made:

The lowest rates are in Charbatia and Chhatisa in the range of Rs. 10 to 25 lakh per acre (an average cost of 18 lakhs per acre has been considered for appropriate calculations). The land acquisition cost per acre in Nirgundi, Choudwar, Nimapur, Mundali and Barang has been assumed to be around 25- 30 lakh per acre. Considering the scarcity of land in the already densely developed Old Cuttack area, the land acquisition cost has been assumed to be Rs. 215 lakh per acre, followed by Bidanasi at Rs. 200 lakh per acre (**Table 7.14**).

The cost for development of raw land has been assumed to be Rs. 10 lakh per acre for extensive development zones. For the already developed areas earmarked for intensive development such as Old Cuttack and Bidanasi, the land acquisition cost includes cost of land development.

The land requirement and their corresponding development costs based on the above assumptions, is indicated in **Table 7.14**.

Table 7.14: Housing cost of development

Planning Zone No.	Planning Zone	Type	2030 Housing Area (in acres)	Land Acquisition cost (lakhs/acre)	Land Development Costs (in lakhs/acre)	Total Development Cost (per acre)	2030 Total Development Cost in Lakhs
1	Nirgundi	Extensive	409	25	10	35	14315
2	Charbatia	Restricted	582	18	10	28	16296
3	Chhatisa	Sensitive					
4	Choudwar	Intensive	317	25	10	35	11095
5	Nimapur	Extensive	386	30	10	40	15440
6	Bidanasi	Extensive	729	200 (Inclusive of land Development cost)	-	200	145800
7	Old Cuttack	Restricted	237	215	10	225	53325
8	Sikharpur	Extensive	510	135	10	145	73950
9	Mundali	Sensitive	282	30	10	40	11280
10	Barang	Extensive	361	30	10	40	14440
11	Gopalpur	Extensive	663	115	10	125	82875
Current backlog + Dilapidated stock			1084	25	10	35	37940
Grand Total			5560		10	86	476756

Therefore, from the above mentioned table it is evident that,

Average cost of development for the CDPA is as follows:

Acquisition Cost = **Rs.76 lakhs/acre**

Land Development Cost = **Rs.10 lakhs /acre**

Total Cost of Development = **Rs.86 lakhs/acre**

7.10 Housing Strategy

The existing population of CDPA of around 8.27 lakh will reach 15 lakh by the period 2030. This will mean an addition of around 6.73 lakh people. With an average household size of 4.5 this implies an addition of 1.5 lakh dwelling units. In addition there is a current backlog of around 67,498 dwelling units. If the qualitative shortage and obsolescence factors are added to that, the total housing requirement for CDPA in 2030 is around 2.68 lakh dwelling units.

The housing strategy envisages:

- i. Re-densification of the planning units for compact growth.
- ii. Development of new housing colonies and new townships in the extensive development zones. This will include apartments and gated colonies, high-rise apartments in areas with relaxed height norms and increase FAR provision.
- iii. Augmentation of the existing housing schemes that are indicating slow growth.

7.10.1 Re-densification of planning units for compact growth

The CDPA area comprises the following planning units:

The Nirgundi Planning Unit number 1 had a dwelling density of about 33 DU/Acre in 2008. It is likely to continue this momentum in the plan period up to 2030 and the dwelling density in the additional area assumed for this period is 30 DU/Acre.

The Nimapur Planning Unit number 5 exhibits a dwelling density of about 24 DU/Acre. The density assumed for the new area required for housing, is 40 DU/Acre.

Table 7.15: Re-densification of Planning units

Zone No.	Name of the Planning Zone	Type	2008 Housing Area (in acres)	2008 Housing Density (DU/Acre)	2030 New Housing Density (DU/Acre)
1	Nirgundi	Extensive	374.92	33	30
2	Charbatia	Restricted	708.94	12	15
3	Chhatisa	Sensitive	80.52	14	15
4	Choudwar	Intensive	385.07	12	15
5	Nimapur	Extensive	638.54	24	40
6	Bidanasi	Extensive	990.10	29	40
7	Old Cuttack	Restricted	1670.54	36	42
8	Sikharpur	Extensive	1090.60	16	35
9	Mundali	Sensitive	271.58	15	15
10	Barang	Extensive	552.79	26	40
11	Gopalpur	Extensive	638.69	42	40
Grand Total			7402.29	21	32

The Bidanasi Planning Unit number 6 currently has only 29 DU/Acre. The density assumed is 40 DU/Acre. This will be achieved through the provision of better infrastructure that will trigger a growth in the currently sluggish character of housing development. This area will witness augmentation of ongoing housing schemes as well as development of new integrated townships. Sikharpur (8), Barang (10) and Gopalpur (11) should be seen in tandem for development of integrated townships. It is also proposed to have a Special Housing Zone (SHZ) and Special Residential Zone (SRZ) in this zone with incentives for affordable housing. The density is assumed to be 40 DU/Acre both for Barang and Gopalpur, for the additional area required for housing .

Choudwar, Planning Unit number 4 is identified for intensive development. The existing density of 12 DU/Acre is assumed to go up to 15 DU/Acre for the additional area.

The existing residential density of CDPA is 21 DU/Acre whereas the overall residential density will be 32 DU/Acre for the period 2030.

7.10.2 Future New/Augmentation of Housing Schemes: (Map 7.2)

Nirgundi (Z-1), Charbatia (Z-2), Chhatisa (Z-3), Choudwar (Z-4): Industrial Housing/Special Residential Zone

The 4 zones of Nirgundi, Charbatia, Chhatisa and Choudwar are a part of the Northern Fringe of CDPA. These areas are presently low density areas but will accommodate a significant share of population and hence, a slight rise in the housing densities is anticipated in the plan period.

The Nirgundi zone has been proposed for extensive development and with an overall residential density from 30 to 35 DU/Acre. The zone of Choudwar has been proposed for intensive development and will also show a marginal rise in the residential density from 12 to 15 DU/Acre.

The zones of Charbatia and Chhatisa have been proposed for restricted, as well as, sensitive development. Hence, the densities of these zones will be limited to 15 DU/Acre, respectively as on date.

Since the entire Northern Fringe acts at present as an 'Industrial Centre' of the CDPA, it will also further function as the same in future. Hence, large quantum of industrial housing is required in these zones.

The zones of Charbatia, Chhatisa, Choudwar and Nirgundi are proposed for industrial housing.

The revitalization of the existing residential industrial infrastructure 'The OTM Colony' in the Choudwar Zone with due clearance from the ASI (as the entire area is under ASI) is proposed.

Special Residential Zone (SRZ) for affordable housing is also proposed in Nirgundi Zone due to availability of uninterrupted vacant land and to meet the housing demands of the future population.

Affordable housing will see an increase in integrated townships, self-contained communities in the price range of 15–20 lakhs. This is likely to generate a quantum demand for 2 BHK/3 BHK units within the range of 900-1300 sq.ft. These efforts will have a spin-off effect in the real estate industry as well as the lending institutions. Currently, banks are encouraged to go for loans upto 20 lakhs as a 'Priority Sector Lending Norm'.

Nimapur (Zone-5):

Large scale housing for spill-over population

Nimapur zone is also an industrial zone of CDPA. But, due to its proximity to the main city a trend in housing shift from the main city to this zone is observed. Hence, future housing in the form of plotted developments for the spill-over population of Cuttack has been proposed. plotted development schemes for LIG, MIG and HIG with plot areas in the range of 1200 - 1500 sq.ft. for LIG, 2000 -3000 sq.ft. for MIG, and 3500 - 6000 sq.ft. for HIG can be proposed. The current density of 24 DU/Acre is likely to increase upto 40 DU/Acre as this zone is proposed for extensive development.

Bidanasi (Zone-6):

High end group housing/ Plotted development

The Bidanasi Township has been planned as one of the largest satellite townships to meet the future housing demands of the city of Cuttack. It had been planned for a population of 1.5 lakh which included the spill-over population of the main city, migrants from outside engaged in various economic activities including the service population. The Bidanasi Triangle until today consists of 15 sectors with an admix of EWS, LIG, MIG, HIG and group housing schemes. But this township is growing at a

very slow pace due to lack of basic infrastructure in some of the sectors. the present density of Bidanasi township is as low as 29 DU/Acre and needs to be augmented to 40 DU/Acre.

Augmentation of the existing housing schemes with Special Residential Zones (SRZ) has been proposed for Bidanasi. Plotted development schemes with plot sizes ranging from 1200–1500 sq.ft. (LIG/EWS), 2000-3000 sq.ft. (MIG), 3000 - 6000 sq.ft. HIG can be implemented. The concept of affordable housing as mentioned earlier is also applicable for this zone.

Slum rehabilitation schemes like VAMBAY etc. can also be proposed in this zone to provide for the service population of this area. Slums/bastis along the riverfront need to be rehabilitated under such schemes.

High end group housing schemes are also proposed in this zone. The acceleration in this zone will absolutely depend on the provision of infrastructure by the government through government housing schemes, private schemes or through PPP mode.

Old Cuttack (Zone 7):

Preservation and Augmentation Approach

The general character of the Old Cuttack is one of low-rise-high-density with traditional Sahi Culture. A sizeable amount of institutional housing and government quarters is also evident in this zone. Sporadic development of high rise apartments is seen in some of the areas where large chunks of land were available or through land amalgamation. It is assumed that the demand for rental housing in Old Cuttack zone will increase and hence intense incentives should be given by the government and the various financial organizations for repair, maintenance and face-lift of old traditional houses in the Sahi areas.

Slum upgradation schemes in the form of reconstruction, VAMBAY and slum networking along the drainage channels can be implemented. The slums along the riverfront and other prime areas can be rehabilitated under such schemes.

The overall housing condition can thus be improvised in the Old Cuttack zone with a marginal increase in the residential density from 36DU/Acre to 42 DU/Acre.

Sikharpur (Zone 8):

Special housing zone and Redensification

The Sikharpur zone shows a heterogeneous character of housing. Unplanned, unorganized housing development along with regular plotted development schemes (e.g. Mahanadi Vihar) and institutional housing (e.g. CRR) are to be seen in this zone. This zone exhibits a very low density of 16 DU/Acre. Re-densification of this zone to achieve a density of 35 DU/Acre is proposed.

Relocation of the wholesale commerce from the Malgodown area is proposed in this zone. So, a Special Housing Zone has been proposed in this zone for rehabilitation of the slum pockets near the Taldanda Canal and the Malgodown area. Approximately 5000 households occupying an area of 75 acres (60 sq.m./hh) need to be provided under this scheme.

Mundali (Zone 9):

Resort Housing

Mundali, being an eco-sensitive zone, sensitive and sustainable development been proposed. This zone has been gifted with varied natural assets such as the riverfront and the Puri Canal on one side, small hillocks with dense vegetation on the other with the backdrop of the Chandaka forest. Hence a very low density of 15 DU/Acre, with eco-friendly development is envisaged for this zone with proposals for lagoon resorts, weekend resorts, Club Towns, etc.

Barang and Gopalpur (Zone 10 and 11):

High end housing/ Group housing, Relocation of village settlements

The zones of Barang and Gopalpur lie in the Southern Fringe of Cuttack. These are the rapidly developing areas with sporadic development and growing speculation. The absence of proper plan for housing development will lead to haphazard growth.

The zones of Barang and Gopalpur have been proposed for extensive development. At present, the housing densities of these zones are as 26 DU/Acre in Barang and 42 DU/Acre in Gopalpur. The future housing densities of these areas is anticipated upto 40 DU/Acre in each zone.

The zone of Barang has been identified as a Special Activity Centre with proposals for high-end activities such as the State Government Office Complex (SGOC), Health Complex, IT SEZ, all along the metro corridor. Also, areas have been earmarked for educational and theological institutions/universities.

Hence, to complement the above mentioned activities, high end and institutional housing has been proposed in this area.

Similarly, in Gopalpur zone also, high end multistoried group housing under the private or PPP mode has been proposed along the NH-5.

The MRTS in the Barang zone and location of the Cultural Hub in the Gopalpur zone calls for relocation of certain village settlements. Hence, Special Residential Zones are proposed in these zones for affordable housing and rehabilitation of these village settlements. Approximately 1636 households in Barang zone and 287 households in Gopalpur zone shall be replaced and an area of 40 and 10 acres, respectively shall be required to relocate them.

Land Sharing approach can be implemented in cases where village settlements exist on prime locations with high land value. This successful model has been attempted in Bangkok and can be especially useful in the areas of Barang and Gopalpur, which can be used for commercial development and the village settlements can be rehabilitated on a small portion of the land.

The success of induced development in these zones will depend upon the provision of infrastructure by the government authorities under various government schemes, private schemes or PPP mode.

7.11 Slums

Globally, the phenomenon of slums exists from the mid 19th cent to the present. These are mainly places in city neighborhoods or inner-city, inhabited by low income people characterized by physical dilapidation. As per the 2001 Census of India, a slum is a compact area of at least 300 persons population or about 60-70 households of poorly built congested tenements, in an unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.

Indicators of slum are:

- i. Land encroachment
- ii. Locational incompatibility
- iii. Unplanned development
- iv. Unauthorized construction
- v. Temporary or semi permanent structures
- vi. Absence or inadequacy of basic services

7.11.1 Existing slums in CMC

The growth rate in CMC area during the decade 1991-2001 was 57.46% which was much higher than the national average of 31.17% or the State average of 27.78%.

According to CMC reports, there are 240 slums in Cuttack, occupying 571.25 acres of land, 28129 no of households and a total of 178817 population. It is also reported that basic facilities are grossly absent in these slums; viz. toilet facilities (60%), electricity (40%) and education facility (30%).

From the **Table 7.16** and **Map 7.3**, it is observed that:

- i. Maximum 57,891 people reside in slums outside the municipality. Most of these slums have developed on private lands.
- ii. Ward no. 1 has maximum 24 slums having 3010 households and 20120 population.
- iii. Ward no 3, 11 and 35 have more than 5% of total slum population.

An onsite survey was been done of different slums, namely of 29 slums present within the Planning Zone CDPA. A few observations has been made.

- i. Around 75% of the slums have the provision of Anganwadi.
- ii. 80% of the slums are not facilitated with the Arogya Kendra.
- iii. There is no application of the Indira Abash Scheme and Vambay Scheme.
- iv. Around 80% of the slums are provided with electricity and water connections.
- v. Piligram Dassahi, Ranihat has maximum no. of tubewells numbered to 17.
- vi. 80% of the surveyed slums are not being provided with a minimal facility of Sulabh Sauchalaya and toilets.
- vii. Dhoba Sahi is supposed to be the oldest of the slums, ranging around 200 years of settlement with a population of 4000.
- viii. The major occupation is working as a labour.

Table 7.16: Slums in Cuttack Municipal Corporation

Ward No.	Total slums	No. of Households	Total slum population	Percentage of Total Slum Popn.
1	24	3010	20120	11.41
2	3	202	1610	0.91
3	8	1195	10730	6.09
4	1	300	1567	0.89
5	2	650	4500	2.55
6	3	1150	6695	3.80
7	2	547	3282	1.86
8	6	1025	5910	3.35
10	1	200	1200	0.68
11	6	1530	10550	5.98
12	3	280	1970	1.12
14	4	510	3315	1.88
15	1	31	400	0.23
17	4	625	4700	2.67
18	8	940	5600	3.18
19	5	235	1730	0.98
20	1	25	150	0.09
21	1	100	350	0.20
22	3	165	855	0.48
23	1	250	1500	0.85
24	3	315	1600	0.91
25	2	643	3266	1.85
26	3	245	1500	0.85
27	6	645	4030	2.29
28	1	45	210	0.12
29	1	60	400	0.23
30	12	917	4595	2.61
31	2	100	600	0.34
33	6	550	2600	1.47
34	4	215	1241	0.70
35	6	1670	10660	6.05
36	1	90	600	0.34
40	1	75	380	0.22
Outside	104	9339	57891	32.84
Total	239	27879	176307	100.00

Source: CMC Report, 2006

7.11.1.1 Slums along the Taldanda Canal

- i. Interior kuchha pathways are in very bad shape.
- ii. No street light or electric supply.
- iii. No toilets exist.
- iv. Canal is the only means of water required for sanitation and washing purposes. **(Fig 7.14)**
- v. Source of drinking water is the timely supply from PVC reservoir laden vehicles.
- vi. Residents have been given Voter I-cards by authorities. But Ration cards for availability of food grains at a cheaper rate are not being provided.
- vii. No school exists.
- viii. Predominant occupation for men happen to be car cleaning, rickshaw pulling (as employees), to work as garbage pickers and sellers (kawari wallah). While for women, it happens to be working as domestic maid-servants in nearby affluent residential neighborhoods.
- ix. A general consensus amongst the dwellers to stick to this place in slums because this area is reportedly close to the place where lies their source of livelihood. Given the option to shift to distant but better living places, they would decline for obvious reasons. **(Fig 7.15)**



Fig 7.14: Canal-the only source of water



Fig 7.15: Poor condition of the slums

7.11.2 Slums in other Municipalities

Except Cuttack, there is negligible presence of slums in other municipality such Choudwar. There is presence of some old settlements called Sahi's, which show the symptoms of a slum. Physical characteristics of these places depict narrow lanes, semi-pucca or pucca built structures, low rise and high density development and deficient in basic urban services.

The other kind of settlements called bastis are also slums present in smaller pockets either in outskirts or within municipal limits.

Physical characteristics of these slums are:

- i. Unorganized development of colonies on Government lands
- ii. Kutcha houses having thatched, tin, or asbestos roof.
- iii. There is severe lack of sanitary facility in these slums. Public wells and community bore wells are source of water supply for the residents.
- iv. Though there is availability of electric supply in these areas but economic condition of most of the residents does not permit to avail this facility.
- v. Most of the residents are staying in these places for more than twenty years.

- vi. Primary occupation of these residents is as agricultural labourers, construction labourers, rickshaw pullers, etc. Younger generation is employed as taxi and four wheeler drivers, workers in warehouses and business establishments. Women and girl children are often engaged in bamboo weaving.
- vii. Most of the residents are Saura, Domu and Bauri community who are socially backward.

7.11.3 Slum Upgrading/Development Approaches

Slum eradication programmes have been a disaster everywhere. Subsequently, slum upgrading approaches were conceived. Some of the slum upgrading approaches undertaken globally and nationally are discussed here which are suggested for implementation in the CDPA. A multicriteria approach is required to arrive at the best-fit solution for the slum pockets (**Map 7.3**).

Slum upgrading approaches will include:

7.11.3.1 Settlement Reconstruction:

If the existing location of the slums is compatible with the surrounding and proposed land use and zoning regulations, settlement reconstruction approach can be considered. Some of the areas of the Old Cuttack zone and Choudwar zone need to be included under this approach.

There should be adequate FSI available and the minimum affordability of households for a 180 sq. ft. tenement with two storied structure.

7.11.3.2 Settlement Relocation:

Mainly the slums, along the Taldanda Canal, Malgodown areas and the riverfront areas of Old Cuttack, Sikharpur, Bidanasi and Nimapur Zones are to be relocated. Also the slums along the heritage areas in Charbatia zone and those occupying prime locations in Nirgundi and Nimapur zone need to be relocated. Alternative land has to be made available for relocation of these slums. The government can create a land bank for this purpose. Also there should be minimum affordability of households for a serviced plot of 200 sq.ft.

7.11.3.3 Slum Networking:

In lines of the successful networking approaches found in Indore this approach can also be suitably adopted. This requires a detail study of the existing slums, especially those along the main drainage channels along with the contours of the area. This will not only improve the slums but integrate this approach with the overall development of the area.

7.11.3.4 VAMBAY

This successful model of VAMBAY in a 50:50 cost sharing between centre and state is proposed for rehabilitating slum pockets in Old Cuttack, Sikharpur and Bidanasi zones. The effort will be to achieve slum less cities. Moreover this will serve the service population of Old Cuttack and Bidanasi.

7.11.4 Ongoing Slum Improvement Projects

Basic services for the slum dwellers are being provided by Cuttack Municipal Corporation by implementation of various developmental and social security schemes of Govt. of India and State Government as indicated below:

- i. National Slum Development Programme (NSDP)
- ii. Valmiki Ambedkar Awas Yojana (VAMBAY)
- iii. Swarna Jayanti Sahari Rojgar Yojana (SJSRY)
- iv. SHG Formation
- v. Provision of Tube wells
- vi. Balika Samrudhi Yojana (BSY)
- vii. OAP/ODP
- viii. Health Facilities
- ix. BPL / Antodaya Arna Yojana
- x. Arnapurna Yojana

All these ongoing schemes are steps in the right direction and will be pursued in the plan period.

7.11.5 Vision for Development of Slums

The vision is based on the National Slum Policy. It shall strive to achieve the following:

- i. Ensuring all households shall have access to basic minimum services.
- ii. Ensuring continuous supply or recycling of serviced & semi-serviced land for high density occupation by LIG.
- iii. Building capacity of the EWS & LIG and empowering them to improve their living conditions.
- iv. Encouraging participation of communities & civil society in all areas of planning & development.
- v. Neither a mono strategic approach, nor a top-down strategy, for settlement up gradation, will work.

- vi. There can be no absolute choice of strategy and it has to be situation specific.
- vii. Experience from across the globe shows that the people have to be involved in the entire process of planning, implementing and maintenance.

7.11.6 Slum Development Policy for CDPA Region

It has to be appreciated that neither a mono strategic approach, nor a top-down strategy, for settlement up gradation, will work. There can be no absolute choice of strategy and it has to be situation specific. Experience from across the globe shows that the people have to be involved in the entire process of planning, implementing and maintenance.

A **detailed project report** on the slum population needs to be prepared to study the various factors such as the slum population, location, the residential status, occupational pattern and the income levels etc. in order to implement the various slum rehabilitation schemes.

The entire proposal will be feasible only on implementation by the government authorities either in the public, private or PPP mode.

An integrated slum development policy for CDPA region has been derived in lines with National Slum Policy.

Objectives:

- i. Integration of slum and their communities into the urban area
- ii. Strengthening of legal and policy framework
- iii. Establishing of a framework for smooth implementation of policy

Governing Principles:

- i. Up gradation and improvement of slums instead of slum clearance
- ii. Access to minimum services in all urban informal settlements
- iii. Goal of city without slums

Strategy:

i. Inclusive Approach to Definition of Slum/Informal Settlement:

In general, all under-serviced settlements, be they unauthorized occupation of land, congested inner-city built up areas, fringe area unauthorized developments, villages within urban areas and in the periphery, irrespective of tenure or ownership or land use shall be covered under the definition of a slum/informal settlement.

ii. Comprehensive Listing of Slums/Informal Settlements:

For the purpose of providing basic urban services, all under-serviced settlements characterized by poor physical and socio-economic conditions, should be identified and demarcated from regular planned neighbourhoods. These settlements should be listed by the urban local body.

iii. Registration of Slum Dwellers:

All people residing in such listed settlements should then be registered with the ULB in order to prevent ineligible beneficiaries being included in development programmes.

iv. Identity Card:

A suitable identity card shall be issued to all households in listed slums. The identity card may contain a few details such as household name, address, details of family members etc.

v. De-listing

The urban local bodies should de-list those settlements which have been provided with a sustainable level of basic services and where socio-economic indicators have reached defined acceptable norms.

vi. Classification of Land Status / Tenability

The land status of all listed slums/informal settlements should be classified by the ULB as either Tenable or Untenable in order to determine whether or not regular planned service provision will be undertaken on an in-situ or re-settlement basis.

vii. Granting of tenure

- i. Tenure on Government Owned Land: Tenure shall be granted to all residents on tenable sites owned or acquired by government. Full property rights shall be granted on resettlement and/or rehabilitation sites.
- ii. Tenure on Privately owned lands
- iii. Land Acquisition: All Tenable settlements on private land should be acquired unless the ULB decides to pass a resolution otherwise.
- iv. Negotiated Compensation: The acquisition of land from private parties should be undertaken on a negotiated basis. All the stakeholders (residents, urban local bodies, public agencies, others) may be invited to participate in the negotiation to promote transparency and equity.

viii. Resettlement and rehabilitation

Draw up comprehensive resettlement and relocation guidelines for urban dwellers and all relocation or resettlement of dwellers residing in untenable sites shall be implemented strictly in accordance with such guidelines which should ensure that:

- i. Alternatives to resettlement should be fully explored before any decision is taken to move people.
- ii. Relocation distances should be minimised to reduce the impact on livelihoods.
- iii. Resident dwellers must be provided with some choice of alternative sites and where feasible, an alternative rehabilitation package.
- iv. All resettlement sites should be adequately serviced and provision should be made for public transportation prior to settlement.
- v. The livelihoods of affected people must be sufficiently compensated within a fixed period.
- vi. Participation of primary stakeholders, particularly women, in planning and decision making is a pre-requisite for any resettlement process.
- vii. Women's particular needs and constraints must be specifically addressed.
- viii. Any urban development project that leads to the involuntary resettlement of communities must make provision to cover the costs of R & R.
- ix. All stages of the resettlement process including the transition and follow-up periods should be closely monitored and supervised by the ULB with community representatives. (Also see section 16 on monitoring and evaluation).

ix. Environmental improvement

The Provision of physical infrastructure components such as water supply, drainage, sanitation, improved access, electricity etc, should support the ultimate objective of improved quality of life. The evidence from existing slum improvement projects clearly shows that an improved physical environment greatly facilitates the integration of the settlement in the wider urban area and at the same time, contributes to improved livelihoods and health and well being of the community.

x. Improving access to social services

It will be desirable to bring Municipal Services under the Consumer Protection Act to monitor quality and reliability of basic infrastructure

services delivered at settlement level. This should be uniformly applied irrespective of tenure and land status of the settlement, with a specific mandate to monitor absolute levels of service coverage and differential levels of service availability throughout the ULB area.

xi. Economic empowerment

Economic Support/Enterprise Development:

There is a need for ULBs to support interventions designed to address livelihood needs of the urban poor. This will include:

- i. the provision of vocational training facilities
- ii. implementation of savings and credit schemes for self-employment
- iii. addressing constraints in the labour market
- iv. providing improved access to raw materials and marketing support
- v. legal rights and redressal systems

It would be desirable for the ULB to involve the private sector in such initiatives wherever possible.

7.12 Housing Policies and Programmes

The housing strategy envisages:

- i. Increase housing availability and affordability.
- ii. Increase land under gross residential area from the existing 9.92% to about 23% in CDPA.
- iii. Create 12000 EWS houses to rehabilitate about 45% of existing slum households.
- iv. Move to market-based auctions to choose the developer:
- v. Build about 5,000 additional low-income housing units by creating "Special Housing Zones" (SHZs) through targeted incentives in Sikharpur zone.
- vi. Upgrade other infrastructure at community, neighbourhood and city level.
- vii. Re-densify the identified intensive development zones such as Sikharpur.
- viii. Development of new housing colonies and new townships in the extensive development zones in Barang, Gopalpur and Nirgundi. This will include apartments and gated colonies, high-rise apartments in areas with relaxed height norms and increased FAR provision.

- ix. Augmentation of the existing housing schemes that are indicating slow growth like those at Bidanasi.

7.12.1 Housing/Rental policy

The government recently hiked the Cash Reserve Ratio (CRR), leading to the increase in the cost of the house. The rising construction cost and land prices will ultimately be passed on to the end user.

The builders' bid for the land to match the reserve price of the land is decided by the development authority. If the land is expensive, it will have a cascading effect on the price of the houses as well.

The government must therefore provide builders land at a reasonable price. Some proposed measures are:

- i. Increasing the Floor Space Index (FSI).
- ii. Announcing more incentives for consumers and suppliers.
- iii. Giving loans to consumer on lower less interest rate real estate mutual funds could be introduced.

If NHB gets money from the market at a cheaper rate, it will be able to lend further on lower rates. Home loans to the tune of Rs 20 lakh or less can be made available to the customers on lower interest rates, and loans of higher amount on commercial rate of interest.

The National Housing Bank will introduce '**reverse mortgage**' for senior citizens under which the house owner can avail of a monthly stream of income while remaining owner and occupying the house.

7.12.2 FDI in Townships

To boost Foreign Direct Investment (FDI) in townships, housing built-up infrastructure and construction of development projects, the Government has reduced the minimum area to be developed from 100 acres to 25 acres (approx.) or built up space of 50,000 sq. meters and with a minimum capitalization of \$10 million for wholly owned subsidiaries or \$5 million in the case of a Joint Venture with Indian partners.

7.12.3 Concept of SRZ and SRC

The Confederation of Real Estate Developers in India (CREDAI) has recommended the concept of Special Residential Zones (SRZ), to the Ministry of Urban Development, Government of India. This is similar to the concept of Special Economic Zones (SEZ). It urges the government to define affordable housing for the EWS and LIG as one in the 300 sq ft to 700 sq ft range and allow construction of only affordable housing in an SRZ.

In another proposal, the **National Real Estate Developers Consortium** (NaREDCo) has proposed that land for affordable housing should be made available by the government at controlled prices. They have proposed the concept of Special Residential Corridors (SRC) which should be located next to SEZs to benefit from the available infrastructure.

According to some reports, most home buyers look at the range between 15-25 lakh for buying a home. With soaring land prices, it is getting increasingly difficult to keep the house price in that range. Real estate developers feel that it is not possible to provide low-cost housing with surging land prices. They state that for consumers to benefit, the government has to provide builders land at a reasonable price; otherwise it is not possible to provide houses at affordable prices.

7.12.4 Concept of Personal Floors

The BPTP one of the major real estate players in India today has introduced the concept of personal floors in their 1350 Acre Township project Parklands in Faridabad near Delhi. This is a low-rise project and it offers freehold floors in ground plus three floors apartments. The price of these floors starts at Rs 19.85 lakh onwards. These floors can be registered as freehold properties. The project offers options of 2 and 3 bedroom floors with an area of 1,170 sq.ft. and 1,414 sq.ft.

7.12.5 Low-Income Housing Tax Credit

The low income housing tax credit programme (LIHTC), according to the US Department of Housing and Urban Development (HUD), 2003, is a massive rental housing programme designed to provide a mixed income development. The programme stipulates builders to construct a specified number of affordable homes for low income groups as part of an inclusive approach. This would entitle the builder to tax credits. The LIHTC provides funding for the development costs of low-income housing by allowing a taxpayer to take a tax credit equal to a large percentage of the cost incurred for development of the low-income units in a rental housing project. To take advantage of the LIHTC, a developer will typically propose a project to a state agency, seek and win a competitive allocation of tax credits, complete the project, certify its cost, and rent-up the project to low income tenants.

7.12.6 Housing Choice Voucher

This programme is an effort to assist LIG and EWS as well as elderly families in the US, find a decent housing for them in the private housing market. The participant is free to choose any housing that meets the requirements of the program and is not limited to units located in subsidized housing projects.

Housing Choice Voucher (HCV) programme aims at fostering mobility among low income groups. Under the HCV programme, a rental housing unit is considered to be affordable when it charges rent at or below the fair market rent for the concerned urban area and it has to meet minimum standards of safety and health. In the US according to studies, there already exists over 16 million such affordable rental units. Housing choice vouchers are administered locally by public housing agencies (PHAs), which receive funds from the U.S. Department of Housing and Urban Development (HUD) to administer the voucher program. A family that is issued a housing voucher is responsible for finding a suitable housing unit of the family's choice where the owner agrees to rent under the program. This unit may even include the family's present residence. A housing subsidy is paid to the landlord directly by the PHA on behalf of the participating family. The family then pays the difference between the actual rent charged by the landlord and the amount subsidized by the program.

7.13 Norms and Bye-laws

For achieving world class standards a set of bye-laws have been proposed in accordance to the Draft Building Regulation of CDA (2010).

“Group Housing” means Housing for more than one dwelling unit, where land is owned jointly (as in the case of co-operative Societies or the public agencies, such as local authorities or housing boards etc.) and the construction is undertaken by one agency..

“Habitable room” means a room having area of not less than 9.0 SqMt., width 2.4 m. (Min.), height 2.75 m. (min.) occupied or designed for occupancy by one or more persons for study, living, sleeping, eating, cooking if it is used as a living room, but does not include bathrooms, corridors, cellars, attics and spaces that are not used frequently or during extended periods.

“Multi - Storey or High Rise Building” means a building whose height is 15 meters or more, measured from the average level of the centre line of the street on which the site abuts.

“Row Housing” means a row of contiguous houses with only front, rear and interior open spaces.

“Semi-Detached Building” means building detached on three sides (front, rear and side) with open spaces as specified under the Regulations.

Refer to Chapter-14 for the permissible/prohibited land uses in different use zones and Appendix-I for the setbacks, height, FAR, parking space; Multi-storied buildings; Group Housing Schemes/Apartments bye laws.

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8.1 Water Supply

8.1.1 Water Supply Scenario of Cuttack Development Plan Area

Cuttack, the erstwhile princely capital of Orissa lies on the head of Mahanadi Delta, more precisely, on the banks of the major Rivers Mahanadi, Devi and Kathajodi. The general topography of the city, which is spread over an area of 38.5 km², is flat and gently sloping from west to east. The general ground levels inside the city are low and below high flood levels of two rivers namely, Mahanadi in the north and Kathajodi in the south. The high ground elevations, which are towards the bank of the rivers, are MSL + 30m in the north and MSL + 20m in the south and to the east of the city. The central part of city is low with an elevation close to MSL + 17m. Thus the city has a saucer-like profile with many low lying areas inside the city. Since the city lies at the confluence of these two big rivers, Mahanadi on the North and Kathajodi on the South, it is regarded as the most flood prone city of Orissa. Though, the city is surrounded by embankments which protect it from flooding, it suffers badly from flooding and water logging in the rivers during floods as well as due to high water tide. It is estimated that an area of 89.44 km² in this district is prone to water-logging.

8.1.1.1 Water Supply Scenario of CMC

Cuttack municipal area has been divided into four water supply districts: (i) Ranihat (ii) Kila Area near Stadium (iii) Annapurna Theater in Tinkonia Baghicha and (iv) Town Hall.

The other areas and institutions like Police Colony, Mahanadi Vihar, Ravenshaw College, Cuttack Medical College, Engineering School and Kanika Kothi Area (Biju Pattnaik Chhak, near OWSSB office) are provided with water supply by their own independent systems. The water is supplied for 8 to 10 hours per day. Source of water supply to the city is based on tube wells only. There are 90 tube wells in the city for supply of drinking water. Average depth of the tube wells is about 100m below ground level. Details of existing water supply system are summarized in **Table 8.1**. Existing distribution pipes are inadequate and not satisfactorily functioning. Pipes are incrustated due to high iron content in the water, and therefore, not able to carry adequate discharge flow rate. Maintenance and repair of these pipes is rather costly compared to that of laying new pipes. Therefore the damaged pipes are currently being replaced by PHEO, Orissa. The quality of groundwater of Cuttack municipal area has been tested at different locations by OWSSB and are reported (**Table 8.2**) within prescribed limits.

Table 8.1: Details of existing water supply

No. of Tube Wells	90
Total Qty. of Water Production (m ³ / day)	115,000
No. of Public Stand Posts	1,146
No. of House Connections	20,000

Source: PHEO, Orissa (updated as per information from PHEO office, 2006)

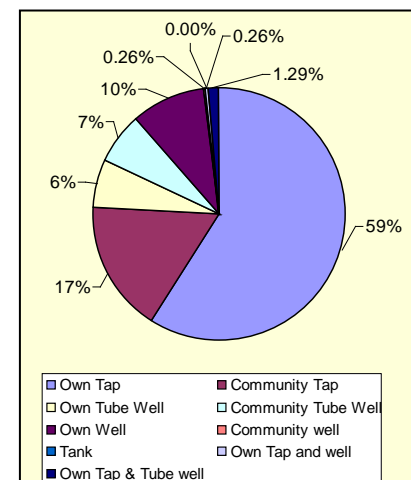
Table 8.2: Characteristics of Groundwater in Cuttack

Parameters	Unit	Deer Park	Naya Bazaar	Nehru Pally	Town Hall	Police Colony	Mahanadi Vihar	Standard
pH	No.	6.80	7.0	7.0	8.2	7.3	7.2	6.5 – 8.5
Turbidity	NTU	1.20	1.5	3.0	3.4	0.5	1.4	-
Conductivity	Micromoh /cm	320.00	140.0	40.0	-	-	307.0	-
Temperature	°C	28.00	28.0	0.2	-	-	26.0	-
Chloride	mg/l	60.00	20.0	86.0	60.0	40.0	40.0	250.0
Iron	mg/l	0.30	0.2	Nil	1.4	0.9	0.1	0.3
Hardness of CaCO ₃	mg/l	70.00	80.0	Nil	24.0	118.0	104.0	-
Fluoride	mg/l	-	-	-	-	Nil	Nil	-
Sulphate	mg/l	-	-	-	-	Nil	Nil	200.0

Source: CPCB, Central Pollution Control Board, 2003

Though the general characteristics of water (**Table 8.2**) are satisfying the requirements of palatable water, in many areas of Cuttack, the groundwater is generally reported saline with high total dissolved solids. The geographical positioning of Cuttack may be responsible for the reported salinity of drinking water sources. It is said that the drinking water is polluted with high concentrations of iron, which can be removed only with proper water treatment. The presence of natural iron in ground water, or its encrustation in water supply systems due to the rusting of pipes may cause the growth of iron bacteria resulting in the contamination of drinking water. Many wards, which were said to be in the water distribution network, are only partially fed. In many areas, water supply is available only for few hours, that too in morning time. The conditions are pathetic in certain semi-urban crowded areas, where the supply is once in two or three days for limited times, and that too only in early hours.

An amount of 115 MLD of water from 90 numbers of tube wells is being supplied to Cuttack town through 20,000 house service connections and 1146 numbers of stand posts. The percentage dependence of people on different water supply sources of Old Cuttack is shown in **Fig 8.1**.

**Fig 8.1:** Percentage dependence on different water supply sources in Old Cuttack

8.1.1.2 Water Supply Scenario in Choudwar Municipalities, Charbatia and Rural areas of CDPA

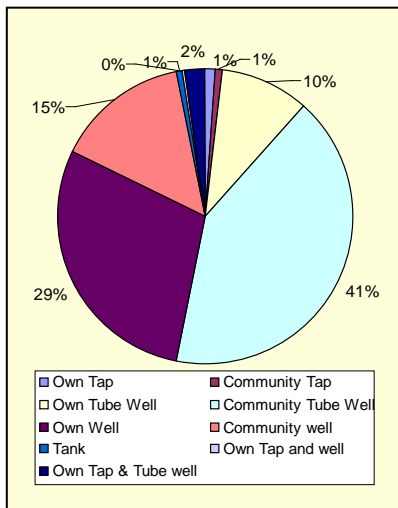


Fig 8.2: Percentage dependence on different water supply sources in rural areas of CDPA

There is no provision of safe drinking water supply through pipelines and majority of the rural population is depending on various ground water sources (Fig 8.2). Considerable percentage of people are depending on open or dug wells for water apart from community tube wells. There is no guarantee on the quality of these waters as the routine monitoring is rarely done.

The existing water supply availability in Choudwar Municipalities and Charbatia areas are shown in Fig 8.3. In all these areas 40-50% people are using water from their own wells for drinking. Around 20-30% have their own tap connections. The percentage of people using community facilities is around 8-12% only. It is clear that people are interested in using their own facilities wherever available. No systematic and consistent water quality data was made available about the quality of water in these systems of supply. A comparative evaluation on the proximity to the drinking water sources is also shown in Table 8.3. The statistics available clearly shows that the proximity to safe drinking water sources is steadily decreasing towards rural areas, suggesting the need for providing more 'closer access'.

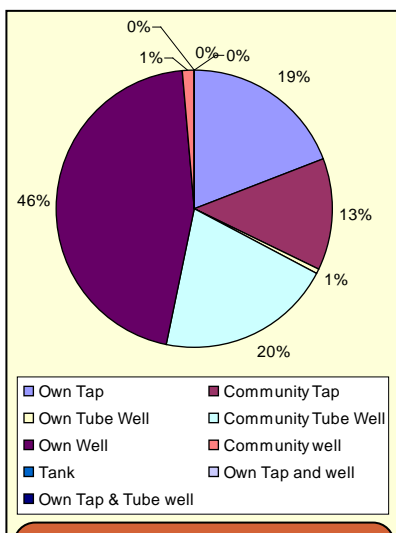


Fig 8.3: Percentage dependence of people on various types of water sources in Choudwar-Charbatia area

Table 8.3: The distance of water sources (%) from individual households - a comparative evaluation

	CMC	CDPA Rural	Choudwar (M) and Charbatia C.T
Inside house	91.16	64.96	65.13
< 100m	6.78	23.54	23.68
100-500m	2.05	11.50	11.18
> 500m	0.00	0.00	0.00

Source: Socio Economic Survey Report, IIT Kharagpur, 2006

8.1.2 Proposals

Based on the objectives of full coverage of urban communities with easy access to potable drinking water in quantities recommended to meet the domestic and other essential non-domestic purposes, the recommended per capita water supply levels for designing schemes is given in **Table 8.4**.

Table 8.4: Recommended per capita water supply levels for designing schemes

Classifications of towns/cities	Recommended maximum water supply levels (lpcd)
Metropolitan and mega cities provided with piped water supply where sewerage system is existing/contemplated	150

Figure excludes "unaccounted for water" which should be limited to 15%

The expected status of water use in various zones of Cuttack Development Plan Area and CMC, CDPA (rural), and Choudwar Municipality (M) for 2008 and 2030 is given in **Tables 8.6 and 8.7** respectively. The rate of water supply is considered for Cuttack Development Plan Area as 200 lpcd.

Industrial needs

While the per capita rates of supply recommended will ordinarily include the requirement of small industries (other than factories) distributed within a town, separate provisions will have to be included for meeting the demands likely to be made by specific industries within the urban areas. The forecast of this demand will be based on the nature and magnitude of each such industry and the quantity of water required per unit of production. The water requirements of various industries are given in **Table 8.5**. The potential for industrial expansion should be carefully investigated, so that the availability of adequate water supply may attract such industries and add to the economic prosperity of the community. In the context of reuse of water in several industries, the requirement of fresh water is getting reduced considerably.

Table 8.5: Water Requirements for Different Industries

Sl. No.	Industry	Unit of production	Water requirement in Kilolitres per unit
1	Automobile	Vehicle	40
2	Distillery	(Kilolitre Alcohol)	122-170
3	Fertilizer	Tonne	80-200
4	Leather	100 Kg (tanned)	4
5	Paper	Tonne	200-400
6	Special quality paper	Tonne	400-1000
7	Straw board	Tonne	75-100
8	Petroleum Refinery	Tonne (crude)	1-2
9	Steel	Tonne	200-250
10	Sugar	Tonne (cane crushed)	1-2
11	Textile	100 Kg (goods)	8-14

Source: CPHEEO "Manual on Water Supply and Treatment".

Table 8.6: Water demand in various zones of Cuttack Development Plan Area

Zone number	Population 2008	Population 2030	Water Demand in 2008 (MLD)	Water Demand in 2030 (MLD)	Area Requirement for Water Treatment Plant (ha)
1	25000	85000	5	17	1.1
2	45000	80000	9	16	2.0
3	6000	12000	1.2	2.4	
4	34000	56000	6.8	11.2	
5	40000	115000	8	23	1.5
6	110000	250000	22	50	10.8
7	317000	350000	63.4	70	
8	138000	220000	27.6	44	
9	22000	42000	4.4	8.4	2.1
10	40000	110000	8	22	
11	50000	180000	10	36	2.4
Total	827000	1500000	165.4	300	19.8

So minimum reserve provision of 25 MGD at Nirgundi zone and 10 MGD at Barang zone for 20 years for meeting future industrial demands. The location of the proposed treatment plants is shown in **Map 8.1**.

Table 8.7: Water demand in CMC, CDPA (rural), and Choudwar Municipality (M) for 2008 and 2030 of Cuttack Development Plan Area

Area	Population 2008	Population 2030	Water Requirement in 2008 (MLD)	Water Requirement in 2030 (MLD)
CMC	655000	1115000	131	223
Choudwar	70000	125000	14	25
CDPA rural	102000	260000	20.4	52
Total	827000	1500000	165.4	300

8.1.2.1 Drinking water scenario of CDPA in 2030

The anticipated population in CMC in 2030 would be 1115000. The expected water demand (@ 200 lpcd with 15% anticipated losses) will be 223 MLD (~ 49 MGD). Since the present availability of drinking water is only 115 MLD, there will be a minimum shortage of 108 MLD (~ 24 MGD) water in 2030 in CMC. The water requirements in CMC, Choudwar Municipality and Rural CDPA as well as various zones of CDPA are illustrated in **Fig 8.4 and 8.5**. It means that the capacity of the existing water supply systems will be insufficient for supplying water to the public even for the urban areas of CMC, suggesting the need for additional water supply to cater to the growing demand.

8.1.2.2 Water availability in 2031

Since Cuttack is under the confluence of the perennial rivers Mahanadi and Kathajodi, sub-surface water potential of the area appears adequate to cater to the needs of people in future. However, the ground water potential can also be explored to a limited extent (**Fig 8.6**). To assure safe drinking water supply, the water from the collector wells/tube wells is to be treated and be properly disinfected.

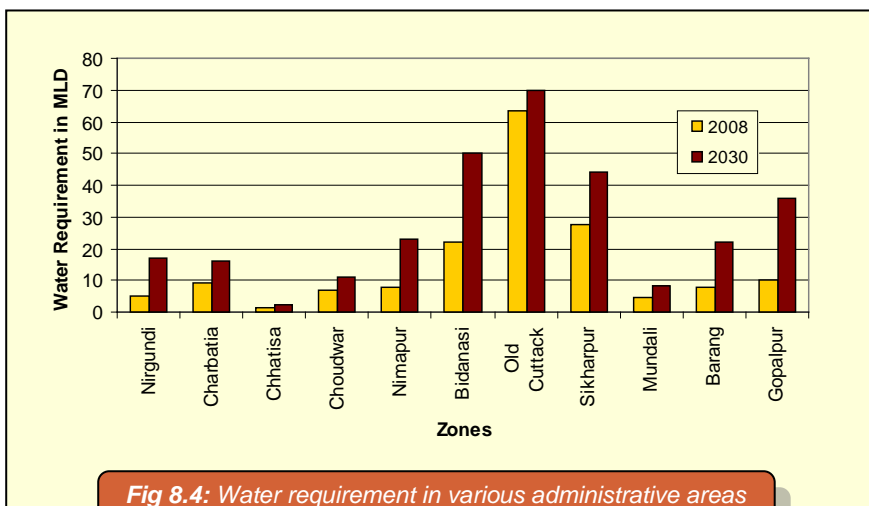


Fig 8.4: Water requirement in various administrative areas of Cuttack Development Plan Area in 2008 and 2030

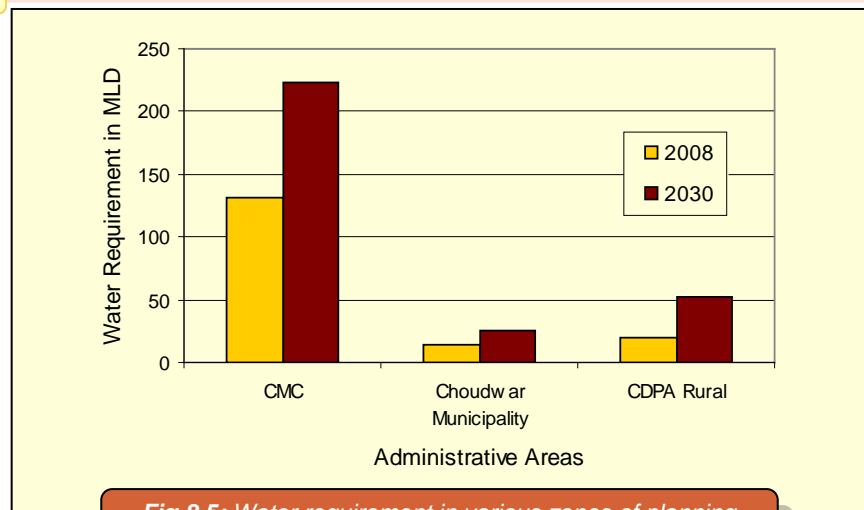


Fig 8.5: Water requirement in various zones of planning area in 2008 and 2030

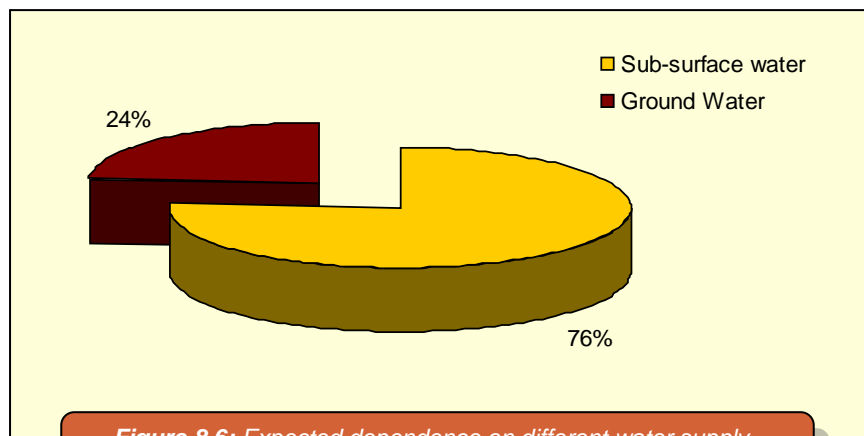


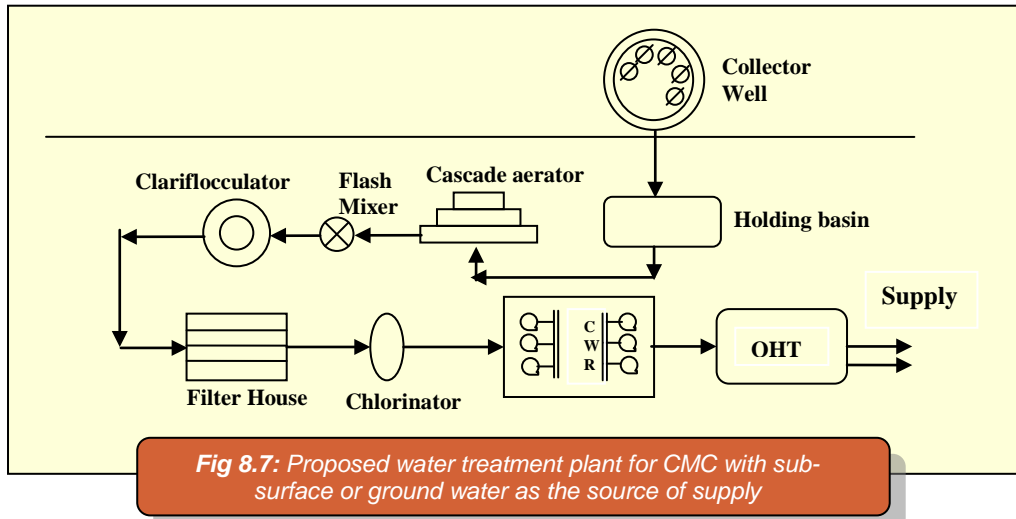
Figure 8.6: Expected dependence on different water supply sources in 2030 in Cuttack

8.1.2.3 Proposals for implementation

A. CMC

It is essential to provide an additional minimum quantity of 108 MLD water to meet the drinking water demand of Cuttack Municipal Corporation in 2030. As ground water potential of the area appears reasonably enough to support the drinking water needs, the present trend of relying solely on it may continue. But, apart from providing individual tube wells, a system of collector wells (cluster of tube wells) with an arrangement for treating the raw ground water (**Fig 8.7**) is recommended for safe drinking water. Majority of the drinking water demand can be met using the surface/sub-surface flow of River Mahanadi/Kathajodi as a source of supply through collector wells/intake wells using vertical turbine pumps. A group of pumps can draw and distribute water directly to the network system, vertical turbine pumps can be used to store water in clear water reservoirs (CWR) by pumping through collector mains, and groups of centrifugal pumps will supply water to nearby overhead reservoirs (OHR) from where it can be distributed. The block diagram of a

proposed water treatment plant is shown in **Fig 8.7**. Two water treatment plants of 122 MLD and 38 MLD using sub-surface/surface water from Kathajodi and ground water respectively can be provided in Cuttack. The locations of water treatment plants and various proposed intake wells/collector wells at various zones of CDPA are marked in **Map 8.1**.



Cost estimate

The anticipated expenditure of the proposed water supply system for Cuttack is shown in **Table 8.8**. In this proposed collector well water supply system, the per capita cost of the scheme will be around Rs. 2300 in 2030 for CMC areas.

Table 8.8: Tentative estimate for the components of water supply system for CMC

Sl. No.	Description of the components	Tentative cost (crores)
1	Proposed raw water intake systems	15
2	Construction of new water treatment plants	30
3	Clear water transmission systems	25
4	Construction of service reservoirs	35
5	Proposed distribution system to cover the whole area	120
6	Miscellaneous items like electrical, contingency, other operational infrastructures etc.	25
Total		250
O&M costs		7.0

Action Plan

The following targets are to be fulfilled to assure a sustainable drinking water system for Cuttack:

- i. Planning, design and implementation of a sustainable water supply scheme mainly based on surface/sub-surface/intake wells

water supply from the rivers Mahanadi and Kathajodi and ground water.

- ii. Covering the entire CMC area with a continuous water supply system assuring 24 hr supply with adequate pressure in the distribution system even at the tail ends.
- iii. Controlled use and management of ground water assuring treatment with disinfectants before distribution.
- iv. Public awareness against misuse of water.
- v. Adequate reforms so as to balance the O&M cost with the revenue out of the water supply distribution.

B. Choudwar Municipalities and Rural Areas of CDPA

No systematic and consistent data was made available about the quality of water in these systems of supply. The available statistics clearly shows that the proximity to safe drinking water sources is steadily decreasing towards rural areas, suggesting the need for providing more 'closer access'.

It appears that in the absence of a centralized water supply system majority of the people are depending on ground water sources for long. But the increasing pollution of ground water sources demands that people should be provided with safe drinking water, necessitating treatment of water. The majority of the high water demand in CDPA rural (~ 52 MLD) and Choudwar Municipal area (~25 MLD) could be met by using the surface/sub-surface/intake wells of River Mahanadi.

Action plan

- i. Planning and implementation of water distribution systems based on available sub-surface and ground water sources.
- ii. Covering the entire CDPA with a continuous water supply system assuring 24 hr supply with adequate pressure in the distribution system even at the tail ends.
- iii. For CDPA rural and Choudwar Municipality the sub-surface water potential of Mahanadi and its tributaries could be explored.
- iv. Public awareness against misuse of water.
- v. Adequate reforms so as to balance the Annual O&M cost with the revenue out of the water supply distribution.

Cost estimate

The tentative cost estimate for the proposed water supply system for CDPA is shown in **Table 8.9**.

Table 8.9: Tentative cost estimate (in crores) of proposed water supply distribution systems in 2030 for various zones of CDPA

Sl. No.	Areas	Zone number	Total capital cost(Crores)	Annual O&M Costs(Crores)
1	Nirgundi	1	19	0.6
2	Charbatia	2	18	0.6
3	Chhatisa	3	3	0.1
5	Choudwar	4	13	0.4
6	Nimapur	5	26	0.8
7	Bidanasi	6	56	1.7
8	Old Cuttack	7	78	2.4
9	Sikharpur	8	49	1.5
4	Mundali	9	9	0.3
10	Barang	10	25	0.8
11	Gopalpur	11	40	1.2
Cost of Industrial water demand			175	5.5
Total CDPA			541	16

*Add the cost towards the price escalation of materials @10% and the cost towards the price escalation of labour charges @10% in the above mentioned capital cost.

8.2 Sewerage System

There is no systematic sewerage system in the city, the discharge of domestic waste through storm water drains is directed to the river. As a result, the quality of water in Mahanadi and Kathajodi Rivers shows deterioration in quality. It is reported that the down stream of Cuttack has a higher degree of pollution with high values of BOD, FC and COD. The high organic pollution in the river is due to the direct flow of sewage and domestic discharge into the river. The open drainage system of the city is totally polluted by sewage, contaminated ground water, and other wastes.

8.2.1 Existing System of Sewerage

A part of the city i.e. Professor Para, Sagadia Sahi, Ranihat and Mahatab Road area have been covered by sewerage system for 40,000 people. The existing sewerage scheme is more than 20 years old and the same is functioning now. Three pumping stations have been installed at Raja Bagicha, Professor Para and Chhatra Bazar for pumping sewage finally to dispose of at Matagajpur oxidation pond. It is reported that the Orissa Water Supply and Sewerage Board have prepared a comprehensive sewerage scheme for Cuttack city. The sewage is to be conveyed to Matagajpur where a sewage treatment plant of 33 MLD has already been constructed and commissioned recently (**Fig 8.8**).



Fig 8.8: A view of the sewage treatment plant of 33 MLD capacity located at Matgajapur.

At present the existing collection system is divided into 3 sewerage blocks, namely Block-V, Block-VII and Block-XIX. The 3 pumping stations at Chhatra Bazar, Professor Pada and Raja Bagicha are using submersible 13.5 HP pumps which are discharging the final flow into the treatment plant. The sewerage system under Block-V covers parts of Ward Nos. 15, 19 and 20. The sewage from this Block is collected at Chhatra Bazar Pumping Station and pumped again into the main sump at Chhatra Bazar Pumping Station. Then this final flow is pumped into the inlet chamber of Sewage Treatment Plant. It is reported that all existing pipe diameters in this block are adequate for future design flows except some portion of trunk sewers and few lateral pipes, which will have to be replaced. In this Block, the total length of existing sewer pipe is 8.45 km and existing diameters vary from 150 mm to 375 mm. The sewerage system under Block-VII covers part of Ward Nos. 20, 21 & 23. This area is fully saturated and scope for further development is less. The sewage from this Block is collected in the sump of Professor Pada Pumping Station. Again this sewage is pumped into the Chhatra Bazar Sump and Pump House. From here it is pumped into the sewage treatment plant. It is reported that all existing pipes of the Block are adequate for future flows. In this Block, the total length of existing sewer pipe is 6.8 km and existing diameters vary from 150 mm to 375 mm. The sewerage system

under Block-XIX covers parts of Ward No. 18 and 19. The sewage from this is collected at Raja Bagicha sump and pumped to the Chhatra Bazar pumping station and then pumped into the sewerage treatment plant. The total length of the existing sewer pipe is 3.82 km and existing sewer pipe diameters vary from 150 to 300 mm. Here also, all small existing pipe diameters are adequate for future design flows except trunk sewers and few lateral pipes. The total sewage flow generated from these blocks in future will be pumped into the existing STP at Matagajpur

8.2.1.1 Waste water generation

The total population of project area for 2008 is available as 827000. For the purpose of design, the wastewater generated is estimated considering water supply rate as 200 lpcd and it is assumed that 80% of the water supply i.e. 160 litres per capita per day (lpcd) reaches the sewers. Infiltration into the wastewater system occurs through defective sewers, manholes etc. The rate of infiltration into sewers also depends upon the ground water table and permeability of the surrounding soil. Strict quality control and good workmanship will ensure minimum infiltration in initial condition; the same may increase, as the system condition deteriorates with age. Since the sewerage system is supposed to be a watertight system, as any leakage will eventually accelerate the sub-soil water pollution, the expected wastewater generation is 132 MLD (29 MGD) in 2008.

8.2.1.2 New Sewerage Scheme

Under this study, a new sewerage scheme is proposed in Ward No. 1, part of Ward No.15 and parts of Ward No.20, 24-33, 34 & 35. The treatment plant of 33 MLD has been constructed and recently commissioned at Matagajpur. The treatment plant is having anaerobic ponds (2 nos) followed by facultative ponds (2 nos). Pre-treatment units of screen and grit chambers are provided. The effluent after treatment will be discharged into River Kathajodi. Low cost sanitation is suggested for Khannagar, Nuashai, Dhabasahi, Malgodown Beharia Sahi, Pilgrim road, Sagar Sahi, Ranihat, Jaimangal, Harijan Basti and Mochi Sahi areas.

In Cuttack City public latrines exist in some areas, which are maintained by Cuttack Municipal Corporation and Sulabh International (Pay and Use Toilets). It is learned that there are 106 slums located all over the city. Community toilets are to be provided in localities where all individual dwellings units do not have their own toilets.

8.2.1.3 Sanitation scenario in Rural CDPA, Choudwar Municipalities and Charbatia areas

The poor sanitation facilities in rural areas of CDPA are represented by the data presented in **Tables 8.10 and 8.11**. The rural areas of CDPA

present a much feeblar picture than rural BDPA. It is evident that the sewerage system in Bhubaneswar is far better than Cuttack. But, as stated earlier, the sanitation facilities in terms of septic tank system is better in CDPA than in BDPA. As expected, the distance between the toilets and wells is more in rural areas than in municipal areas (**Table 8.11**).

Table 8.10: The type of sanitation facilities (in average percentages) available among the Municipal and rural areas - a comparative evaluation

	C MC	CDPA Rural	Choudwar (M) and Charbatia C.T
Sewer Connected	6.605	0.0	19.83
Septic Tank	88.67	76.03	66.12
Pit	1.11	2.05	0.83
Others	2.665	6.16	0.00
Not Responded	0.95	15.75	13.22

Source: Socio-Economic Survey Report, IIT Kharagpur, 2006

Table 8.11: The average percentage distance between toilets and wells in the Municipal and rural area of CDPA- a comparative evaluation

	C MC	CDPA Rural	Choudwar (M) and Charbatia C.T
<5m	4.84	14.47	38.89
5-10m	14.59	17.11	31.48
10-15m	29.01	38.16	24.07
>15m	51.57	30.26	5.56

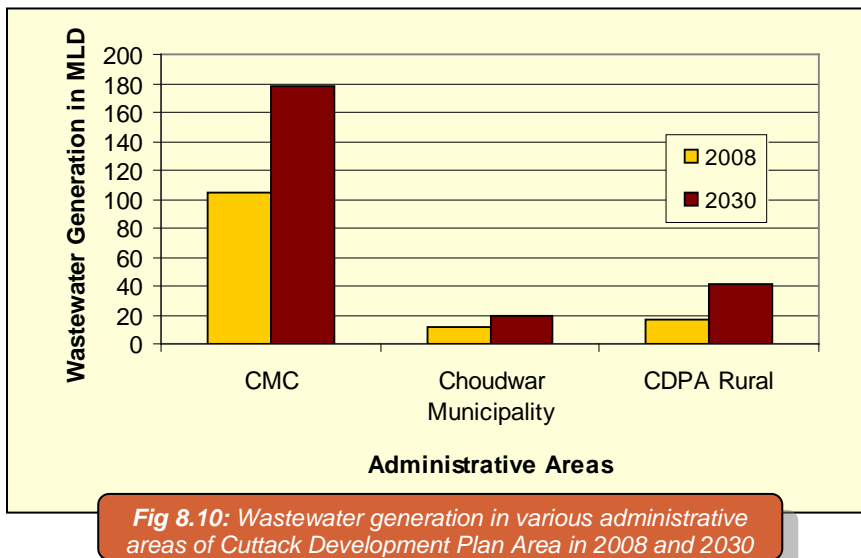
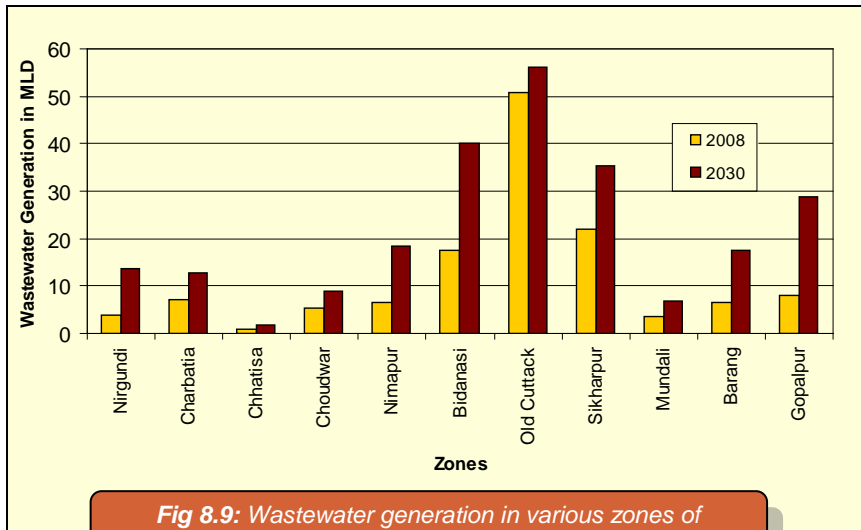
Source: Socio-Economic Survey Report, IIT Kharagpur, 2006

8.2.2 Wastewater Management in 2030

8.2.2.1 Expected Sewage Generation in Cuttack Development Plan Area (CDPA)

The total population of project area for 2008 is available as 827000. For the purpose of design, the wastewater generated is estimated considering water supply rate as 200 lpcd and it is assumed that 80% of the water supply reaches the sewers. So, the expected wastewater generation is 132 MLD (~29 MGD) in 2008. Similarly, for an anticipated population of 1500000 in CDPA in 2030, the expected wastewater generation would be 240 MLD (~ 53 MGD). The wastewater generation rates are compared in **Fig 8.9 and 8.10**. and also in **Map 8.2**. Since the maximum capacity of the existing facilities is only 37.5 MLD, there will be a shortage of sewage facilities for 94.5 MLD and 202.5 MLD in 2008 and

2030 respectively. So, additional STP facilities for this excess sewage are to be provided.



8.2.3 Proposals for Implementation

8.2.3.1 The Background

In a modern society, proper management of wastewater is a necessity, not an option.

A wide range of communicable diseases can be spread through elements of the environment by human and animal waste products, if not disposed properly.

The development of effective water and wastewater treatment methods has virtually eliminated major water borne epidemics in developed countries. Developing countries like ours, where treated water is not available to a majority of the population, still experience epidemics like

cholera and typhoid. It is also to be mentioned that as per the report of the Planning Commission for the Tenth Five Year Plan, which emphasizes that all cities, towns and industrial areas should compulsorily have sewage treatment plants and are to be implemented in a time bound manner. Advanced waste water treatment process is currently being so developed that it will produce palatable water from domestic wastewater.

8.2.3.2 Recommendations

- i. Since it is necessary to provide sewage treatment facilities for 240 MLD wastewater, a decentralized wastewater treatment system would be more appropriate. The centralized sewage treatment system appears inappropriate as it may end up with very huge sizes of sewers and various issues of conveyance in handling this huge quantity of wastewater.
- ii. The treatment plants and sewers are to be so aligned as to reduce the number of crossings with railway tracks and National Highways of the area. The proximities of natural drains for treated effluent disposal, minimum obstructions for laying sewers, and the possibilities of acquiring land for sewage treatment plants (STPs) turns important in orienting and locating the plants.
- iii. It is proposed to construct five sewage treatment plants (STP I, STP II, STP III, STP IV and STP V) in Cuttack Municipal Corporation to cover Bidanasi, Old Cuttack, Sikharpur, Nimapur and Gopalpur zones of the planning area. The land requirements and capacity of the sewage treatment plants are given in **Tables 8.12** and **8.13**, respectively.

The locations of these treatment units are given in **Map 8.3**.

To cover the other zones, 5 STPs of various capacities, as given in **Table 8.13**, are proposed and its locations are shown in **Map 8.3**.

- Nirgundi Zone,
 - Charbatia Zone,
 - Chhatisa Zone and Choudwar Zone
 - Mundali Zone
 - Barang Zone
- i. The possibilities of re-use of treated wastewater effluent for irrigation, gardening etc. should be looked into.
 - ii. The construction of treatment plants could be carried out in a phased manner on a modular/zonal basis in the planning area consistent with the future development/demand.

Table 8.12: Sewage generation in various zones of CDPA in 2008 and 2030

Sl. No.	Areas	Zone number	Population in 2008	Population in 2030	Wastewater Generation in 2008 (MLD)	Wastewater Generation in 2030 (MLD)	Area requirement (ha)
1	Nirgundi	1	25000	85000	4	13.6	4
2	Charbatia	2	45000	80000	7.2	12.8	4
3	Chhatisa	3	6000	12000	0.96	1.92	1
4	Choudwar	4	34000	56000	5.44	8.96	3
5	Nimapur	5	40000	115000	6.4	18.4	6
6	Bidanasi	6	110000	250000	17.6	40	12
7	Old Cuttack	7	317000	350000	50.72	56	17
8	Sikharpur	8	138000	220000	22.08	35.2	11
9	Mundali	9	22000	42000	3.52	6.72	2
10	Barang	10	40000	110000	6.4	17.6	5
11	Gopalpur	11	50000	180000	8	28.8	9
Total CDPA			827000	1500000	132.32	240	72

Table 8.13: Capacity of Sewage treatment plants for various zones of CDPA

Sl. No.	Zones	Area	Capacity of Sewage Treatment Plant (MGD)
1	Nirgundi	Narapara	3.0
2	Charbatia	Kalyansinghpur	3.0
3	Chhatisa	Chashapara	2.5
4	Choudwar		
5	Nimapur	Gopinathpur	4.0
6	Bidanasi	Subarnapur	9.0
7	Old Cuttack	Mahanadi No.2	12.0
8	Sikharpur	Kantilo	8.0
9	Mundali	Talagar	1.5
10	Barang	Belagachhia	4.0
11	Gopalpur	Pratapnagari	6.5
Total CDPA			53.5

8.2.3.3 Treatment Options

Considering the technical feasibility and economical viability of different treatment options for treatment of wastewater (like Activated sludge process(ASP), Up-flow anaerobic sludge blanket (UASB) reactors,

Fluidized aerobic beds, Trickling filters, and waste stabilization ponds) for CDPA, the choice can be either the conventional activated sludge process or UASB reactors.

The conventional ASP system is a widely used wastewater treatment option in major cities of India. It has become popular as a reliable technology with good resource recovery (60-75% methane) of biogas. It assures a removal rate of more than 90-95% of organics from wastewater. UASB reactors are also gaining ground as an alternative to the conventional treatment techniques with their simplicity and comparable removal efficiency. However, the UASB renders effluents with relatively high NPK values demanding post treatment by polishing units. The cost of treatment of wastewater, unit cost, and quality of the effluent varies only marginally among these two treatment options. The success of the ASP systems elsewhere, with its easy maintenance and management makes it an appropriate choice for CDPA.

8.2.3.4 The Sewage Treatment System proposed

The ASP system proposed as shown in **Fig 8.11** should contain the following units:

- 1) Screens
- 2) Grit chamber
- 3) Primary clarifier (PC)
- 4) Aeration tank or ASP tank
- 5) Secondary clarifier (SC),
- 6) Sludge digesters, and
- 6) Sludge drying bed for the treatment of sludge obtained from primary clarifier and secondary clarifier.

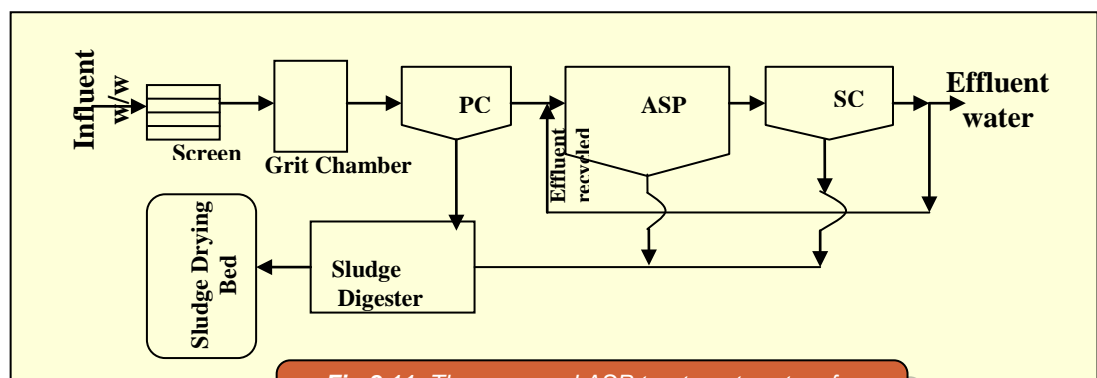


Fig 8.11: The proposed ASP treatment system for Cuttack Municipal Corporation

8.2.3.5 Cost Estimates

The tentative expenditure for the proposed sewage treatment plants at Bidanasi, Old Cuttack and Sikharpur is given in **Table 8.14**. The tentative cost of the proposed sewerage system is around 353 crores, as given in **Table 8.15**. The cost estimates for the other 7 zones are given in **Tables**

8.16-8.22 respectively. The cost estimate for the proposed sewerage system for CDPA is given in **Table 8.23**.

Table 8.14: The expected cost estimate of the proposed Sewage Treatment Plants at Bidanasi, Old Cuttack and Sikharpur zones.

Sl. No.	Description of the items	Tentative quantity/costs
1	*Quantity of sewage to be treated	94 MLD
2	Area of STP required	97 acres
3	Cost of construction of a STP unit (Rs. 60 lakhs/MLD)	5640 lakhs
4	Annual O&M costs for a STP unit	Rs. 170 lakhs
5	Total initial investment required for three STPs of 94 MLD#	Rs. 5610 lakhs
6	Total initial cost for 3 STPs in Cuttack	Rs. 5610 lakhs (around Rs.56 crores)

* Excluding the cost of existing treatment facilities of 37.5 MLD.

Excluding land cost.

Table 8.15: The expected cost estimate of the proposed underground sewerage system of Bidanasi, Old Cuttack and Sikharpur areas for 2030.

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Proposed treatment plants	56.00
2	Improvements to the existing sewage collection system	50.00
3	Proposed sewage collection system	232.00
4	Provision for crossings at Railway lines and major roads for trunk sewers	15.00
5	Total capital cost	353.00
6	Operation & Maintenance Cost	Rs.12.0 Crores/annum

Table 8.16: The expected cost estimate of the proposed sewerage system at Nirgundi

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Quantity of sewage to be treated	14 MLD
2	Area of STP required	4 ha
3	Total initial investment required for a STP including Annual O&M costs for a STP unit	9.0
4	Proposed sewage collection system	33
5	Total capital cost	42.00
6	O&M Costs	1.5

Table 8.17: The expected cost estimate of the proposed sewerage system at Charbatia

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Quantity of sewage to be treated	13 MLD
2	Area of STP required	4 ha
3	Total initial investment required for a STP including Annual O&M costs for a STP unit	9.0
4	Proposed sewage collection system	33.0
5	Total capital cost	42
6	O&M Costs	1.5

Table 8.18: The expected cost estimate of the proposed sewerage system at Chhatisa and Choudwar

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Quantity of sewage to be treated	11 MLD
2	Area of STP required	4 ha
3	Total initial investment required for a STP including Annual O&M costs for a STP unit	7.0
4	Proposed sewage collection system	26
5	Total capital cost	33.0
6	Annual O&M Costs	1.00

Table 8.19: The expected cost estimate of the proposed sewerage system at Nimapur

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Quantity of sewage to be treated	18 MLD
2	Area of STP required	6 ha
3	Total initial investment required for a STP including Annual O&M costs for a STP unit	12
4	Proposed sewage collection system	42
5	Total capital cost	54
6	O&M Costs	2.00

Table 8.20: The expected cost estimate of the proposed sewerage system at Mundali.

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Quantity of sewage to be treated	7 MLD
2	Area of STP required	2 ha
3	Total initial investment required for a STP including Annual O&M costs for a STP unit	5
4	Proposed sewage collection system	18
5	Total capital cost	23
6	O&M Costs	0.8

Table 8.21: The expected cost estimate of the proposed sewerage system at Barang.

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Quantity of sewage to be treated	18 MLD
2	Area of STP required	6 ha
3	Total initial investment required for a STP including Annual O&M costs for a STP unit	12
4	Proposed sewage collection system	42
5	Total capital cost	54
6	Annual O&M Costs	2.00

Table 8.22: The expected cost estimate of the proposed sewerage system at Gopalpur

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Quantity of sewage to be treated	29 MLD
2	Area of STP required	9 ha
3	Total initial investment required for a STP including Annual O&M costs for a STP unit	18
4	Proposed sewage collection system	68
5	Total capital cost	86
6	Annual O&M Costs	3.00

Table 8.23: Tentative cost estimate (in crores) of proposed sewerage systems in 2030 for CDPA

Sl. No.	Areas	Zone number	Total capital cost(Crores)	Annual O&M Costs(Crores)
1	Nirgundi	1	42	1.5
2	Charbatia	2	42	1.5
3	Chhatisa	3	33	1.0
5	Choudwar	4		
6	Nimapur	5	54	2.0
7	Bidanasi	6	353	12
8	Old Cuttack	7		
9	Sikharpur	8		
4	Mundali	9	23	1.0
10	Barang	10	54	2.0
11	Gopalpur	11	86	3.0
Total CDPA			687	24

Add the cost towards the price escalation of materials @10% and the cost towards the price escalation of labour charges @10% in the above mentioned capital cost.

Accordingly 5 ASP treatment plants of capacity of 40, 56, 35, 18 and 29 MLD are proposed for the five sewage centers of Cuttack Municipal Corporation. The existing treatment plant at Matagajpur of 33 MLD capacity will handle the wastewater generated in Sikharpur area.

Since it is necessary to provide additional sewage treatment facilities for 94 MLD in Cuttack, possibilities for expanding the treatment capacities of the existing plants at Bidanasi and Matagajpur is to be looked into. Since the STP-I at Subarnapur, in Bidanasi zone contains enough aeration tanks, it could be converted to an activated sludge treatment system after proper modification and enhancement of capacity to a minimum of 40 MLD (STP-I). The remaining demand can be met by providing one more STP i.e STP-II at Mahanadi revenue village, while existing STP-III at Matagajpur will handle the quantity of wastewater (35 MLD) generated at Sikharpur area (Zone 08).

8.3 Drainage

8.3.1 Topography

The city is located at the confluence of two rivers namely, the Mahanadi and the Kathajodi. It is surrounded by embankments, which protect it from flooding, but the city suffers severe water logging during high floods and during high tides in these rivers. The general topography of the town is a gentle slope from west to east. The maximum elevation is MSL+30 m in the north and the minimum is MSL+20 m in the south east. The central part of the city is low with an elevation of about MSL+17 m. A major canal known as Taldanda canal starts from Jobra at about the center of the city and runs in a south-southeast direction bisecting the eastern part of the town. On the western and southern part, the city is divided by the canal. Storm water drain known as Drain No. 1 runs from west to east and discharges into the Kathajodi river. Main Drain II runs in west-east direction and discharges into the Mahanadi river. The East Coast railway line divides the city into two segments. The western part has the old city area with maximum population and habitational density, as well as the areas of newly developed Abhinaba Bidanasi areas of CDA (Cuttack Development Authority).

8.3.2 The open drain system

The city's drainage, which includes wastewater transport and disposal, is entirely by open drains. The city presently has two main drainage channels along with their tributary drains. These cater to the two portions of city, segmented by the Taldanda canal, which runs along the central part of the city. These drainage channels are referred to as CMC Main Drain I and CMC Main Drain II, as shown in **Map 8.4**.

8.3.2.1 CMC Main Drain I

The CMC Main Drain I runs for a length of about 10.47 km. The mean longitudinal slope of the CMC Main Drain I is around 0.05% and the average longitudinal slope of secondary channels which generally runs from north or south to the CMC Main Drain I is around 1%. It originates at Srivihar Colony (Hanuman Temple) near Tulasipur which is to the north west of the city and ultimately outfalls into the river Kathajodi near Matagajpur at the city's south east end (**Fig 8.12**). Beyond the Matagajpur sluice, water flows for about 2.25 km parallel to the Kathajodi river inside the flood plain before joining the stream. This reach is not having a defined drain section. At the origin of CMC Main Drain I, a tributary drain also joins it at about a km upstream of Srivihar colony. The drain which joins the main drain has been encroached upon and is almost in decaying state. The drainage area of the main drain up to Matagajpur sluice is 2727 hectares. The average flow of the drain, as was estimated in a 1982 report, was 106 cumecs at Matagajpur sluice



Fig 8.12: A view of the major drain No. 1 of Cuttack city from Bajrakabati square.

and 81 cumecs at NH-5 bridge crossing. At many reaches the drain sidewalls are reported damaged. The section of the drain is also irregular and less adequate at many locations in the reach from Naya Bazaar to Matagajpur. Proper gradient is not maintained at several stretches on its reach and the hydraulic parameters are also not uniform.

It is reported that the carrying capacity of the drain is throttled due to narrow culverts at many locations. To prevent the back flow of the river's water from entering the city during floods, the drain is controlled by a gated sluice at its discharging end into river Kathajodi at Matagajpur. The flap shutters of the Matagajpur drainage sluice are in a damaged state and allow significant flood flow to enter through it during floods. This causes flooding in the upstream of the drain, especially affecting the low-lying pockets. During 1985, two more sluices were built, one at Matrubhavan to release water to Taldanda canal and the second at Khannagar Railway Bridge. The Khannagar sluice is linked to the CMC Main Drain I by a link drain to discharge water into river Kathajodi (**Fig 8.13**). The link drain is about 1.30 km in length. This gets silted up regularly and needs regrading from time to time. Matrubhavan sluice seldom helps in evacuation of floodwater due to interference of canal regulation measures for safety at critical reaches down stream and other constraints.



Fig 8.13: Disposal of Main Drain into Kathajodi River, a view at Khannagar

8.3.2.2 CMC Main Drain II

The CMC Main Drain II originates from the eastern part of Cuttack Railway Station, in the vicinity of the railway track. It runs for a length of 5.175 km from OMP square to the bank of river Mahanadi beyond C.R.R.I. campus and thereafter 3.825 km inside the flood plain before joining the river Mahanadi. Guluguli sluice on Mahanadi's right embankment, just on the eastern boundary of C.R.R.I, controls the waters of the river Mahanadi and prevents its back flow from entering the city. The drainage area of CMC Main Drain II at Guluguli sluice is 565 hectares. No definite drain section is maintained in the reach inside the C.R.R.I campus.

8.3.3 The problems of flooding

The city suffers badly from flooding and water logging mainly due to high water levels of the rivers. It gets inundated during heavy downpours due to inadequate drainage systems. There are also a number of lower pockets in the city, from where storm water does not get evacuated through the existing drainage system (**Map 8.4**). During the rainy season, the sewage and storm waters mix and find their way into the households, creating very unhygienic situations in many of these pockets/localities. It was reported that during the 2003 monsoon, the issue of water logging aggravated due to continuous heavy rainfall throughout Cuttack city followed by high flooding in the rivers. The stormwater drains from

Cuttack city could not discharge floodwaters to the rivers for more than 29 days in August, September and October due to flood lockage. Except for stagnating pools of sewage and wastewater, there are fewer problems in dry weather and non-monsoon seasons. As stated earlier, the problem becomes acute every year during the monsoon due to inadequate carrying capacity of the drains. The problem aggravates when flood water levels in the two rivers are above the water levels in the drainage channels. Over the years the two rivers have progressively silted and, as a result, the floodwater flows at the rivers are at higher levels than the main drains. This cause flood lockage and often results in back flow of floodwater to the town through the ineffective control sluices. During such times many areas in the city remain water logged while the low-lying areas get inundated. The problems are so severe that to drain out rainwater from the city even during moderate rains, pumping becomes essential. The Cuttack Municipal Corporation had identified 17 points as low pockets in the city during the 2003 floods, which is given in **Table 8.24**. Other low lying areas are also identified and reported in DPR, 2006 as given in **Table 8.25**.

Table 8.24: Low Lying areas in Cuttack City

SI No.	Place & Designation	Extent in ha.
1.	Bidanasi Low Pocket	1.26
2.	Tulasipur Low Pocket	8.87
3.	Police Colony Low Pocket	10.09
4.	Sutahat Low Pocket	1.95
5.	Kajibazaar Low Pocket	1.52
6.	Gomhadia Low Pocket	3.32
7.	Pattapola Low Pocket	10.87
8.	Rausapatna Low Pocket	1.62
9.	Samanta Sahi Low Pocket	1.17
10.	Bhagatpur Low Pocket	6.22
11	Haripur Low Pocket	1.02
12.	Raja Bagicha Low Pocket	3.81
13.	Badambadi Low Pocket	4.42
14.	Khannagar Low Pocket	0.98
15.	Jobra Low Pocket	114.08
16.	Mahanadi Vihar Low Pocket	35.00
17.	Khapuria Low Pocket	13.15

Source: Cuttack Municipal Corporation

Table 8.25: Other low lying areas in Cuttack City

Sl. No.	Place & Designation	Area in ha.
1.	Friends colony Low Pocket	0.91
2.	Santa sahi (east) Low Pocket	0.73
3.	Sikharpur Low Pocket	23.21
4.	Paisa Low Pocket	10.55

Source: DPR, 2006 (Detailed Project Report on Integrated Sewerage and SWM System for Cuttack City, STC, 2006)

8.3.4 Critical Issues of Concern

By analyzing the present drainage system of Cuttack, the following critical issues are observed as of concern:

- i. The existing system of drainage is inadequate to handle the increasing wastewater generation and lacks the vigor of present day planning technology.
- ii. Though the city is growing at a rapid pace, the systems of sanitation and drainage are unable to keep pace with it.
- iii. The natural depressions and ponds, which were instrumental in preventing excess storm run-off, are getting filled up at a rapid rate due to urbanization. This may further aggravate the existing problem of water logging.
- iv. Due to the lack of proper drainage and wastewater management, combined with indiscriminate dumping of solid waste, natural drains are functioning like sewers.
- v. A detailed understanding of drainage problems of Cuttack, including the possibilities of de-silting of rivers, and preparation of a master drainage plan is much essential.

8.3.5 Proposals

8.3.5.1 Drainage Network Proposed

A comprehensive schematic diagram of both existing and newly proposed secondary as well as tertiary drains of Main Drain I of CMC is shown in **Fig 8.14**. The systematic diagram of Main Drain II and III of CMC is shown in **Fig 8.15**, while Main Drains IV, V, and VI are shown in **Fig 8.16**. The network of proposed/ existing drains in Barang zone is shown in **Fig 8.17**. The systematic diagram of proposed/ existing drains of Choudwar Municipality is shown in **Figs 8.18 and 8.19** respectively. The list of new drains proposed in DPR, 2006 are given in **Table 8.26**.

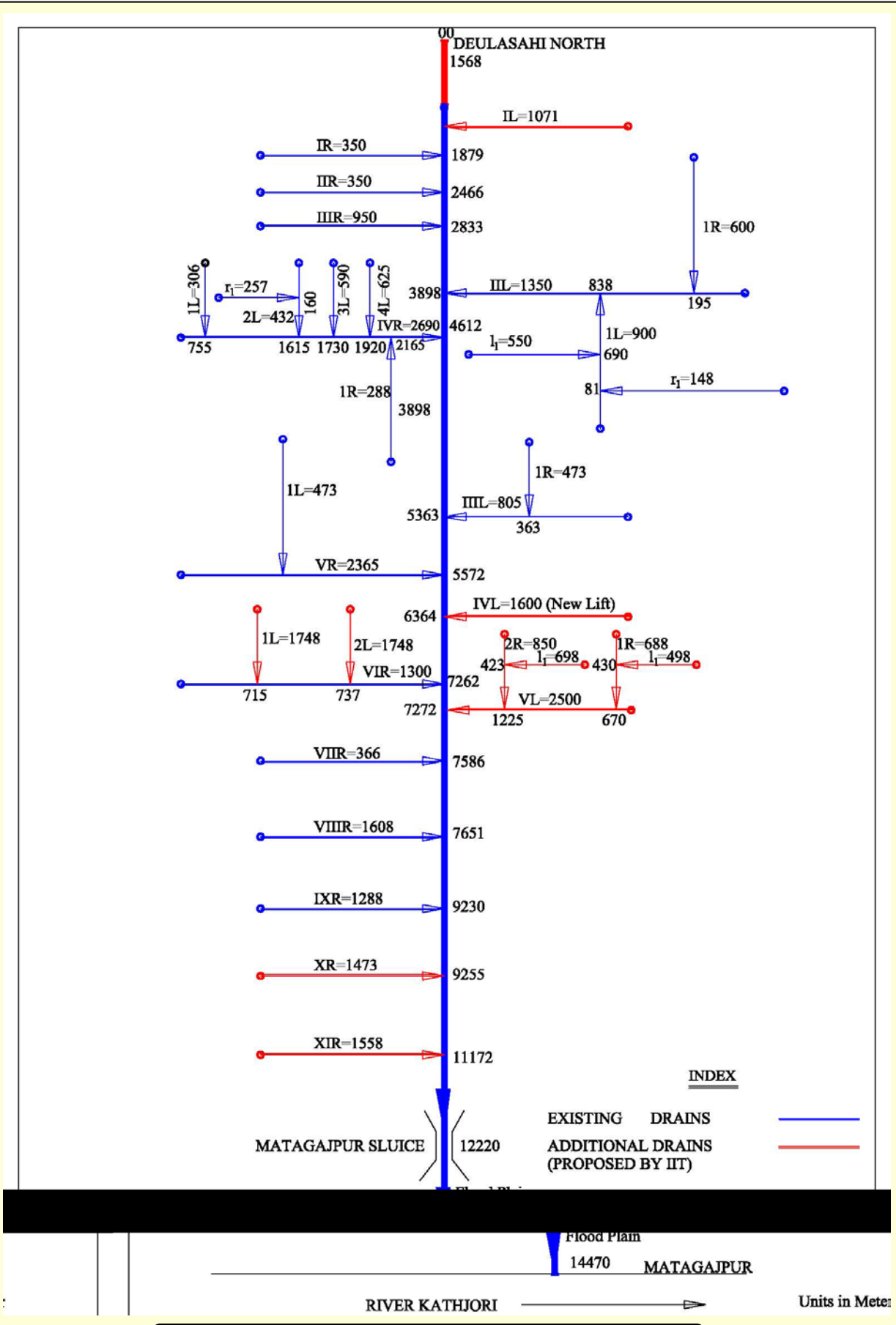


Fig 8.14: Drainage Network of CMC Main Drain No. 1

Source: DPR, 2006 (Detailed Project Report on Integrated Sewerage and SWM System for Cuttack City, STC, 2006)

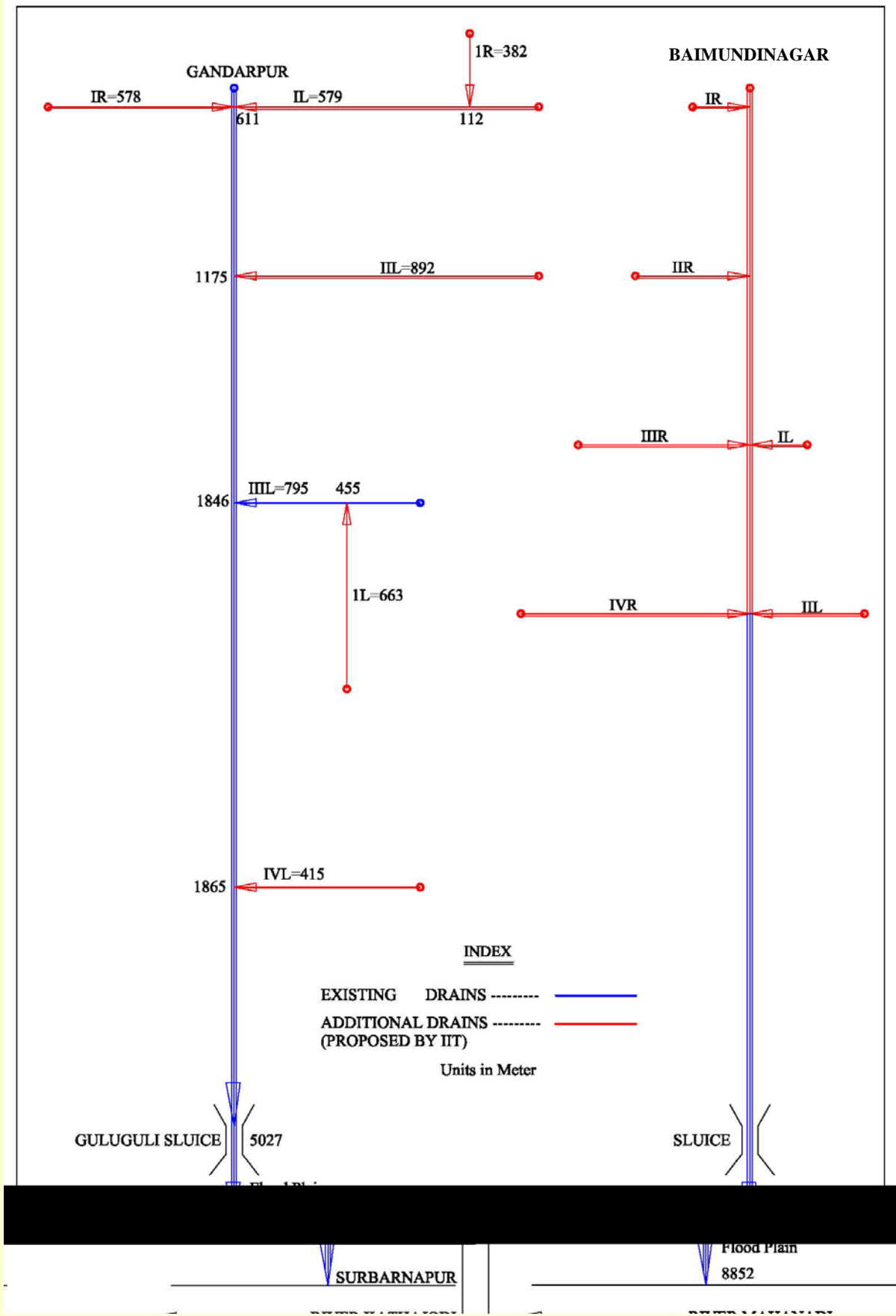
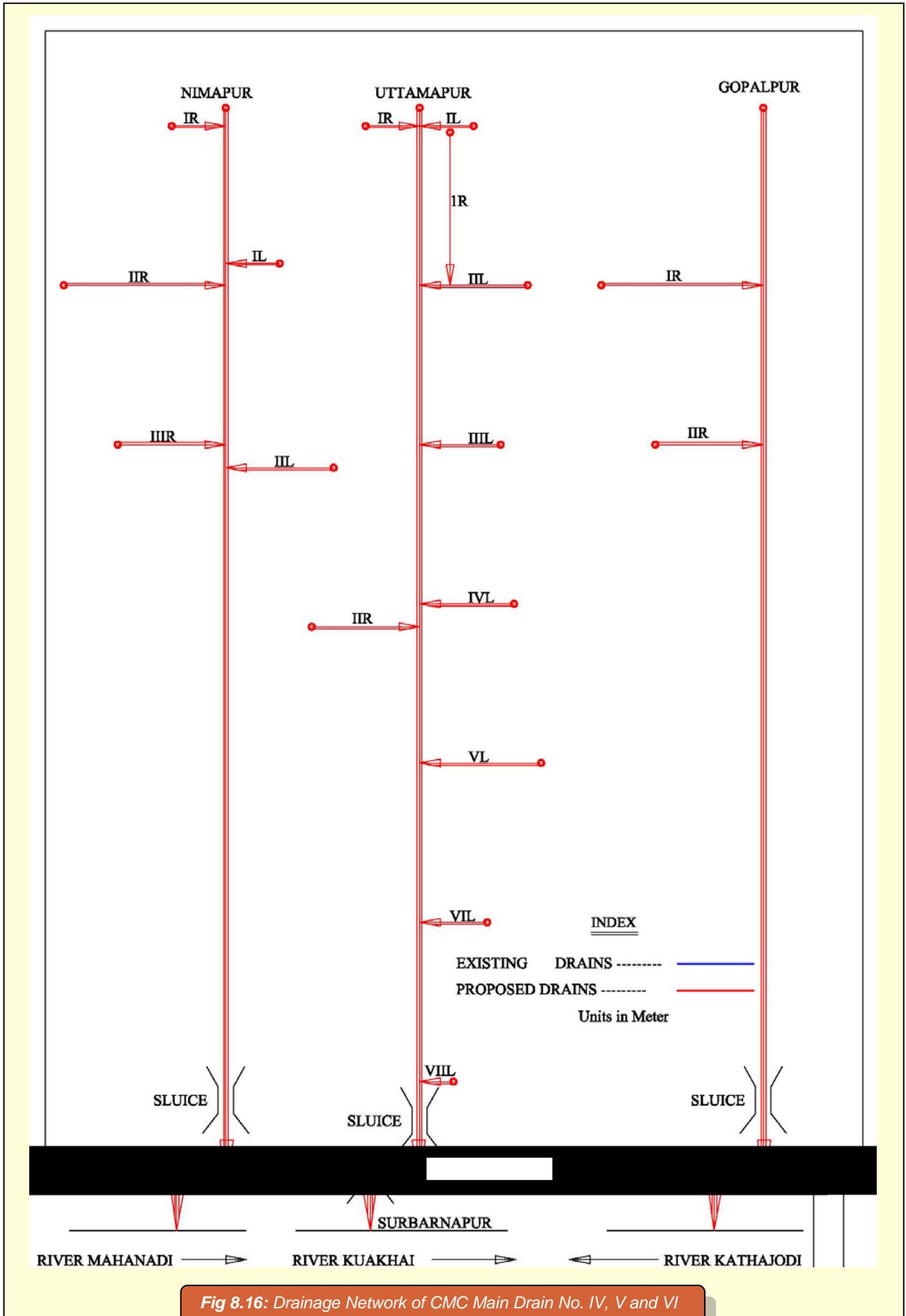


Fig 8.15: Drainage Network of CMC Main Drain No. II and III

Source: DPR, 2006 (Detailed Project Report on Integrated Sewerage and SWM System for Cuttack City, STC, 2006)



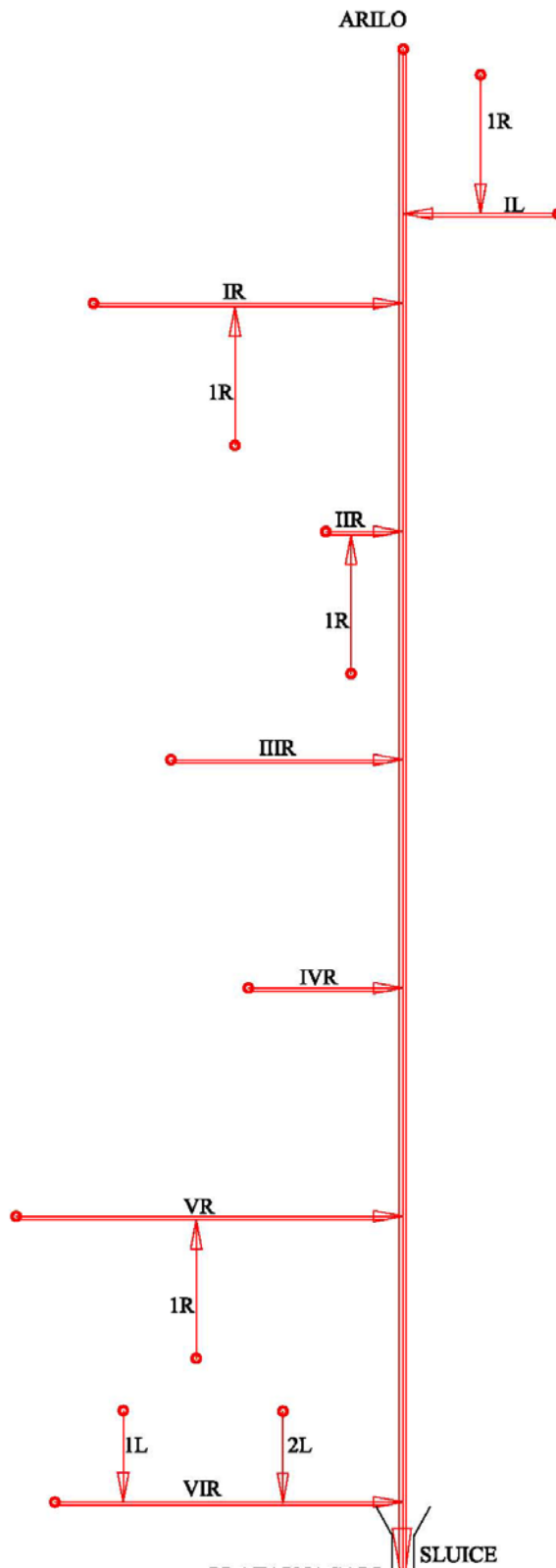


Fig 8.17: Drainage Network of Barang Main Drain I

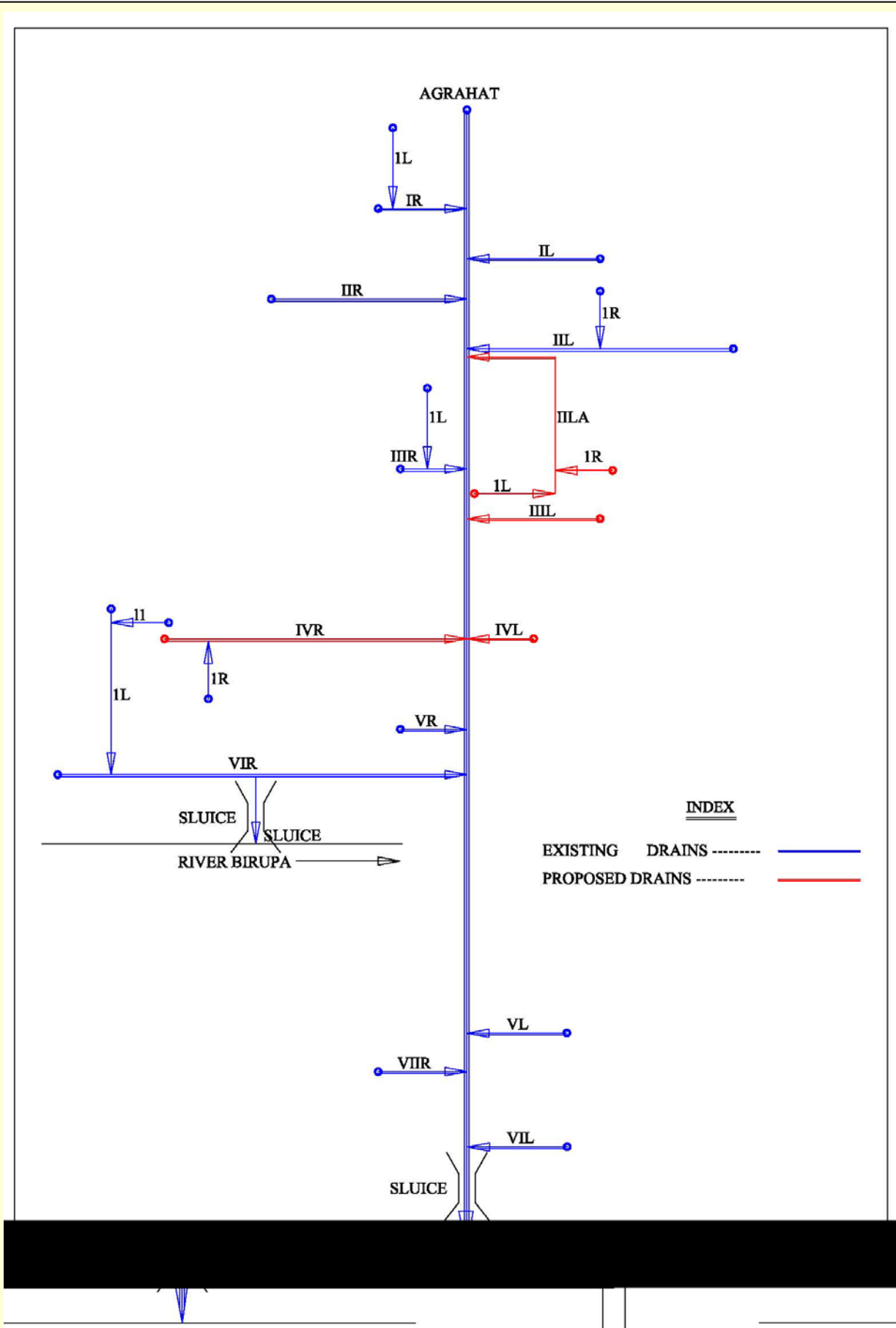


Fig 8.18 Drainage Network of Choudwar Main Drain I

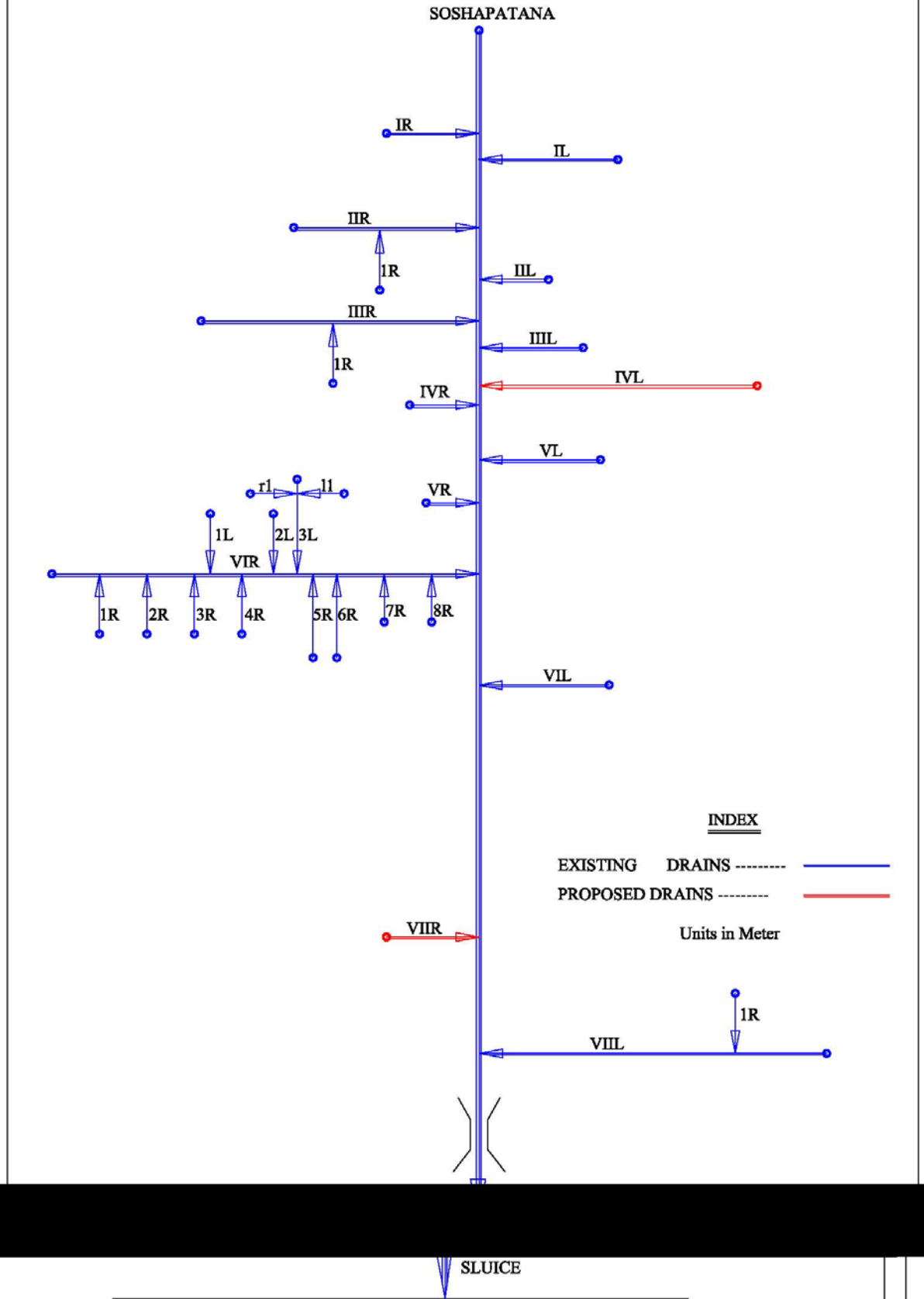


Fig 8.19: Drainage Network of Choudwar Main Drain II

Table 8.26: List of CMC Main Drain I and II

Sl. No.	Name of drain	Length in m	Location
(a) Main Drain No. I.			
1.	I.L.	1071	Chahata, Police Colony, Bidanasi area connected to main drain no. – I.
2.	IVL	1600	Cuttack Medical and Director of Fisheries area connected to main drain no. – I at Chhatra Bazaar by lift and pumping.
3.	1L of VIR.	1748	Along side of Link road from Badambadi Bus stand to Railway bridge discharging to VIR (one on each side of road).
4.	2L of VIR	1748	
5.	XR	1473	From Nuapada area to main drain no. I at Naya Bazaar
6.	XIR	1558	From Sartol area to main drain no. – I at Kantilo.
(b) Main Drain No. II			
7.	IR	578	From Cuttack Paradeep road to Divine Nagar.
8.	IL	579	From National Highway to Divine Nagar.
9.	IIL	892	From Mahanadi Vihar to Aparna Nagar.
10.	IIIL	795	From R.E.O. Office campus to Naya Bazaar.
11.	1L of IIIL	663	From Binayak Nagar to R.E.O Office campus.
12.	IVL	415	From Potapokhari to Naya Bazaar.
Total	12 nos.	13,120 m	

Source: DPR, 2006 (Detailed Project Report on Integrated Sewerage and SWM System for Cuttack City, STC, 2006)

The abstract of drainage network and length of Cuttack are given in **Table 8.27**. The two main drains of CMC namely Main Drain I and II along with the secondary and tertiary networks drain nearly 1900 ha. and 600 ha. of the respective city areas, as shown in **Tables 8.28 and 8.29**. The abstract of drainage network of CDPA is given in **Table 8.30**.

Table 8.27: Abstract of network of Cuttack Main Drain I & II

Sl. No.	Type of drain.	Total No.	Length in m
1	Main Drain	02	17,247
2	Secondary Drain.	20	22,383
3	Tertiary Drain.	12	8,846
4	Minor Drain.	03	955
5	Total	37	49,431

Note: This table does not include the length of drains inside the rivers (or flood plains) beyond the control sluices. Such lengths are 2250m and 3825m respectively for Main Drain I & II.

Source: DPR, 2006(Detailed Project Report on Integrated Sewerage and SWM System for Cuttack City, STC, 2006)

Table 8.28: Drainage Area of CMC Main Drain No. I

Sl. No.	Drain No.	Drainage area in Ha.
1	I L	38.42
2	Main Drain No. I	180.57
3	I R	55.36
4	Main Drain No. I	25.48
5	II R	14.27
6	Main Drain No. I	10.90
7	III R.	108.59
8	Main Drain No. I	36.45
9	II L	187.58
10	Main Drain No. I	36.25
11	IV R	154.44
12	Main Drain No. I	25.36
13	III L	59.24
14	Main Drain No. I	10.41
15	VR	77.98
16	Main Drain No. I	47.39
17	IV L	98.92
18	Main Drain No. I	30.09
19	VIR	182.53
20	Main Drain No. I	25.45
21	VII R	25.45
22	Main Drain No. I	02.00
23	VIII R	75.0
24	Main Drain No. I	34.86
25	IX R	37.84
26	Main Drain No. I	01.00
27	XR	56.26
28	Main Drain No. I	116.15
29	XI R	70.30
30	Main Drain No. I	74.27
	Total	1898.84

Source: DPR, 2006 (Detailed Project Report on Integrated Sewerage and SWM System for Cuttack City, STC, 2006)

Table 8.29: Drainage Area of CMC Main Drain II

Sl. No.	Drain No.	Drainage area in Ha.
1	Main No. II	103.00
2	I R	11.00
3	I L	12.00
4	Main No. II	13.00
5	II L	77.00
6	Main No. II	20.00
7	III L.	52.00
8	Main No. II	01.00
9	I V L	45.00
10	Main No. II	101.00
11	Main No. II	149.00
Total		584.00

Source: DPR, 2006 (Detailed Project Report on Integrated Sewerage and SWM System for Cuttack City, STC, 2006)

Table 8.30: Abstract of proposed drainage network for CDPA

Drain Name	Main Drain	Secondary Drain	Tertiary Drain	Minor Drain
CMC Main Drain I	1	16	13	5
CMC Main Drain II	1	5	2	0
CMC Main Drain III	1	6	0	0
CMC Main Drain IV	1	5	0	0
CMC Main Drain V	1	9	1	0
CMC Main Drain VI	1	2	0	0
Barang Main Drain I	1	7	6	0
Choudwar Main Drain I	1	14	7	1
Choudwar Main Drain II	1	14	14	2
Total	9	78	43	8

8.3.5.2 Recommendations

- i. Though Cuttack is growing at a rapid pace, the systems of sanitation and drainage are unable to keep pace with it. The natural drains seem to be functioning like sewers. The lack of proper sanitation and solid waste management, combined with indiscriminate dumping of solid waste in the drains reduces the carrying capacity of these natural drains. The implementation of a systematic solid waste and wastewater collection and treatment system is a necessary prerequisite for proper drainage of the area.

- ii. At many locations, the natural drains (e.g. the CMC Main Drain I, upstream of Srivihar colony) have been encroached upon and are almost in dilapidated state. Also, at many reaches the drain sidewalls are found to be damaged. The section of the drain is also irregular and less adequate at many locations (e.g. as in the reach from Nayabazar to Matagajpur). Proper gradient is not maintained at several stretches on its reach and the hydraulic parameters are also not uniform. Also, no definite drain section is maintained in many reaches (e.g. at Main Drain II, near C.R.R.I campus). So, proper maintenance and management of the existing natural drains turns important. This necessitates a proper evaluation of the existing natural drainage system.
- iii. The flap shutters of the Matagajpur drainage sluice were reported in damaged condition and significant flood flow enters through the sluice during floods. This causes flooding in the upstream of the drain especially affecting the low lying pockets. Periodic inspection of these sluice shutters should be ensured, and repaired before every monsoon.
- iv. Over the years the two rivers have progressively silted up due to which the flood water flows at ever higher levels than the water levels in these main drains. This cause flood lockage and often results in back flow of flood water to the town through the ineffective control sluices. During such times many areas in the city remain water logged while low lying areas get inundated. A detailed understanding of this issue, including the possibilities of de-silting of rivers, should be looked into.
- v. The natural depressions and ponds, which were instrumental in preventing excess storm run-off, are getting filled up at a rapid rate due to urbanization. This may further aggravate the existing problem of water logging. It is necessary that 'natural sinks' be retained as such as, they are instrumental in controlling the water logging of the area.
- vi. An organized drainage system is invariably associated with the implementation of a systematic solid waste and wastewater collection and treatment system.
- vii. Periodic de-silting of the existing storm water drains should be done.
- viii. Perimeter protection of all the major drains should be checked before every rainy season.
- ix. Overall, the preparation and implementation of a master drainage plan appears essential for Cuttack.

- x. All roads of the town/city should have side-drains, which will serve as minor or tertiary drains.
- xi. The drainage facilities provided in CDPA are very poor. A master plan for the drainage of some of these areas has not yet been prepared. The implementation of a master drainage plan for these areas appears very essential. The tentative expenditure for the proposed drainage system in CDPA is given in **Table 8.32**. The alignment and network of major drainage channels of CDPA is shown in **Map 8.5** and **Figs 8.14 - 8.19**. The natural width of all the major drainage channels in CDPA should be protected and there should not be any encroachment within at least 5 m on either side of these major channels. The exact bed width, land width and land requirements can be calculated after preparation of drainage master plan of the various zones of Cuttack Development Plan Area. All the major proposed roads should have side-drains, the cost of which have already been included in the Transportation Projects.

Table 8.31: The expected cost estimate of the drainage system in Bidanasi, Old Cuttack and Sikharpur zones for 2030.

Sl. No.	Description of the items	Tentative quantity/costs (Crores)
1	Improvements of existing major and minor drains and channels	38
2	Reconstruction of channel sections of major drains	68.00
3	Total capital cost	106.00
4	Annual O&M Cost	7.0

Table 8.32: Expected cost estimate of the proposed drainage system in CDPA.

Sl. No.	Zones	Total capital costs for drainage in (Crores)	Annual O&M Cost (Crores)
1	Nirgundi	37.0	1.9
2	Charbatia	37.0	1.9
3	Chhatisa	22.0	1.2
4	Choudwar	23.0	1.2
5	Nimapur	35.0	1.8
6	Bidanasi, Old Cuttack and Sikharpur	106.0	7.0
7	Mundali	42.0	2.1
8	Barang	47.0	2.4
9	Gopalpur	31.0	1.6
10	Total Rupees in Crores	380.0	21.1

8.4 Solid Waste Management

8.4.1 Solid Waste Management Scenario of CMC

The Cuttack City does not have an adequate garbage collection and disposal system. In general there is no systematic collection, segregation and storage system for the solid waste generated in the city. All the municipal wastes generated from various sources are generally dumped either on the streets or into the storm water drains and canals. The present system of solid waste collection is through dust bins placed in different places and street sweeping followed by carriage by open trucks or tractors by the employees of the Cuttack Municipal Corporation to the open dumping yards for disposal.

8.4.1.1 Solid Waste Generation Rate

The population of Cuttack Development Planning Area as on 2008 is 8,27,000. The average SW generation per person is expected as 500 gram per capita per day(gpcd). Accordingly, the total SW generation in CDPA is estimated as 413 MT/d in 2008, the total Municipal waste generation in Cuttack from various sources is about 264 T per day as per the data reported in DPR, 2006. Waste generation from various sources has been summarized in **Table 8.33**.

Table 8.33: Waste generation from various sources

Sl. No.	Sources	Quantity (Tonnes per day)
i.	Sweeping	15
ii.	Household	97
iii.	Hotels and Restaurants	8
iv.	Vegetable Market, Fish/meat market	12
v.	Commercial & Industrial Waste	10
vi.	Hospital Waste	1.3
	Construction waste, debris and silt from drains	120
Total		264 T

Source: DPR, 2006 (DPR for Integrated Sewerage and Solid Waste Management System for Cuttack City for Abatement of Pollution in Rivers Mahanadi and Kathajodi, by Shah Technical Consultants Pvt. Ltd.)

8.4.1.2 Existing System of Collection and Storage of Solid Waste in Cuttack

The sweeping of streets in the morning is entrusted to Safai Karmacharis. Each worker is assigned a specific area known as a beat, of length of about 300-500m, depending upon the size of road and density of population. The sweepings accumulated in small piles are taken up in

wheelbarrow (single chambered) or by means of metal/wooden plates and shifted to the nearest collection point manually. Garbage collection points are mostly located on wide roads within the city. Garbage is transported to the disposal ground by tractor and trucks from time to time. More than 300 wheelbarrows are used by the CMC for this purpose. Around 900 permanent staff and 150 temporary staff are engaged. The entire process of the sweeping operation, collection, transportation and disposal of solid waste is actually being looked into by Jamadars, supervised by sanitary inspectors, who are in turn monitored by Health officers. Private contractors are also appointed to provide sweeping and various drain cleaning services. However house-to-house collection of waste is still the responsibility of CMC. There are presently around 90 collection points and depots in the entire Cuttack City. The wastes brought from primary collection in wheelbarrows and auto-rickshaw containers also unload into open heaps at these collection depots. The mode of transportation is through dumpers, minitrucks, loaders and tractor-trailers which directly collect the solid waste from garbage points, then have an outfall into the dumping ground.

In most of the places, where collection points and depots are unavailable for the household wastes, people generally dump these wastes openly on the roads. Since the facilities for SW collection are not provided in slum areas, like the Chhatra Bazar Area, people usually dump the waste into the nearby Taldanda Canal. It is a common practice that the shopkeepers throw their wastes on the roads and drains. The wastes from vegetable and fruit market, fish and meat market and restaurants and hotels are not collected and transported to disposal sites separately. Being highly biodegradable this waste contributes to maximum odour.

Since the segregation of wastes is not being practiced, composting plants are not in operation and all the wastes, both biodegradable and non-biodegradable, are being dumped on the dumping ground. Even the infectious and non-infectious biomedical wastes are not segregated, stored and treated before disposal. Only few hospitals are seeking the help of some private agencies to collect and dispose their bio-medical wastes properly. All the hospitals are dumping these infectious and non-infectious biomedical wastes in the hospital premises itself and burning them.

8.4.1.3 Disposal of Solid Waste

The Solid Waste ultimately gets dumped into the dumping ground at Brajabiharipur near Bidanasi development area between the rivers Mahanadi and Kathajodi. This land has basically been selected maybe because of its deep natural depressions. It is learned that CMC has identified a new dumping ground at Chakradharpur, near Mundali of 27.65 Hectares for disposal of SW (**Map 8.6**).



Fig 8.20: The open dumping of Solid Waste near Kathajodi River in Cuttack



Fig 8.21: A common scene of People dumping their solid waste in backyard of their houses

Though two composting plants were set up at Satichoura and Nehru Pally with capacities of 5T and 1T respectively to treat the biodegradable wastes from 18 wards of the Municipality, it is not functioning now. So, simple open dumping is the only management technique practiced. It has also been observed that some wastes are also being dumped at a high embankment in the Kathajodi river bed and on Mahanadi river bed (**Fig 8.20**). Since the city also does not have adequate land for waste disposal, 90% of the waste gets deposited in the river bed, low lying areas and back yards of houses (**Fig 8.21**), with only a very low percentage taken to the land fill sites.

8.4.1.4 The existing scenario of solid waste management in CDPA

The major contributors of SW in the planning area include domestic, institutional, commercial, hotels and restaurants, temples, marriage halls, street sweeping, construction and demolition, industrial, and biomedical wastes. Almost all or substantial part of the MSW generated remains unattended and grows in heaps at poorly maintained collection centers and dumping yards. The choice of a disposal site also is more a matter of what is available than what is suitable. There are waste bins to collect, mainly, the household wastes, but the system is not efficient. The bins are, however, only randomly provided in most of the CDPA. Further, these waste bins are inadequate in size and are open, thus providing easy access for birds and other animals. Some of these bins are often misplaced, forcing the residents to throw away garbage in open areas of the probable bin sites. Even when the bins are available, wastes are sometimes thrown outside the bins anyway and since the wastes are always thrown loose, the problems become unmanageable very quickly. Not only in the residential areas, loose wastes from large market places and grocery centers are thrown on the ground around the roadside waste bins. Stinky rubbish lies around the waste bins in the residential areas and market centers for a long time before being collected by the waste collectors. The collectors have to clean up the areas messed up by loose waste and shovel the loose waste into baskets, and then onto trucks. Thus dumping of loose wastes into waste bins and roads create major waste management problems in most of the areas of CDPA, especially near busy urban centers. Before getting collected by trucks, the wastes swept from the roads are piled on the side of the roads. Animals and scavengers dig into the piles made up of swept up wastes and scatter it. Moving vehicles scatter overflowing garbage from the piles. The uncollected wastes usually contain a significant portion of fecal matter, and as a result, children playing around these wastes and scavengers who handle these wastes, face high risks of health problems. These problems are especially significant for the inhabitants of the larger and most densely populated informal or illegal settlements where regular

garbage collection service and waste bins are not available. In case of delay in waste collection, the task becomes unimaginably massive.

Uncontrolled dumps generate a wide range of pollutants and pose serious threats to human health. Substances produced during garbage decomposition, when disposed of in an improper manner, results in significant soil contamination. This is one of the most frequent externalities of inappropriate garbage disposal. As garbage decomposes, leachate is produced and drains into the ground. It contains large number of chemicals produced in waste degradation, and can subsequently affect the groundwater which, in turn, may pollute the entire subsoil of the region. With the exception of sanitary landfills, every other site is a risk to human health and a source of environmental pollution.

8.4.2 Proposals

8.4.2.1 Solid waste management system (SWM) - the need of the future

An integrated solid waste management system has become a primary necessity for assuring the quality of human life in any habitat. The Municipal Solid Waste (MSW) is an essential by-product of everyday living. The volume of MSW produced annually, is increasing rapidly in all urban centers as a result of global urbanization, rapid industrialization and economic development. The management of MSW has earned increasing attention as a major hindrance to urbanization and economic development all over the world. In view of the institutional inability in managing the ever-increasing amount of solid waste, it has become necessary to formulate and implement a comprehensive SWM strategy to assure a sustainable solid waste management system. MSW treatment is a combined responsibility of the citizen, the local government and the industrial or business sector. The principal strategy to manage MSW is to recycle as much as possible to reduce its quantity. However, even if effort is made to minimize the amount of waste, a large proportion still requires treatment in view of the activities of modern society.

It has been felt that the solid waste management in CDPA is not in tune with the rapid development of the area. The management of solid waste continues to remain one of the most neglected areas of urban development in the CDPA. Appraising the efficacy of the solid management project requires an assessment of the effectiveness of collection and disposal services in all wards of the area. The degree of effectiveness can be examined through a subjective assessment of spatial coverage and efficiency of collection and transfer services. Likewise, the proportion of waste collected could also be considered as an indicator of the performance of the management system. It appears that more than 50% of the solid waste generated in the entire area remains unattended. This gives rise to unsanitary conditions especially in

the densely populated areas of Old Cuttack, which in turn may have serious health and environmental consequences. Despite the fact that management of SW comprises a whole range of activities involving the public sector, small-scale private enterprises and service users and, given the size, complexity, and budget share, it is surprising that dedicated SWM departments have still not started functioning in CDPA.

8.4.2.2 Assessment of SW generation

The expected SW generation in different areas of CDPA are illustrated in **Tables 8.34 and 8.35** and are compared in **Figs 8.22 and 8.23**. The average rate of SW generation for CDPA is taken as 500 gm/capita/d. This enormous increase in solid waste generation will have significant impacts in terms of the land requirement for disposal, impending ground water pollution, methane emissions to atmosphere due to open burning (contributing significantly to global warming) and the health impacts on people. If land filling is adopted, the total land area requirement will be enormously high to fulfill the requirements of solid waste dumping. The increase in solid waste generation demands cumulative requirement of land for disposal of MSW. But, very high diversion of land for waste disposal would be physically impossible since areas with largest concentration of solid waste would also be the areas with serious scarcity of vacant land. Thus, if the current methods of solid waste disposal persist, the waste would have to be carried over long distance necessitating great deal of transport facilities and infrastructure. This would involve enormous additional finances and liabilities to these Municipalities in future. So, the situation demands a number of decentralized treatment units to handle the solid wastes of future.

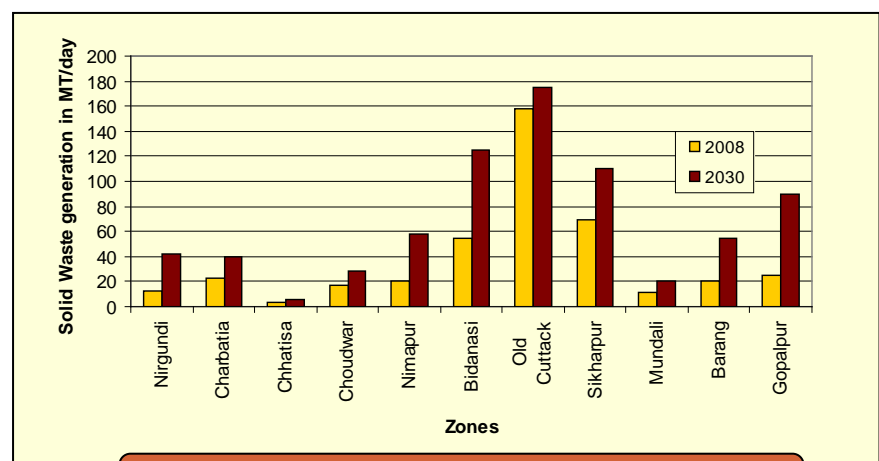


Fig 8.22: Solid Waste generation in various zones of planning area in 2008 and 2030.

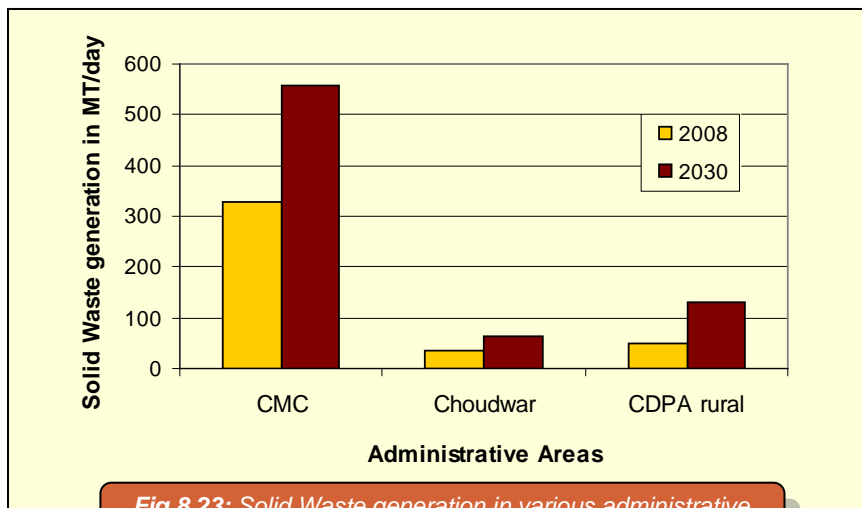


Fig 8.23: Solid Waste generation in various administrative areas of Cuttack Development Plan Area in 2008 and 2030.

Table 8.34: Expected Solid Waste Generation in various zones in 2008 and 2030 for CDPA

Sl. No.	Zones	Zone Number	Population in 2008	Population in 2030	Solid Waste in 2008 (MT/d)	Solid waste in 2030 (MT/d)
1	Nirgundi	1	25000	85000	12.5	42.5
2	Charbatia	2	45000	80000	22.5	40
3	Chhatisa	3	6000	12000	3	6
4	Choudwar	4	34000	56000	17	28
5	Nimapur	5	40000	115000	20	57.5
6	Bidanasi	6	110000	250000	55	125
7	Old Cuttack	7	317000	350000	158.5	175
8	Sikharpur	8	138000	220000	69	110
9	Mundali	9	22000	42000	11	21
10	Barang	10	40000	110000	20	55
11	Gopalpur	11	50000	180000	25	90
12	Total CDPA		827000	1500000	413.5	750

Table 8.35: Expected Solid Waste Generation in CMC, Choudwar Municipality and CDPA Rural

Area	Population in 2008	Population in 2030	Solid Waste in 2008 (MT/d)	Solid Waste in 2030 (MT/d)
CMC	655000	1115000	327.5	557.5
Choudwar Municipality	70000	125000	35	62.5
CDPA Rural	102000	260000	51	130
Total	827000	1500000	413.5	750

8.4.2.3 Action Plan for a Sustainable SWM Programme

1. Need for a decentralized solid waste treatment system

The developmental pattern of all the areas, especially Cuttack, demands the implementation of an integrated solid waste treatment system. It is felt that only a decentralized MSWM system could help solve the seemingly intricate problem of solid waste treatment in this area in an economically viable, socially desirable and environmentally sound manner.

2. People participation

General environmental awareness and information on health risks due to improper solid waste management are important factors which need to be continuously communicated to all sectors of the population. Building awareness among public and community about the need for a better solid waste management system is as essential as management. Public awareness and attitudes to waste can affect the people's willingness to cooperate and participate in adequate waste management practices. If people keep on throwing waste on the streets indiscriminately, the local body alone cannot keep the city clean in spite of their best efforts. Thus, it is very important to make people understand that the treatment and management of solid waste is a collective responsibility of the local authority and the community. Municipalities or local governments through participatory programs should convey this message to the people.

3. Enhancement of collection facilities

- i. Old masonry type dustbins are to be replaced with different types of covered dustbins made out of cast iron, which reduces the time of pickup and improves the process of primary collection of wastes.
- ii. The sweepers of Municipalities may be provided with handcarts and detachable containers and be allotted a fixed area or number of houses for door to door collection. They should also be provided with safety gears and proper uniforms.
- iii. It can be made compulsory for the management of societies/complexes to keep covered bins in which waste is to be stored at acceptable locations, to be picked up by the municipal staff.
- iv. The local body may collect waste from community bins by using container handcarts or tricycles whichever may be convenient, for transferring the wastes to the waste storage sites by employing municipality sweepers.

- v. The collection service can be provided on a full-cost recovery basis using contractor services on a day-to-day basis from individual houses.
- vi. The collection service can be provided on a full-cost recovery basis using contractor services on a day-to-day basis from individual shops also. The service of rag pickers and part-time sweepers can also be used in agreement with the shop owners.
- vii. Sweeping of all public roads, streets, lanes, by-lanes where there is habitation or commercial activities on either side of the street should be done daily. A list of such streets and roads together with their length and width should be prepared. The local body, keeping in view the norms of work prescribed should work out a program for their daily cleaning. However, roads and streets where there is no habitation around and do not require daily cleaning may be put in a separate group.

4. Provision of storage facilities

One of the immediate measures to revamp the existing collection services structure would involve provision of covered community waste bins at proper distances for the people to deposit domestic waste. This is the first step that will ensure that people do not throw their garbage on the roads and hence do not create open dump sites. This will enable the sanitation workers to transfer waste to the transportation vehicle quickly and efficiently with minimum health risk which will also help to maintain the aesthetics of the surroundings.

The Municipal solid waste (Management and Handling) Rules 2000 of the Government of India have prescribed the compliance criteria for waste storage depots as under:

- i. Storage facilities shall be created and established by taking into account quantities of waste generation in a given area and the population densities. A storage facility shall be so placed that it is accessible to users.
- ii. Storage facilities to be set up by municipal authorities or any other agencies shall be so designed that waste stored are not exposed to open atmosphere and shall be aesthetically acceptable and user-friendly.
- iii. Storage facilities or “bins” shall have “easy to operate” design for handling, transfer and transportation of waste. Bins for storage of biodegradable waste shall be painted green, those of recyclable waste shall be painted white and those of other wastes shall be painted black.

- iv. Manual handling of waste shall be prohibited. If unavoidable due to constraints, manual handling shall be carried out under proper precaution with due care for safety of workers. So, the storage and handling of SW are extremely important, and hence the steps to be taken by the Municipal authorities for storage of solid wastes are listed in **Table 8.36**.

Table 8.36: Proposed steps to be taken by the Municipalities for storage of solid wastes

Sl. No	Sources of waste generation	Proposed Action /methodology
1	Households	<ol style="list-style-type: none"> 1. Not to throw any waste in neighborhoods, on streets, open space, and vacant lands, in drains or water bodies. 2. Keep food waste / biodegradable waste in a non corrosive bin type – D1 3. Keep dry/ recyclable waste in bin type – D2 4. Keep hazardous waste separately.
2	Multistoried buildings, commercial complexes, private societies etc	<ol style="list-style-type: none"> 1 to 4 as above. 5. Provide separate bin type – B large enough to hold wastes generated both biodegradable and recyclable. 6. Direct member of the association / society to deposits waste in bins provided. Sanitary inspectors should vigil the area and fine should be imposed for not following the actions.
3	Slums	<ol style="list-style-type: none"> 1 to 4 as above. 5. Use bin type – C
4	Shops, offices, Institutions etc	<ol style="list-style-type: none"> 1 to 4 as above. 5. Store the waste in bin type - D1, D2.
5	Hotels and restaurants	<ol style="list-style-type: none"> 1 to 4 as above <p>They should arrange their own bins and dispose waste in near by municipal bins.</p>
6	Vegetable, fruit markets, meat, fish markets, and street vendors.	<p>Keep small baskets with them and transfer waste to large bin type-A.</p> <p>Shop keepers not to dispose of the waste in front of their waste or shops or open space.</p> <p>Deposit waste as and when generated into bin type-A.</p> <p>Fines should be imposed for not following the actions</p>
7	Marriage halls, Community halls, kalyan mondaps etc.	<ol style="list-style-type: none"> 1 to 4 as above. 5. Provide a large bin type -B
8	Garden waste	<ol style="list-style-type: none"> 1. Compost the waste in garden itself, if possible. 2. Store wastes in large bags or bins and transfers it to community bins.

Note: Bin type A (volume 7 m3), type B (0.75 m3), type C (0.5 m3), type D1 and type D2 (12 liters).

3. Segregation of Solid Waste

The percentage composition of the solid waste in the CDPA are shown in **Fig 8.24**. The constituents of the solid waste are quantified as shown in **Table 8.37**. These compositional characteristics of the solid waste underline the need for proper segregation before treatment. Proper segregation of waste into different components and their separate collection can definitely lead to remarkable changes in the entire system.

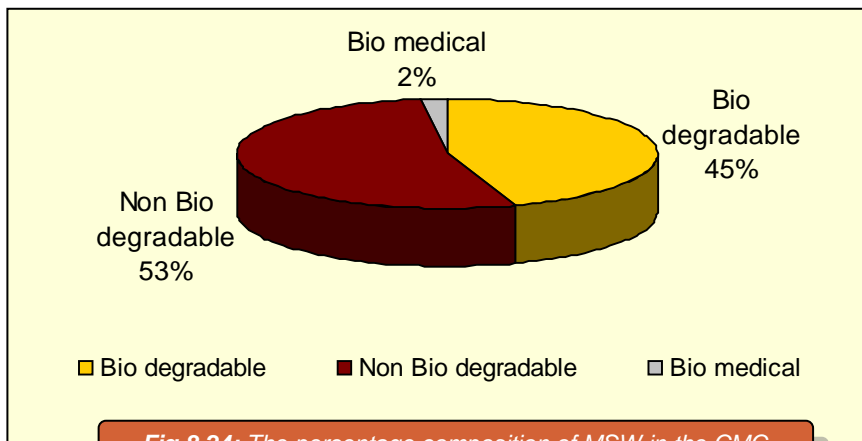


Fig 8.24: The percentage composition of MSW in the CMC

Table 8.37: Waste composition analysis of Cuttack

Sl No.	Type of MSW and source	% of total	Quantity of MSW	Bio degradable %	Bio degradable M.T	Non Bio degradable percentage	Non Bio Metric tones	Bio medical %	Bio medical M.T
1	Road Sweeping	5.68							
(a)	Tree leaves	3.83	10 MT	3.83%	10 MT	X	x	x	x
(b)	Road sweeping dust, light rubbish	1.92	3 MT	Dust etc.	5 MT	3	5MT	x	x
2	Household MSW	37	97MT	32%	86 MT	4%	10 MT	1%	1 MT
3	Hotels & Restaurants	3.04	8 MT	2%	5 MT	0.90%	2.4 MT	0.14%	0.6 MT
4	Vegetable market/fish	4.59	12MT	3.44%	9.36 MT	1%	2.6MT	0.15%	0.04MT
5	Commercial & Industrial waste	3.83	10MT	1%	2.5 MT	2.50%	6.5MT	0.30%	1MT
6	Hospital waste	0.004	1MT	0.10%	0.25MT	0.10%	0.25MT	0.30%	0.50MT
7	Construction waste + silt from drain								
(a)	Debris	23	55 MT	x	x	23%	55MT	x	x
(b)	Silt from drain	19.39	53 MT	x	x	19.39%	53MT	x	x
(c)	Cow dung	3	6 MT	3%	6	X	x	x	x
Total		100	261MT	45.18%	118.86MT	53.89%	134.75MT	1.89%	3.84MT

Source: DPR, 2006 (DPR for Integrated Sewerage and Solid Waste Management System for Cuttack City for Abatement of Pollution in Rivers Mahanadi and Kathajodi, by Shah Technical Consultants Pvt. Ltd.)

The segregation of the waste would be a long drawn exercise as it involves attitudinal changes in people and will have to be done with careful planning, in a phased manner. The general public is to be first sensitized towards the whole concept and educated about the need and advantages of doing the segregation. Segregation of waste at the source itself is extremely important as municipal solid waste, which is otherwise environmentally benign on getting mixed with hazardous waste like paints, dyes, batteries, human excreta turns hazardous. The recyclables like paper and plastic etc. become unsuitable for recycling as these get

soiled by the organic matter. Although, it would be more fruitful to sort and place different kinds of recyclables in separate receptacles, the waste could be segregated into at least two categories of biodegradable and non-biodegradable initially.

The recyclables obtained through segregation could be straightway transported to recycling units which in turn would pay certain amount to the corporations, thereby adding to their income. This would help in formalizing the existing informal set up of recycling units, and this formalization in turn could lead to multi-advantages. The biodegradable matter could be disposed off either by aerobic composting, anaerobic digestion or sanitary land filling. Depending upon land availability and financial resources, either of these disposal methods could be adopted. Though simple land filling is the traditionally practiced system of solid waste management in the planning area, aerobic composting by wind-row method will be an appropriate option.

All the non-biodegradable waste which is non-recyclable, non-reusable shall be dumped into sanitary land fill. Bio-degradable waste shall be subjected to composting. Area required for composting shall include the area for storage of unprocessed material, processing facilities for composting operation and storage for green compost. The area required for windrow composting with 15 days composting period with moisture content between 55-60% for aerobic composting, the first turning shall be done at the 4th day and thereafter every third day shall be 1.5 acres to 2 acres per 50 MT per day waste.

4. Reuse and recycling

The concepts of reuse and recycling can well be applied in solid waste management as solid waste is basically a heterogeneous mixture. In typical Indian municipal solid wastes, there is a small percentage of recyclable material and more of compostables and inert materials like ash and road dust. There is a very large informal sector of rag pickers, who can collect recyclable wastes (paper, plastic, metal, glass, rubber, etc) from the streets, bins and disposal sites for their livelihood. Thus, the rag pickers can be effectively used for the collection of reusable materials especially because the use of non recyclable packaging materials like PET bottles for soft drinks, mineral wastes, and soft-foam products and metalised plastic film coated food packing materials are on the rise. During recycling, many of these release toxic gases and ozone depleting products. So it is advisable to educate people to replace these items with eco-friendly packaging materials. The desirable home sorting mechanisms includes dry recyclable materials (e.g. glass, paper, plastic, cans etc.), kitchen and garden wastes, bulky wastes, hazardous wastes, construction and demolition wastes. Sorting can also be done just prior to waste processing or land filling.

5. Energy from solid waste

Electricity can be produced by burning MSW as a fuel. MSW power plants, also called waste-to-energy (WTE) plants, are designed to dispose of MSW and to produce electricity as a byproduct of the incinerator operation. Mass Burn is the most common waste-to-energy technology, in which MSW is combusted directly in much the same way as fossil fuels are used in other direct combustion technologies. Burning MSW converts water to steam to drive a turbine connected to an electricity generator. Burning MSW can generate energy while reducing the volume of waste by up to 90 percent, an environmental benefit. However, this burning MSW in WTE plants produces comparatively high carbon dioxide emissions, a contributor to global climate change. The net climate change impact of these emissions is lessened because a major component of trash is wood, paper and food wastes that would decompose if not burned. If left to decompose in a solid waste landfill, the material produces methane, a potent greenhouse gas. The concept of producing energy from MSW derives significance as it is given high priority by the Ministry of Non-Conventional Energy Sources (MNES), Government of India.

8. Instructions for public

- i. The citizens must be directed not to throw away the solid waste in their neighborhood or in open spaces.
- ii. The citizens must be directed to keep the waste as and when generated in covered domestic waste containers.
- iii. All private sectors, association of flats, lodges, multistoried buildings etc. must be directed to provide a community bin facility for storing solid wastes and to facilitate its collection by the local body.
- iv. All shops/offices/institutions are to be directed to refrain from throwing their solid waste on footpaths, streets and open spaces. They should be encouraged to keep the wastes in containers of appropriate capacities for easy handling.
- v. The footpath dwellers, people engaged in serving eatables on the road side must be directed to keep bins for their wastes.
- vi. The marriage halls, religious places and all such places which are frequently used for serving food must keep containers for the disposal of SW through private sweepers.
- vii. The vegetable and fruit markets produce large volumes of solid waste. The local body should provide adequate size bins for storage.

- viii. The disposal of construction wastes/ debris on the streets/open spaces should not be permitted without prior approval of the concerned authority. The authority must prescribe the rate per metric Tonne for the collection, transportation and disposal of such wastes.

6. Treatment options

The biodegradable portion of the waste is considerably high as shown in **Table 8.35**. So, aerobic composting of SW after proper segregation will be more appropriate. In selected locations especially in rural areas, Vermi-Composting can also be recommended. The manure obtained by these methods can be sold to the local public as fertilizer. Though costly, sanitary land filling can also be practised at selected urban locations where the recovery from the waste will be very high, serving minimum ecological damage. It appears that the aerobic composting by Windrow method may be a desirable option for the management of the solid waste. The possibilities of generating energy from SW could be looked into on an experimental basis.

7. Biomedical wastes and its management

Biomedical waste has been a growing concern because of the awareness in public regarding HIV, AIDS and Hepatitis B and exposure to discarded needles, syringes and other medical waste from municipal garbage bins and disposal sites. The management of biomedical waste turns important as it has serious bearing on the quality of human life. This becomes more significant especially in the context of the recent trend of establishing multi-specialty hospitals in urban centers. Biomedical waste can be regarded as any waste generated during the diagnosis, treatment or immunization of human beings or animals or produced due to activities of biological research, human anatomical waste, animal waste, microbiology and biotechnology waste, waste sharps, discarded medicines and cytotoxic drugs, solid wastes, liquid waste, incineration ash, chemical waste, etc. Medical wastes contain pathological waste (such as human tissues such as limbs, organs, foetuses, blood and other body fluids), infectious waste (soiled surgical dressing, swab material in contact with persons or animals suffering from infectious diseases, waste from isolation wards, cultures or stocks of infectious agents from laboratory, dialysis equipment, apparatus and disposable gowns, aprons, gloves, towels, etc.), sharps (any item that can cut or puncture such as needles, scalpels, blades, saws, nails, broken glass, etc.), pharmaceutical waste (drugs, vaccines, cytotoxic drugs and chemicals returned from wards, outdated drugs, etc.), chemical waste (any discarded solid, liquid or gaseous chemicals from laboratories, cleaning and disinfection) etc.

If a small part of these infectious hospital wastes are mixed with other hospital wastes or municipal solid wastes, the entire waste will have to be treated as infectious. Segregation helps in reducing the total treatment cost, stops general waste from becoming infectious, reduces the chances of infecting the Health Care Workers, etc. All these wastes after segregation must be stored in colour coded containers. Infectious waste should be disinfected before disposal. It has been observed that majority of the hospitals, nursing homes, pathology laboratories and health care centres located in these areas are not taking adequate measures for safe disposal of their bio-medical wastes. These hospitals generate waste in substantial quantities, which needs to be managed by the hospitals themselves. Many large hospitals dispose of their mixed wastes within the hospital premises, where waste remains unattended in the open for a long time. Some hospitals and nursing homes have set up low-temperature incineration plants for the disposal of wastes, which quite often remain out of order as they are not managed and maintained properly. Infectious and non-infectious wastes are generally not segregated at source and instead the mixed (often wet) waste is taken to the incineration plant in a very unhygienic manner. The system of collection, transportation and disposal of bio-medical waste is thus not scientifically designed and practiced in these areas.

8. Implementation of Bio-medical Wastes (Management and Handling) Rules, 1998

The Ministry of Environment and Forests issued the Bio-medical Wastes (Management and Handling) Rules, 1998 which were amended subsequently. These rules provide for segregation, packaging, transportation, storage, treatment and disposal of wastes generated by hospitals, clinics and laboratories. Bio-medical wastes (BMW) have been classified into various categories (**Table 8.38**) and the treatment and disposal options for each of the categories are specified (**Table 8.39**). The treatment and disposal should be in compliance with the standards prescribed in Schedule V, which stipulates standards for incinerators (operating and emission standards), for waste autoclaving, for liquid waste, of microwaving and for deep burial. A schedule for implementation of BMW rules has been laid down in Schedule VI. Imposing segregated practices within hospitals to separate biological and chemical hazardous wastes that will result in a clean solid waste stream, which can be recycled easily. An Advisory Committee is to advise the prescribed authority on the implementation of these Bio-medical wastes (Management and Handling) Rules.

Table 8.38: Categories of Bio-Medical wastes

Waste Category	Waste Class	Waste Description
No. 1	Human Anatomical Wastes, blood and body fluids	Waste consisting of human tissues, organs, body parts, body fluids, blood and blood products and items saturated or dripping with blood, body fluids contaminated with blood and body fluids relieved during/after treatment, surgery or autopsy or other medical procedures.
No. 2	Animal Waste	Waste consisting of animal tissues, organs, body parts, carcasses, bleeding, fluid blood and blood products, items contaminated with blood and fluids, wastes from surgery treatment, and autopsy and wastes of experimental animals used in research, Waste generated by veterinary hospitals, colleges, animal houses and livestock farms.
No. 3	Microbiology	Wastes from laboratory cultures, stocks or specimens of micro-organisms, live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes and production of biologicals, dishes and devices used for transfer of cultures
No. 4	Waste Sharps	Wastes consisting of sharps such as needles, syringes, scalpels, blades, glasses etc. those are capable of causing puncture and cuts. This includes both used and unused sharps.
No. 5	Highly infectious wastes	Waste containing highly infectious living and nonliving pathogens and exposure to it could cause disease.
No. 6	Isolated waste	Biological wastes from discarded materials contaminated with blood, excretion exudates or secretions from human and animals isolated due to communicable diseases,
No.7	Discarded Medicines	Wastes comprising of outdated, contaminated and discarded medicines,
No.8	Discarded Glass wares	Wastes generated from glass-ware and equipments used.
No.9	Soiled Waste	Wastes generated from soiled cotton, dressings, liners, beddings including the packaging materials.
No.10	Disposables	Wastes generated from disposable items other than the waste sharps.
No.11	Liquid wastes	Wastes generated from laboratory and washing, cleaning, house-keeping and disinfecting activities.
No.12	Biotechnology	Wastes generated from activities involving genetically engineered organisms or products and their cultures not declared to be safe.
No.13	Slaughter House	Wastes generated in the form of animal tissues, blood and body fluids.
No.14	Incineration wastes	Ash from incineration of any Bio-medical wastes.

Source: Report of the high power committee, Urban Solid waste Management in India, Planning Commission, Government of India, 1995.

Table 8.39: Treatment and Disposal options of Bio-Medical Wastes

<i>Waste Class</i>	<i>Treatment and Disposal Options</i>
<i>Human Anatomical Waste</i>	<i>Disinfection and incineration/Burial</i>
<i>Animal Wastes</i>	<i>Disinfection and burial</i>
<i>Micro-biology</i>	<i>Disposal in special container</i>
<i>Human blood and Body fluids</i>	<i>Dilution with disinfectant Disposal in special drains</i>
<i>Waste sharps</i>	<i>Disposal in special containers and landfill</i>
<i>Highly infectious wastes</i>	<i>Special decontamination, packing in specially designed containers and final disposal on secured landfill.</i>
<i>Isolated wastes</i>	<i>Secured landfill disposal after suitable treatment.</i>
<i>Discarded medicines</i>	<i>Incineration</i>
<i>Discarded glassware</i>	<i>Decontamination, destruction</i>
<i>Soiled-waste</i>	<i>If infectious, to be disposed of as infectious waste, if no infectious to be disinfected and disposed.</i>
<i>Disposables</i>	<i>Packaging in appropriate containers and incineration, disposal on secured Landfill.</i>
<i>Liquid Wastes</i>	<i>Disinfection and discharge in special drains.</i>
<i>Bio-technology waste</i>	<i>Packaging in special containers and disposal on land.</i>
<i>Slaughter house waste.</i>	<i>Disinfection and disposal on land for solid and treatment and discharge for liquid.</i>

Source: The Gazette of India (extraordinary) no. 233 dated 25th April, 1995, New Delhi

8.4.2.4 Processing and Disposal of Solid Waste

The solid waste can be processed by composting, vermi-composting, anaerobic digestion, sanitary land filling, incineration or any other biological processing for stabilization of wastes. Since it contains a high amount of biodegradable portion (**Table 8.37**), composting may be a cost-effective option for processing. The process of microbial composting or vermi-composting may be adopted with least mechanization to keep the cost low, and to market the compost as fertilizers to adjoining villages. So the concerned municipalities are duty bound to earmark minimum 20-50 acres of land to meet the requirement of solid waste treatment. The areas of existing dumping yards can also be developed. The rejects from these plants and domestic hazardous wastes may be carefully land-filled. The bio-medical wastes may be disposed off as per the Bio-Medical Waste Management and Handling Rules as described above.

A decentralized treatment system will be more feasible option for solid waste treatment. In recent times, there is a trend towards smaller, manually operated composting plants at community level, initiated primarily by citizens' initiatives or non-governmental organizations

(NGOs) supported by many national and international nodal funding agencies. In combination with primary waste collection, composting improves the precarious waste situation in the communities, and residents become less dependent on the poor municipal waste collection service. Decentralized composting can be operated by an appropriate technology and implemented at reduced investment and operating costs. Manual composting in small, decentralized plants is more easily integrated in the prevailing level of development in India and the socio-economic background, as it requires labour-intensive processes. It will create employment opportunities and a source of income to the underprivileged people in the rural CDPA. Decentralized composting allows reuse of organic waste where it is generated, thereby reducing waste quantities to be transported as well as transport costs. This may drastically reduce the overall cost of municipal solid waste treatment.

8.4.2.5 Proposals for solid waste treatment

Since the solid waste generation expected in CDPA in 2030 is very high, providing compost treatment facilities for this huge quantum of wastes, though essential, may not be practically possible in a single phase. So, it is necessary to propose economically feasible, and, technically viable solutions which can be implemented in a phased manner. The densely populated urban areas of CDPA are to be given first priority in providing the composting facilities for solid waste treatment. The area required for solid waste treatment and disposal facilities are given in **Table 8.40**.

Table 8.40: Details of the proposed disposal sites and area requirement for solid waste disposal in CDPA

Sl. No.	Zones	Land fill area required (Acres)	Land fill Site (LS)	Composting Plant (Acres)	Composting Plant Site (CS)	Total Area Requirement (LS+CS)
1	Nirgundi	4.7	Mangalpur in Charbatia Zone (21.5 acres+20%)	2	Agarjodi	2
2	Charbatia	5.4		2	Mangalpur	27.8
3	Chhatisa	0.8		-	-	-
4	Choudwar	3.9		2	Chashapara	2
5	Nimapur	6.7		2	Gunjarpur	2
6	Bidanasi	15.5	Chakradharpur In Mundali Zone (78.6 acres + 20%)	3.5	Deulasahi South	3.5
7	Old Cuttack	28.7		-	-	-
8	Sikharpur	15.4		3.5	Poparada	3.5
9	Mundali	2.7		0.5	Chakradharpur	94.82
10	Barang	6.4		3	Belagachhia	2
11	Gopalpur	9.9			Pratapnagari	2
Total CDPA						139.62

LS – Land fill Site CS – Composting Plant Site

1. Cuttack

The biodegradable solid waste production in Cuttack would be around 164 MT/d in 2030. The anticipated cost of a compost plant to process this quantum of waste would be around 1500 lakhs. For other infrastructure, including the land site developments the requirement would be around 1000 lakhs. So, for treating the total 164 MT/d of solid waste, the total expenditure would be around 2500 lakhs (**Table 8.41**).

Since the city also does not have adequate land for waste disposal, it is now disposing 90% of the waste onto the river bed and low lying areas and backyards of houses. Though two composting plants were set up at Satichoura and Nehru Pally with capacities of 5T and 1T respectively to treat the biodegradable wastes from of 18 wards of the Municipality, they are not functioning now. However, the dumping yard at Satichoura (SWTP1) may be retained and another new dumping ground at Matagajpur could be developed to treat 80 MT/d of solid waste each.

2. CDP Areas

The total solid waste generation expected in CDPA would be 750 MT/day as on 2030. The tentative cost estimate for the proposed solid waste treatment facilities in CDPA is given in **Table 8.42**. It is always advisable to have decentralized compost plants for effective implementation and better efficiency and can be located as per local generation rates and availability of land. It is advisable to provide controlled Composting plants (microbial composting or vermi-composting) at the following zones (**Map 8.6**):

1. Nirgundi (Agarjodi)
2. Nimapur (Gunjarpur)
3. Choudwar (Chashapar)
4. Bidanasi (Deulasahi)
5. Sikharpur (Poparada)
6. Gopalpur (Pratapnagari)
7. Barang (Belagachhia)

It is appropriate to provide atleast 2 disposal sites in the following zones:

1. Charbatia (Mangalpur)
2. Mundali (Chakradharpur)

The locations of these treatment plants and disposal sites are shown in **Map 8.6**. The compost from these compost plants can be marketed for agriculture in the adjoining villages. The solid waste amount can be reduced to 50% and amount of land required for sanitary land fill will also reduce drastically, if the segregation of biodegradable and non-biodegradable is done at source. The bio-degradable waste can be treating using composting method.

Table 8.41: The tentative costs of the proposed solid waste management and treatment system for Cuttack (Bidanasi, Old Cuttack and Sikharpur)

Sl.No	Description of items	Costs (crores)
1	Collection segregation, and storage	15.0
2	Transportation	5.00
3	Augmentation of 2 existing compost plants (SWTP1 and SWTP2)	25.0
4	*Total capital cost	45.00
5	Annual O&M costs	7.0

* Excluding land cost

Table 8.42: Tentative cost estimate (in crores) of proposed SWM and treatment systems in 2030 for CDPA

Item	Bidanasi, Old Cuttack and Sikharpur	Nirgundi	Nimapur	Choudwar	Gopalpur	Chhatisa	Charbatia	Mundali	Barang	CDPA Total Cost (Crores)
Total capital costs	45	8.0	11.0	5.5	17.5	1.5	8.0	4.0	11.0	111.5
O&M costs	7.0	1.3	1.8	1.0	2.7	0.25	1.3	0.6	1.8	17.75

3. Hazardous/bio-medical waste treatment

(i) The Notification from the Government of India, Ministry of Environment dated 20th July 1998, which deals with the collection of Bio-Medical Wastes entrusts the liability of its disposal with the waste producer itself. Thus the management of bio-medical waste is not the responsibility of Municipalities. But, however, they can assist in the management of biomedical wastes on a full cost recovery basis without sharing any legal responsibilities.

(ii) It is advisable to have some hazardous/bio-medical facility for the entire CDPA. The bio-medical wastes collected from spots can be stored in selective transfer stations and can be transported to this central treatment facility at Mangalpur revenue village (in Charbatia zone) as shown in **Map 8.6**. If so desired, the authorities can formulate an action plan for implementing this plant through some competent agencies and can suitably charge for the treatment and disposal of bio-medical wastes. The solid waste dumping sites closest to industrial sites will be a more appropriate option.

4. Financial Management Plan

Any proposed solid waste management system will require provision of financial resources for its smooth running. The financial requirements vary substantially from year to year. However, since revenue instrument cannot be made to adjust annual requirements, it is proposed to raise the financial sources through:

- i. Introduction of SWM benefit tax/cess.
- ii. Loans especially for capital investments from appropriate agencies.
- iii. Effort should be made for encouraging private capital through Built-Operate-Own (BOO), Built-Operate-Transfer (BOT), Built-Operate-Lease-Transfer (BOLT) and other arrangements.

9.1 Introduction

Social and community infrastructure and services are provided in response to the needs of communities. Provision of their amenities or infrastructure depends on the regional bearing, size and hierarchy of the settlement. Major social policy concerns of the Government include the provision of infrastructure services, fostering Government and community partnerships, community capacity building, integrated service delivery and social justice. The cost of delivering social benefits is very high and constitutes a major proportion of the State budget. The concept of social infrastructure is very broad and covers various aspects of Government service delivery.

This is also a sector where involvement of the private sector has been limited. To ensure substantial progress in the Government's efforts in promoting equality for all, the Government needs to focus on the following aspects:

1. Providing basic human needs (including primary health care, basic education, power and telecommunication).
2. Improved delivery of infrastructure services with emphasis on the poor and building their capacity for sustenance.
3. Safe-guarding human rights and providing good governance.
4. Seeking private sector participation in development of areas like tertiary education.
5. Building a clean and healthy environment.

Cuttack Development Plan Area (CDPA), being an important delineated region in Orissa state has 8.27 lakhs (2008) population who need education, health care, and cannot be neglected by a civilized government. CMC, CDPA Rural and Choudwar Municipality are not directly involved in the planning of education or making of programmes for health institutions. The Govt. of Orissa has its own department of education and health, which prepare and execute plans for these services for the entire State including areas covered by CDPA. However, there is one particular aspect of social infrastructure planning in which involvement of all the agencies are essential and unavoidable. That aspect is the aspect of space, i.e. the area allocation for education, healthcare, recreation and other such social infrastructural facilities. In CDPA, data's and studies indicate that social infrastructure has scope of improvement, both quantitatively and qualitatively.

9.2 Education

One of the principal components of social infrastructure is education and directly affects the 'level of living' and the 'quality of life' of its people.

Further, education is an important indicator of social development, since higher level of growth is generally believed to be driven by innovation, which is in turn driven primarily by the level of education.

9.2.1 Existing Educational Facilities in CDPA:

The **Old Cuttack** (Planning Zone 07) can be called the Institutional zone of the CDPA region with the maximum concentration of educational institutions as shown in **Map 9.1**. Some of the institutions present are Ravenshaw University, Madhusudan Law College, Institute of Management & Information Technologies, SCB Public Medical School, Old Kendriya Vidyalaya School, Cambridge School, St. Joseph's Girls High School, Sailabala Women's College, YMCA Building, Christ College, S.E Rly M.P School, Biju Pattnaik Film and TV Institute, BOSE Engineering Institute etc. Also, there are a number of institutions concentrated within Bidanasi (Planning Zone 06) **Map 9.1** like Saraswati Sishu Mandir, Raghunath Jew College, ABIT College, Kendriya Vidyalaya, DAV School, International Centre for Ideal Education, Bidanasi High School, Lajpat Rai DAV Public School, and in Sikharpur zone, institutions like Mahanadi Vihar School, Saraswati Vidyamandir (Residential), CRRH High School, Ruchi Food Craft Institute and St. Xavier's High School-1 etc. **Map 9.2** shows the deposition of different educational components in the Charbatia (Planning Zone 02), that includes institutions like Bandalo Primary School, Charbatia UGME School & High School, Kalinga Public School, Birata Cuttack School, OTM High School, Agrahat High School and ARC Campus. **Map 9.2** shows the locations of Choudwar Women's College, Choudwar M.E School, Chashapara U.P. School, Nigamananda Bidyapitha etc. in Choudwar Zone. **Map 9.3** shows the elements of institutions in Mundali zone like Jawahar Navodaya Vidyalaya, Mundali High School, Godi Sahi High School and in **Gopalpur** zone namely Kalinga Bharati Residential College, Kalinga Bharati Institute of Management Studies, ICFAI etc.

9.2.2 Suggested Policies and Strategies for Education:

Some important measures to be taken up by appropriate authority to transform CDPA into an important educational hub are:

A) Capacity Building:

- a. Release of land for setting up of high quality day schools in the model of DPS in Barang zone.
- b. Formation of teachers' training institute for improvement in the qualification and experience of the teachers at all levels, especially the secondary and higher secondary level.
- c. Augmentation of infrastructural support such as text books, furniture, storage in classrooms, playgrounds, libraries, laboratories etc; with a stress on extra-curricular and

recreational activities especially in the primary sections. Introduction of mid-day meal would enhance the effort in this direction.

B) Quality of Education:

Introduce Institutions of Technical, Medical and Management and Vocational Training Education. The supply of skilled man power is the key factor in the process of managing the future urban development. It is important to develop new initiatives in management training outside the formal education and training system to provide the adequate skill required for running operation and maintenance of various old and new industrial institutions.

C) Administrative Reforms:

- a. The Government should work very closely with the private and public sector to form an advisory committee comprising representatives from all concerned parties and form up-to-date courses only to ensure that its education and training system would meet the tertiary needs, now and in the future.
- b. Close collaboration with international reputed institutions in the development of various training courses could form part of the Government's HRD policy. The Government, along with National Productivity Council, Technical Education Board and other appropriate organisations should also develop extensive programs to upgrade the skills of the existing workforce under the overall guidance of experienced and well qualified national and overseas personnel. Only then could we identify their best practices and suitably modify them for developing the present education and training system.
- c. The Government could promote the adoption of the city's municipal schools by NGO's and communities to reduce drop out rates (e.g. policies adopted in Karnataka).

D) Adequate and appropriate Space Allocation:

Ample space and healthy environments for educational and institutional facilities can pay dividends in the form of better attitudes and positive mindset in the students, thus resulting in greater productivity. Thus, to serve the region as well as state, a clear cut policy guideline is required to be incorporated for earmarking areas for various professional/ educational institutions, research centres and training institutes those would serve the region as well as state. These institutions may be set up in suitable locations, as shown in **Map 9.4**.

9.2.3 Assessment of Future Requirements and Proposals

Based on the recommended norms specified by the UDPFI guidelines, as summarized in **Table 9.1** the assessment of existing and future requirements of facilities and recommended area for education has been done in **Table 9.2**. The requirements have been categorized by the different levels of education and indicated by the additional number of educational facilities and respective areas required.

Table 9.1: Recommended UDPFI Guidelines for Educational facilities

Level of Education	Population per facility	Student Strength	Recommended area (In hectares)		
			Building	Playground	Total area
Primary	5,000	500	0.2	0.2	0.4
High + Higher Secondary	7,500	1000	0.6	1.0	1.6
College	1,25,000	1500	2.2	1.8	4.0

Table 9.2: Zone wise existing and future (2030) no. of educational facilities and their area requirement

Level of Education	Primary School			Secondary School + Senior Secondary			University/ College + Technical College		
	No. of existing facilities (2006)	No. of additional facilities Required (2030)	Additional Area Requirement (in ha.)	No. of existing Facilities (2006)	No. of additional facilities Required (2030)	Additional Area Requirement (in ha.)	No. of existing Facilities (2006)	No. of additional facilities Required (2030)	Additional Area Requirement (in ha.)
Nirgundi	17	0	-	6	5	8	2	-	-
Charbatia	14	2	0.8	7	4	6.4	6	-	-
Chhatisa	4	0	-	1	1	1.6	0	-	-
Choudwar	8	3	1.2	6	1	1.6	6	-	-
Nimapur	15	8	3.2	7	8	12.8	7	-	-
Bidanasi	37	13	5.2	33	0	-	25	-	-
Old Cuttack	101	0	-	62	0	-	60	-	-
Sikharpur	40	4	1.6	22	7	11.2	25	-	-
Mundali	14	0	-	4	2	3.2	1	-	-
Barang	29	0	-	7	8	12.8	2	-	-
Gopalpur	19	17	6.8	8	16	25.6	6	-	-
Total CDPA	298	47	18.8	163	37	59.20	140	-	-

Source: Socio-economic Survey, SPARC, 2006

In order to provide adequate educational facilities and infrastructure in all the zones, an assessment of the existing facilities has been done for the primary, secondary and specialised institutions in all the zones. It has been noticed that all the zones of CDPA excluding Old Cuttack, will require additional educational facilities in primary and secondary level to provide for the future population. The existing educational infrastructure in the Old Cuttack zone needs to be augmented with policies and programmes to enhance the capacity building. The zone of Nirgundi has been proposed for specialised institutions such as, Engineering, Medical and Management institutes. Building centres and mason training institutes have been proposed in Chhatisa zone for development and propagation of new building construction technology. In the Nimapur zone, vocational training institutes for industrial training and catering technology have been proposed. Additional Institutional areas for specialised institutes like the Law University, Institute of Judicial Sciences etc. and other technical and training institutions have been proposed in Bidanasi zone. In the Sikharpur zone delineation of land for research and development institutions at national level in continuity with the existing one like the CRRRI has been made. Land allocations for specialised theological, philosophical universities such as Sri Sri Ravishankar University have been made. Quality educational facilities for primary, secondary and higher secondary at par with international levels like DPS model with day boarding facilities have also been made in the Barang zone. Defense institutions such as DRDO and specialised research institutions such as Institute for Astronomical Studies, Non-conventional Energy Research Centre have been proposed in Mundali zone (**Map 9.4**).

9.3 Health Care

To ensure the progress of any region, it is important that its citizens are healthy and have access to adequate health infrastructure.

9.3.1 Existing Health care Facilities in CDPA:

The existing scenario indicates a greater access of city dwellers to better health facilities than the rural population who need to travel long distances to avail the Govt. health services. Although awareness about health and hygiene among the population has increased over the years, and many private healthcare facilities are coming up, the Government health facilities are yet to be upgraded to match today's health service demands or standards. Government healthcare facilities in CDPA urgently need to be augmented with more sophisticated medical

equipments, implementing waste disposal autoclave, setting up drugstore and purchase more no. of ambulances.

Existing important health facilities within CDPA are almost wholly concentrated in Old Cuttack Zone. Some of them are Acharya Harihara Cancer Institute, SCB Medical College, Red Cross Blood Bank, Lion's Eye Hospital, Braja Rambha Dispensary Campus, Veterinary Hospital, Orissa Nursing Home, Nigaam Hospital, Udaya Bhanu Nursing Home, etc. Welfare Nursing Home, Sun Clinic, SMCC, Ashwini Hospital, JPM Rotary Eye Clinic all belong to the Bidanasi Planning Zone and Leprosy Ashram, Cuttack Homeopathic Medical College, Moon Hospital in Sikharpur zone (**Map 9.1**). ARC Hospital and ESI Hospital are the important hospitals in the Charbatia - Planning Zone 03 (**Map 9.2**). Panda Cancer Hospital, Veterinary Dispensary are the existing Health Care facilities in Gopalpur zone (**Map 9.3**).

It is found that the 78 hospitals and health care facilities are located in the CDPA, maximum located in Old Cuttack Planning Zone, where both the urban and rural people flock in large numbers to avail themselves of the outdoor and indoor facilities and for the preventive and curative treatment. Out of 167 nursing homes 95 are located in Old Cuttack zone. An account of the existing health facilities in CDPA is presented in **Table 9.4**, along with the future requirement in terms of number of additional facilities, land required.

9.3.2 Assessment of Future requirements and proposals

The assessment of future requirements for healthcare has been done based on the recommended norms specified by the UDPFI guidelines, as specified in **Table 9.3**.

Table 9.3: Recommended UDPFI Guidelines for Healthcare Facilities

Type of Facility	Population served	Number of Beds per facility	Area requirement (in hectares)		
			Hospital	Residential	Total
General Hospital	250,000	500	4.0	2.0	6.0
Intermediate hospital(A)	100,000	200	2.7	1.0	3.7
Intermediate hospital (B)	100,000	80	0.6	0.4	1.0
Polyclinic	100,000	-	-	-	0.2-0.3
Nursing home/ Maternity	45,000 – 100,000	25-30	-	-	0.2-0.3

The additional number of health care units required along with additional land requirement is given in **Table 9.4**. The approximate fund requirement for 2030 is shown in **Table 9.11**.

It has been noticed that, adequate facilities at primary level are available in all the zones of CDPA to cater to the present population. Also specialised hospitals to cater to the city level and regional level population already exist in the zones of Choudwar, Old Cuttack and Bidanasi. These health care facilities need to be augmented with increase in capacity and availability of trained man power. Additional hospital and health care facilities have been proposed in the new zones of Nirgundi, Nimapur, Mundali, Barang and Gopalpur to cater to the needs of the future population. The health infrastructure needs to be upgraded in the form of multi specialty hospitals, health complexes and also inviting the corporate sector to contribute to the development of this sector. Land allocations have been made for such specialised complexes in the newly developing zones like Barang and Nirgundi (**Map 9.4**).

Table 9.4: No. of existing Healthcare Facilities (2006) and additional requirement of facilities and recommended areas for 2030

Zone name	Hospital and Health care			Nursing Home		
	No. of existing facilities (2006)	No. of additional facilities Required (2030)	Additional Area Requirement (in Ha.)	No. of existing facilities (2006)	No. of additional facilities Required (2030)	Additional Area Requirement (in Ha.)
Nirgundi	2	1	4	1	1	0.3
Charbatia	3	0	0	2	0	-
Chhatisa	1	0	0	0	0	-
Choudwar	3	0	0	2	0	-
Nimapur	1	3	11	10	0	-
Bidanasi	13	0	0	23	0	-
Old Cuttack	37	0	0	95	0	-
Sikharpur	10	0	0	31	0	-
Mundali	1	1	4	0	0	-
Barang	3	1	4	0	2	0.6
Gopalpur	4	2	7	3	1	0.3
CDPA Total	78	8	30	167	4	1.20

Source: Socio-economic Survey, SPARC, 2006

9.3.3 Suggested Policies and strategies for health facilities

A) Capacity Building:

- a. The average number of beds in the hospitals and health centers in CDPA is presently sufficient as per UDPFI recommended guidelines of 2 beds per 1000 population. In future these norms should be extended in rural areas also, since the major concentration of health institutions are mostly in the urban area.

- b. There is an immediate need to increase the number of qualified doctors as well as the para-medical staff.
- c. There is an immediate need for upgrading all basic and diagnostic equipments in all primary health centers and sub-centers mainly in the rural areas which lack these facilities.

B) Community based approach

- a. The motto for tomorrow's health care should be "help at the doorstep". Preventive practices coupled with medical help provided by community health officers will ensure that the number of patients with critical diseases will decrease. All categories of citizens including CMC workers are to be brought under the medical insurance coverage to avail the facilities in the major hospitals.
- b. The strategy for community based approach will be to increase the participation of the people, especially womenfolk in semi-urban, industrial and rural areas. A system of health card has to be introduced to each individual by the NGO's and CBO's.
- c. Introduce a system of appropriate user fees in all the state-run hospitals without withdrawing the sanctioned fund.

C) Public Private Partnership:

- a. Encourage public-private partnership in the creation of new kinds of hospitals for ensuring specialised kinds of medical facilities for the people at large.
- b. The private sector in healthcare should cater to the referral hospital like that of VMC, Tata memorial etc. while improving the medical equipment and laboratories. However some form of cross subsidy may be worked out so that the private sector could provide services to people at more affordable prices.

D) Raising the level of medical services:

New trends of health care services such as tele-medicine, setting up of health intranet, patient information centre through internet, and related computerization should be actively encouraged in the CDPA region.

9.4 Other Social Infrastructural facilities

Other facilities which form an integral part of social infrastructure are Telecommunication, Financial Institutions, Postal Services, Fire Services, Recreation facilities, parks and playgrounds, etc.

9.4.1 Existing Scenario of other Social Infrastructural facilities

In CDPA, other social infrastructural facilities again are concentrated within Old Cuttack Planning Zone.

The commercial banks already functioning in the CDPA are State Bank of India, UCO Bank, Union Bank, Indian Overseas Bank, NABARD, Allahbad Bank, State Bank of Hyderabad, LIC etc. When compared with the UDPFI Guidelines, the number of financial institutions (10000 per facility is satisfactory in urban area where as in rural areas the number is below satisfactory level.

Postal services in CDPA are satisfactory in terms of number of post offices and telegraph offices and also the population served per post office as per UDPFI Guidelines, which suggests 15000 populations per post office.

There are Four existing Fire stations serving the CDPA of which 1 is located in Old Cuttack (**Map 9.1**), 1 in Charbatia (**Map 9.2**) and 2 in Bidanasi (**Map 9.1**).

The present condition of amenities is very poor in terms of cinema halls, auditoriums and stadium in the entire CDPA, when compared to standards.

9.4.2 Assessment of Future requirements and proposal

The requirements have been indicated by the additional number of facilities, additional land requirement and approximate fund requirements for Telecommunication, Financial Institutions, Postal Services, Fire Services, Recreation facilities, parks and playgrounds, etc. All the above social infrastructural facilities have to be located within the prescribed institutional, commercial and recreational land uses in the CDPA to cater to the future population. Hence appropriate space or land at prescribed locations need to be kept reserved for accommodating modern infrastructural facilities, all leading to raising the quality of life of the people of CDPA and BCUC as whole. The UDPFI guidelines have been followed for computation of future requirement in terms of number of facilities and land requirement (**Tables 9.5, 9.6A, 9.6B and 9.6C**).

The proposals for Telecommunication, Financial Institutions, Postal Services, Fire Services, Recreation facilities, parks and playgrounds etc. are as follows.

Telecommunication, Postal Services and Fire Services: It has been computed that total 15000 lines are required for expansion of Telecommunication facilities in the CDPA. Adequate infrastructural facilities for Postal services are available in all the zones of CDPA. A marginal addition of 11 numbers of postal infrastructural facilities at

various levels are required to cater to the future proposed population in the various planning zones. In addition to the existing number of fire stations, 7 more fire stations have been proposed. The zone wise distribution of all these facilities has been mentioned in **Table 9.6A**.

Financial Institutions, Recreational Hall, Parks and Playground:

It has been observed that the concentration of financial institutions is mainly in the zones of Bidanasi and Old Cuttack. An attempt has been made for a proportionate distribution of these facilities in all the zones with respect to the population of each zone. To further accentuate development in this sector a 'Business Improvement District' has been proposed in Barang. Various commercial and financial office complexes have been distributed in different zones of CDPA. 39 additional recreational halls in the form of cinema halls/auditorium/multipurpose halls have been proposed for the various zones of CDPA. Also modern day facilities such as multiplexes, city centres, urban plazas have been proposed as a part of high end recreation in the zones of Barang, Gopalpur, Choudwar and Bidanasi. It has been observed that, very minimal amount of land area at present functions as formal parks and playgrounds. It is extremely essential to increase the land area under this category. After computation of the requirement it has been found out that a total of 1350 ha is required under this category. Major passive recreational areas along the river front of Mahanadi and Kathajodi have been proposed in the form of Barabati Haat, Utkal Ratna Bhumi, Naraj Barrage Park, Mundali Barrage Park, Choudwar Park, Chhatisa amusement park, Science and Technology Entrepreneurs Park, Energy Park, Water Theme Park, Heritage Park, Veer Sthal etc. along with major fair and festival grounds such as Baliyatra fair ground, Choudwar fair ground etc, large open spaces for religious discourses near the Sri Sri University, Barang and Bidanasi. Neighbourhood level parks and playgrounds should be distributed proportionately in the various zones. A major sports complex for Sports Authority of India has also been proposed in Choudwar zone. Besides this it has been envisaged to make most of the stretches and sand beds along the river front areas as green recreational areas with beautiful plantations and gardens, streetscapes and street lighting thereby making the river fronts as attractive spaces for passive recreation (**Map 9.4**). The zone wise distribution of all these facilities has been mentioned in **Table 9.6B**.

Community Hall and Library, Music, Dance and Drama Centre:

The existing facilities are quantitatively high in number but lack qualitative infrastructure in terms of space standards, ambience, resources etc. these existing facilities need to be augmented to serve the population. Further for the propagation and development of culture, many policy guidelines have been outlined in the forthcoming chapters. As per this

Other Infrastructure Facilities

policy guidelines computation of city level facilities have been made and it is expected that around 17 numbers of additional community halls/libraries are needed and 3 major music/dance/drama/performing art centres are required in the three portions of CDPA (**Table 9.6C**). Further to accentuate and to promote the image of the entire CDPA as a world class cultural centre, a 'Cultural Hub' has been proposed in Gopalpur zone, on a scenic peninsular land mass in the backdrop of river Khathajodi, for an international level performing art centre, along with convention centre, media complex etc (**Map 9.4**). Thus a boost has been given to revive the literary, art, craft and theatre in the CDPA region.

Table 9.5: Recommended UDPFI Guidelines for Telecommunications, Postal Services and Fire Service

Type of Facility	Walking Distance	Population threshold
Telecommunication	-	10 lines per 100 population
Postal Services	-	1 post office per 15000 population
Fire Service	<3 km	1 fire station for 2 lakh population
Commercial/Cooperative Bank	1.6 – 3 km	10000
Recreational Hall (cinema/auditorium)	.5 – 1.6 km	20000
Stadium/ Sports Complex	-	2 lakhs
Overall city level open space		10-12 sq.mt. per person

Table 9.6A: Future requirement of Telecommunications, Postal Services and Fire Service in CDPA

Zone name	Telecommunications	Postal Services		Fire Service	
	Total lines required (2030)	No. of existing Facilities (2006)	No. of additional facilities Required (2030)	No. of existing Facilities (2006)	No. of additional facilities Required (2030)
Nirgundi	850	6	0	0	1
Charbatia	800	6	0	1	-
Chhatisa	120	0	1	0	-
Choudwar	560	7	0	0	1
Nimapur	1150	4	4	0	1
Bidanasi	2500	16	1	2	-
Old Cuttack	3500	55	0	1	1
Sikharpur	2200	13	2	0	1
Mundali	420	3	0	0	0
Barang	1100	7	0	0	1
Gopalpur	1800	9	3	0	1
CDPA	15000	126	11	4	7

Source: Socio-economic Survey, SPARC, 2006

Table 9.6B: Future requirement of Commercial/Cooperative Bank, Recreational Hall and Park and Playgrounds in CDPA

Zone name	Commercial/ Cooperative Bank		Recreational Hall (Cinema/ Auditorium)		Parks and playgrounds		
	No. of existing Facilities (2006)	No. of additional facilities Required (2030)	No. of existing Facilities (2006)	No. of additional facilities Required (2030)	Existing Facilities	Existing Area (in Ha.)	Additional Area Requirement (in Ha.)
Nirgundi	3	6	1	3	13	1.03	83.97
Charbatia	4	4	1	3	17	16.05	63.95
Chhatisa	0	1	0	1	2	0.98	11.02
Choudwar	2	4	3	0	10	7.43	48.57
Nimapur	6	6	4	2	6	1.7	113.3
Bidanasi	21	4	5	8	38	31.5	218.5
Old Cuttack	71	0	16	2	63	60	290
Sikharpur	21	1	7	4	17	16.72	203.28
Mundali	1	3	0	2	5	4.7	37.3
Barang	3	8	0	6	16	4.2	105.8
Gopalpur	6	12	1	8	12	6	174
CDPA	138	49	38	39	199	150.31	1349.69

Table 9.6C: Future requirement of Community Hall, Library and Music, Dance & Drama Centre in CDPA

Zone name	Community Hall and Library			Music, Dance and Drama Centre		
	No. of existing facilities (2006)	No. of additional facilities Required (2030)	Additional Area Requirement (in Ha.)	No. of existing facilities (2006)	No. of additional facilities Required (2030)	Additional Area Requirement (in Ha.)
Nirgundi	14	0	-	0	1	0.1
Charbatia	11	0	-	3	0	-
Chhatisa	1	0	-	0	0	-
Choudwar	4	0	-	2	0	-
Nimapur	4	4	0.8	2	0	-
Bidanasi	32	0	-	5	0	-
Old Cuttack	72	0	-	11	0	-
Sikharpur	19	0	-	7	0	-
Mundali	2	1	0.2	0	0	-
Barang	3	4	0.8	1	0	-
Gopalpur	4	8	1.6	0	2	0.2
Total CDPA	166	17	3.4	31	3	0.3

Source: Socio-economic Survey, SPARC, 2006

9.5 Power

9.5.1 Existing Scenario in CDPA

Energy is the prime mover of economic growth and is vital to sustaining a modern economy and society. Orissa is the first state to privatize power supply distribution in India. Whole state is divided into four zones. BCUC falls under Central Electricity Supply Utility (CESU). Source of power to BCUC is from Power Grid Corporation of India Ltd (PGCIL), NTPC, OPGC, OHPC, Independent power producers and captive plants. Supply of power to Old Cuttack city and its surrounding areas is from three grids i.e. Bidanasi, Choudwar and Poparada. Cuttack has three Electrical divisions such as CDD-I, CDD-II and CED. It has the capacity of 5x40 MVA. From the Socio-Economic Survey, it is observed that almost 97% of household in urban area and 77% household in rural area have electricity. Percentage of household having electricity connection, total consumers in urban areas, and category of consumers is shown in **Table 9.7** and **Table 9.8**.

The various zones in the CDPA region are served by power stations at Ranihat (Old Cuttack Planning Zone), Grid stations at Choudwar and Poparada and a number of substations at Bidanasi, Sikharpur, Jobra, CRRRI Campus, Badambadi, Chhatisa etc.

Table 9.7: Percentage of Households having Electricity

	Cuttack MC		CDPA Rural	Choudwar (M)	CDPA
Stratum	4	5	7	10	
Percentage	97.04	96.46	76.46	82.89	93.39

From the **Table 9.7** it is observed that,

1. Even in areas under CMC i.e. Old Cuttack and the newly developed areas, which represent Stratum 4 and 5 in our study, have only 97.04% and 96.46% respectively of total households with electricity connection.
2. There exist a wide range of variations in the percentage of household having electricity in the CDPA region. It is observed that 83% of all the households of Choudwar Municipality have electricity connection.

Table 9.8: Total Consumers in BCUC

	Total Households	Total Consumers	Percentage
CMC	126531	78870	62

9.5.2 Estimation of Electricity Demand

As per UDPFI Guidelines, based on the requirements of power supply as per the Master Plan of Delhi the consumption works out to be about 2 Kilo Volt Ampere (KVA) per household per day at the city level and includes domestic, commercial, industrial and other requirements. **Table 9.9** shows the zone wise electricity demand for 2008 and 2030.

The power supply of CDPA area is approximately being managed by 150 MVA whereas the demand is of 670 MVA in 2030. In order to achieve 670 MVA power demand, minimum 80 nos. of 33/11 Kv sub-station with capacity of 2x5 MVA each has to be installed. Out of the 80 nos. sub-stations 20 nos. already exist in the plan area. Therefore future requirement is of 60 nos. of 33/11 KV sub-station For installation of each such sub-station, an area measuring 50 mtrs X 40 mtrs is required.

In order to feed these 80 nos. of sub-station, 33 KV lines are to be drawn for which minimum 7 nos. of 220/132/33 KV Grid sub- station needs to be installed.

Presently Cuttack city and its periphery are supplied by existing 3 Nos. of 220/132/33 KV grid sub-station of OPTCL at Tangarhuda mouza in Bidanasi zone, Nuapara mouza in Sikharpur Zone and Kapileswar mouza in Choudwar Zone.

Another 4 Nos. of 220/132/33 KV grid sub-station has been proposed to meet the power demand at Uttampur mouza in Gopalpur zone, Govindpur mouza in Mundali zone, Khaera mouza in Nimapur zone and Sardola moza in Nirgundi zone (**Map 9.5**). For each such sub-station an area of 10 acres is provided along the vacant space available.

Table 9.10 shows the present number of substations and future requirement (2030) for CDPA. **Table 9.11** shows the tentative capital investment requirements for development of power infrastructure.

Table 9.9: Zone wise Electricity Demand

Zone name	2008		2030	
	Household	Electricity in MVA	Household	Electricity in MVA
Nirgundi	5556	11.11	18889	37.78
Charbatia	10000	20	17778	35.56
Chhatisa	1333	2.67	2667	5.33
Choudwar	7556	15.11	12444	24.89
Nimapur	8889	17.78	25556	51.11
Bidanasi	24444	48.88	55556	111.11
Old Cuttack	70444	140.88	77778	155.56
Sikharpur	30667	61.33	48889	97.78
Mundali	4889	9.78	9333	18.67
Barang	8889	17.78	24444	48.89
Gopalpur	11111	22.22	40000	80
Total CDPA	183778	367.54	333333	666.68

Table 9.10: Present number of sub-stations and future requirement (2030) for CDPA

Type of sub-station	Area required per facility	Nos. of grids	Total area required
33/11 KV	2000 sq mt.	60	120000 sq mt
220/132/33 KV	40000 sq mt	4	160000 sq mt

Table 9.11: Tentative capital investment requirements for development of power infrastructure by 2030 in CDPA

Items	Total cost in crores
4 nos. of 220/132/33 KV grid sub-station	250
220/132 KV lines and infrastructure	300
60 nos. of 33/11 KV – 2x5 MVA sub-station	210
Construction of 180 km of 33 KV lines	10
Construction of 700 km of 11 KV lines	20
5000 nos. of 11/.4 KV distribution sub-station of 100 KVA capacity	150
Drawal of 10000 km of LT lines through AB Cable including alteration	300
Total cost	1240
Extra escalation cost 25%	310
Grand Total	1550

9.5.3 Bottlenecks

Bottlenecks or Impediments in the distribution system:

1. Loss of power and old network system along with power theft are important bottlenecks in efficient distribution.
2. Old transmitting lines in the core areas of municipalities with inadequate safety measures sometimes result in power supply breakdown and loss of life and property.
3. Due to haphazard unplanned growth of settlements in other municipalities such as Choudwar and other rural areas, there is loss of power due to increase in length of supply lines,
4. Lack of adequate land available for location of transformers in some places result in locating transformer by the side of the roads and may result in significant loss of life and property in case of accidents. Capacity constraint of transformers results in low voltage supply in core areas and fringe areas.

9.5.4 Vision for Development of Electricity generation and distribution

1. Access to electricity from 93.39% to 100% in future for all household in CDPA by 2030.
2. Power cuts should be drastically reduced by 2011.
3. Establishment of a long-term planning mechanism of power sector operations based on a detailed sector reform roadmap, a long-term power system master plan, and a sector-wise capacity building programme.
4. Provision of open space (1/2 acre) for accommodation of future 33/11 KV substations should be kept at every 3 km distance in a distributed manner in zonal development plan.
5. Promotion of private sector participation and public-private partnerships in power generation and distribution
6. 100% metering and MIS for reduction of T&D losses
7. Cabled LT supply wires help in prevention of hooking and power theft. Control of electric meter in the hand of the distribution authority to prevent illegal tampering.
8. Power tariff should be suitably modified for raising the revenue to be used for modern development of power infrastructure.

9.5.5 Power Generation Technologies from Renewable Sources

In BCUC there is huge potential for power generation from renewable energy sources, such as wind, biomass and solar energy. Special emphasis is to be given for the generation of grid quality power from renewable sources of energy. The renewable energy power sector includes:

- Wind Energy
- Solar Energy
- Biomass Energy
- Biomass Gasifier
- Energy from waste

9.5.6 Renewable Energy at Local Government Level

Various instruments exist with the Indian local Governments that can be exercised for promoting use of Renewable Energy in local urban developments in CDPA.

Legal

Local Authority can use legal instruments for application of Renewable Energy by amending existing byelaws or by making new laws promoting Renewable Energy. A model regulation / building bye law for making installation of solar assisted water heating system mandatory in various categories of new buildings will go a long way in energy conservation.

Fiscal and financial incentives

To promote Renewable Energy, local Government can also adopt the strategy of providing incentives. These incentives can be financial or social in nature. For Example Municipal Corporation can introduce an incentive of 10% cut in property tax for those who install solar water heating systems. On the similar line FAR may be relaxed for buildings adopting solar panels in design.

Persuasive (organizing awareness programme etc.)

To accelerate development and deployment of Renewable Energy programme at local level, local government can organize awareness and training programmes. It can organize workshops for prospective users such as housing societies, builders, developers and architects. Banks are also coming forward with interest free loans.

Demonstration projects

Some pilot projects can be implemented demonstrating renewable energy and energy efficiency. Large scale use of solar energy for water heating, power traffic lights, and hoardings will result in cost and energy saving. It will also generate confidence among the public for use of Renewable energy and energy efficient technology.

9.6 Investment Proposal

The capital investment requirements for the construction of various infrastructural facilities discussed here are based on adhoc construction prices. Thus, tentative figures for the capital investment requirement have been computed. However, this may not reflect the actual fund outlays required in the next three decades. The tentative cost estimate for educational facilities is rupees 148 crores; for health care facilities, rupees 330 crores, and for other infrastructures rupees 1842 crores (**Table 9.12**).

Table 9.12: Tentative Cost Estimate (In Crores) of Proposed Social Infrastructural Facilities for CDPA

Type of Facility		Additional No. of Facilities required	CDPA Total Cost (Crores)
Educational	Primary School	47	47
	Secondary School+ Senior Secondary School	37	101
	College, University + Prof. Tech. Institute	-	-
		84	148
Health	Hospital + Health Care Centres	8	320
	Nursing home	4	10
		12	330
Others	Telecommunication	-	50
	Postal Service	11	6
	Fire Service	7	7
	Commercial/Cooperative Bank	49	148
	Recreational Hall (Cinema/Auditorium)	39	33
	Parks and Playground	1350 (Area in ha)	34
	Community hall and Library	17	10
	Music dance and Drama Center	3	4
	Power Infrastructure	64	1550
		208	1842
Total CDPA		304	2320

10.1 Policies on Cultural Development in CDPA

CDPA Region offers a rich cultural heritage with Cuttack, the former capital and one of the oldest cities of Orissa and the administrative headquarters of the district. Cuttack, being more than a thousand years old, and the capital of Orissa for almost nine centuries, before Bhubaneswar was made the capital city in 1948, is also known as the "Millennium City". The town is situated at the apex of the delta formed by the rivers Mahanadi in the North and Kathajodi in the South. It thus serves as a convenient base for touring the various places of interest in the district. Also, with its world famous unique filigree works in silver, ivory and brass works and textiles of woven silk and cotton, Cuttack is perhaps the grandest showroom of Orissa, and its rightful cultural capital. Planning for Cultural Development for CDPA, therefore, must be attended through the augmentation of existing cultural facilities in distributed urban centres throughout the planning area, as well as developing the manpower and skills of its rural population.

Proposals for Propagation and Development of Culture are:

1. Promotion of Traditional Fairs and Festivals through government and NGOs participation so as to generate awareness among the new generation towards rich cultural heritage and inviting cultural tourism.
2. Augmentation and development of Balijatra Cultural Festival ground at Cuttack with infrastructural development for round the year activities. **(Figs 10.1 and 10.2)**
3. Centre for Development of Ghora Naach (horse dance) and handicrafts at Choudwar for artisan skill development and tourism promotion for the region.
4. Religious fair and festival grounds integrating famous Astha Shambhu (Eight Shiva) Temples in Choudwar including scenic spot development, traditional mason training centre for stone art work to generate artistic interest.



Fig 10.1: Balijatra Fair at Cuttack



Fig 10.2: Traditional utensil shop at Balijatra

10.1.1 Manpower or skill development for the rural population

At present, the rural folk and tribal population residing at villages in the planning area fringe is not exposed to alternative avenues of earning. Special drive should be initiated to impart vocational training for skill up-gradation in traditional sector. The rural folk may be appropriately trained and engaged in handlooms, handicrafts (like basket weaving, gun metal work, clay pottery, bamboo work etc.) and forest based product recycling. Development of herbal gardening and forest product processing should be encouraged. Special training may also be extended to them regarding

guidance and hospitality in rural tourism and as well as towards their indigenous cultural performances (music, dance etc.) for incoming tourists. Periodic fairs and festivals may be organized in certain picturesque natural locations to boost up their cultural publicity, to give confidence for social acceptance and mainstream participation and to open up the new possibilities of additional earning through selling their products before a wider audience, and in a better manner. In this regard, the household limit has to be watched otherwise too many tourists may despoil the character of the area.

10.2 Policies on Development of Recreation

Recreation is any physical or psychological revitalization through the voluntary pursuit of leisure time. It is an activity which is relaxing to people and provides diversions from their normal routine. Generally there are four types of recreation. These are:

Revitalization: restoration and enhancement of mental and physical health.

Play: relaxation and exercise

Adventure: excitement and challenge

Education: organized and incidental

City level recreational facilities are of two types. Indoor facilities consist of libraries, clubs, cinema hall, auditorium, multiplex, art and craft centre, shopping malls, food courts, cyber cafés, gymnasium etc. Outdoor recreation facilities consist of gardens, parks, play grounds, golf courses, zoo, botanical garden, race course, stadium, exhibition ground, water sports complex, green ways, bike ways, forest camping sites etc. **(Fig 10.3)**

CDPA offers varied forms of indoor and outdoor recreational facilities with large river fronts, hills, reserve forest, heritage and cultural resources, offers great potential for development of recreational facilities and services. **(Map 10.1)**

Proposals for Augmentation and Development of Recreational Facilities of CDPA are:

1. Urban Parkway System along Taldanda Canal with landscape continuity and hierarchy of various parks with defined uses at Cuttack.
2. Development of Barabati Fort Tourist Complex with museum / recreational area development, Barabati Haat and Balijatra Fair ground. **(Figs 10.4 and 10.5)**
3. Tip of landmass at Bidanasi - Naraj Barrage, Cuttack can be developed as picnic spot/ water based sports and recreation



Fig 10.3: Indoor Stadium at Cuttack

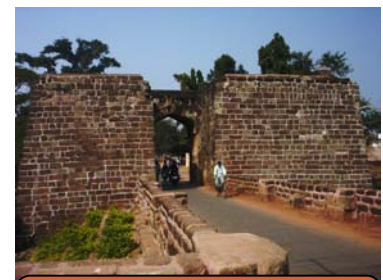


Fig 10.4: Barabati Fort at Cuttack

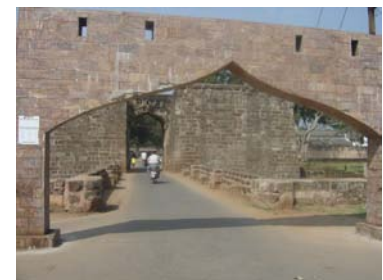


Fig 10.5: Entrance gate of Barabati Fort



Fig 10.6: Uttareswar Temple at Choudwar



Fig 10.7: Budhalinga Temple, Choudwar

- spaces etc. 'Utkal Ratna Bhumi'- an area can be earmarked for the memorials of the great laureates of Orissa.
4. Development of green belts, plantations, parks, ghats, plazas along the riverfront abreast the Urban set up and invite nature in harsh built environment through myriad ways.
 5. Choudwar Fort / Uttareswar Temple / Buddhalinga Temple (Tank) Complex and large tanks like Raja and Rani Pokhari may be developed with landscaping and environmental lighting with tourist day service facilities highlighting benefits of water bodies in habitat. **(Fig 10.6 and 10.7)**
 6. Amusement Parks to be developed in Chhatisa zone along with horticulture, pisciculture, herbal parks, etc.
 7. 'Kataka Kala Kosh' – a world class cultural hub in the Gopalpur zone with media complexes, convention centres and multiplexes and high-end recreation.
 8. Science and Technology Park, high-end activity centre viz. BID, IT SEZ, health complex and high end commerce in Barang will usher new development.
 9. Institutional development such as Sri Sri Ravi Shankar University along with open spaces for religious discourses, Yoga Clubs, naturopathy centers, etc. in Barang may be welcome.
 10. Development of eco-tourism with provision of water theme parks, lagoon resorts, weekend resorts and world class recreation centres such as club towns, golf clubs, spa resorts, etc. at Mundali Planning Zone.

10.3 Policies on Tourism Development

As a service industry, tourism has numerous tangible and intangible elements. Major tangible elements include transportation, accommodation, and other components of a hospitality industry. Major intangible elements relate to the purpose or motivation for becoming a tourist, such as rest, relaxation, the opportunity to meet new people and experience other cultures, or simply to do something different or have an adventure.

Tourism is vital for every place, due to the income generated by the consumption of goods and services by tourists, the taxes levied on businesses in the tourism industry, and the opportunity for employment and economic advancement by working in the industry. For these reasons government and private agencies sometimes promote a specific region as a tourist destination, and support the development of a tourism industry in that area. The contemporary phenomenon of mass tourism

may sometimes result in overdevelopment; however alternative forms of tourism such as ecotourism seek to avoid such outcomes by pursuing tourism in a sustainable way.

CDPA offer great potential for tourism development. Most of the existing or potential areas have 'one day travel' possibilities from the main urban nodes. Overnight staying facilities for people at these tourist spots may not be a strong proposition though adequate provision for Day Service facilities (like eating places, temporary rest shelters, toilet facilities, STD booths, local tourism information centres, retail outlet for local handicrafts etc.) are utmost necessary.

The comprehensive planning proposal for tourism and recreation development aims to strengthen tourist attraction through improved publicity and facility upgradation. More tourists mean more business for local people in retail and service sectors. Thus it will also create a strong economic base through various types of outdoor recreation.

According to the existing scenario analysis of CDPA, it has been observed that the following categories of tourism have immense potentialities for this region:

1. Religious Tourism with historically important structures such as temples and other outdoor worshipping areas in the vicinity. **(Fig 10.8 and 10.9)**
2. Cultural and Heritage Tourism with annual / seasonal traditional village fairs and festivals, folk or tribal socio-cultural events with arts, crafts, music, dance etc.
3. Nature based outdoor recreation and Eco-tourism for hills, forest, riverfront / derelict stone quarries and vast agricultural area/ village settlements with undulating landforms including picnic spots, sight seeing, camping sites etc. Presence of all these tourism products calls for the growth of Adventure Tourism.

10.3.1 Integrated Approach and Strategy for Development of Tourism

1. Coordinated Marketing to attract more tourists from other states and foreigners.

Orissa is a kaleidoscope of past splendors and present glory: a fascinating state with majestic monuments, beautiful beaches, sprawling Chilika Lake, luxuriant forests, captivating wildlife, exquisite handicrafts, traditional tribes, enchanting classical and folk dances and music and above all a hospitable and peace-loving people. In other words, Orissa has rich tourism potential to attract a large number of tourists, both foreign and domestic. Share of foreign and domestic tourists visiting Orissa among other states is very low compared to other states in the



Fig 10.8: The famous Goddess Chandi at Cuttack



Fig 10.9: Quadam-i-Rasool at Cuttack

Country. Out of 39.1 lakh foreign tourists that arrived to India in 2005, only 0.85% visited Orissa. In the domestic front, the share of tourists visiting from neighboring states like west Bengal continues to be maximum (21.18%) followed by Andhra Pradesh (5.39%). Tourists visiting from New Delhi, Tripura and Kerala have the lowest percentage share (0.21%) each (*Source: Orissa Tourism Policy*). Proactive Marketing Strategy is required to harness the optimum tourism potential of the state in general and the CDPA region in particular, so that it can invite more tourists from the foreign and domestic front.

Shanghai, Bangkok, Goa, Dubai are the names which generate a sense of excitement and thrill to a tourist's perspective. These places have the maximum 'pull factor' for a tourist among the various options available to him. Branding of a tourist destination and its products is done basing on a certain theme. It helps to target and invite a certain segment of tourists. When a tourist visits a certain highlighted place, he will also be interested to visit other important tourist destinations in the vicinity. Some of the suggested potential themes on which the CDPA region can be branded are

- Silver city, Cuttack
- Mythological city Choudwar. The place where Pandavas of Great Hindu Mythology Mahabharat spent their *Agyatvas* (hidden staying) before the Mahabharat War.

2. Enhancing Product Quality so as to create a brand image for tourist destinations and enhancing service quality.

Heightened demand through coordinated marketing and branding needs to be supported by consistent quality of Product Delivery across CDPA. There is a common interest in developing consistent and product standards and industry codes of conduct, benchmarked on National and International best practices. Investigation, Green Labelling and other quality assurance programmes should be undertaken to decide suitable types of nature and cultural ecotourism products such as Nature Cure Centres, Ayurveda Clinics and Health Spas for tourists.

Formulation of guidelines for regular augmentation and upgradation of tourist infrastructure and services of public and private agencies is required on a regular time frame so as to be a front runner in the competitive tourism industry.

3. Facilitating Travel for easy access of tourists to major urban centres and tourist destinations.

Given the high income elasticity of air passenger traffic demand and declining costs of air travel, air connectivity will play a significant role in strengthening regional, national as well as international linkages. In this

context Cuttack, being served by the Bhubaneswar airport is poorly connected to major important national and international destinations of tourist importance. There is no direct flight accessibility of Bhubaneswar Airport with many important cities in India.

Though rail linkage connectivity is better in comparison to air but accessibility of Cuttack is less in comparison to other major tourist destinations of the country. A rail based travel circuit can be explored to connect important tourist destinations of the nation with that of CDPA.

There is no public transport facility to every tourist destination. Hence enhancement of public transportation facility along with improvement of private modes of travel services is of foremost necessity to attract local and regional tourists of every income group.

4. Developing Human Resources for lasting impression

Human resources play a vital role for any Tourism Development Programme. A tourist spends his total itinerary with this resource. "Good Host Training" to encourage friendliness, increase awareness of Tourism and foster attitude of Oriya Hospitality Culture in the frontline people such as porters, taxi drivers, tourist guides, travel agencies, hotel and restaurant/ café staff is required. An effective regulatory and supervisory mechanism should be encouraged to protect the interest of tourists.

Growth of tourism industry has a direct bearing on the supply of quality techno-managerial manpower. In this context Hotel Management and Catering, Travel and Tourism Management Institutes can be established in CDPA's Planning Zones after careful evaluation of future market demand. It will also provide an alternative career opportunity to the young generation in this sunrise industry.

5. Developing Eco-tourism based on Nature and Culture for Sustainable Tourism Development.

Ecotourism includes programs that minimize the adverse effects of traditional tourism on the natural environment, and enhance the cultural integrity of local people. Therefore, in addition to evaluating environmental and cultural factors, initiatives by hospitality providers to promote recycling, energy efficiency, water re-use, and the creation of economic opportunities for local communities should be an integral part of ecotourism.

It is an approach that creates a variety of quality tourism products that are:

- environmentally/ ecologically sustainable
- economically viable
- socially and psychologically acceptable

The result of which would reflect:

- an integrated and holistic approach to product development
- capacity building in host communities
- a sense and uniqueness of place
- commitment to the greening of the tourism industry

6. Developing Tourism Travel Circuits for integrating tourist destinations having a common theme.

Tourism travel circuits help in equitable tourism development. Some of the themes for tourism travel circuits in CDPA are

- a. Religious Tourism
- b. Monument and Culture based
- c. Art and Craft
- d. Tribal or village tourism based
- e. Ecotourism and Adventure (water based)
- f. Weekend and scenic area based

7. Enabling Private Sector Participation for accelerated growth of the industry and efficiency in facilities and services.

Public Private Partnership offers a significant opportunity for the government to bring investment, improve infrastructure, creation of jobs, skill development, contracts for small businesses and better conservation practices. Above all, by accepting investment from private agencies, government can utilize its valuable resources to some other developmental projects. PPP imparts a sense of competitiveness among the government and private agencies.

A typical PPP would usually have the following characteristics:

- a. The private sector partner typically invests in a capital asset and is responsible for maintaining and operating it over the life of the contract.
- b. The focus is on the services provided and not on the assets used.
- c. Risk transfer is a key element.
- d. Government assets are often transferred or made available to the private party.
- e. The contractual arrangement specifies that a private party takes responsibility for and assumes the risks for all or part of a public sector function.

- f. Value for money, which is critically dependent on the way risks are allocated between the parties, must be demonstrated.

In CDPA, scope of private sector participation exists in establishment and maintenance of tourism and recreational assets like water parks, theme parks, multiplexes, star category hotels, food courts, traffic island development and maintenance, avenue plantation, sanitation and solid waste management near tourist destinations.

10.3.2 Eco Tourism Development

Sustainability should be the prime focus while planning for environmental protection. A detail analysis for assets and liabilities from various zones of CDPA indicates the varied carrying capacities, sensitivity and ecological fragility in the developmental zones. Thus, World class Club town, weekend cottages, recreation centres, etc. have been planned for the Mundali Planning Zone of CDPA.

Most portion of River Mahanadi remains dry except rainy season. These river beds can be suitably developed at for jogging space, religious discourse, fairs and festival celebration ground like Kite flying competitions on Makar Sankranti, Holi and Diwali celebrations. This will provide much needed open space to Cuttack city dwellers.

10.3.3 Vernacular Art and Cultural Heritage

The traditional fairs and festivals, music and dance, living style vernacular architecture and décor of these rural/tribal folk – all can be presented into a marvelous tourist package. Tourist participation may boost up the local economy, create a better market for their traditional art and craft, at the same time generating a sense of pride among the local mass toward their society, culture and bring positive technological and hygienic awareness for those hither to neglected rural folk.

Regular monitoring of the tourist influx is very much required for these areas so that excessive tourists may not disturb the indigenous social fabric and the natural pace of their living style.

The Planning zone of Old Cuttack has been proposed to have a Work-cum-living centre for Filigree (**Fig 10.10**).

Rural Representational Centers or Tribal Art and Handicrafts Centers at Choudwar, with display centers at Choudwar zone can be developed for covering both the interest of rural tribal folk and tourists. This will give enough information about their unique lifestyles, culture and creed, preferences, and obsolescence (social backwardness) to incoming tourists. On the other hands, rural/tribal people will also come in contact with the urban folk, publicize their own creation and also be able to come in to vocational training for improving their quality of life. Traditional work cum living centers with activity demonstration (like pottery, basket



Fig 10.10: The traditional filigree work of Cuttack

weaving, gunmetal work, handloom and handicrafts etc.) can be really a very interesting source of infotainment for the tourists. Vernacular eating joints can also be developed along with these centers. Accessibility for this area has to be improved first to ease consequential development.

10.3.4 Tourist Accommodation

The tourist accommodation development for CDPA essentially calls for Day Service facilities for visitors at various locations of interest. The main night stay will still be confined in to the major Planning Zones in CDPA. Existing hotels in these areas mainly cater to administrative and business tourism. Sight-seeing with a day long travel circuit may really be an interesting proposition for the incoming visitors who would frequent the CDPA for their official and business tours. So more specialized hotels (3, 4, 5 star category), motels, guest houses, dormitories, lodges should be constructed in the various Planning Zones of CDPA for the official and business tourists. For educational tourism youth hostels, log huts, eco-trails, camping sites, trailer parks may be developed in comparatively remote locations amidst natural surroundings with basic infrastructural facilities. Illegal mushrooming of hotels near scenic natural spots, historical and archeological places of importance must be strictly controlled and transit accommodation facilities should be permitted at strategic locations only near important modal transfer points.

Incentives like tax concessions; special F.A.R. allowance etc. may be extended to private developers for boosting up tourist accommodation facilities in this planning area. This new accommodation for greater occupancies will also address the need for increasing investors, who will be coming for education, industries, IT sector on regular basis.

10.3.5 Tourist Travel Circuits

A Tourist Travel Circuit is a journey to different places of tourist importance having a common theme. CDPA is surrounded by many places of tourist importance which can be covered in a one day trip (**Map 10.2**). Tourist Travel Circuit is basically a concept derived by tourism promotion agencies and tour operators where tourists are taken to different tourist destinations having a common theme. It is beneficial to both tourists and operators as per unit travel cost is reduced and a tourist is able to visit more destinations in a shortest possible time. It helps pilgrims, students, researchers and back-packers. A tourist place starts receiving more tourists once it is put on a travel circuit which results in growth of commercial and recreational amenities. It also helps in generating employment and improving the socio-economic condition of local people.

Some important factors which influence a travel circuit are

- Mode of travel

- Time duration of visit
- Infrastructure, facilities and services (road condition, hygiene, variety of food, shopping and entertainment option)
- Publicity of the places
- Intermittent serial viewing in between two nodes of a circuit or the sequential relationship among the connected nodes.

Main tourist travel circuits for CDPA and its vicinity can be categorized as:

A. Regional Circuits:

1. Cuttack – Dhabaleswar – Kapilash – Saptasajya
2. Cuttack – Ratnagiri – Lalitgiri – Udaygiri
3. Garh Khurda – Barunei - Chandaka- Deras – Udaygiri-Khandagiri – Bharatpur – Nandankanan – Mundali – Naraj - Barabati fort- Choudwar fort.

B. Day Travel Circuits (Zone wise)

1. Old Cuttack – Bidanasi – Dhabaleswar
2. Gopalpur – Barang – Mundali
3. Choudwar – Charbatia – Chhatisa - Dhabaleswar

10.3.6 Database on Tourist Characteristics

Developing a well networked tourist data base for CDPA with the following inventories:

- a. Different categories of tourists.
- b. Tourist behavior, preference and expectations.
- c. Quantum of tourists flow at various places of attraction.
- d. Frequently visited places in order of tourist priority and reasons.
- e. Feedbacks of a tourist's trend experiences to the defined areas of interest.
- f. Special hazards (if any).
- g. Remembering events (positive).

This database, if regularly updated will throw light on 'dos' and 'don'ts' in local tourism and help in rectifying defects and increasing positive effects on tourists. This will reveal

- Which activities are to be continued unconditionally.
- Which activities are to be continued with partial modifications.
- Which activities are to be totally discontinued for safeguarding socio-physical environment.

SWOT analysis (strength/weakness/opportunities/threat) can be conducted periodically with these updated data inputs and user feedbacks for achieving an ideal tourist environment with least problems.

10.3.7 Thoughts on Tourism Management

Sustainable tourism Development for CDPA can be achieved through strong partnerships, accountability and continuous improvement mechanism which will yield derived outcome in the form of enhanced image for the tourist destinations, increased employment or job creation and improved community facilities and services, consumer trends and tourism opportunities have to be realistically balanced like the following:



With changing times, peoples' affordability and new public attitude, tourism and out door recreational facilities have to be planned through the following strategies:

1. 'Out of ordinary' experiences associated with special venues - like developing the Religious and historical Circuit.
2. 'Going with the grain' – exploring the natural assets of the region (riverfront) - internationally / nationally famous or locally notable.
3. Identifying the champion projects for the area like Balijatra ground redevelopment and 'Kataka Kala Kosh' resource projects.
4. Drawing inspiration from the National Tourism Policy 2002 in terms of
 - **Swagat (Hospitality)**
 - **Soochana (Information)**
 - **Suvidha (Comfort)**
 - **Suraksha (Security)**
 - **Sahyog (Co-operation)**
 - **Sanrachna (Infrastructure)**

5. Online publicity forum and web log on the State Tourism website.
6. Disaster management and preparedness for remote areas.
7. Spelling out prohibitive actions / remote areas and dangerous areas for tourist safety.
8. Linking the programme to market initiatives that offer Approved Tourism Operators (ATO) support in financing and promotion.
9. FDI must be actively encouraged with international players' expertise in outdoor recreations.
10. Thus the 'new model' can be derived to ensure optimum utilization of rich tourism resources for creating new employment especially in rural or suburban areas, to strengthen the already existing market for the rich and varied Orissan handicrafts, to preserve and accelerate the contribution of tourism in the socio-economic development of the CDPA region.

10.4 Tourism and Recreational Development Proposals for the various Planning Zones

Cuttack being one of the ancient towns of India and earlier capital of Orissa, possesses unique development features which may be nourished in the mainframe of Context, Time and Technology. Excellent land-water interface, picturesque locales, rich historical landmarks, colourful festivals, traditional art and cultural ensemble – all make Cuttack Development Plan Area a strong magnet for tourist attraction. Every year lots of local, regional, national and international tourists arrive here to feel the vibrant culture of the place. Existing scenario analyses reveal that the number of speciality resorts, quality tourists' accommodation are much less than the expected supply. Besides, road linkages, other facilities, safety and environmental concern are not well integrated towards tourists' convenience.

In zonewise planning for tourism and recreational development for Cuttack Development Plan Area, the following general issues should be covered into realistic mode on long-term basis.

1. Integrated tourist circuit networks with travel destinations in a day trip mode.
2. Provision for special travel route(s), if any, combining both roadways and waterways.
3. Control of environmental pollution at travel nodes by legal measures or by setting development threshold limits.

4. Ensuring safety and security for the tourists, especially international tourists by setting up police outposts, telephone call booths in remote peripheral areas, or at tourist destination places.
5. Quality food eateries, availability of ATM counters, community help kiosks, volunteer guide groups, rest rooms or well maintained lavatories (for both male/female) are absolutely essential as interim journey wayside convenient facilities.
6. Identifying appropriate locations for local Art and Cultural Interpretation Centres for tourists' interest.
7. Community involvement through active participation from local people with their hospitality, selling of handicraft products, tourists' guidance or even temporary renting their house components for tourists' stay during certain occasions and festivals.

10.4.1 Charbatia: Planning Zone 2

Restoration and Conservation of major waterbodies along the religious complexes of the Astha Shambhu Circuit (especially the water tank within the Baidesarwar temple complex, which is famous for its medicinal properties) along with maintainance repair and regular periodic cleaning of waterbodies. Arrangement for appropriate illumination around Charbatia Fort and environmental accessories like provisions for Agro-horticultural development outside the old Fort of Charbatia can also be a special attraction. Ceremonial open spaces, brass and bell metal artefact display and sales centres may be developed around the Charbatia Fort for tourists' interest. An Open Air Theatre is also suggested near the fort for performing the traditional Ghoda Naach along with light and sound effects. Conservation of water tanks like Raja and Rani Pokhari is also proposed along with recreational parks and floral gardens around them.

10.4.2 Chhatisa: Planning Zone 3

Chhatisa being mostly a swampy area with lots of natural drainage channels can be well developed as amusement parks, with lagoons/lakes after proper identification and delieneation of the drainage channels. Pisiculture/floriculture, herbal gardens can also be promoted in this area to elevate the economic potential of this zone.

Chhatisa can be an ideal spot for tourist recreation on the way to Dhabaleswar temple with the SEZ in the backdrop. Though Dhabaleswar Temple is beyond our planning area limit, this approach may be planned with roadside tourist facilities including pilgrims' rest shelter, toilets and eateries.

10.4.3 Choudwar: Planning Zone 4

Choudwar being the place for numerous small scale and cottage industries, some allied activities, generating tourist interest can be planned. Bell metal and brass works and stone handicrafts, etc. – these can be presented before tourists with the objects' manufacturing process and display. A Textile-and-Handicraft Hub and Building Industries along with Mason Training Centres can be planned with fly-ash brick production units. Amongst the cultural activities 'Ghora Naach' (Horse-dance) takes the prime position for this area. Folk art and Horse-dance training and performance areas can be suitably planned for tourists' interest. Religious and Cultural Fair Grounds should be well serviced and pre-planned to cater to the seasonal influx of the visitors. The temples belonging to the Astha Shambhu Circuit should also be developed with pilgrim shelters, eateries, shops, toilets, etc.

10.4.4 Nimapur: Planning Zone 5

Special recreational activities with parks and gardens, water sports, movie theatres, food streets, etc. can be planned for industrial workers and other people of this locality. Extensive development is preferred for Sports Complex, Fitness Centres, etc. in this area.

10.4.5 Bidanasi: Planning Zone 6

Along the Mahanadi river banks, picnic spots, martyrs' memorial, landscaped parks (Shantiban, Delhi style) for Oriya historic personalities can be made for tourist attraction (Utkal Ratna Bhumi). This area possesses excellent natural beauty with undulating land forms and water bodies in a serene environment. Deer park, birds' sanctuary, etc. can also be designed along with these activities. Open spaces with beautiful landscape can be earmarked for fair grounds, religious discourses, etc. with supportive activities.

Near the confluence of Mahanadi and Kathajodi, water-based recreational park (Naraj Barrage Park) for water sports like boat racing, yachting, canoeing, swimming, water taxi running, etc. may be successfully included in the area's development program.

10.4.6 Old Cuttack: Planning Zone 7

Restricted development is desired with augmentation of existing socio-cultural and recreational activities and also new development for tourist facilities in limited parcels of land.

Tourist complex around historical Barabati Fort can be developed with archaeological museum, light and sound shows, tourist-care activities, etc. Surrounding moat or water course can be revived for paddle boating, musical fountains, landscaped gardens, etc. Formal spaces can be

introduced for performing traditional 'yatra' with the peripheral audience seating near the landscape gardens. Historical parks depicting chronological development of Cuttack city may be developed as special attraction for both domestic and international tourists.

At the Balijatra Fair Ground new services like potable water supply, toilets with sewer connections, information kiosks, and police help booths should be provided for the convenience of the tourists. Barabati Haat, an Oriya Cultural Ensemble can be planned in the line of 'Delhi Haat' where the tourist can see the glimpses of Orissa's rich traditional art and culture, cuisine, handicrafts, textile and lifestyle in one place only. This concept can make the riverfront busy with tourist and recreational activities throughout the year. Only temporary kiosks will be allowed at the Barabati Haat instead of permanent buildings.

Within the core city of Cuttack, Urban Parkway System with a chained hierarchy of sector and neighbourhood parks can be established with landscape linking of the existing parks as well as the introduction of new outdoor spaces both for active and passive recreation.

Corporate sponsorship may be searched for the creation and maintenance of these 'Lung Spaces' within existing densely built urban area.

Along the Mahanadi and Kathajodi riverfront on both the sides, idol immersion ghats have to be provided for the seasonal festivals and other religious rites. Enlistment of the present ones, repairing and future maintenance for the same, creation of new ghats will be utmost important in attracting people towards the river.

Near Gadgadia Shiva Temple, facilities for tourist care should be initiated immediately along the waterfront. Every year, thousands of religious tourists visit this temple area, necessitating the urgent development for this area.

Netaji's birth place can be conserved through urban conservation program with appropriate landscaping, environmental lighting, Homage offer site, etc. Youth Development Centre for inspiring power among the youth, generating patriotic awareness and community service – may bear the scope of new allied development for this 'Veer Sthal'.

Suitable River Strand Drive Program should be introduced along the entire stretch of Mahanadi from Naraj point to Jobra barrage with various parcels of development focused into different appropriate activities to offer kaleidoscopic ventures in retail-recreational front. According to the water stretches (perennial or temporal), embankment characteristics, abutting settlement or dominating activities, view potentials and accessibility, befitting uses can be brought forward for this neglected riverfront.

Similarly, on the Kathajodi riverside too, waterfront program can be introduced from Belle View point to NH connection.

Roadside sculptures, outdoor murals, city gates for transition areas, roadside landscaping, outdoor lighting, innovative street furniture and street hardware, bus shelters, decorative boundary walls, information kiosks – all these elements can highlight the changing image of Cuttack city towards the tourists.

Pedestrian travel circuits or even day trip vehicular travel circuits should be worked out for the convenience of the tourists considering the major travel nodes or destinations in sequential approach with changing views and vista. Seasonal festival procession march routes should be identified and serviced accordingly.

10.4.7 Sikharpur: Planning Zone 8

Along Taldanda Canal, Urban Parkway System may be introduced with intermittent approach ghats for navigational and other socio-cultural activities. Boating for tourists may be planned in the line of Backwater Cruise in Kerala.

10.4.8 Mundali: Planning Zone 9

Mundali being an eco-sensitive zone, sensitive development should be encouraged with less built-up and more nature-based recreational activities for revenue earning from visitors and tourists. Golf Club, Club Town, riverside resorts are choiceable options for this area's development. Besides, arboriculture in this area can also generate income. Availability of large amount of open areas makes nature-based habitat development in this area possible. Water based activities such as water theme parks, lagoon resorts, spa resorts are also proposed in this area. Smaller hillocks can be developed with afforestation and recreational parks such as Energy Park, resort housing along the foothills thereby forming ideal locations for picnic spots. The natural green should be preserved as far as possible with beautifully landscaped gardens, making it an interesting spot for activities such as trekking, bird watching, etc., thus transforming this entire zone into an exotic Eco-Hub, and a weekend rendezvous for the city dwellers.

10.4.9 Barang: Planning Zone 10

Barang has been planned as a high-end activity zone with high-end commercial activities along the riverfront. Open spaces for religious discourses, Yoga Clubs, naturopathy centers, etc. have been proposed along the riverfront near Sri Sri Ravi Shankar University. Also a Science and Technology Entrepreneur's Park has been proposed in this zone along the riverfront. These recreational areas will act as 'lung spaces' in this newly developed activity zone.

10.4.10 Gopalpur: Planning Zone 11

Due to the greater stretch of Kuakhai riverfront, city level outdoor recreational parks may be developed along the river with hierarchy of functional nodes.

Near Jain Museum Complex and near the meeting points of Kuakhai river and Puri Canal, integrated recreational development may be planned with small cottages, boat cruises, picnic spots etc.

Zone wise Tourism Proposals are shown in **Table 10.1 and Map 10.3.**

10.5 Cost of Development

The tourism potential in various planning zones according to the resources available in the given planning units has been earmarked. The cost however is subject to change depending upon the nature of tourism potential and infrastructural development in the given zone. The cost for development along with the land requirement has been stated in (**Table 10.2**). Altogether 170 hectares of land are required under tourism activities to cater for an estimated 25 lakhs annual tourists for an approx. investment of Rs.176 Crores.

10.6 Conclusion

With the portrayal of various cultural, tourism and recreational activities for different Planning Zones within the CDPA, it has been observed that they may be well connected in an intra-zonal or inter-zonal fashion through a perimeter ring road and inner circulation corridors. Important Travel Circuits can be created by connecting the various zones viz. (1) Old Cuttack – Bidanasi – Dhabaleswar, (2) Choudwar – Charbatia – Chhatisa – Dhabaleswar, (3) Mundali – Barang – Gopalpur, with tourist nodes distributed over the entire CDPA.

A western ring road development will improve the connectivity between Udaygiri and Khandagiri - Nandankanan (via Deras) - Cuttack – Choudwar and an eastern ring road connecting Barunei – Dhauli – Cuttack – Choudwar. Adequate and appropriate connectivity with the various tourist nodes will boost up tourism in the CDPA as well as the entire BCUC region.

New standards for tourism development have to be introduced with contextual frame in mind but with international perspective. Cuttack's rich cultural heritage has to be presented in a new appropriate tourist package embracing both co-cultural feeders and contemporary leisure standards.

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11.1 Introduction



Fig 11.1: Barabati Fort



Fig 11.2: Janakinath Bhawan,
Oriya Bazaar



Fig 11.3: Charbatia Fort



Fig 11.4: Ghora Naach

CDPA area is endowed with varied historical and cultural resources from different historical periods. Also important is a unique natural resource of long stretches of river fronts that are intricately related with rich traditions and cultural richness of CDPA.

Historical and cultural significance of Cuttack and its surrounding region dates back to a very early period. Cuttack city is the nucleus of this region with its long antiquity of more than a thousand years. Formed in 989 A.D., Cuttack was the capital of Orissa for almost nine centuries, before Bhubaneswar was made the capital city in 1948. Derived from the Sanskrit word 'Kataka', which signifies a military camp or a fort (**Fig 11.1**) or a Government seat protected by an army, the city is one of the oldest cities in India and the commercial capital of Orissa. The cultural history of Cuttack is reflected in its unique festivals of Dusshera and Balijatra. The Balijatra is the festival of remembering the ancient tradition of trade between Orissa and Java, Bali and Sumatra. All those festivals are celebrated in a grand way at Cuttack. The city is also famous for its *chandi medha*, which are basically unique filigree works in silver for which it is also called "Silver City". With its filigree works in silver, ivory and brass works and textiles of woven silk and cotton, Cuttack is perhaps the grandest showroom of Orissa.

Cuttack was also the nerve centre in Orissa for the cultural and educational renaissance during 19th and early 20th century and has a special place for its role in the freedom movement of India. Cuttack has many educational institutions of national repute, like the Ravenshaw University (formerly Ravenshaw College). This college has a prestigious history. Nobel laureate Professor C. V. Raman worked here for some time. There are many other structures which are noted for their association with institutions and people with significant contribution in the freedom movement. The birth place of Netaji Subhash Chandra Bose which is known as Janakinath Bhawan in Oriya Bazaar has now been converted to a museum named as Netaji Birth Place Museum (**Fig 11.2**) and been declared as a protected monument by Orissa State Archeology. Original letters written by Netaji along with other Netaji's important materials are present in this museum.

The fort at Charbatia, popularly known as Birat Raja's fort is another place of significant historical importance in this region and has been declared as a protected area by ASI (**Fig 11.3**). The religious significance of Astha Sambhu and Athagarha (just beyond the CDPA boundary) temples, the *Ghora Naach* (**Fig 11.4**)-still practiced by a small artisan community in Choudwar, the Barabati Fort in Cuttack as well as numerous social and educational institutions of repute indicate a rich and diverse cultural heritage of the Cuttack city and its surrounding region. A

distinctive feature of Cuttack is the Cantonment area with majestic colonial structures—churches, schools, bungalows from the Colonial period located in a quiet green area along the riverfront. **(Fig 11.5)**

The unique heritage of Cuttack region is the natural heritage of rivers and extensive river fronts. Mahanadi, Kathajodi and Birupa rivers along with their tributaries have formed a network of rivers in and around this region. The river fronts along with the cultural sites and built heritage offer an enormous potential for exclusive river front development to cater to local people as well as tourists and visitors. But that needs a holistic approach and sensitive revitalization strategies. Preservation and redevelopment measures need to be guided by a policy of integrating conservation of natural, cultural and built heritage with future development of this region.

11.2 Historical Timeline of Cultural Landscape

History of Cuttack helps us to know more about the cultural heritage of the city and the surrounding region. Cuttack, the erstwhile capital of Orissa, is one of the ancient cities of India. Cuttack has witnessed the rule of several dynasties: the Kesharis, the Gangas, the Gajapatis and the Bhois. In 1568 A.D., the city passed to the hands of Afghan rulers of Bengal, then to the Moghul Empire in 1592 and the Marathas in 1751. Cuttack, with the rest of Orissa, came under the British rule in 1803. It became the capital of the newly formed state of Orissa in 1936 and continued to be so till 1948 when the capital was shifted to Bhubaneswar. The city completed one thousand years of its existence in 1989.

Phase I Early Period - a maritime outpost

In the remote past, Cuttack was connected both by land routes and waterways with renowned medieval ports like Chelitalo, Palur and Tamralipti. Although politically Cuttack was not that significant before the eight century A.D., but it was a flourishing mart of Eastern trade.

Phase II 10th –11th Century – Military Cantonment to a Capital City

According to the History of Cuttack, the city was built in 989 A.D. as a military cantonment because of its impregnable situation that further developed into the capital of the state of Orissa.

Inscriptions of Anangabhimadeva III refer the original city as Abhinab-Baranasi-Katak. Like the city of Baranasi situated in between Baruna and Asi, Cuttack is situated between the rivers Mahanadi and Kathajodi and was therefore named as Abhinab-Baranasi (New-type of Baranasi). Cuttack developed into a city out of five villages viz. Choudwar Katak, Baranasi Katak, Sarangagarh Katak, Viraja Katak and Amaravati Katak.

Cuttack (or Kataka) was founded by King Nrupa Keshari in 989 A.D. King Marakata Keshari built the stone revetment on the left bank of the



Fig 11.5: Colonial bungalows in the Cantonment Area

Kathajodi in 1006 A.D. to protect the city from the ravages of floods. Cuttack became a capital city in the end of the 10th century A.D., during the reign of Somavanansi dynasty of Orissa. The city has witnessed the rule of several dynasties: the Kesharis, the Gangas, the Gajapatis and the Bhois.

Phase III 12th –16th Century – Capital City of Hindu Kingdom

According to Stirling, an eminent historian, the city gained prominence in the socio-political scenario of India in the 12th century when it became the capital of the Ganga Dynasty. According to 'The Madalapanji', a chronicle of Lord Jagannath Temple, the kingdom of the Ganga stretched from Godavari River in the south to the River Ganges in the northern part of India. The importance of Cuttack rapidly increased after the occupation of Orissa by Chohagangadeva early in the 12th century A.D. Chodaganga transferred his capital from Kalinganagar to Katak which was more centrally located. The famous Barabati Fort was constructed by the famous Ganga ruler Anangabhimadeva III. **(Fig 11.6)** Due to its strategic location, King Anangabhimadeva III shifted his capital from 'Choudwar Kataka' to the present Cuttack, then known as 'Abhinaba Varanasi Kataka' and built the fort of Barabati in 1229 A.D.



Fig 11.6: Barabati Fort constructed by Ganga Ruler Anangabhimadeva III

After the Ganges, Orissa passed into the hands of the Gajapati under whom Cuttack continued to be the capital of the state. The reference from Ain-i-Akbari clearly denotes that Cuttack was a flourishing capital city during the time of Mukunda Deva. The Chalukya King, Mukundadev Harichandan, built a nine-storey building in the precincts of Barabati Fort in 1560 A.D. In the fifteenth and sixteenth centuries, Barabati Fort was defended by two rings of forts on either side of the Mahanadi and the Kathajodi.

It is said that the Hindu kingdom in Cuttack came to an end with the death of Mukunda Deva - the last Hindu king who ruled the city of Cuttack. This last independent Hindu king of Orissa died fighting the Sultan of Bengal, Suleiman Karni in 1568 A.D. On the eve of Afghan occupation, Cuttack was found to be a well guarded and heavily fortified capital.

Phase IV 16th –18th Century – Afghan and Moghul Rule

According to the archaeological evidences of Cuttack and its territory, the city passed to the hands of Afghan rulers of Bengal in 1568 A.D, then to the Moghul Empire in 1592. The city is said to have been prosperous till it was captured by Firoz Shah Tughlaq. Under Firoz Shah Tughlaq (during the 14th century), the city witnessed a brief period of unrest, which was marked by vandalism, destruction and looting.

The Afghans, however were not destined to rule Orissa and they were soon ousted by the Imperial Moghuls. Cuttack continued to be the capital

of Moghul Orissa and Abul Fazl clearly mentions that Moghul Governor was residing in that city.

Phase V 18th Century – Maratha Occupation

The city came under Maratha occupation in 1751. During the rule of Marathas, Cuttack greatly prospered as an emporium of trade and commerce and became a central market of exchange between the Marathas of Nagpur and the English merchants of Bengal and Northern Circar.

Phase VI 19th Century – British Rule

As per the Treaty of Deogaon, Cuttack came under British occupation in 1803 and the English set themselves to the task of consolidation and land revenue administration. As an after effect of the devastating famine of 1866, the government gave serious consideration to remove the isolation of Cuttack from the outside world and at the same time to prevent the recurrence of such calamities in future. Along with several water ways, roads were also opened during the later part of the 19th century to provide Cuttack with internal communication. Then towards the last decade of the 19th century railway line of BNR connected Cuttack directly with Madras and Calcutta.

The Cuttack Municipality has a long heritage in the field of urban management. The Municipality was constituted in 1876 with 30 members- 24 elected, 4 ex-officio and 2 nominated by the Govt. The Municipal Board took charge of lighting the town, providing drinking water facilities, medical relief and public instruction at primary stage. The Municipality also took charge of few mileage of road and it worked, although under great restriction to develop Cuttack in to a modern town.

Phase VII Early 20th Century – Cultural Renaissance and Freedom Movement

The first Newspaper of Orissa “Utkal Dipika” was published by the Cuttack Printing Company due to the efforts of Gourisankar Ray in 1866. There was a great change in the educational scenario of Cuttack after British occupation with the establishment of first Government English school in 1841 and it slowly progressed as the Higher English school until the famine of 1886. Then the school was converted into a college with intermediate teaching in 1868 which in due course of time took the name of Ravenshaw college. Ravenshaw College was converted to Ravenshaw University (**Fig 11.7**) on 15th November 2006. Orissa Medical was established in 1875 following the establishment of Cuttack general hospital in 1874. The Cuttack Municipality came into existence in 1876. In 1923, two new educational institutions were opened in Cuttack. One was Cuttack Training College and the other was Orissa School of Engineering, which developed out of the old survey school



Fig 11.7: Ravenshaw University



Fig 11.8: Government Workshop, Jobra



Fig 11.9: Sishu Bhawan



Fig 11.10: High Court - Indo-European style



Fig 11.11: Filigree works

separated from the Ravenshaw College in 1915 and from the Government Workshop located at Jobra. **(Fig 11.8)**

During Freedom Struggle, Swaraj Ashram of Sahebazada Bazaar was the center of all nationalist activities. The Ashram is place of pilgrimage for all Gandhites as Gandhiji indoctrinated the youths of Orissa with the mantra of truth and nonviolence.

Phase VIII 20th Century – Capital of Orissa

Cuttack has been enjoying all along the unique privilege of being the administrative and commercial nerve center of Orissa. It was the seat of the commissioner of Orissa Division till 1936 and with the formation of the province of Orissa in that year, it was exalted to be the head quarter of the new province. The historic Lalbagh palace which was being occupied by the Commissioner became the Governor House. Now it was been converted to children's hospital called "Sishu Bhawan" **(Fig 11.9)**. The High Court came into existence in 1948 and its building is an impressive structure of Indo-European style **(Fig 11.10)**. In 1948 Akaswani (All India Radio) was established in the Old Madhupur Palace building of Cuttack.

Phase IX Present - Commercial and Cultural Hub of Orissa

In 1948, the capital of Orissa was shifted to Bhubaneswar. However, the Chief Judiciary of the State continued to be located in the High Court Complex in the old historic core and is the pride of the town.

The city still remains a commercial and cultural hub of Orissa with its unique blend of Sahi culture, as a "Silver City" with its filigree works **(Fig 11.11)** in silver and as an educational hub with its numerous educational institutions.

The city that completed one thousand years of its existence in 1989 is gradually being overshadowed by the emerging importance of the new Capital city of Bhubaneswar. Stretches of river front with vast horizon lie almost neglected as a witness to the past glory of this region. Neglect and obsolescence, crowding and deprivation are clearly visible in the overall environment of the city of Cuttack and its neighboring region. CDPA is in urgent need of revitalization and redevelopment of its built, cultural and natural heritage resources.

11.3 Significant Heritage Areas

Of the innumerable historical structures and cultural precincts, areas of cultural and natural significance, mainly seven areas and specific stretches of river front emerge as most outstanding and deserve special attention. These are outlined below: **(Map 11.1 and Table 11.1)**

11.3.1 Special Developed Area:

1. Zone 2: Charbatia/Choudwar Fort

1450 acres of land around Charbatia Fort has been declared as a protected area by ASI. **(Fig 11.12)** The area also houses Astha Shambhu Temples of local religious significance. **(Fig 11.13)** A local form of folk dance, Ghora Naach is still practiced by a small artisan community in Choudwar.

2. Zone 7: Barabati Fort

The area comprises of the famous Barabati Fort (1229 A.D) **(Fig 11.14)**, Gada Gadia temple and the Balijatra ground. With Barabati stadium, the area serves as a city level open place.

3. Zone 7: Cantonment Area

The Cantonment area has a number of 19th century colonial structures – churches, educational institutions and bungalows. **(Fig 11.15)** The area still retains an open and low density character. Recent trend of constructing high rise structures must be regulated to preserve the character of the area.

4. Zone 7: Judiciary Complex **(Fig 11.16)**

The area in the vicinity of the High Court houses several important administrative and educational institutes of colonial character and historical associations. Increasing need for more and more space is resulting in unsympathetic new construction and demolition of some old structures. There is need for urban design guidelines and control of vehicular movement in this area.

11.3.2 Other Areas:

Amongst the other significant heritage areas are the Cuttack Chandi temple; prestigious institutions such as the Ravenshaw University; memorials like the Netaji Birth Place Museum; built forms depicting colonial architectural character such as Jobra Workshop, Chinese Restaurant **(Fig 11.17)**, the Kanika Raja Palace **(Fig 11.18)** and the Darpani Rani Palace **(Fig 11.19)**, etc. Also the existing work-cum-living centres of the filigree workers contribute significantly to the cultural heritage of Cuttack.

11.3.3 Natural heritage: River front

Entire CDPA region is intersected by a network of rivers- Mahanadi, Kathajodi and Birupa. Cuttack city and its surrounding region flourished mainly because of the strategic location formed by the river network. Long stretches of river front and stretches of sand beds are environmental and natural assets that need careful development strategies.



Fig 11.12: Charbatia/Choudwar Fort



Fig 11.13: Astha Shambhu Temples



Fig 11.14: Barabati Fort Entrance Gate



Fig 11.15: Colonial Structures in Cantonment Area



Fig 11.16: Judiciary Complex

Significant Heritage Areas



Fig 11.17: Chinese Restaurant



Fig 11.18: Kanika Raja Palace



Fig 11.19: Darpani Rani Palace



Fig 11.20: Balijatra Ground

All these heritage sites have immense historical and cultural values and each one is significant in its own merit. Only a very few monuments and structures within these areas are protected by ASI and State Archeology. Most are unlisted. Fortunately, many structures especially institutional and religious structures continue to be in use and are taken care of by government organizations as well as private bodies and authorities. However unsympathetic treatment and ad hoc modification often pose a serious problem. In absence of a systematic inventory and formal/legal tools to preserve living heritage, quite a few heritage structures have been demolished. Inventory prepared by State Archeology give a list of many 'unprotected monuments' and is a valuable document for formulation of any policy guideline or plan proposal. This list must be supplemented and formalized through an appropriate legal framework as suggested in the BCUC Perspective Plan.

Cuttack has a rich tradition of cultural heritage. Traditional crafts and art form like filigree, textile, horn and brass work, *Ghora Naach* – a folk dance form, festivals like Balijatra (**Fig 11.20**) have much more potential. There were drama and Yatra groups which have lost their popularity. With well structured rejuvenation policy and management guidelines, these crafts, festivals, performing arts and theatre groups can be projected at national and international forums.

Rejuvenation and development of natural, cultural and built heritage of CDPA have to address conflicts between preservation of heritage, economic development and social equity. Sustainable solutions must evolve from a systematic understanding of the present status within the proposed vision of the CDP and an assessment of opportunities, potentials and threats.

11.4 Existing State of Natural, Built and Cultural Heritage in Different Zones within CDPA

11.4.1 Zone 2: Choudwar/Charbatia

Popularly known as Birat Raja's fort, the place was originally known as 'Choudwar Kataka' and was the capital of King Anangabhima Dev III before he shifted his capital to Abhinaba Varanasi Kataka' - the present Cuttack, and built the fort of Barabati in 1229 A.D.

Declared as a protected area by ASI, the ancient fortified site of Charbatia fort (**Fig 11.21**) and its environment is an important archeological site. A substantial part of the early historic site still remains undiscovered. No attempt has been made by the ASI (Archaeological Survey of India) for further excavation of the site. Large water tanks from

ancient times, empty stone quarries and miles of barren land surround the protected ruins of the existing fort.

Astha Sambhu temples with local religious and architectural significance are located in this area. However, private initiatives to maintain and refurbish the temples have often jeopardized the historical and aesthetic authenticity of the structures. Ghora Naach – a folk dance form continues to be popular as a local mode of recreation and festivity. Only a small community of artisans in Choudwar is trying to preserve and promote the art form – an intangible asset of this region. Also located in this region is the residential colony the OTM factory, now a sick industry. **(Fig 11.22)**

The Charbatia fort with its ecologically sensitive natural surrounding and water bodies, pilgrimage sites and folk art is an important site that need to be protected as a special site of archeological reserve, an area of anthropological and historical interest to be discovered, experienced and cherished by the local people, researchers as well as tourists.

11.4.2 Zone 7: Barabati Fort (Fig 11.23)

Barabati Fort played a significant role in the history of Orissa. Its contribution is remarkable especially, in the field of military activities during Moghul, Maratha and British. According to the legend, Ganga king Anangabhimadeva III founded the city of Cuttack. The strategic location site had been decided to shift his capital from Chudangagada (Choudwar, Cuttack) to Barabati village and named the city as Abhinava Varanasi Cuttack. Various sculptural and archaeological remains explored in its vicinity testify to an anterior existence of Cuttack and its antiquity dating back to the rule of the Bhaumakaras and later by the Somavansis.

The fort is square in plan. It spreads over an area of 102 acres and surrounded on all sides with stone paved moat of 10 m. wide in northern and western sides and 20 m. wide in the eastern and southern sides. The entire fort wall except the entrance is missing. **(Fig 11.24)** Since 1915, in view of its national importance, the place has been declared as a protected site by Archaeological Survey of India. At the centre of the fort, there is a high mound with a tank in the western side. To the east of the mound, there is the Sahi mosque while in the west of the tank lies the mazar of Hazrat Ali Bukhari. Of the structures, the excavated ruins of a temple deserve special mention. It is believed that it was the temple of Jagannath then called Purusottama to have been built by Anangabhimadeva III (1211-1238) the builder of the fort. This temple was known to have been destroyed by Firoz Tughlaq during his invasion in 1361. The excavations have also yielded the grand pillars of the palace.

In 1803 the Britishers occupied Cuttack when extensive stone robbing took place to build the Cantonment Road. The Archaeological Survey of



Fig 11.21: Excavated Charbatia Fort



Fig 11.22: Abandoned bungalow in OTM Colony



Fig 11.23: Barabati Fort



Fig 11.24: Entrance to the Barabati Fort



Fig 11.25: Colonial bungalows set in sprawling gardens



Fig 11.26: Church in Cantonment Area



Fig 11.27: Cambridge School- construction of high rise buildings



Fig 11.28: Orissa State High Court building

India has partially excavated the site and it is hoped that on completion of excavations, a complete history of Barabati fort will be known which would throw further light on the glorious Barabati fort of Orissa.

11.4.3 Zone 7: Cantonment

The Cantonment area has a characteristic feature different from the rest of the old Cuttack city. Straight roads/avenues, colonial bungalows (generally single storied and with sloping roof) set in sprawling gardens (**Fig 11.25**), religious and educational institutions and churches from colonial time; contribute to the high quality townscape and environmental quality of the cantonment area. Quite a few cultural and social institutions of recent origin are also located in this area. Bungalows are generally owned by the state Government and used as official residences of high officials. The Cantonment area is predominantly institutional in character except the bungalow region. There are many schools and churches generally owned and maintained by individual trusts or public agencies (**Fig 11.26**). Most of them are more than 100 years old and of significant architectural and aesthetic values and well maintained. The area as a whole represents a specific era in Cuttack's history and its development as an educational and cultural hub in early twentieth century.

In recent time, many old buildings, schools and churches have been demolished to give place to new structures. Bungalows are also being modified or demolished. Recent trend of construction of high rise buildings – for academic as well as residential purposes, (**Fig 11.27**) is a threat to the townscape quality of this area. The cantonment area of Cuttack needs special area regulations to preserve the natural, built and cultural heritage. It reminds one of the Lutyen's Delhi, which has been declared as a special area to preserve its townscape, built and natural heritage.

11.4.4 Zone 7: Judiciary Complex in Old Cuttack

Judiciary complex is the symbol of Cuttack's earlier status as the headquarter of Orissa Province and Orissa State. The beautiful High Court building (**Fig 11.28**) along with subsidiary offices still functions as the Judicial headquarter of the Orissa state and pride of Cuttack. Several Colonial structures with historical and architectural significance are located within a walking distance. The historic Lalbagh place which was earlier the Governor House and later converted to Children hospital 'Sishu Bhawan', Ravenshaw Collegiate School where Netaji Subhas Bose studied in his childhood, are all located in this area. The area has significant townscape values with vistas, precincts and important landmarks.

The new constructions are generally unsympathetic to the distinctive colonial style. However there is exception. The new building of the

Department of Pediatric Surgery in the children's hospital complex has been able to usher modernism in a harmonious manner. Only through careful conservation strategy and urban design guidelines, it is possible to ensure more of such positive infill in future. (Fig 11.29)

11.4.5 River Front

River front includes the areas along Mahanadi and Kathajodi in Choudwar (zone 4), Bidanasi (zone 6), Old Cuttack (zone 7), Gopalpur (zone 11), Barang (zone 10).

Cuttack city is almost an island surrounded by Mahanadi and Kathajodi rivers. Cuttack flourished due to its rivers and its major problem of drainage is also partly attributed to the rivers. This contradictory role of river is apparent in the neglect of river front. Ring roads abutting the river are used only as embankments and vehicular corridors. As a result, river banks have failed to attract the residents on a regular basis. Only few identified locations like Balijatra ground (Fig 11.30) and Barabati stadium (Fig 11.31) occasionally act as city level recreational grounds. Otherwise river banks are almost neglected abandoned and act as backyards. Same is true for other sides of the rivers in Choudwar, Bidanasi, Gopalpur and Barang. Along many stretches, factories, godowns, unauthorized structures and slums are located along the river front. Illegal quarrying of sand from the river beds is environmentally disastrous and causing irreparable damage.

Long stretches of river fronts have the potential to create city level public places, recreational and commercial hubs, tourist facilities and high end housing. In absence of any urban design guideline, new constructions are coming up in a haphazard manner and can ruin the river fronts for ever.

These river fronts are natural assets of the CDPA region intricately linked with its history, cultural development and built heritage. Its development potential is manifold and that can only be ensured through a sound riverfront development strategy that integrates management of environmental and cultural assets with future development of the region. Recently initiated project to restore Jobra Workshop as a maritime museum is a right step towards this direction. This can serve as a role model and a key intervention. (Fig 11.32)

11.5 Issues

Heritage areas described above, show that these areas have intrinsic opportunities to become a vehicle of positive change and to restore a sense of cultural identity of the residents of CDPA. Only a few



Fig 11.29: Department of Pediatric Surgery: Sishu Bhawan



Fig 11.30: Balijatra Ground near the river bank



Fig 11.31: Barabati Stadium



Fig 11.32 Restoration of Jobra Workshop as a maritime museum

monuments and sites have been declared as a protected area, and the State Archeology and ASI have meager presence in this region. Most areas, structures, traditions are people oriented, usually lived in and owned by individuals, trusts, and organisations. Sizable number of properties are also owned and used by the State Government. In absence of proper listing, grading, appropriate guidelines and incentives; potential of built, cultural and natural heritage resources are not being fully realized. On the contrary, degradation of the existing built, cultural and natural heritage is being witnessed. It is therefore necessary to integrate all these cultural and natural resources and the special heritage areas with the emerging development of the millennium city and also to satisfy the specific needs of CDPA. Focus should be on re-development and rejuvenation of the CDPA area as a whole.

What is needed is a value-based heritage management that encompasses various aspects like conservation interventions, visitor management, infrastructure development and interpretations; essentially to find out the future role of these diverse cultural and heritage resources in the emerging and envisaged development scenario of BCUC.

11.6 Goals and policies

The unique combination of built, natural and cultural heritage resources of CDPA has tremendous potential. With an aim of revitalization and re-development, conservation policies must attain a dynamic interaction between cultural heritage and the natural environment. CDPA is languishing behind the emerging eminence of Bhubaneswar as the major capital complex. Conservation and development policies must be geared towards the reversal of this trend. CDPA with its invaluable cultural and natural heritage resources must develop a unique identity that complements BDPA in its path of future development.

Preservation of built, natural and cultural heritage and environments as an integral to the overall process of development must be able to:

- i. Preserve cultural and ecological diversity as far as possible.
- ii. Give priority to local value system.
- iii. Explore the new opportunities arising out of heritage resources.
- iv. Consider archeological and environmental conservation as tools to stimulate economic development.
- v. Promote economic development by promotion of traditional art/craft and upliftment of the workers involved in a healthy and sustainable manner by appropriately using and preserving the heritage resources.

- vi. Enforce a proper scrutiny so that short term benefits should not take precedence over long term costs.
- vii. To use zoning and special area rules and regulations as tools to establish an enabling environment and ensure resource compatibility.

With appropriate policy guidelines and heritage management, the cultural resources of CDPA can boost local economy, highlight the past heritage, promote tourism and also be able to play crucial and meaningful role in projecting Cuttack's cultural identity. This will contribute a great sense of pride amongst the residents of CDPA and become a touchstone for future development.

11.7 Inventory of Heritage Resources

A detail inventory of all the resources, built, natural and cultural for the Special Heritage areas, as well as, outside heritage areas is a prerequisite to conservation plan. A preliminary list of some of the identified built heritage is outlined in the **Annexure III** and shown in **Map 11.2** is a guideline and future reference. The list needs to be augmented and elaborated.

11.8 Proposal for Heritage and Conservation

11.8.1 Special Heritage Zones

The major heritage sites of CDPA need to be managed as Special Areas. For each of the identified Heritage Zones, Special Area Action plan be initiated that will maximize the maintenance of significance through 'management of change'. This is contrary to the purist approach of 'conservation without compromise'. Change has to be permitted but that must be decided by a systematic analysis of significance, and formulation of policy and plans. Systems of classification of heritage zones/cultural sites have also been proposed.

It is suggested that following areas are declared as Special Heritage Zones or Special areas: (**Map 11.3**)

- i. Zone 2 & 4: Parts of Charbatia and Choudwar
- ii. Zone 7: Barabati Fort
- iii. Zone 7: Cantonment
- iv. Zone 7: Judiciary Complex in Old Cuttack

It is recommended that:

- i. Identified Heritage zones and Special areas for river front development are to be declared as important cultural sites of CDPA and protected and preserved as Special Areas.

- ii. In addition to enforcement of relevant acts whichever is applicable to the monuments/precincts/sites, Special Area Rules and Bye-laws are to be prescribed for the identified special areas.
- iii. A detail inventory of all the resources, built, natural and cultural for the Heritage sites, as well as, other heritage resources for the entire CDPA has to be prepared by proposed Heritage Committee for BCUC Metro Area. Enlisting and grading of all heritage resources are to be taken up on a priority basis for any further detail recommendation.
- iv. Heritage Trails need to be planned and executed to ensure proper accessibility and connectivity to the heritage areas.

Table 11.2 shows proposed activities and land use classification of various Heritage Zones in CDPA.

With these guiding principles and within the framework proposed for tourism, recreation and culture, the following section deals with specific proposals for major heritage special development zones in CDPA.

11.8.2 Zone wise Detail Recommendations:

Zone wise proposal and recommendations are outlined below:

11.8.2.1 Zone 2 & 4: Charbatia and Choudwar Fort

(Map 11.4) (Fig. 11.33, 11.34, 11.35, 11.36, 11.37, 11.38, 11.39)

- i. ASI protected area.
- ii. Prohibited and regulated area.
- iii. No constructional activity and mining operation permitted.
- iv. Afforestation can be initiated with mandatory approval from ASI.
- v. Rehabilitation and revitalization of the existing settlements within the protected area.

Proposal: Archeological Park and protected archeological reserve with proper maintenance and landscaping, planned heritage trails and basic minimum facilities, folk art centre and compatible development of necessary facilities and amenities.

- i. Proposed to be developed as a special area for cultural landscape site and archeological park, incorporating vast open spaces and water bodies.
- ii. The historically important Fort is well protected but needs promotion and interpretation. Further excavation need to be given priority by ASI.



Fig 11.33: Remains of the Choudwar Fort



Fig 11.34: Raja Well at the Choudwar Fort



Fig 11.35: Rani Tank near the Choudwar Fort

- iii. The adjoining Astha Sambhu Temples need to be preserved and promoted as a living religious heritage. Existing community, their rituals and beliefs, historical and spiritual structures, water bodies all are inter-linked and need to be promoted through well developed religious circuit. Proper maintenance and landscaping, planned heritage trails and basic minimum facilities need to be worked out in detail.
- iv. Local folk art (Ghora Naach) practiced by a small group of people needs to be revitalized through training and workshops, festivals on a regular basis, museums, research and documentation centre. Proposed activities are centre for folk culture, folk art and craft museum, open air theatre and tourists spots at Charbatia. An Open Air Theatre is also suggested near the fort for performing the traditional Ghoda Naach along with light and sound effects. Folk art and Horse-dance training and performance areas can be suitably planned for tourists' interest.
- v. Facilities and amenities for tourists, pilgrims need proper planning and harmonious development. Large scale natural green area required for protecting the area from encroachment and incompatible use.
- vi. Projects like Historical Theme Park; Son-et-lumiere show, Festivals can be developed in consultation with ASI, State Archeology, proposed Heritage Committee and Local NGO's.
- vii. All historical structures and tank within Zone 2 are to be enlisted, graded and suitable recommendations be formulated by the proposed Heritage Committee.

11.8.2.2 Zone 7: Barabati Fort

(Map 11.5) (Fig. 11.40, 11.41)

Protected area of highest significance:

1. Within demarcated Special Area -Protected area. No constructional activity and mining operation permitted.
2. Upto 200 meters from the moat - Prohibited and regulated area. Height and FAR Restriction.
 - i. The area within the fort along with is rich in archeological remains, both above and below ground, requires protection from damaging land use practices and intrusive development. Because of its immense historical potential, the status of the area as a protected site needs to be strictly adhered to.



Fig 11.36: Chateswar and Bateswar Temple, Choudwar



Fig 11.37: Kapaleswar Temple, Choudwar



Fig 11.38: Entry to the Barabati Fort



Fig 11.39: Budhalinga and Kedareshwar Temple



Fig 11.40: Quila Sahi Mosque within the Barabati Fort



Fig 11.41: Moat around the Barabati Fort



Fig 11.42: Colonial bungalows of Cantonment, Old Cuttack



Fig 11.43: Institutional building in the Cantonment Area

- ii. Activities proposed are Son-et-lumiere show, Historical Theme Park, Interpretation centre and museum within the Fort; fair ground, cultural complex in the vicinity.
- iii. Facilities and amenities for tourists and visitors need proper planning and harmonious development. Large scale natural green area required for protecting structures from pollution. The issue of encroachment must be dealt effectively.
- iv. Special guided tours for visitors and tourists who have a special interest in archeology, architecture, art and culture of Orissa and will be willing to contribute to conservation through high entry fees.
- v. Special tours for school children to show the excavated archeological sites.
- vi. Temporary training camps and workshops for students of archeology, art and architecture, as well as, conservation specialists.
- vii. Revival of the surrounding moat which will act as a buffer, as well as, for boating as a recreational facility.
- viii. Activities that are permitted beyond the protected area but within 200 m are amphitheatre, fair ground, heritage interpretation centre, water front development.

11.8.2.3 Zone 7: Cantonment – Old Cuttack

(Map 11.6) (Fig. 11.42, 11.43, 11.44, 11.45)

Preservation of townscape value and heritage structures. Regulation and urban design guidelines for new construction. Proposed activities– Institutional and Govt. residential.

- i. Preservation of Colonial Township needs an integrated physical planning along with proper landscape and urban design guidelines.
- ii. All historical structures, precincts, landmarks within cantonment are to be enlisted, graded and suitable recommendations to be formulated by the proposed Heritage Committee.
- iii. Along with a Special Area Development Plan, special bye-laws and regulations are to be formulated for the Cantonment Area by the proposed BCUC Heritage Committee. To enhance the streetscape quality, strict urban design guidelines and regulations must be formulated and strictly adhered to.
- iv. Development Controls specifying maximum coverage, set-back regulations, FAR, building height and maximum number of floors must be specified for any new construction.

- v. It is recommended that for the Cantonment Area, maximum permissible height be 10 m, 0.4 FAR.
- vi. Urban design guidelines like colour and finishes, material, ornamentation, openings, roofline must also be prescribed specially for some of the streets. e.g. Cantonment Road and Street adjoining the areas.
- vii. Sound maintenance policy along with grants and incentives for colonial heritage preservation will promote preservation of the existing built heritage and socio-cultural activities.
- viii. Restoration and rehabilitation of unused or derelict heritage structures to accommodate new activities like guest houses, club houses, schools, institutes etc. to be allowed. In case of totally derelict and unlisted structures, new construction/developments may be allowed. New construction and/or addition alteration must be approved by the Heritage Committee.
- ix. There is a need for well organized guided tours to colonial landmarks supported by well planned tourist facilities.



Fig 11.44: Christ Collegiate: Institutional building in the Cantonment Area



Fig 11.45: Stewart School: Institutional building in the Cantonment Area

11.8.2.4 Zone 7: Judiciary Complex in Old Cuttack

(Map 11.7) (Fig. 11.46)

- i. Highest level public activities with high value built heritage and socio cultural institutes.
- ii. Preservation and augmentation of Townscape value.
- iii. Urban design guidelines eg. colour and finishes, material, ornamentation, openings, roofline must be prescribed . Restriction on unsympathetic new construction. Any new construction, addition, alteration must be approved by the Heritage Committee.
- iv. Intrinsic morphology of the area must not be disrupted.
- v. Identified precincts to be pedestrianised.
- vi. Sound maintenance policy along with grants and incentives for colonial heritage preservation will promote preservation of the existing built heritage and institutional activities.
- vii. Improvement and augmentation of facilities and amenities for the users.



Fig 11.46: The High Court in the very busy Old Cuttack region

11.8.2.5 Promotion of Filigree Works

Filigree works employ a large number of local artisans and a unique feature of Cuttack. The craft needs to be promoted through training and workshops, organised marketing, incentives and modernisation. An area in Bidanasi near Barabati Fort has been earmarked for Craft Village, as well as, a Centre for promotion of filigree works at an international level.



Fig 11.47: Orissa State Maritime Museum, Jobra



Fig 11.48: Beautiful River front area along the Ring Road

11.8.2.6 River Front Development along Mahanadi and Kathajodi (Map 11.8) (Fig. 11.47, 11.48)

With scenic value of highest level and in need of environmental protection, specific stretches of river front are delineated as special zones. Activities proposed are city level open spaces, parks, fair ground, recreational areas, cultural complex, commercial development, institutional areas, resorts, hotels and residential complex. Specific urban design guidelines need to be formulated to develop the river banks into attractive zones.

Proposed Activity: Recreational and Cultural Hub at Gopalpur

The river front in Gopalpur is proposed to be developed as the Recreational and Cultural hub for the entire CDPA as well as BCUC. With proper connectivity and new activities that complement and support the river front development, the proposed Recreational Hub is envisaged to act as one of the major cultural and recreational complex. Some of the activities proposed are Drama Academy, Fair Ground, Open Air Theatre, and Parks.

All these special areas designated for river front development need to be developed according to specially formulated guidelines, Varying degree of development controls is necessary to ensure a proper and attractive river front. Along with a Special Area Development Plan, special bye-laws and regulations are to be formulated for River Front development area by the proposed BCUC Heritage Committee.

- i. Priority for open space based water front related recreational activities. Related commercial activities, specific institutional areas and housing may be encouraged.
- ii. Strict urban design guidelines and regulations must govern the design to ensure a harmonious development. Development Controls specifying maximum coverage, set back regulations, FAR, building height and maximum number of floors must be specified.
- iii. Urban design guidelines eg. Built form, colour and finishes, material, ornamentation, openings, roofline must be prescribed.
- iv. Restriction to be imposed on unsympathetic new construction. Any new construction, addition, alteration must be approved by the Heritage Committee.
- v. All historical structures, tanks, precincts, as well as, significant secular structures within River Front special areas are to be enlisted, graded and suitable recommendations to be formulated by the proposed Heritage Committee. .
- vi. Scope for adaptive re-use of some underused precincts. for meaningful activities

- vii. Improvement and augmentation of facilities and amenities conducive to river front activities.
- viii. The issue of encroachment and polluting activities must be dealt effectively.

11.9 Heritage and Tourism - an integrated approach

A comprehensive heritage and tourism development plan is a prerequisite for developing potential of heritage resources. Some of the fundamental principles of such a development plan are:

- i. Benefits to both conservation and tourism.
- ii. Long term interests of the local people - living and working in heritage areas should be the determining factor in selecting options.
- iii. A significant proportion of revenue earned from tourism be applied for the benefit of conservation.
- iv. Educational programmes and awareness campaigns to assist and invite tourists and visitors to respect and understand the local way of life, culture, history and religion.

Map 11.9A and **11.9B** shows possible Heritage Trails that connect heritage and cultural sites in various parts of CDPA.. Development of necessary facilities for tourists and visitors along these routes at appropriate locations need to be encouraged. Various modes of operations (BOT, BOOT etc.) can facilitate resource generation and quality improvement.

11.9.1 Heritage Trails:

Option 1:

Cuttack Railway Station – Ravenshaw College – Taldanda Parkway – Maritime Museum – Barabati Haat – Gada Gadia Temple – Barabati Fort-Cantonment Area – Cuttack Chandi Temple – Netaji's Birth Place Museum – Judiciary Complex – Utkal Ratna Bhumi – Dhabaleswar Temple – Naraj.

Time: 1 Day

Option 2:

2A: Proposed Choudwar Bus stand – Astha Shambhu Temple Complex – Charbatia Fort - Tribal Folk Art Training Centre.

Time: ½ Day

2B: Cuttack Railway Station - Jobra Barrage – Tribal Folk Art Training Centre – Astha Shambhu Temple Circuit - Charbatia Fort – Yagneswari Temple – Dhabaleswar.

Time: 1 Day

The trails must be supported with necessary facilities, augmentation and improvement of road network and water ways, transit nodes, signage and trained guides.

11.9.2 Integrated movement network of heritage, tourism and recreation (Map 11.10)

To promote economic development of the special heritage areas in a healthy and sustainable manner, 'Connectivity' is an essential prerequisite. Connectivity that will be convenient cost and time effective as well a pleasurable one. For an enabling approach of heritage conservation, it is necessary to explore the new opportunities arising out the proposed movement network and to integrate that to archeological and environmental conservation as mentioned below:

- a) Road network connecting all special Heritage zones with major transport nodes (airport , rail station, bus routes and proposed MRT) ensuring a gradual transition of various modes of travel – air/ railways/MRT – luxury buses – cars - boats/battery operated para-transit - two wheelers – pedestrian.
- b) Recreational waterways connecting some of the heritage sites and proposed facilities for tourists and pilgrims eg. moat around Barabati Fort, may be explored .

Proper connectivity is important and must be designed in a holistic and integrated manner. All transit points need special attention with regard to provision of facilities, connectivity, awareness and publicity, signage system as well as proper restrictions to enable smooth transition from one mode to other. For convenience of visitors and local people as well as for long term benefit, all places of recreation, proposed cultural centres, museums, resorts and hotels, tourist and pilgrim facilities must form an integral part of Heritage circuits/trails/walks and be strategically located.

11.10 Heritage Management & Organisational Structure

Proposed Heritage Committee for BCUC will be working in an advisory capacity for preservation and development of all the heritage zones. The structure, role and functions of the Heritage Committee, have been discussed at length in the Perspective Plan for BCUC.

Respective Development Authorities/municipalities as well as local stakeholders, NGOs have significant role to play in successful implementation of strategies proposed for Special Heritage Areas.

Formulations of special regulations to control or mediate development within the heritage areas are a prerequisite for effective implementation of the proposed recommendations. Special regulations for all development within heritage areas, including new construction, demolition or modification to existing buildings around historic structures or within historic precincts must be formulated by the BCUC Metro Authority with the advise of Heritage Committee as per the provision mentioned in 'Conservation of Heritage Buildings, Heritage Precincts and Natural Features' (section 54) of the Bhubaneswar Development Authority (Planning & Building Standards) Regulations, 2008. Detail plans must be prepared by respective development Authorities and Municipalities. It is necessary to prepare an inventory of built, cultural and natural heritage resources of the special areas. The inventory must include both protected and unprotected resources. **Table 11.3** shows cost estimate for promotion and preservation of heritage resources and development of special areas in CDPA. Cost for most of the new developments in special heritage areas is already covered in budget allocation for 'Tourism, Recreation and Culture' and hence not included in this table. Estimates for projects those are specific for preservation of heritage resources are only included. River Front Development is treated as a separate item of budgetary allocation.

11.11 Conclusion

Appropriate policy guidelines and management of cultural and natural heritage, can rejuvenate and revitalize the CDPA region and project Cuttack's cultural identity. It can also promote tourism, boost local economy and contribute a great sense of pride amongst the residents of CDPA and become a touchstone for future development.

12.1 Environmental Profile of Cuttack

12.1.1 Air Environment

The quality of human life is associated with the quality of air we breathe. The rising levels of various pollutants in the air environment generate concern as it drastically reduces the quality of life in any habitat. The available literature on air pollution studies of Cuttack reveals that the quality of air is affected from different sources. Hence the quality of ambient air deserves a systematic and scientific investigation. The climate of Cuttack is greatly influenced by the Bay of Bengal, as it is situated to the south of the Tropic of Cancer, in the coastal plains of Orissa. The characteristics of its climate include hot summers, dry winters, high humidity during the southwest monsoons, and low range of temperature throughout the year. Summer is from April to May, winter from December to March, rainy season is from June to September, with monsoon from October to November. The maximum temperature recorded goes up to 45-48°C with a minimum of 15.9°C. The average annual rainfall of the city is about 1442 mm and the average humidity reported was of 41%. Southwest monsoon brings rainfall due to cyclone. Wind speed of the city area vary from 6.7-9.11 km/h with an average of 2.6 km/h.

12.1.1.1 The pollution level

The average concentration level of air pollution in respect of Suspended Particulate Matter (SPM), Respirable Particulate Matter (RPM), Nitrogen Oxide (NO_x), Sulphur dioxide (SO₂) and Carbon monoxide (CO) in 2005 was reported at few selected locations in Badambadi Chhak, Press Chhak, CMC Chhak, and Kanika Chhak in a pre-monsoon season. It was reported that SPM concentrations in all the four locations were exceeding the prescribed standard (200 µg/m³). The maximum concentration was at Kanika Chhak (496.3 µg/m³) and minimum (239.1 µg/m³) at Press Chhak. The RPM concentrations at two locations viz. Badambadi Chhak and Kanika Chhak exceeded the prescribed standard limit of 100 µg/m³. The maximum concentration was at Kanika Chhak (189.8 µg/m³) whereas minimum value (83.3 µg/m³) was reported at Press Chhak. The maximum concentration of NO_x was observed at Badambadi Chhak (65.4 µg/m³) whereas the minimum value (32.8 µg/m³) was recorded at S.C.B Chhak. Comparison of 24 hours average concentration of NO_x with National Ambient Air Quality Standard (NAAQS) for residential areas (80.0 µg/m³) revealed that NO_x concentration at all the four locations were well within the limits. The maximum concentration of SO₂ was observed at Badambadi Chhak (65.4 µg/m³) whereas the minimum value (32.8 µg/m³) was recorded at S.C.B Chhak. All these values were well within the limit (80.0 µg/m³). The maximum concentration of CO was

observed at Badambadi Chhak ($0.037 \mu\text{g}/\text{m}^3$) whereas the minimum value ($<0.001 \mu\text{g}/\text{m}^3$) was recorded at S.C.B Chhak. These values of CO are also within the limits ($4.0 \mu\text{g}/\text{m}^3$).

12.1.1.2 The noise environment

The ambient noise levels reported at specific locations of Cuttack for day and night time in dB (A) is shown in **Table 12.1**. The average value in the table represents the mean over 5-minute periods. Analysis of the data indicate that in all the noise monitoring locations noise level exceeds both the day time and night time standards.

Table 12.1: The reported Average Noise levels in different areas of Cuttack and the permissible limits

Area/Location	Day Time (6 AM to 9 PM) dB(A)	Night Time (9 PM to 6 AM) dB(A)
Choudhury Bazaar	78	70.4
Khannagar	76.5	71.5
Near High Court	76	70.2
Matagajpur	78	72.0
Badambadi	80.1	70.0
Matagajpur	58	52
Jobra	75.5	70
Deer Park (off Biju Pattanaik Chhak)	66.0	63.3
Biju Pattanaik Chhak	75.5	70.2
Naraj	69.5	66
Chattra bazaar	82.5	82.1
Railway Station	75.2	72.4
Ranihat	72.5	60.5
Cantonment Road	80	67.3
Mangalabag	78	66.7
Darga Bazaar	75	63.3
Kanika Chhak	75	71.6
Link Road Crossing	80	78.2
College Square	81	73
CMC More	83	75
Permissible limits		
Industrial	75	70
Commercial	65	55
Residential	55	45
Silent Zone	50	40

Source: Environment Assessment Report, Gheizi Eastern, 2005

12.1.1.3 Proposals

1. A detailed air quality analysis of the area is to be done to identify the sources of air polluting units including the source apportionment study for key pollutants, especially particulate pollutants and NO_x.
2. Automobile emissions should also be given importance as these are sources of direct ground level pollution. The city should be equipped with sufficient number of auto emission testing centers where the petrol and diesel driven vehicles could be tested and certified.
3. Necessary steps are to be initiated to provide a green belt comprising thick vegetation of minimum 200m width around all factories clustered in and around Cuttack. Industries are to be directed to maintain stack heights above the inversion layer.
4. It is advisable to have greening of townships. Green belt development and afforestation should be encouraged, which may act as sink for air pollutants.
5. Target the particulate matter levels especially re-suspension of road dust and soil dust. As far as possible convert the unpaved pathways to paved pathways to minimize re-suspension of road dust and associated particulate pollution levels.
6. Steps should be taken to control the use of loud speakers, especially in residential areas. In no case are loud speakers to be permitted after 10 p.m.

12.1.2 Water Environment

The quality of water has become an integral part of any sustainable water supply system. Pollution of water resources has increased due to population pressure, industrial and agricultural activities, to the point where even human health is endangered. Water quality has many dimensions, among which are dissolved oxygen (DO) that is critical to aquatic life, suspended solids that cause turbidity, dissolved solids (salts) that cause hardness and damage crops and piping systems, and many natural and artificial chemical agents, some of which (like PCBs, mercury, and DDT) are concentrated in the water based food chain and cause toxic effects in fish and humans. As human health is directly linked to the availability of water in sufficient quantity and quality, its preservation is very much critical in imparting the required quality to human life.

12.1.2.1 Sources of Water

Surface Water

River water in the region is used for outdoor bathing, agriculture, industrial cooling process, aquaculture etc. A comparison of the reported characteristics of surface water from different parts of Cuttack as on May

2005 (Table 12.2), shows that the values are within the stated standard values of Inland Surface Water (IS: 2296) Class E.

Table 12.2: Characteristics of surface water from different parts of Cuttack as on May 2005

Parameters	Kathajodi River, Khannagar	Kathajodi River, Khannagar (U/S)	Kathajodi River, Matagajpur	Mahanadi River, CTO Chhak	Mahanadi River, Jobra	Mahanadi River, Naraj Barrage
Colour	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless
Temperature (°C)	35	32.5	27	28	29.5	30.5
pH at 25°C	6.97	7.93	8.0	8.19	8.02	7.85
TSS (mg/l)	18.0	5.0	1.0	32.0	28.0	18.0
TDS (mg/l)	310	120	135	122	131	115
Total Alkalinity (mg/l)	110	70	100	95	100	110
Total Hardness (mg/l) (as CaCO ₃)	120.9	72.54	80.6	72.54	76.57	68.51
DO (mg/l)	5.4	6	5.4	6.6	6.2	6.0
BOD (mg/l)	10.0	8.0	20.0	2.0	3.0	2.0
COD (mg/l)	29.0	16.0	40.0	9.0	6.0	5.0
Oil & Grease (mg/l)	3.28	2.78	1.92	0.895	0.882	1.91
Chloride (mg/l)	65.3	19.8	31.2	17.0	22.7	15.2
Sulphate (mg/l)	7.1	5.1	5.1	6.2	5.9	3.9
Calcium (mg/l)	27.5	15.6	21.1	17.8	18.9	15.6
Magnesium (mg/l)	12.5	8.7	6.5	6.8	7.8	8.2
Fluoride (mg/l)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cyanide (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenolic Compound (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (mg/l)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Iron (mg/l)	1.52	0.52	0.17	0.41	0.62	0.29
Copper (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (mg/l)	0.83	0.39	0.01	0.18	0.31	0.22
Lead (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (mg/l)	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Zinc (mg/l)	0.17	0.18	0.24	0.25	0.31	0.19
Nickel (mg/l)	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Cadmium (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium (mg/l)	38.7	15.8	29.8	21.3	26.3	27.8
Potassium (mg/l)	5.3	1.5	3.7	2.3	3.2	2.5
Nitrate (mg/l)	0.1	0.042	0.047	0.02	0.03	0.05
Silver (mg/l)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Source: Environment Assessment Report, Gheizi Eastern, 2005

Ground Water

The analysis of ground water samples were collected from tube wells fitted with hand pump and one from dug well at different locations of the

area in 2004 are shown in **Table 12.3**. It appears that the physical parameters of the ground water samples are within the permissible limits of Bureau of Indian Standards, BIS: 10500 (1991). As shown, the concentration of iron is increasing in ground water in most of the locations. However, the other heavy metals, and other geogenic pollutants like fluoride and arsenic are reported well within the permissible limits. The ground water sample of dug well from Khannagar is contaminated with both total and faecal coliform and can not be recommended for drinking purpose.

Table 12.3: Characteristics of ground water in tube wells and dug wells from different parts of Cuttack as on 2004

Parameters	Khannagar (Dug Well)	Matagajpur (Tube Well)	Ring Road, Mangalabag (Tube Well)	Biju Pattanaik Chhak (Tube Well)	Naraj (Tube Well)	College Square (Tube Well)	Desirable Limit
Colour	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	-
Temperature (°C)	28	27.5	29	26	28	28.5	NS
pH at 25°C	6.85	7.56	8.02	7.93	8.25	7.27	6.5-8.5
TSS (mg/l)	11.0	1.0	5.0	10.0	2.0	1.0	NS
TDS (mg/l)	390	131	167	181	129	302	500
Total Alkalinity (mg/l)	190	90	100	125	100	155	200
Total Hardness (mg/l) (as CaCO ₃)	161.2	88.6	85.5	100.75	80.6	120.9	300
BOD (mg/l)	1.2	1.4	0.8	1.8	1.4	1.6	NS
COD (mg/l)	5.0	3.0	5.0	3.0	2.0	2.0	NS
Oil & Grease (mg/l)	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Chloride (mg/l)	57.0	22.7	19.8	17.0	18.5	39.8	250
Sulphate (mg/l)	27.6	6.0	2.0	2.9	3.2	10.2	200
Calcium (mg/l)	38.9	25.3	25.9	27.5	22.7	32.4	75
Magnesium (mg/l)	15.6	6.8	5.8	7.8	5.8	9.7	30
Fluoride (mg/l)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	1.0
Selenium (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Cyanide (mg/l)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05
Phenolic Compound (mg/l)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.001
Arsenic (mg/l)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.05
Iron (mg/l)	0.35	0.23	0.52	0.41	0.44	0.47	0.3
Copper (mg/l)	0.09	<0.001	<0.001	<0.001	0.15	0.07	0.05
Manganese (mg/l)	0.22	0.10	0.41	0.23	0.32	0.22	0.1
Lead (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
Chromium (mg/l)	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.05
Zinc (mg/l)	0.19	0.17	0.57	0.52	0.21	0.16	5
Nickel (mg/l)	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS
Cadmium (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.01
Mercury (mg/l)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Sodium (mg/l)	42.8	16.3	17.8	18.3	20.5	22.3	NS
Potassium (mg/l)	5.8	2.1	2.0	2.3	2.5	2.6	NS
Nitrate (mg/l)	0.079	0.056	0.104	0.073	0.037	0.095	45
Total Coliform (MPN/100ml)	60	0	0	0	0	0	10
Faecal Coliform (MPN/100ml)	10	0	0	0	0	0	Nil

Source: Environment Assessment Report, Gheizi Eastern, 2005

12.1.2.2 Proposals

1. Available literature suggests that the water quality in Mahanadi and Kathajori shows a decreasing trend with lower quality levels at some points. Since the waste loads from Drain No.1 and 2 ultimately finds its way to these rivers, in general, care should be taken to see that the river is not polluted much above its carrying capacity.
2. In areas where septic tanks are available, it should be followed by soak pits. Permitting the leachate to flow through the open drains without passing it into soak pits will invite serious surface water pollution and may aid in the out break of water borne diseases. The construction of soak pits of enough capacity along with septic tank is to be made mandatory.
3. The minimum clearance prescribed should be maintained between wells and septic tanks or soak pits. The application for building permits should contain all these information and should be made mandatory. The residents are to be advised against the improper construction and management of septic tanks and soak pits which will ultimately lead to ground water contamination and out break of water borne diseases.
4. The open defecation in the rural and semi-urban areas may contribute to the surface water or well-water pollution. So, necessary steps may be initiated to construct low cost community latrines in these areas, especially in slums to solve this problem.

12.2 Need for Disaster Mitigation

The Cuttack Development Plan Area has been prone to both natural and man-made disasters. Natural disaster like wind hazard is a regular feature in the area since 1965, but cyclone is less frequently observed. Also, the CDPA comes under **Very High Damage Risk Zone- B**, where the speed goes up to 50 m/s.

The CDPA is also vulnerable to earthquakes. It comes under Moderate Damage Risk Zone- MSK VII of Earthquake.

Though most of the areas are protected with embankment, the CDPA has threats of floods in some of the areas.

It is therefore necessary, to reduce the consequences of natural disasters through Planning and subsequently preparing a list of guidelines for the major urban communities so that the local capacity is strengthened and they are prepared to respond to natural disasters.

12.2.1 Vulnerability Issues in CDPA

12.2.1.1 Earthquake and Fire

Cuttack falls under Moderate Damage Risk Zone (MSK VII), as stated in the Vulnerability Atlas of India 1997. Cuttack being an old city has many old and dilapidated buildings which are more vulnerable to earthquake and fire. Most of the buildings in the main city are co-joined thereby increasing the vulnerability in case of earthquake and fire.



Fig 12.1: Electric Transformer and Post near Petrol Pump



Fig 12.2: Narrow lanes with houses joined to each other without setbacks increases the vulnerability during fire

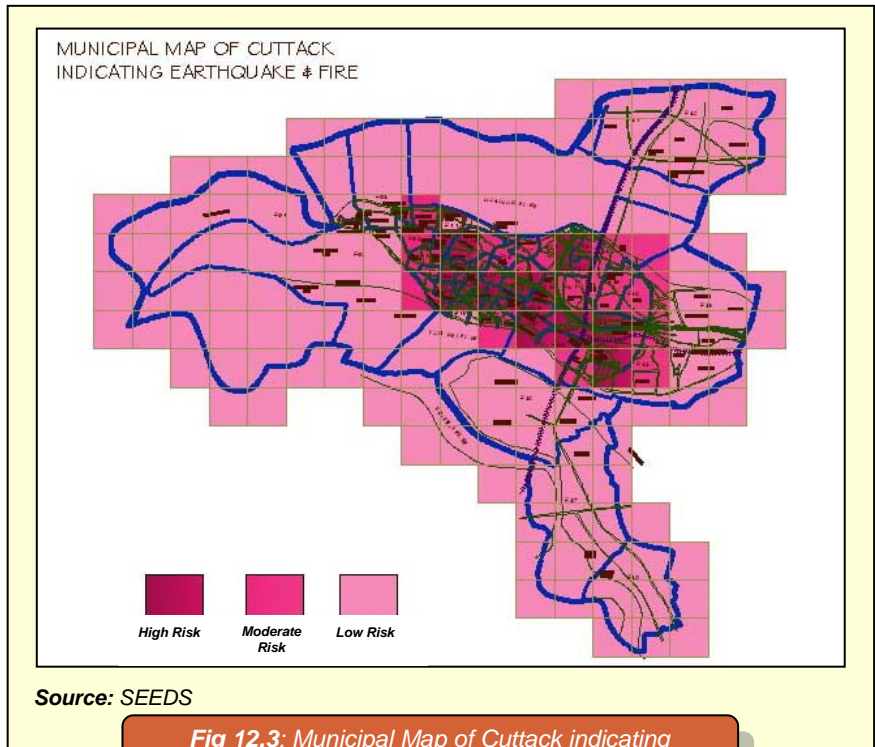


Fig 12.3: Municipal Map of Cuttack indicating Earthquake and Fire

Ward nos. 29, 25, 31, 39, 30, 16,15, 24, 23,19, 17, 18, 13, 14, 07 and 05 of Cuttack Municipal Corporation are all congested areas with no open spaces and marked with narrow roads, all increasing the vulnerability to fire. Ward no. 39 houses the HP Easter Zone Oil Depot which has the potential to blow up, causing devastation upto ward no 40, 36, 35, 32, 31 and 34, as stated by the stakeholders (Fig 12.3).

12.2.1.2 Flood and cyclone

Cuttack city falls under Very High Damage Risk Zone B (50mtrs /sec) according to the Vulnerability Atlas of India 1997. The wind speed generally reaches upto 120 kms/hour causing damage to the large number of hutments in the city. The scale of devastation during these cyclonic storms is often magnified due to improper planning and the haphazard growth of the city. Due to the saucer-like land profile of the city, most of the areas remain inundated in flood water during monsoons. Ward No. 2, 3, 9, 14, 17, 20, 26, 33, 40, 43 are especially prone to water logging due to the low-lying nature of the land. In the newly expanded areas there is almost no proper drainage system. Inside the city, due to its topographical position, storm/waste water has become a major concern. The century old storm water drainage systems which presently act as sewerage system, and are inadequate, also intensify the magnitude of the problem. Since it rains for almost three months in a year, most of the areas in the city face flood problems during the rainy season. This city is considered as the highest flood prone city of Orissa. The city being located on the lower basin of river Mahanadi gets flooded even if it rains in the upper basin of the river Fig 12.4.



Fig. 12.4: Slums encroached on low-lying areas of Cuttack

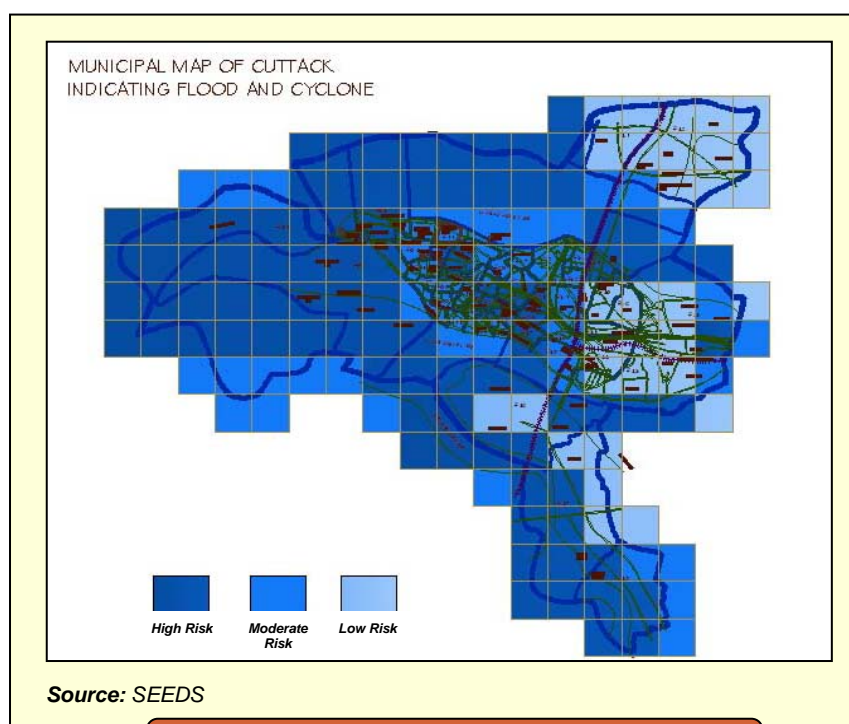


Fig. 12.5: Municipal Map of Cuttack indicating Flood and Cyclone

Also, Cuttack being nearer to the sea is highly vulnerable to cyclone. To add to this, the houses being joined to each other with narrow lanes form wind tunnels, thereby making the wind cause more destruction. There are also many slums mostly located along these low lying areas which face the worst problem during rains.

12.2.1.3 Environment and Public health



Fig 12.6: Open dumping near roadsides in Cuttack

The city has around 1 lakh of floating population each day. The higher rate of population growth as compared to the increase in urban land has led to the increase in daytime population density per sq. km. This is the prime cause of degradation of the urban environment of Cuttack. The unplanned, unrestricted urban sprawl along the narrow lanes and pathways, without any firm land use policy has added to the Urban Environment Degradation. Lack of civic amenities in densely populated residential areas, unsanitary conditions and narrow winding streets have further aggravated the conditions. This is more prominent during the rains when most of the streets are flooded and many low-lying areas remain submerged for several days. The problem is accentuated as the underground drainage system is yet to be active and the entire sewerage is discharged through open drains. Open dump yards are yet another menace to the environment. The city dump yard, although located far from the town is not far enough and still affects the sanitation of the city. There are lakes and canals covered with weeds and the worst part is that there are slums all along these ponds and canals. The dust laden winds from the dry exposed sandy bed of Kathajodi are an additional cause of air pollution, especially during the summers **Fig 12.6.**

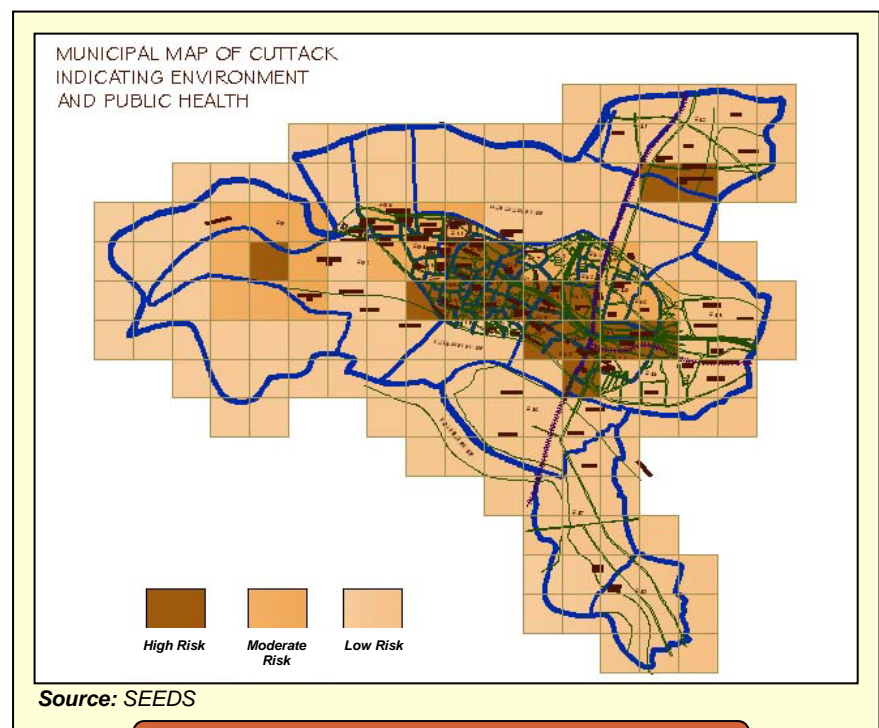


Fig. 12.7: Municipal Map of Cuttack indicating Health and Environment

12.2.1.4 Traffic Congestion

Cuttack, being mostly an old, overgrown village, the roads are very narrow and winding, suitable only for smaller vehicles. Thus, narrow roads with heavy traffic are the major concern of the city. Areas like Badambadi, Ranihat, Mangalabag, Baxi Bazaar, Link road, Satichoura, Bajrakabati, Chandni Chowk, Chandi Chhak, College Square, Mastana Durgah are the areas where there is more traffic congestion and traffic jam has become a chronic problem. No one-way system of movement has yet been implemented to simplify this problem. To add to this, there are several illegal encroachments and temporary stalls along the road sides by the hawkers and also by the shop owners further decreasing the width of the road.

In absence of space availability for parking in the city, incidence of on-road parking is found everywhere, adding to the woe of traffic. Around 1770 buses fly everyday to Cuttack from different areas. The main bus stand is located in the heart of the city - in Badambadi. Also, Cuttack being a commercial trade center for the entire state of Orissa, there is heavy inflow of goods vehicles. Further, in absence of any parking place in the city, even the buses and the trucks are parked along the road shortening the area available for maneuvering **Fig12.10**.



Fig. 12.8: Open drains near roadsides in Cuttack



Fig. 12.9: A busy road in Cuttack



Fig. 12.10: A typical narrow road in Cuttack

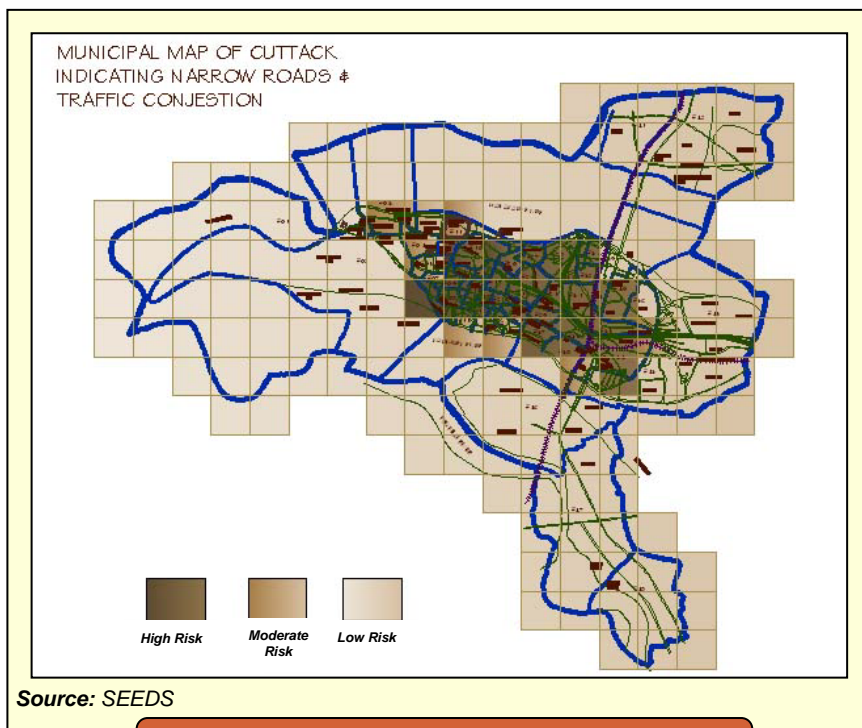


Fig. 12.11: Municipal Map of Cuttack indicating Narrow Roads and Traffic Congestion

12.2.2 Summary of Findings

12.2.2.1 Cyclone and Flood

1. To combat flooding, there is a general tendency for making all new construction with high plinth - created out of soil excavation from nearby areas, thereby forming random low lying areas in the Urban Centers.
2. Reclamation of water bodies for the purpose of building construction is enhancing the risk flooding in future.
3. Most of the areas along the natural drains and engineered drains are occupied by the slum dwellers who put up their hutments and often carry out their livelihood activities thereby increasing the vulnerability for natural disaster.

12.2.2.2 Earthquake and Fire

1. Town core areas having high densities are marked with very old and unsafe buildings, thereby increasing the risk of earthquake and fire casualties.
2. The new construction taking place does not adhere to the norms of seismic-safe or cyclone-resistant construction, increasing the risk.
3. Due to urbanization, there is sprawl of slums in most of the urban centers. These structures are mostly thatched and unengineered, increasing their susceptibility to earthquake and fire.
4. Except for bigger cities like Bhubaneswar and Cuttack, most of the fire brigades have an outreach of only G+2, increasing the risk of taller buildings in other areas. Moreover, the high rise buildings do not have proper space for the MFEs or the provision of hydrant systems.

12.2.3 State Initiative and Objectives

The Orissa State Disaster Mitigation Authority (OSDMA) was set up on 28 December 1999 as the first disaster management authority in the country. The main objectives of OSDMA are:

- To act as the nodal agency for disaster reconstruction works.
- To coordinate with the line departments involved in reconstruction.
- To coordinate with bilateral and multi-lateral aid agencies.

- To coordinate with UN Agencies, international, national, and state-level NGOs.
- To promote disaster preparedness at all levels in the state,
- To network with similar and relevant organizations for disaster management, and
- To prepare suitable guidelines for disaster mitigation.

12.2.4 Factors Enhancing Vulnerability

Major natural disasters to which CDPA region is prone are cyclones, earthquakes and flood. Lack of awareness of vulnerability and risk is a major factor for enhancement of vulnerability in case of a disaster. Some of the important factors are listed in **Table 12.4**.

Table 12.4: Factors Enhancing Vulnerability

Categories	Description
Flood	<ul style="list-style-type: none"> • 80% of the annual rainfall is concentrated over a short monsoon period of 3 months • Coastal plains are flat and the slopes in the inlands are precipitous leading to heavy siltation, flash floods and poor discharge of flood waters into the sea and thus the embankments are breached with alarming frequency • Flood is often synchronized with high tide • High encroachment in the flood plains / natural drains • Poor infrastructure and weak houses • Poor drainage systems in the cities
Cyclone	<ul style="list-style-type: none"> • East coast of India is one of the six most cyclone prone areas in the world • 20% of all severe cyclone landfalls on eastern coast have hit Orissa • Poor socio-economic conditions • Weak housing and poor quality of infrastructure or lack of it • Non adherence to building norms and lack of awareness regarding the same • Depletion of mangroves and trees shelter belts
Earthquake	<ul style="list-style-type: none"> • Moderately high seismicity in major parts of Orissa • Haphazard growth of urban centres • Weak infrastructure and housing

12.2.5 Proposals for Disaster Mitigation

As natural disasters cannot be prevented, appropriate mitigation measures need to be taken to reduce the extent of damage, destruction and human suffering.

12.2.5.1 Earthquake

Earthquake occurs due to movements along faults that have evolved through geologic and tectonic processes. Often they are unpredictable. Among all natural calamities, earthquakes are most disastrous since their

impact can cover large areas causing loss of human and built structures on massive scale. Some of the proposals for earthquake disaster mitigation are:

1. The soil in Cuttack zone is alluvial deposits predominantly sandy with different clayey pockets inside the city. This alluvial ground is not very suitable for large structures having very low bearing capacity (1 ton/ sq ft). Mostly the levees are sandy soils whereas the back swamps are of clayey soils. For instance, the area near Kuakhai-Daya flood plain is mostly alluvial in nature not suitable for large construction.
2. Basement slab, if any, for all buildings should be properly reinforced to combat up-thrust due to change in water table during rainy seasons.
3. Real-time information updates in GIS support better decision making and improve earthquake management. Creating an urban inventory, thematic maps and queries will also help identify CDPA's most vulnerable areas and "what-if" scenarios and help in planning mitigation measures such as retrofitting and relocation.
4. Open spaces, if any, in urban areas such as parks, green tracts and roads, have important functions in disaster prevention. Efforts to secure such open spaces should give top priority to areas where they are lacking.

Development of a Disaster-Proof Living Zone

1. To build firebreaks which make up disaster-resistant urban areas, improve roads, parks, rivers, etc., and promote fireproof measures for areas along roads.
2. Projects for creating disaster-resistant living zones being roughly the size of an elementary or junior high school district, which are surrounded by firebreaks, should be carried out first in those areas where the risk is greater, which need guidance and subsidies should be provided.
3. Within each disaster-proof living zone, make use of the district planning system to better public squares and minor roads and to improve the living environment and its capacity to fend off disasters.

12.2.5.2 Cyclone

A tropical cyclone is a meteorological term for a storm system characterized by a low pressure system center and thunderstorms that produces strong wind and flooding rain. A tropical cyclone feeds on the

heat released when moist air rises and the water vapour it contains condenses. They are fueled by a heat mechanism leading to their classification as "warm core" storm systems. CDPA region experienced a disastrous cyclone in the year 1999 which is called "Super Cyclone". It left a deep impact on the minds of the State Government and the general public for the need of Disaster Mitigation Measures. Some of the proposals for Cyclone Disaster Mitigation are:

1. A thick plantation belt of 0.5 km to be created all along the riverfront border, near Nimapur and Sikharpur of the CDPA region.
2. Adopt strict enforcement on illegal cutting of forests and protection of existing forest reserve.
3. Building byelaws to be suitably modified as per the guidelines of the National Disaster Management Authority.
4. In some special cases, these byelaws may be suitably amended as per the judgment of the architect to avoid tunneling effect between buildings while designing a cluster of buildings.
5. Recreating the forest resources within the designated forest areas through the following measures:
 - i. Re-densification of forest.
 - ii. Afforestation of the denuded forest land.
 - iii. Restoration of forest land and afforestation.
 - iv. Identification of open Govt. / vested lands and temporary afforestation for revenue generation.

12.2.5.3 Flood

Flooding is caused by inadequate capacity within the banks of the river to contain the high flow brought down from the upper catchments due to heavy rainfall. It is also caused by accumulation of water resulting from heavy spells of rainfall over areas which have poor drainage characteristics. Major rivers such as Mahanadi, Kathajodi, Birupa, Kuakhai and its tributaries pass through the CDPA planning area.

The various measures adopted for flood mitigation may be categorized into two groups:

- Structural
- Non- structural

The general approach is aimed at preventing floodwaters from reaching the potential damage centers, as a result of which a large number of embankments should be constructed along the various flood prone rivers. The main thrust of the flood protection programme to be undertaken in future in the form of structural measures may be grouped into the following:

- i. Dams and Reservoirs
- ii. Embankments
- iii. Natural detention basin
- iv. Channel improvement
- v. Drainage improvement
- vi. Diversion of floodwaters

The non-structural measures, on the other hand, aiming at modifying the susceptibility to flood damage as included in the plan are:

Modifying the susceptibility to flood damages through:

- Flood plain management.
- Flood proofing including disaster preparedness, and response planning and
- Flood forecasting and Warning.

Some of the suggested broad guidelines for flood mitigation in CDPA region are:

1. Rainwater harvesting is to be made mandatory for all buildings with more than 200 sqm. roof area while awarding sanction of building plan.
2. Storm water harvesting has to be carried out to utilize the excess water through creation of lakes and water bodies that would facilitate irrigation and put less pressure on the drainage systems in post flood situations.
3. Storm water drainage for the city as well as for individual premises must be properly designed.
4. In flood prone areas, buildings should preferably be designed on stilts leaving ground space free of any important activities, with no basement.
5. A regional plan approach is to be followed for evolving the policies in regulating the carrying capacity of the river channels and retention capacity of the river valleys.
6. The vulnerable areas susceptible to annual flooding should be earmarked as the catchment's detention areas. During the off flooding period the stagnant water is to be drained off to the nearby water channels with preliminary treatment.
7. Mapping of yearly flood pattern to be recorded by Irrigation Department.
8. It should be mandatory to submit a proper geotechnical soil report along with structural design for all building proposals for sanction.

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13.1 Introduction

It is an established fact that all plans, however relevant and useful they may be, fall apart if the right kind of organisational arrangement and necessary finances are not put in place for implementation of the plans.

Implementation of Perspective Plan for Cuttack Development Plan Area (CDPA) would entail establishment of new infrastructure and upgradation of existing ones. Projects that include new construction, as well as, major improvement of existing roads and interchanges, installation or replacement of infrastructure (water, sewer, storm drainage, electrical, telephone) networks, re-development of slum areas including construction of large number of residential units for the growing population, provision of new industrial sites, regional and local commercial complexes, transport terminals, entertainment complexes, tourism facilities, provision of open spaces and solid waste management, fire services etc, shall need to be implemented and then managed properly for delivering services to beneficiaries.

The sources of funding available to existing major development agencies such as Cuttack Development Authority (CDA), Cuttack Municipal Corporation (CMC), Choudwar Municipality and the Panchayat Samitis have been looked into and their performances evaluated. The new roles of the urban local bodies in the context of urban governance have also been evaluated.

The details of the existing situations of the various Urban Developmental bodies namely, CDA, CMC, Choudwar Municipality and CDA Rural; their institutional structures along with the financial and functional and legislative structures are in the Status Report.

13.2 Committed Projects and Schemes

13.2.1 UIDSSMT Scheme for Cuttack City

Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT) is funded by the Central and State Govt. for the Cuttack City during 2005-06. It ranges to a period of 7 years. The main objectives of the scheme are:

- Improve infrastructural facilities and help to create durable assets and quality oriented service.
- Enhance public-private partnership in infrastructural development.
- Promote planned integrated development of Cuttack City.

The scheme will be implemented for urban infrastructural development projects and will cover the following areas:

- Re-development of old city roads.
- Water supply and sanitation.
- Sewerage and Solid Waste Management.
- Construction & Improvement of drains.
- Construction/Upgradation of roads & highways.
- Parking lots on public-private partnership basis.
- Development of heritage areas.
- Preservation of water bodies.

The scheme will not be covered for the following items:

- Power and Telecommunication Works.
- Rolling Stock like buses and trains.
- Health and Educational Institutions.
- Urban Transport (MRTS, LRTS, etc.)
- Wage Employment Programme and Staff Component
- Maintenance.

Keeping the above objectives of the scheme in view and after discussion with the different lines Departments of Cuttack City such as CDA, PHED, PWD (R&B), Water Resources Department, the Planning and Development Standing Committee of Cuttack Municipality Corporation recommended a list of projects with an approximate estimated out lay of **Rs.901.56 crores** for sanction under UIDSSMT Scheme for Cuttack City (Table 13.1).

Table 13.1: Projects recommended under UIDSSMT Scheme for Cuttack City

Sl. No	Name of the Project	Name of the Department	Estimated Cost (in crores)
1.	Construction and Improvement of Storm Water Drains (Channel) I & II of Cuttack City	CMC (H&U.D Dept.)	100.00
2.	Improvement of Cuttack City internal roads, construction of sub-ways & flyovers.	Cuttack R & B Division, Works Dept.	100.00
3.	<ul style="list-style-type: none"> • Improvement of existing Ring Road on Mahanadi & Kathajodi embankments. • Extension of Ring Road from Press Chhak to Matagajapur & bridge on Taldanda Main Canal. • Extension of Ring Road on Mahanadi Capital Embankment from Sikharpur to GatiROUTPATANA with bank protection. • Improvement of Taldanda Canal from Jobra to Barabati & Matrubhawan Sluice. • Modernisation of all sluice gates. 	Mahanadi South Division, Cuttack Water Resources Dept.	47.70

Continued...

4.	Improvement of roads in Abhinab Bidanasi, Cuttack	CDA(H&U.D Dept.)	17.06
5.	Construction of Truck Terminus at Jagatpur	CDA(H&U.D Dept.)	14.00
6.	Construction of 1000 DU's for rehabilitation of slum dwellers along the Ring Road (phase I)	CMC (H&U.D Dept.)	12.30
7.	Construction and improvement of internal roads & drains of Ward No: 1,2,41,42,46,47 & 48 of CMC	CMC (H&U.D Dept.)	20.00
8.	Construction of Fly over Bridge from Pravat Cinema Hall to NH-5	CMC (H&U.D Dept.)	100.00
9.	Improvement of water supply system of Cuttack City	Cuttack P.H Div. No.1, H&U.D Dept	282.70
10.	Construction of drainage system of Mahanadi Vihar Area	CMC (H&U.D Dept.)	1.50
11.	Construction of drainage system of Chahata Nagar to Kanika Chhak	CMC (H&U.D Dept.)	2.50
12.	Construction of 1000 DU's for rehabilitation of slum dwellers along the bank of Taldanda Canal (phase II)	CMC (H&U.D Dept.)	15.00
13.	Preservation and development of water bodies of river Mahanadi towards right embankment of the river	CMC (H&U.D Dept.)	25.00
14.	Construction and improvement of all BSWC of Cuttack City	CMC (H&U.D Dept.)	50.00
15.	Development of Heritage Buildings of Cuttack City	CMC (H&U.D Dept.)	5.00
16.	Modernisation of Solid Waste Management System of Cuttack City	CMC (H&U.D Dept.)	108.80
Total			901.56

However, the Government of India, Ministry of Urban Development has released an Additional Central Assistance (ACA) amounting to **Rs.5607.78** lakhs for Urban Infrastructure development under UIDSSMT Scheme for Cuttack City vid the office memorandum dated: 30th March 2007 as shown in the **Table 13.2**.

Table 13.2: Projects approved by Govt. of India under UIDSSMT Scheme for CMC (for the year 2006-07) (costs in lakhs)

Sl. No	Name of the Project	Cost of the project approved by the SLSC	Eligible Additional Central Assistance (Central Share)	First Installment @ 25% of the Central share to be released	Incentive @ 1.5% for DPR Preparation	Total funds (1 st installments+ incentive to be released)
1.	Repair and Renovation of Roads of Cuttack City	5074.12	4059.30	1014.85	76.11	1090.96
2.	Repair and Renovation of Water bodies of Cuttack City	533.66	426.93	106.73	8.00	114.73
Total		5607.78	4487.23	1121.58	84.11	1205.69

13.2.2 Identified development projects translating Perspective Plan VISION 2030 by CDA

A tentative scheme identified for CDA and the concerned Government Departments with reference to the VISION 2030 proposals submitted within the Perspective Plan for BCUC Urban Complex (**Table 13.3**).

Table 13.3: Projects identified to be developed in CDPA Area within 2030

Planning Zone	Name of the Project	Name of the Department
Nirgundi	Shifting of Wholesale activities.	CMC, CDA, Police
	Development of Transportation hub.	State Transport Dept., N.H
	Development of Large scale oil distribution centre.	CDA, Police, IOC
	Transshipment facilities.	CDA, Paradeep Port Trust, Police
Chhatisa	Development of Amusement park & water sport activities.	CDA, Revenue Dept., Tourism & Sports Dept.
Choudwar	Development of Textile Park.	Revenue, Textile Dept., IDCO
	Development of IT Park.	Revenue, Science & Technology Dept., ASI
	Development of Low & Medium scale industries.	Revenue & Industry Dept., IDCO
	Housing including Industrial housing.	Revenue & Industry Dept., IDCO, CDA, OSHB
Nimapur	Large scale housing to accommodate future housing demand.	Revenue Dept., CDA, OSHB, Nationalised & private banks
	Extension of small & medium scale industries in Jagatpur Industrial Area.	Revenue & Industry Dept., IDCO
Bidanasi	Extension of Bidanasi Housing Project, CDA.	Revenue Dept., CDA
	Development of Shopping Mall.	Revenue Dept., CDA
	Development of water sport activities.	Revenue Dept., Tourism & Sports Dept.
	Development of Institutional campuses at Naraj	Revenue Dept., Higher Education
	Development of Housing at Naraj.	Revenue Dept., CDA
	Development of Bus Terminus	Revenue Dept., CDA
Old Cuttack	Shifting of Wholesale activities from Malgoldown and Choudhury Bazaar Area.	Revenue, Works & Finance Dept., CDA, CMC, Police
	Development of fly over from Pravat Cinema to Samrat Cinema	Revenue, Works & Finance Dept., CMC
	Development of slums	Revenue Dept., CMC, OSHB
	Development of Balijatra Ground	Revenue Dept., CMC
	Housing & Recreational Project at Hadiapata	Revenue & Tourism Dept., CDA
Sikharpur	Development of Plotted scheme for housing Project	Revenue Dept., CDA
	Excavation & renovation of Taldanda Canal	Revenue Dept. & Water Resource Dept.
Barang	Development of world class railway station	State Transport Dept., East Coast Railway
	Development of Farm Housing Project	Revenue Dept., CDA
Gopalpur	Development of Institutional Office Complex	Revenue Dept., CDA
	Development of Shopping Malls	Revenue Dept., CDA
	Development of Medical & research centre	Revenue Dept., CDA

13.2.3 Achievements of CDA for the year 2007-08

The Cuttack Development Authority has undertaken development within different planning zones of the CDPA Area. The achievements within the year 2007-08 have been summarized in the **Table 13.4**.

Table 13.4: Projects achieved by CDA within the year 2007-08

Schemes	Name of the Project	Estimated Cost (in crores)
Schemes implemented during 2007-08	Development of Duplex Housing Schemes in Sector-9, Bidanasi over an area of 5.77 acres.	
	Improvement, beautification & development of Biju Pattnaik Park at Sector-12	1.00
	Plotted Development Scheme at Sector-13, Bidanasi	60.86
Achievements in the year 200-08	Plotted Development Scheme at Sector-13	10.03
	Plotted Development Scheme at Sector-6,7,8,9,10 & 11	5.83
	Commercial Plots	9.47
	Shopping Complex	0.57
Total		87.86

13.3 Strategy for Plan Implementation

There are three essential elements in any successful plan implementation strategies, i.e.

- Clearly identified set of projects
- Adequate sources of finances for the required investment
- A flexible, pragmatic and responsive approach to management of development process.

13.3.1 Projectisation and Packaging the Projects

The plan proposals are statements of intention, or at best, a guiding framework which need to be translated into a set of implementable projects. Then the projects shall need to be prioritised, suitably packaged and the phasing of implementation determined.

13.4 Organisational and Institutional Profile

The establishment of appropriate organisational/institutional set up along with procedural layout is as important as finances. The set of organisation/institution would need to work in a coordinated manner so that the proposed initiatives from project conception, formulation, financing, execution and operation and maintenance through the project lives can happen as conceived or visualised.

The concerned agencies in the Cuttack Development Plan Area (CDPA) will be Cuttack Development Authority (CDA), Cuttack Municipal Corporation (CMC), Choudwar Municipality and CDA Rural i.e. Panchayat Samitis.

The necessity on convergence of planning and development initiatives, particularly those identified in the Perspective Plan, is of immense importance. Observations on some of the relevant issues concerning urban management are discussed below.

13.4.1 Inter-Agency Coordination

Coordination among various agencies for providing infrastructure and services in the urban areas requires consideration on priority. Execution has to be done in a planned and coordinated manner. There is an evident need to re-strategise and streamline the responsibility of the functions of the participating agencies. Many programmes have suffered serious setback due to lack of adequate communication, commitment, co-operation and co-ordination between different agencies and department within. Greater participation of the citizen and other stakeholders must generate better partnership. Partnership should go beyond mere participation in emphasising collaborative activities among interested groups, based on mutual recognition of respective strength and weaknesses.

13.4.2 Creation of a Single Coordinated Body (BCUC Metro Authority)

There is no single organisation or body really accountable for entire BCUC area. It is proposed to create a single body, i.e., BCUC Metro Authority encompassing both BDA and CDA areas. The Chief Minister (CM) should play the key role as chairman of the BCUC Metro Authority. The CM should lead the Steering Committee consisting of key ministers, mayors, chairman of the municipalities and other local functionaries.

This authority will need a managing director. Creating a minister of BCUC as well as a separate department should be explored. However this should not create bureaucratic hurdle with farther delays and transaction cost. The key functions such as urban development and housing should be carved out of the respective departments and consolidated under the aegis of the minister for BCUC in addition BDA, CDA and other functional agencies should report to the minister.

13.4.3 Establishment of a Special Purpose Company (SPC) to Implement the Plan

The task being implementation of a dynamic plan, demands a wide range of technical, financial and management skills to be successful, it may be preferable that to establish a Special Purpose Company (SPC) to

implement the plan or to contract out services needed rather than to hire in-house staff.

It could be setting up of a joint venture company between the Government and the Private Entrepreneurs, financial institutions like HUDCO etc, on the basis of equity distribution as may be mutually agreed upon. This could also be a company on the CIDCO model.

In order to expedite development and attract developers, following may be provided:

- i. A bankable risk sharing mechanism
- ii. Mortgage leasehold rights
- iii. Exempt first sale on transfer from payment of Stamp Duty or Registration fees
- iv. Exempt all inputs from sales tax during construction

13.4.4 Involvement of Private Sectors

In addition to all the government agencies, the State's corporates and the private sector will need to play an active role in taking CDPA forward. To begin with, it is recommended that 2-3 Corporate CEOs and heads of NGOs be appointed to the Empowered Committee.

Following areas need immediate private sector involvement for achieving the required momentum:

- i. Advocacy: Seminars and reports on local issues and press conferences to spread awareness.
- ii. Funding: Advertisements (bus shelters, public toilets, roads, street lights and donations or sponsorship for key projects
- iii. Infrastructure creation: Visible business models for roads, parks and gardens, public toilets and slum rehabilitation. .
- iv. Management resources: High caliber management talent on secondment of Government and other non profiting agencies and task forces for specific business related initiatives (eg. Land issues).
- v. Independent project: Venture capital funding and image marketing.

13.5 Urban Governance

Both in India and in Orissa, the Panchayati Raj Institutions [PRIs] and Urban Local Bodies [ULBs] are institutional forms representing decentralised planning, accompanied by the devolution of power and people's participation. The process of building institutions at local level in Orissa attained its peak only after 1985 when the Government decided to revitalise the Local Self Government. The 74th CAA, 1992, of the GOI has imparted constitutional status on the ULBs and has assigned appropriate functions to them. A constitutional basis is given to the

relationship of the ULBs with the state Government with respect to their functions and powers, ensuring timely and regular elections, arrangements for revenue sharing etc. ULBs are given additional powers including preparation of local development plans, programmes for ensuring social justice, and environmental management there by making them more responsive to the local needs. This was the noble attempt to overhaul the Local Self Government and introduce drastic systematic changes in it. The tenure of these bodies are fixed for five years. The Orissa Municipal Corporation Act, 2003 have come into force w.e.f 11.02.2003.

The Proposed CDP should look into:

- i. Redefining the role and responsibilities of BCUC
- ii. The Municipalities and other urban areas must augment their status of Governance and strengthen capacity building.
- iii. It is expected that some of the non-municipal areas will attain municipal status.
- iv. It is further expected that proposed distribution of development will also suggest creation of new municipalities.

The National Action Plan for Good Urban Governance (Government of India & UNCHS) with specific focus on Participatory Planning Process along with strengthening the local bodies have been accepted and adopted by the State Governments. This has been also reflected in their various Legislative efforts.

Salient points have been towards:

- i. Active decentralisation of power.
- ii. Facilitating with more planning and development functions as well as taxing powers.
- iii. Improve Capacity Building of local bodies by introduction of community participation and delivery of public services. Interactive participation of Ward Committees, CDS and HHW is made responsible for infrastructural development at the community level.
- iv. Augment resource base for revenue generation including rationalised fiscal transfer.
- v. Adopting modern financial tools for development functions.
- vi. Change of mindset and public awareness is essential for implementation of Cost Recovery.
- vii. Enhancement of Tax base and improvement of collection of Property Tax and other taxes.
- viii. Thrust and focus on adopting Transformation in Civic engagement.
- ix. Expanded role in capital budgeting and selecting their priority schemes.

- x. The integration of urban local bodies with its own decentralised management through ward committees as well as with the high level District Planning Committees is essential.
- xi. The participation through micro planning process, prioritisation of needs, organising community structure as well as hygiene education program are the essential framework.
- xii. Trans-Municipal Projects, should be centrally examined by the specialised and higher level agencies, who should be entrusted for planning designing etc with active participation, and involvement of concerned ULBs.
- xiii. Training of officials as well as non-officials connected with all agencies and institutions need to be given appropriate training so as to enable them perform the new set of tasks.
- xiv. Augmenting capacity building in collecting base line information, data up dating and compilation in GIS format.
- xv. Municipalisation of urban centers at appropriate time must be organised.
- xvi. Involvement and induction of professionally trained urban planners, engineers and architects must be considered for various institutions as a part of capacity building.
- xvii. All institutions must also be supported by modern communication and information technology.
- xviii. Strong capacity to ensure the delivery of services through a variety of mechanism.
- xix. Adopt appropriate regulatory system.
- xx. Generate strong public trust and public access to information.

13.5.1 Good Governance:

The principals of high impact governance have been distilled to identify the major issues for Bhubaneswar-Cuttack Urban Complex.

- i. Create the right structure
- ii. Make the concerned agencies accountable by instituting target setting, MoUs and monitoring processes
- iii. Streamline key processes
 - Redesigning the Development Control and Building approval process
 - Strengthening internal systems through accounting reforms
- iv. Increasing dialogue with citizens
 - E – governance
 - Citizen involvement in Prioritization of projects at grass root level
 - Strengthening of Grievance Redressal System
- v. Generate momentum through quick wins
- vi. Institute a report card system for all agencies

13.6 Legislation

The evolutionary process of development needs have been reflected in the new legislation and amendments of existing legislation.

The following Acts are in operation:

- i. Orissa Town Planning and Improvement Trust Act, 1956 (Orissa Act 10 of 1957).
- ii. Orissa Development Authority Act, 1982 (Orissa Act 14 of 1982).
- iii. Orissa Development Authority Rules, 1983.
- iv. 73rd & 74 Constitution Amendment Act in 1992.
- v. Orissa Municipal Corporation Act, 2003
- vi. Panchayat Extension to Schedule Areas Act (PESA), 1996
- vii. Orissa Zilla Parishad Act, 1994
- viii. Orissa Gram Panchayat Act
- ix. Cuttack Development Authority (Planning and Building standards) Draft Regulations 2010
- x. Ancient and Historical Monuments and Archaeological Sites and Remains Act (1958) and the Rules of 1959
- xi. Section 4 of the (Water Prevention and Control of Pollution) Amendment Act 1975

The following Rules are in operation:

- i. Orissa Zilla Parishad Rules 2001
- ii. Orissa Zilla Parishad Standing Committee Rules 2002
- iii. Orissa Panchayat Samiti Standing Committee Rules 2002
- iv. Orissa Gram Panchayat Standing Committee Rules 2002
- v. Orissa Gram Panchayat Rules 2002

13.6.1 Orissa Municipal Corporation Act 2003:

The provisions of the Orissa Municipal Corporation Act 2003 define the functions of CMC from 2003, till then Orissa municipal act 1951 is the base for CMC. The Act came into force with effect from February 11, 2003.

- i. Empowers elected persons having special knowledge or experience in municipal administration by assigning them with various functions of the corporation.
- ii. Envisaged democratic decentralisation by devolving powers and functions to the corporation on one hand and introducing decentralized planning on the other.
- iii. Appointment of officers to receive complaints relating to the provision of the various services of the Corporation and to arrive at a settlement by agreement through negotiation by passing award in accordance with the provisions of the Arbitration Land Conciliation Act, 1996.

- iv. New constitutional status of municipal corporations would provide an institutional framework for participatory democracy.

13.6.2 Orissa Development Authority Act, 1982:

The salient features of the Act are:

- i. Extension of the provisions of the Act over the identified area and declaring such area as a development area.
- ii. Constitution of Development Authority.
- iii. Preparation of interim, comprehensive and zonal development plans.
- iv. Publication of development plans for inviting objections and suggestions.
- v. Finalizing the development plan in the light of objections and suggestions.
- vi. Approval of the development plan by the State Government.
- vii. Enforcement of the provisions of the development plan, zoning regulations and planning and building standards by the Development Authorities by way of issuing permissions for construction of buildings.
- viii. Preparation of development schemes and their implementation.

The CDA Planning and Building Standards Regulation 2010 have been largely accepted. However, in view of the recent notification by the Ministry of Housing and Urban Development has accepted the BDA Planning and Building Standards Regulation 2008 which has been prepared after thorough review and analysis. The Town and Country Planning, Govt. of India and its officials were involved in the preparation and finalisation of the regulation. The statutory obligation of people's and stakeholders were also followed. Moreover, the consultants of IIT Kharagpur were also involved in reviewing the same.

Since, this is part of the same planning area are geographically contiguous, it is proposed that the some of the regulations be accepted for the CDPA with such modifications as important have been suggested by the consultants of IIT Kharagpur.

13.7 Land Use Policy

Adhering to the requirements of environment the current thinking is in favor of flexible land use, which reaps the synergies between workplace, residence and transportation as well as also between complementary vocations. Ideally land use should be responsive to the dynamics of market. The proposed Perspective Plan of BCUC has indicated the land use pattern to accommodate the dynamic growth of the planning area using land efficiently in a planned manner, fulfilling the conservation obligation.

13.7.1 Development Zones and Use Criteria

Four types of development zones have been identified for the preparation of Perspective Plan for BCUC (**Map 13.1**):

- i. **Extensive development Zone:** It will be encouraged in low density areas and where there is a potential for growth. Availability of land and good connectivity will be the major deciding factors for extensive development. This may require some land acquisition, land pooling or land transfer. The Special Economic Zones for attracting national and international investment will be also included in this category.
- ii. **Intensive development Zone:** It will be mainly in the form of strengthening the existing infrastructure through modernisation and diversification. The stress will be on providing connectivity and distribution of existing activities in medium to high-density zones. Revival and reuse will be encouraged to ensure effective utilisation of land.
- iii. **Restricted Development Zone:** These areas include rich cultural heritage zones, monuments, religious spots and high density old urban areas and area under defense. Development will be highly restricted with low density to facilitate the character of the zone.
- iv. **Sensitive Development Zone:** These areas include land with difficult topography that cannot accommodate conventional development like low lying flood prone areas existing agricultural land, tribal settlements and forest areas. **Sensitive development** like botanical and zoological garden, water retention basins, cottage industries with related training facilities will be encouraged here.

13.8 Development Promotion Regulation

The contents or proposals of the Comprehensive Development Plan outlining the development of various areas suggested through Land Use Zoning or Development Promotion Guidelines serves as legal instrument for planning and execution.

Perspective Plan primarily being a policy document did not attempt to show very many details of land use and adopt a very simplified main use. On the basis of the Urban Development Plans Formulations and Implementation (UDPFI) Guidelines, 1996 of the Ministry of Urban Development suggested simplified Development Control Rules for the

different Land Uses, an exhaustive list of activities / use premises has been prepared.

It may be noted, while adopting the land use classification, we reviewed the three major norms i.e.

1. BDA guidelines adopted for Comprehensive Development Plan for Bhubaneswar Development Authority (Planning and Building Standards) Regulations-2008
2. Cuttack Development Authority (Planning and Building Standards) Regulations-2010
3. Urban Development Plans Formulation and Implementation (UDPFI) guidelines

After review and evaluation of the 3 sets of norms, it has been decided to adopt BDA regulation and UDPFI with minor changes in the classification.

Residential Use Zone, Retail Commercial and Business Use Zone, Wholesale Commercial Use Zone, Industrial Use Zone, Public and Semi-public Use Zone, Utilities and Services Use Zone, Recreational Use Zone, Transportation Use Zone, Agriculture and Forest Use Zone and Water Bodies Use Zone have been retained as it is.

Special Area Use zone has been re-grouped as

- a) Environmentally Sensitive Use Zone
- b) Special Heritage Use Zone

Environmentally sensitive river front areas, forest areas, marshy areas etc. as Environmentally Sensitive Use and old built up areas, scenic value, archaeological sites, etc as Special Heritage Use.

Following deviation may be noted from the CDA Planning and Building Standards Regulation of 2010:

- a) Two new use zones have been created as Special Heritage Use Zone, primarily to identify heritage zone, archaeological sites and special functions and Environmentally Sensitive Use Zone to identify river front areas, forest areas, and marshy areas.
- b) Special Development and Urban design guidelines have been suggested for specified river front areas.

Perspective plan refers to level-1 classification of land use. List of Activities for each land use at two levels is as follows:

Table 13.5: List of Uses, Activities, Use Premises Areas in CDPA

Sl. No.	AN	Land Use (Level – I)	Land Use (Level – II)
1.	R	Residential Use	Primary Residential
			Mixed Residential
			Unplanned / Informal Residential
2.	C-1	Retail Commercial and Business Use	Retail Shopping
			General Business and Commercial District/Centers
3.	C-2	Wholesale Commercial Use	Wholesale, Godown, Warehousing, Storage
4.	I	Industrial Use	Services and Light Industry
			Extensive and Heavy Industry
			Special industrial Zones(Hazardous, Noxious and Chemical)
5.	PS	Public Semi – Public use	Govt/Semi-Govt/Public Offices
			Institutional (Educational / Research / Medical /Social and Cultural/Religious)
6.	US	Utilities and Services use	Water Supply/Sewerage/Drainage/Solid Waste
			Power, Transmission and Communication
			Cremation and Burial Ground
7.	P	Recreational Use	Playgrounds/Stadium/Sports Complex
			Parks and Gardens
			Special Recreational Zone (Restricted Open Spaces/ Green Buffer)
			Multipurpose open space (Maidan)
8.	T	Transportation Use	Roads
			Railways (terminal /Circulation)
			Airport
			Bus Depot/ Terminal, Truck Terminals and Freight
9.	A	Agriculture and Forest	Agriculture and Horticulture
			Forest
			Brick Kiln and Extractive Areas
10.	W	Water Bodies Use	River, Canal, Streams, Spring
			Ponds, Lakes, Wetland, Aquacultural Pond Reservoir
			Embankments
11.	SH	Special Heritage Use	Old built-up core area
			Heritage and Conservation Areas
			Other uses
12.	ES	Environmentally Sensitive Use	River front developments
			Scenic Value Areas

13.9 Financing Urban Development

The question more often asked by the Development Authorities is not what needs to be done for a planning area but how the huge investment will be funded. Financing urban development in a sustained manner requires looking at two major aspects of financing, viz. capital finances and revenue finances. Capital financing that usually figures in the current account of development budget pertains to development of urban infrastructure comprising civic services (utility) infrastructure, social infrastructure and economic or commercial infrastructure. For achieving this, it would be imperative to mobilise adequate resources.

Traditionally they have been funded through budgetary support of Central, State Government and local bodies through five-year plans and the annual plans. These resources have in some cases been supplemented by assistance from sources such as World Bank, multilateral agencies such as ADB, JBIC, CFIC, USAID, DFID and UNICEF etc as partly grants and partly as loans. The domestic financial institutions like HUDCO, HDFC and NHB have also provided financial assistance for urban infrastructure development projects. ICICI, IDBI, UTI and commercial banks have also made forays into the sector with their urban infrastructure portfolios. However, with the process of economic liberalisation being in practice throughout the country, the public sector resources are becoming increasingly scarce.

On the other hand, domestic financial institutions lay emphasis on financial viability of projects, which is hardly possible for most of the basic services infrastructure projects to match. Assistance from international donor agencies is also appearing hard to come by. In this context, exploring alternative sources of financing capital investment is the major option left.

13.9.1 Innovative Options for Resource Mobilisation

Infrastructure financing requires long-term lending, whereas the normal borrowing in the Indian capital and debt market is short-term only. Financial Institution would need a mix of resources and balanced combination of lending portfolio constituting both long and short-term fund. Some of such suggested mechanism is listed below.

- i. Consortium Finances
- ii. Development Authority Bond or Municipal Bond
- iii. Project Initialisation Fund / Project Development Fund
- iv. Foreign Direct Investment
- v. Leveraging Insurance Sector Funds
- vi. Special Economic Zone

Some of the areas could be brought under Special Economic Zone (SEZ)

as duty free zones for industrial, services and trade operations to attract foreign investment and facilitate expeditious development. They will be treated as priority areas in the provision of infrastructure, convergence in statutory clearance, exemption from duties and levies as well as liberal regulations.

- vii. Public Private Partnership
- viii. BCUC Capital Infrastructure Fund

It is proposed to create a dedicated BCUC capital infrastructure fund with an annual funding of Rs.1000 crores to attract debt and private finance. This could mobilise about Rs.20,000 crores during next 20 yrs.

13.9.2 Revenue Financing Options

Capital investments on infrastructure entail expenditure on recurrent basis for proper operation and maintenance, without which delivery of services would not happen as expected and the same would frustrate the very objectives of capital investment programmes carried out. Any capital investment expenditure calls for meeting, on recurrent basis, the requirement of funds for debt servicing, operation and maintenance and capital replacement reserve. Some of the innovative instruments are:

a) Water Supply

- Advance registration fees.
- Enhancement of water tariff and metering
- Connection charges
- Water tax
- Development Charges
- Other sources such as property tax,
- Sale of plots etc.

b) Sewerage

- Connection charges
- Sewerage Tax
- Conservancy tax
- Sale of sludge
- Sale of renewable waste
- Fines for untreated effluent disposal

c) Solid Waste Management

- Collection charge
- Cess
- Sale of renewable waste
- Fines on Dumping waste

d) Roads

- Toll tax

- Advertising rights
- Cess on diesel and petrol
- Land as a resource

e) Airport/ Railway Station / Bus Terminus

- Toll tax
- User charges for transport terminals
- Advertising rights
- Land as resources
- Surcharge on tickets

g) Property tax reforms

One area that needs adequate attention is the collection of property tax on which count most of the municipalities in the state have performed poorly. Property tax is the single largest source of revenue and is an indirect user charge for municipal services whose benefits are collective and are not confined to any identified individual. Reform in property tax is necessary to for promoting efficiency through linking of provision of municipal services closely to their financing. Some recommended Property tax reforms are (i) simplification of tax laws (ii) coverage of tax net (iii) valuation accuracy (iv) collection efficiency (v) rate setting (vi) administrative incentives and (vi) policy and institutional reforms. Steps should be taken for transparent assessment of properties (unit area method), increased coverage by property mapping using GIS applications and rationalisation of self-assessment system. Every property in the city must be given a Property Tax Index Number (PTIN) whereby the payment, the changes and nature of use of the property can be done through computer and e-seva centre.

13.9.3 Non-Tax Revenue Generation through Commercial Development of Properties

- Build and lease
- Sell land for private development
- Public-private joint development

13.9.4 Non Tax Revenue Generation through Innovative Land Planning and Development Control Regulation

- Creation of Special Development Districts (SDD) to make major investment in infrastructure and services and formulate different Development Control Regulations.

- Imposition of Development Impact Fees in the SDD, the designation of district zones with differing built form parameter is assumed.
- Utilisation of Transfer of Development Right (TDR) enabling flexible development control and permitting trade for there lost FSI.
- Imposition of User Charges i.e., cost recovery through direct charges to beneficiaries.

14.1 Introduction

The Comprehensive Development Plan provides strategic framework for land use planning in the Cuttack Development Plan Area (CDPA), for shaping its future towards Vision-2030. It sets out the spatial strategy for 11 planning sub-zones as identified in the Perspective Plan to address the different needs of each area. The priority set out for each planning zone is based on and supported by the policies in this plan. The common aim is to actively manage changes within CDPA limit to deliver a better quality of life and environment.

14.2 Land Use Strategy

Proposed land uses have been systematically perceived based on the detailed analysis of the following factors;

- a. Existing land use distribution
- b. Landform characteristics
- c. Soil type
- d. Vegetation index
- e. Ground water prospect
- f. Drainage channel levels
- g. Transportation network
- h. Physical problems of each zone
- i. Land Ownership
- j. Perspective Plan Guidelines
- k. Government Policies and programs including committed scheme and proposals
- l. Future population distribution
- m. Development potentials of each zone

14.3 The Proposed Plan

The land use proposal assumed that all the planning zones will be self sufficient with all social and physical infrastructural facilities to serve the future population.

14.3.1 Hubs of Specialised Activities

To promote a balanced and integrated growth, the entire CDPA has been divided into 3 portions:

- The Northern Fringe,
- The Central Millennium City, and
- The Southern Fringe.

The allocation of activities in space has led to the concept of specialised activity '**Hubs**' in the various zones, after quantum analysis of the existing and proposed land uses.

The different '**Hubs**' are spread out throughout the CDPA and they are representative of the specialised activities with respect to CDPA as well as the BCUC region.

The Northern Fringe

The Northern Fringe constitutes of the five planning zones on the North of Mahanadi namely,

Nirgundi, Charbatia, Chhatisa, Choudwar and Nimapur.

Together, these five zones function as the '**Industrial Hub**' of the entire CDPA due to the presence of industries and availability of suitable land in contiguity to form the Industrial Complex.

Nirgundi zone, has been proposed as the '**Transportation and Commercial Hub**', due to its regional connectivity through the major road and rail linkages, and the quantum distribution of commercial activities in this zone. This zone has also been proposed as the '**Institutional Hub**' of the Northern Fringe due to the allocation of land for specialised institutions such as engineering/ medical colleges and management institutes in this zone.

The zones of **Charbatia and Choudwar** together contribute to the '**Heritage and Socio-cultural Hub**' of the Northern Fringe. Choudwar also functions as the '**Administrative Hub**' of the Northern Fringe and will continue to do so during the plan period.

Nimapur will function as a '**Residential Hub**' due to the large scale housing proposed in this zone to accommodate the spill-over population of Cuttack.

Agro-based Activities, as well as Recreational Activities, namely floriculture, pisciculture, apiculture, etc. as well as amusement parks, have been proposed at **Chhatisa** to specialise as the '**Recreational Hub**' of the Northern Fringe.

The Central Millennium City

The Central Millennium City comprises of the three planning zones of Bidanasi, Old Cuttack, and Sikharpur.

The zone of **Bidanasi** has been planned as a satellite township to cater to the housing requirements of the 'Central Millennium City' and hence is an exclusive '**Residential Hub**'.

The **Old Cuttack** zone is multifarious activity centre and has been functioning as an '**Administrative and Institutional Hub**'. Various State Government offices such as Directorate of Industries, Police

Headquarters, the Judiciary Complex, etc. and prestigious institutions of the CDPA, such as the Ravenshaw University, SCB Medical College and Hospital, Bose Engineering School, etc are all concentrated in this zone. The **Old Cuttack** zone also functions as the '**Heritage and Socio-cultural Hub**' due to the conglomeration of various sites and structures having historical and socio-cultural importance such as the Barabati Fort, Barabati Stadium, the proposed 'Barabati Haat', Balijatra ground, etc.

The **Sikharpur** zone has been proposed for the relocation of the wholesale commerce from the Old Cuttack zone and hence, in future, will function as the '**Commercial Hub**' of the Central Millennium City.

The riverfront areas of the Old Cuttack Zone and Bidanasi zone have been proposed with various recreational activities such as boating, cruises, angling clubs, theme parks, fair and festival grounds and hence contribute to the '**Recreational Hub**' of the 'Central Millennium City'.

The Southern Fringe

The planning zones of Mundali, Barang and Gopalpur constitute the Southern Fringe of the CDPA. These areas are proposed for new development.

Barang, being centrally located with availability of vacant land most of the activities have been proposed in this zone. Barang has been envisaged as an '**Administrative, Commercial and Industrial Hub**' of the Southern Fringe. It will also function as an '**Institutional Hub**' as maximum numbers of institutions are proposed in this zone.

Gopalpur, on the other hand, will function as the '**Residential and Cultural Hub**' with allocation of substantial amount of land for residential activities and the proposed 'Kataka Kala Kosh' – the cultural hub in this zone.

Mundali, on the contrary, is an eco-sensitive area, endowed with natural beauty in varied forms such as the riverfront on one side and small hillocks on the other, and therefore has been proposed as the '**Recreational Hub**' of the Southern Fringe as well as the CDPA on the whole.

Thus, all the three portions of the CDPA have been conceived as independent, self-sufficient and symbiotic urban units, assuming various roles by virtue of their inherent and proposed functions, thereby contributing to the holistic growth and development of the entire BCUC region as a whole. **(Map 14.1 and Table 14.1)**

Table 14.1: Hubs of Specialised Activities

Sl. No.	Classification of Hubs	Northern Fringe Zones	Central zones	Southern Fringe Zones
1	Administrative Hubs	Choudwar	Old Cuttack	Barang
2	Residential Hubs	Nimapur	Bidanasi	Gopalpur
3	Institutional Hubs	Nirgundi	Old Cuttack	Barang
4	Commercial Hubs	Nirgundi	Sikharpur	Barang
5	Industrial Hubs	Charbatia, Choudwar, Chhatisa, Nirgundi, Nimapur	-	Barang
6	Transportation Hubs	Nirgundi	-	-
7	Heritage and Socio-Cultural Hubs	Charbatia, Choudwar	Old Cuttack	Gopalpur
8	Recreational Hubs	Chhatisa	Old Cuttack, Bidanasi	Mundali

14.3.2 The Spatial Structure

It has been observed that while analyzing the innumerable complex variables involved in the dynamic process of urban development, a unique and interesting phenomenon has evolved which has been pragmatically and physically interpreted while allocating the different land uses in the various zones.

The 10 different use areas have been identified formulating the future spatial structures with concentration of urban activities. These have been originated from a logical reference to the various use areas and can be termed as follows:

1. Public/semi-public Areas
2. Residential Areas
3. Institutional Areas
4. Commercial Areas
5. Industrial Areas
6. Transportation Areas
7. Special Heritage Areas
8. Recreational Areas
9. Environmentally Sensitive Areas
10. Riverfront Areas

The detailed description of the proposed spatial structure is mentioned below:

1. Public/ semi-public Areas

Public/semi-public uses have been planned for each of the northern, central and southern portions of the CDPA area. Choudwar zone acts as the public/semi-public area of the northern portion of the CDPA areas. The Old Cuttack zone is one of the major public/semi-public area of the entire CDPA region due to the location of major important activities such

as, the various state government departments, the police head quarters, the CMC, the Judiciary Complex, etc. The Barang zone has also been proposed as the public/semi-public use for the newly developing southern portion and of the CDPA.

2. Residential Areas

The residential areas have been allocated keeping the overall proposed activities in perspective. The zones of Nirgundi, Choudwar and Chhatisa have been identified and earmarked for industrial housing. The zone of Nimapur also comprises of industrial housing and new housing areas for spill over population of Cuttack.

Substantial quantum of land has also been identified for high end housing, high rise group housing and club town/resort housing in the newly developing zones of Barang, Gopalpur and Mundali, respectively.

Special Housing Zones (SHZ) for re-habilitation of the slum population have been planned along the Sikharpur zone. Special Residential Zone (SRZ) for high rise group housing along with affordable housing has been proposed in the Bidanasi zone.

3. Institutional Areas

The distribution of institutional areas have been conceptualised within the Barang zone, especially where land allocation has been made for varied institutions such as State Government office complexes, education and health complex, and theological institutions.

The Old Cuttack zone is primarily an institutional area having the Barabati Fort, Cantonment, Judiciary Complex, Ravenshaw University, etc. has been earmarked as a special institutional heritage area.

Institutional activities have also been proposed in Mundali, Sikharpur, Bidanasi, Nimapur and Nirgundi planning zones of the CDPA.

4. Commercial Areas

Commercial areas have developed along the major linear mass transit corridors, national highways, state highways and ring roads in the newly developing zones such as, Barang, Gopalpur, Nirgundi, Nimapur and Chhatisa. Wholesale commerce has been planned in the Sikharpur zone of CDPA.

5. Industrial Areas

The concentration of industrial activities is mainly in the original industrial areas of Charbatia, Choudwar and Nimapur and the newly developing adjacent zone of Chhatisa.

IT SEZ has also been proposed in the newly developing Barang zone along the MRTS.

6. Transportation Areas

The transportation corridors like the roadways, railways and the proposed MRTS constitute the major transportation areas in the CDPA. Nirgundi zone acts as a major transportation area of CDPA due to the proposed location of the logistic hub by virtue of its connectivity with eastern and the western by-pass, east coast railways and NH-5.

7. Special Heritage Areas

The CDPA is well known for its natural, built and cultural heritage. Some of the areas under the Old Cuttack zone have been earmarked as special areas which mainly comprise of the institutional heritage areas. Similarly, large chunks under Choudwar and Charbatia zones have also been identified as special areas, as reserved by the ASI.

8. Recreational Areas

The entire area of CDPA is gifted with tremendous natural resources in the form of rivers like Mahanadi, Kathajodi, Birupa and Kuakhai, as well as, zones with dense vegetation/forest such as Mundali.

The recreational area of the CDPA comprises of the playgrounds, stadia, sports complexes, parks/gardens at the city/neighbourhood level, multi-use open spaces, fair and festival grounds distributed throughout the various zones in the CDPA. Botanical gardens/ deer parks, bird sanctuaries, golf clubs, yoga clubs, picnic huts, theme parks, lagoon resorts, weekend resorts, spa resorts, etc. as proposed mostly in the Mundali zone are a part of the Recreational area of the CDPA.

9. Environmentally Sensitive Areas

Environmentally Sensitive Areas such as Chhatisa and Mundali where floriculture, pisciculture, apiculture, arboriculture, etc. have been proposed are a concentration of this use. Water bodies/ ponds/ lakes, canals and major drainage channels, areas between river bund and river water are also part of the Environmentally Sensitive Area.

10. Riverfront Areas

The entire riverfront area of the two main rivers Mahanadi and Kathajodi along with their tributaries Birupa and Kuakhai are included in this category. Certain stretches of Mahanadi and Kathajodi have been proposed for city level activities such as theme parks – ‘Barabati Haat’, ‘Utkal Ratna Bhumi’, open fair and festival grounds – ‘Balijatra’ ground, Choudwar park, etc. Many specialised activities such as the SAI Complex, the Cultural Hub, high-end commercial activities in the form of star hotels, restaurants, entertainment plazas, etc. have also been proposed along the riverfront (**Map 14.14**). Besides this, immersion

ghats, neighbourhood parks, plantations, green buffers have also been planned along the riverfront.

Special development regulations are to be framed to control the land uses along the riverfront and save the riverfront from unwanted development. Special urban design guidelines are suggested to be framed to control the heights, forms, facades, architectural styles, colour, textures, streetscape, signage, landscaping or plantations, etc. to enhance the quality and the beauty of the riverfront area.

Certain stretches where specialized activities have been proposed in this use area, as per the CDP need to be delineated as special areas in order to enhance the scenic, heritage, cultural and commercial value of the riverfront.

Thus, the riverfront area essentially requires a special emphasis and a '**River front Development Plan**' needs to be prepared separately in order to control the growth and development along with specific development and control guidelines which will help conserve this natural asset that renders a unique identity to the CDPA.

The classification of the various use areas throughout the CDPA has been shown in the following **Table 14.2**.

Table 14.2: Classification of various Use Areas

Sl. No.	Classification of Use Areas	Zones
1	Public/ Semi-public Areas	Choudwar, Old Cuttack and Barang
2	Residential Areas	Nirgundi, Choudwar, Chhatisa, Nimapur, Bidanasi, Sikharpur, Barang, Gopalpur and Mundali
3	Institutional Areas	Barang, Old Cuttack, Mundali, Sikharpur, Bidanasi, Nimapur and Nirgundi
4	Commercial Areas	Barang, Gopalpur, Nirgundi, Nimapur, Chhatisa and Sikharpur
5	Industrial Areas	Chhatisa, Charbatia, Choudwar, Nimapur and Barang.
6	Transportation Areas	Nirgundi
7	Special Areas	Old Cuttack, Choudwar and Charbatia
8	Recreational Areas	Old Cuttack, Bidanasi, Choudwar, Mundali, Chhatisa
9	Eco-sensitive Areas	Chhatisa and Mundali.
10	Riverfront Areas	Riverfront areas of Mahanadi, Kathajodi, Birupa and Kuakhai.

It is important to remember that the future spatial structure recommended here can be achieved, as visualised and realised through the combined effort of the public authority as well as the private sector individuals. Therefore efforts are made through this CDP for the CDPA to;

- i. Indicate the needed direction of development in different parts of the CDPA in context of the BCUC region.
- ii. Indicate future areas of employment, housing, heritage and recreation.

- iii. Indicate the pattern of the spatial structure plan and to realise the vision for Cuttack as a world class cultural and commercial center of the eastern region through innumerable concepts proposed throughout the various planning zones of CDPA.
- iv. Indicate the areas of investments and also the heritage and cultural values, thereby making CDPA a complete package of varied kind of investments within the various planning zones.
- v. Envisage an overall balanced & integrated development making CDPA an integral part of the entire BCUC State Capital Region.

14.4 Future Land Use Proposals

The future land use proposals is mainly based on existing land use characteristics, and availability of large chunks of government land, uninterrupted vacant land and land forms. The proposed land uses are shown in **Map 14.2**. Zone wise Land Use distribution is given in **Map 14.3** to **14.13** and **Table 14.3** and **Fig 14.1**

Nirgundi (Zone No. 1) (Map 14.3)

The Nirgundi zone has been proposed for extensive development zone due to the availability of uninterrupted vacant land and its regional connectivity with the major transportation linkages such as the western and the eastern bypass, NH 5 and the east coast railways. Hence, Nirgundi has been planned as an ideal location for the Logistic Hub. Major industries such as, processing and packaging industries, oil depots, hazardous industries and other ancillary downstream industries constitute to the industrial land use of Nirgundi. Hotels, lodges etc. contribute to the commercial land use. Institutional areas have also been earmarked for technical and specialised institutions such as engineering and medical colleges, management and hotel management institutes. Industrial housing along with Special Residential Zone (SRZ) comprising of affordable and group housing comprehend the residential land use in this area.

Charbatia (Zone No. 2) (Map 14.4)

Charbatia zone has been proposed for restricted development due to the distinct characteristics of the existing land use. A large chunk of land within Charbatia zone lies under the Aviation Research Centre (ARC), on one hand and the ASI on the other due to the location of Charbatia Fort and the Astha Sambhu temples. This imposes a lot of restrictions on the allotment of land uses within this zone.

So mainly open space related activities such as archaeological parks, OAT, fair and festival grounds and temporal display and sales counter for

local art and craft are proposed around the Choudwar Fort. Conservation of water bodies with landscaped gardens has also been proposed around the fort and the temples belonging to the Astha Shambhu circuit.

Around ARC, institutional land use, housing and police academy has been proposed with the considerations to the security aspects of this area.

Chhatisa (Zone No. 3) (Map 14.5)

Since most of the land under Chhatisa zone is low lying and swampy, an eco-sensitive and eco-friendly development has been proposed in this zone. Water-based recreational activities such as lakes/lagoons, amusement parks are proposed only after the delineation of the existing drainage channels. Floriculture, pisciculture, herbal gardens etc. have been proposed as a measure to promote the agro-economy of the zone along with institutions for the same.

The SEZ comprising of the textile hub, building industry with industrial housing and the IT SEZ on the periphery also forms a part land use of Chhatisa in continuation with the adjoining zone. Commercial activities have also been proposed along the NH 42 in this zone.

Choudwar (Zone No. 4) (Map 14.6)

Although some part of the land in Choudwar lies under ASI, quite a considerable amount of land is developable for various activities such as housing, industry, commercial, recreational, etc. The SAI Complex has been proposed along the tip of land mass facing Mahanadi complemented by a high end recreational and commercial land use along the river front of Mahanadi. Choudwar zone being very much a part of the urban area, an urban plaza, intra-city bus stand, city park and housing are all a part of proposed activities in Choudwar. Institutional land use at Choudwar comprises mainly of the Tribal and folk art development centre. The industrial activities includes the textile hub along with modernized textile weaving and handicraft training and display centres and building industries with mason training centres, brick manufacturing, silicate and ceramic and glass industries. A bio-park is also proposed in this zone adjoining the industries. This industrial development has been proposed in Choudwar after analyzing the existing industries, local trends and its suitability for specific industrial activities on the river bank, an international sports complex has been proposed for various national and international sports meets.

Nimapur (Zone No. 5) (Map 14.7)

Nimapur zone is essentially a peri-urban area with lot of industrial activities and developable land. It has therefore been planned keeping

abreast the existing land use to develop this area for medium and low rise housing to cater to the spill over of Cuttack. A substantial amount of commercial and public/semi-public activities have also been proposed along the NH 5 and the state highway. Vocational and training institutes have been proposed along the river front with recreational green buffer and plantations.

Bidanasi (Zone No. 6) (Map 14.8)

Bidanasi zone has been identified for extensive development as special residential zone for group housing, composite housing, and plotted development with provision of neighbourhood level community facilities. Development of health and education related institutional and public/semi-public activities have also been suggested in this zone.

Theme parks such as “Utkal Ratna Bhumi”, water based sports activities like boating, angling clubs etc. complemented by commercial activities like hotels, malls, etc. contribute to the river front recreation at Bidanasi along the Mahanadi. Promenades, jogging tracks, plantations and neighbourhood parks area proposed along the river front of Kathajodi. Viewing towers and recreational parks along the Naraj barrage is also a part of proposed recreational activities in the Bidanasi zone.

Relocation of the bus terminus from Badambadi to Bidanasi along the ring road to improvise the east-west connectivity is also proposed in this zone.

Old Cuttack (Zone No. 7) (Map 14.9)

Old Cuttack is the traditional age old “millennium city” abundant with built, cultural and natural heritage which truly needs to be conserved. Hence, those areas which consist of an agglomeration of built heritage have been earmarked as special areas which include the Barabati Fort Complex, Cantonment Road and Judiciary Complex. Other important historical areas have also been identified for conservation of the built heritage. The river front area along the Mahanadi near the Balijatra Fair Ground has been planned as a fair and festival ground and a place for city level recreation with display kiosks of the traditional art of filigree, beautifully landscaped plazas, vending zones, boat cruises and water sport activities, in the form of Barabati Haat (similar to ‘Delhi Haat’). An urban parkway system has been planned along the Taldanda Canal making it navigable. Urban renewal programmes for the community of the filigree workers with proposal for work-cum-living centres and training institute has also been proposed in the city in close proximity to the display areas of Barabati Haat. A heritage park depicting the growth of Cuttack along with the Netaji Birth Place Museum has been proposed near the Ganga Mandir tank. It has been planned to maintain all the open

spaces as parks/play grounds etc. in order to provide certain lung spaces within the city. Relocation of the wholesale hub to Sikharpur zone and the bus terminal to Bidanasi has been proposed to decongest the area. Existing wholesale area can function as public/ semi-public retail commercial/mixed land use. Bus stand at Badambadi can function as city level bus stand. Conservation of major water bodies has been proposed to act as retention basins, in order to prevent water logging during monsoons. Rehabilitation of slum dwellers along Taldanda Canal has been proposed towards Sikharpur zone.

The existing commercial development and transformation of the same is acceptable but no further commerce will be encouraged within the city. It has been proposed to augment the basic social infrastructural facilities within the existing neighbourhoods in order to promote balanced and integrated growth in this zone.

Sikharpur (Zone No.8) (Map 14.10)

Sikharpur zone consists of large amount of a vacant land for new activities like commerce, housing, institutional, etc. The connectivity of this zone with the eastern bypass and the Cuttack-Paradeep rail line makes this zone an ideal location for relocation of the wholesale hub from the Malgodown area of Old Cuttack. Institutional land uses are planned in continuity with the existing institutions like CRR. Special Housing Zones for slum rehabilitation, plotted housing have also been proposed in this zone. Plantations and ghats and parks along the river front have been planned to maintain the green belt all along the Mahanadi and Kathajodi.

Mundali (Zone No.9) (Map 14.11)

Mundali has been identified as a Sensitive Development Zone due to its proximity to Kathajodi river front on one side and the Chandaka reserve forest on the other. The landscape of this zone constitutes the original Puri Canal on one side with vast stretches of agricultural fields and small hillocks on the other. This zone is susceptible to constant flooding due to lack of embankments along the Puri Canal and the river front, hence making it eco-sensitive. Provision of embankments and extension of ring roads has been proposed to protect this area from calamities and save the agricultural produce. The unique landscape of this zone makes suitable for as an exclusive recreational hub with water theme parks, lagoon resorts, spa resorts, energy parks, club towns, golf clubs, picnic spots, weekend resorts, etc.

Arboriculture has also been proposed to elevate the agro-economy of this zone. Institutional activities such as DRDO etc. have been proposed in continuity with the existing institutional land use.

Barang (Zone No. 10) (Map 14.12)

Barang is an important zone for locating all important institutional, commercial, administrative, residential functions essential for the development of the CDPA due to its availability of vast vacant developable land. Hence, this zone has been conceptualized as a high end activity zone with the BID, SGOC, IT SEZ, urban plazas, shopping malls, high end commerce and educational and health complexes, high end housing, condominiums, etc. constitute to the major land use of this zone. Theological institutional areas such as Sri Sri Ravi Shankar University have been planned on one side of Barang along with yoga centres, natural therapy centres and gatherings along the river front acting as buffers. Riverfront recreation in the form of commercial parks, etc. is proposed. A Science and Technology Entrepreneurs Park has also been planned in this zone as a part of river front recreational land use.

Thus, an attempt has been made to maintain the high end character along the MRTS in continuity with the Chandrasekharapur zone of the BDPA area. This also calls for relocation of certain village settlements in the near-by residential areas.

Gopalpur (Zone No. 11) (Map 14.13)

Gopalpur zone is placed along the NH 5 in continuation with the East Kuakhai of the BDPA area.

Since a sizeable amount of development has already been taken place along the NH 5, the planning proposal is keeping abreast the existing land use of the zone. High rise group housing, institutional and commercial and mixed land use activities are proposed along this zone. A peninsular tip of unique land mass has been identified for location of the cultural hub constituting the Kataka Kala Kosh- a centre for performing arts/ craft/ culture, media complexes, convention centres, complemented with high end commerce-hotels, malls, multiplexes and riverside recreation. Therefore, making it as the cultural hub of CDPA, it has been proposed to relocate some of the village settlements in the near-by residential areas.

Some recreational activity has also been planned around the Jain museum complex with parks, water sports activities like boating, angling clubs, etc. near Pratapnagari and in continuity with the Sribantapur zone of the BDPA.

14.4.1 Summary of Proposed Land Use Distribution

A study of spatial distribution of the proposed Comprehensive Development Plan reveals Special Heritage and Environmentally Sensitive use in various zones. However, the proposed aggregate land use distribution of CDPA shows Residential land use as 24.94%, Retail Commercial, Business and Wholesale Commercial land use as 4.37%, Industrial land use as 5.47%, Public and Semi-Public land use as 10.63%, Utilities and Services land use as 1.09%, Recreational land use as 4.78%, Transportation land use as 11.59%, Agriculture and Forest land use as 3.63%, Water Bodies use as 27.77%, Special Heritage use as 2.13% and Environmentally Sensitive use as 3.62% of the total 302.17 sq. km of land area of CDPA as shown in **Table 14.4**.

Table 14.4: Comparison of Existing and Proposed Land uses for Major Categories of CDPA

Sl. No.	Use	Existing Land Use (%) in CDPA	Proposed Land Use(%) in CDPA	
			Area (in Ha)	Area (in%)
1.	Residential Use	9.89	7535.18	24.94
2.	Retail Commercial and Business	0.85	1014.98	3.36
3.	Wholesale Commercial Use		305.48	1.01
3.	Industrial Use	0.78	1652.31	5.47
4.	Public and Semi-Public Use	3.15	3210.63	10.63
5.	Utilities and Services Use	0.46	327.89	1.09
6.	Recreational Use	0.54	1442.95	4.78
7.	Transportation Use	2.77	3502.71	11.59
8.	Agriculture and Forest Use	39.31	1096.19	3.63
9.	Water bodies Use	13.23	8391.43	27.77
10.	Special Heritage Use	NA	642.53	2.13
11.	Environmentally Sensitive Use	NA	1095.06	3.62
CDPA			30217.34	100.00

Table 14.4 shows a comparison of the some of the major categories of land uses in the existing and the proposed Land Use plans of CDPA. It is observed that there has been a significant rise of area allocations for all the major land uses as per the future land use proposal.

14.5 Zoning Regulations

Introduction

In order to promote public health, safety and the general social welfare of the community, it is necessary to apply reasonable limitation on the use of land and buildings. This is to ensure that the most appropriate economical and healthy development of the city takes place in accordance with the land use plan. For this purpose, the City is divided into a number of use zones, such as residential, commercial, industrial, public and semi-public, etc. Each zone has its own regulations as the same set of regulations cannot be applied to the entire town.

Zoning protects residential area from the harmful invasions of commercial and industrial uses and at the same time promotes the orderly development of industrial and commercial areas. By regulation the spacing of buildings, adequate light, air, protection from fire etc. can be provided. It prevents overcrowding in buildings and land thus ensures adequate facilities and services.

Zoning is not retrospective. It does not prohibit the uses of land and buildings that are lawfully established prior to the coming into effect of the zoning regulations. If these uses are contrary to the newly proposed uses, they are termed as non-conforming uses and are gradually eliminated over years without inflicting unreasonable hardship upon the property owners.

The zoning regulations and their enforcement are a major tool in keeping the land uses pattern of the Comprehensive Development Plan.

It has been stated that the consultants have adopted the UDPFI guidelines with minor modification.

However while detailing out the use permissibility, etc in various categories all care has been taken to integrate:

- (A) "Cuttack Development Authority" (Planning and Building Standards), Regulation 2010;
- (B) "Bhubaneswar Development Authority" (Planning and Building Standards), Regulation 2008.
- (C) UDPFI Guidelines.

This formulated guideline may adopt other provision of the regulation towards intensity of development and built form guidelines, etc.

- 1) In the Cuttack Development Planning Area (CDPA), various use zones namely Residential, Commercial, Industrial, Public and Semi-Public, Utilities and Services, Recreational, Transportation, Agricultural, Water bodies and Special Areas having their location as indicated in the Comprehensive Development Plan shall be regulated

and guided as per **Table 14.5**. Except or otherwise provided, no structure or land hereinafter shall be erected, recreated or altered unless its use is in conformity with the following regulations.

- 2) All existing places of worship, temples, churches, mosques, burial and cremation ground etc. shall be exempted from being treated as non-conforming uses, provided that continuance of such uses are not detrimental to the locality as decided by the Authority from time to time.
- 3) All non-conforming uses of land and buildings shall be discontinued by the owner and the modified uses shall be made to conform to the land use of the development plan in force within six months of the Regulations coming in force.

14.5.1 Simplified Urban Land Use Zoning Regulations

Buildings and premises listed below are permitted normally on specific sites/locations forming part of the provision of the CDP. Besides the *Activities Permitted* (column A) for each of the 10 land use zones in **Table 14.5**, it also contains the buildings/premises which could be allowed upto 30% of the area on an application to the Competent Authority, if such sites do not form a part of the plan. Such use/activity is termed as *Permissible on Application to Competent Authority (with conditions/on special consideration)* (column B). The uses/activities which are otherwise not allowed in a particular use zone are termed as *Activities/Uses Prohibited* in certain use zones and are presented in (column C).

A broad description of the proposed land uses according to 'Activities/Uses Permitted', 'Permissible on application to Competent Authority (upto 30% area on special consideration)' and 'Activities/Uses Prohibited' is given below.

a. Residential Use Zone:

In Residential Use Zone 'R' (Primary Residential with densities, Mixed Residential Zone Unplanned/ Informal Residential Zone) have been marked for general guidance.

i. Uses/Activities Permitted:

Residence plotted (detached, semi-detached and row housing), group housing, work-cum-residential centre, hostels, boarding and lodging houses, night shelters, dharamshalas, guest houses, educational buildings (nursery, primary, high school), neighborhood level social, cultural and recreational facilities with adequate parking provisions, marriage and community halls, convenience shopping, local (retail) shopping, community centers, clubs, auditoriums, exhibition and art

galleries, libraries and gymnasiums, health clinics, yoga centers, dispensaries, nursing homes and health centers (20 beds), yoga Centres, public utilities and buildings except service and storage yards, electrical distribution depots and water pumping stations, nursery and green houses, services for households (salon, parlours, bakeries, sweet shops, dry cleaning, internet kiosks etc.), banks and professional offices not exceeding one floor, bus stops, taxi stands, 3 wheeler/auto stands, rickshaw stands, police posts and post offices, parks and tot-lots, Accessory uses clearly incidental to residential use (except service uses) which will not create nuisance or hazard, customary home occupation if the area for such use does not exceed 25% of the total floor area of the dwelling and there shall be no public display of the goods.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Places of worship, shopping centres, municipal, state and central government offices, colleges and research institutions, petrol filling stations, places of entertainment, cinema halls, restaurants and hotels, markets for retail goods, IT and IT enabled services, tourism related services, motor vehicle repairing workshop, garages, storage of LPG cylinders, burial grounds, printing presses employing not more than 10 persons, godowns /warehousing of non perishables, bus depots without workshop, household industries if the area for such use does not exceed one floor and there shall be no public display of the goods, consulates.

iii. Prohibited Uses/Activities:

Heavy, large and extensive industries, noxious, obnoxious and hazardous industries, warehousing, storage godowns of perishables, hazardous, inflammable goods, wholesale mandis, junk yards, workshops for buses, slaughter houses, hospitals treating contagious diseases, sewage treatment plants and disposal sites, water treatment plants, solid waste dumping grounds, outdoor and indoor games stadiums, shooting range, zoological garden, botanical garden, bird sanctuary, international conference centers, district battalion offices, forensic science laboratory, all uses not specifically permitted.

b. Retail Commercial Business Use Zone:

In Commercial Use Zone 'C-1' (Retail Shopping Zone/ and General Business, Commercial District Centers) have been marked for general guidance.

i. Uses/Activities Permitted:

Retail business, mercantile, commercial centers, banks, financial services and stock exchanges, perishable goods markets, business and

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professional offices, private institutional offices and semi government offices, shops and shopping malls, commercial services, restaurants and hotels, hostels, boarding houses, social and welfare institutions, guest houses, convenience and neighborhood shopping centers, local shopping centers, weekly and formal markets, bakeries and confectionaries, cinema halls, theaters, banquet halls, auditoriums, marriage and community halls, night shelters, clinics and nursing homes, petrol pumps and service stations on roads of 12 meter or more ROW, IT and IT enabled services, commercial institutes, research and training institutes, service uses like hair salon, tailoring shops, beauty parlour, laundry and dry cleaning shops etc. bus stops, Taxi stands, 3 wheeler/auto stands, rickshaw stands and parking spaces.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Associated residential uses, wholesale storage yards, junk yards, service garages provided they do not directly abut the main road, printing presses employing not more than 10 persons, 20 bedded hospitals not treating contagious diseases and mental patients, weigh bridges, colleges, polytechnics and higher technical institutes, sports complex and stadiums, transient visitor's homes, places of entertainment, recreational uses and museums, convention centers, religious places, public utilities, telephone exchanges, police posts and post offices, residential plot/group housing, picnic hut, parks, playgrounds, clubs.

iii. Prohibited Uses/Activities:

Polluting industries, heavy, extensive, noxious, obnoxious, hazardous and extractive industrial units, large scale storage of hazardous and other inflammable materials except in areas, specifically earmarked for the purpose, poultry farms, dairy farms, slaughter houses, sewage treatment plants and disposal sites, solid waste treatment plants and dumping grounds, agricultural uses, storage of perishable and inflammable commodities, quarrying of gravel, sand, clay and stone, zoological gardens, botanical gardens and bird sanctuary, sports training centers, district battalion offices, forensic science laboratory and all other related activities which may cause nuisance, hospitals, research laboratories treating contagious diseases, court, all uses not specifically permitted herein.

c. Wholesale Commercial Use Zone:

In Wholesale Commercial Use Zone 'C-2' (Wholesale, Godowns, Warehousing, Regulated Markets) have been marked for general guidance.

i. Uses/Activities Permitted:

Wholesale business, commercial and business offices and work places, wholesale and storage buildings, godowns, covered storage and warehousing, weigh bridges, bus stops, Taxi stands, 3-wheeler / auto stands, rickshaw stands, truck terminal, bus depots and parking spaces, restaurants, public utilities.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Freight terminal, railway yards and stations, warehousing, storage godowns of perishable, inflammable goods, coal, wood, timber yards, non-polluting, non-obnoxious light industries, service centers, garages, workshops, junk-yards, gas installation and gas works, government and semi-government offices, banks, financial services, associated residential uses, water treatment plants.

iii. Prohibited Uses/Activities:

Polluting Industries, large scale storage of hazardous and other inflammable materials except in areas, specifically earmarked for the purpose, all uses not specifically permitted herein.

d. Industrial Use Zone:

In Industrial Use Zone 'I' (Service and Light Industry, Extensive and Heavy Industry and Special Industrial Zone) have been marked for general guidance.

i. Uses/Activities Permitted:

All kind of non polluting industries, IT & ITES, SEZs notified by government of India, Loading, unloading spaces, warehousing, storage and depots of non perishable and non-inflammable commodities, cold storage and ice factory, gas godowns, banks, financial institutions and other commercial offices, wholesale business establishments, petrol filling station with garages and service stations, bus terminals and bus depots and workshops, parking, taxi stands, 3-wheeler/auto stands, rickshaw stands, residential buildings for essential staff and for watch and ward, public utilities, railway siding, incidental and utility use incidental to the main use.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Heavy, extensive and other obnoxious, hazardous industries subject to the approval of the Orissa Pollution Control Board, Industrial Research

Institute, Technical Educational Institutions, junkyards, sports/ stadiums/ playgrounds, sewage disposal works, electric power plants, service stations, govt. semi-govt., private business offices, agro-based industries, dairy and farming, gas installations and gas works, workshops garages, hotels and guest houses, museum, helipads, hospitals and medical centers, quarrying of gravel, sand, clay and stone.

iii. Prohibited Uses/Activities:

Polluting industries, general business unless incidental to and on the same site with industry, schools and colleges, hotels, motels and caravan parks, recreational spots or centers, other non-industrial related activities, religious buildings, irrigated and sewage farms, major oil depot and LPG refilling plants, social buildings, all uses not specifically permitted.

e. Public and Semi-Public Use Zone:

In Public and Semi-Public Use Zone 'PS' (Govt./Semi-Govt./Public Offices Zone) have been marked for general guidance.

i. Uses/Activities Permitted:

Government offices, central , state, local and semi-government, public undertaking offices, universities and specialized educational institutions, colleges, schools, research and development centers, social and welfare centers, libraries, hospitals, health centers, dispensaries and clinics, social and cultural institutes, religious buildings, conference halls, community halls, kalyan mandap, museums, art galleries, exhibition halls, auditoriums, police stations, police lines, jails, local state and central govt. offices uses for defense purpose, educational and research institutions, social and cultural and religious institutions, local municipal facilities, hotels, dharamashala, guest houses, monuments, convention center, banking and financial services, commercial uses center, shopping complex, public utility buildings, uses for defense purpose, defense quarters, educational and police headquarters, radio transmitters and wireless stations, uses incidental to govt. offices and for their use, incidental/ancillary residential use.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Residential flats, residential plots for group housing and staff housing, IT services, defense quarters, hostels, transit accommodation, entertainment and recreational complexes, nursery and kindergarten, welfare center, open air theater, playground, residential club, guest house, bus and truck terminals, helipads, parking areas, taxi stands, 3-wheeler/auto stands, rickshaw stands, retail shops, shopping complexes, residential and other uses which is no way causing any nuisance and hazard incidental to main use.

iii. Prohibited Uses/Activities:

Heavy, extensive and other obnoxious, hazardous industries, slaughterhouses, junkyard, wholesale mandis, dairy and poultry farms, farmhouses, workshops for servicing and repairs, processing and sale of farm products and uses not specifically permitted herein.

f. Utilities and Services Use Zone:

In Utilities and Services Use Zone 'US' (Water Supply/Sewerage/Drainage/Solid Waste, Power, Transmission and Communication, and Cremation and Burial Ground Zone) have been marked for general guidance.

i. Uses/Activities Permitted:

Post offices, Telegraph offices, public – utilities and buildings, water Treatment Plant, Sewage Treatment Plant, Solid waste Treatment Plant solid waste dumping grounds, radio transmitter and wireless stations, telecommunication centers, telephone exchange, water supply installations, sewage disposal works, service stations, cremation grounds and cemeteries/burial ground, power plants/ electrical substation, radio and television station , fire stations, observatory and weather office.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Service industry, warehouse/storage godowns, health center for public and staff or any other use incidental to public utilities and services, information/Payment kiosk, incidental/ancillary residential use, truck terminals, helipads, commercial use center.

iii. Prohibited Uses/Activities

Any building or structure which is not required for uses related to public utilities and activities is not permitted therein, heavy, extensive and other obnoxious, hazardous industries, all uses not specifically permitted herein.

g. Recreational Use Zone:

In Recreation Use Zone 'P' (Playgrounds/Stadium/Sports Complex, Parks and Gardens, Special Recreational Zone and Multipurpose Open Space Zone), have been marked for general guidance.

i. Uses/Activities Permitted:

Specialized parks/ maidans for multipurpose use, regional parks, district parks, playgrounds, children's parks, clubs, stadiums, picnic huts, holiday

resorts, shooting range, sports training center, swimming pools, botanical/ zoological garden, bird sanctuary, green belts, bus and railway passenger terminals, public utilities and facilities such as police post, fire post, post and telegraph office, health center for players and staff, animal racing or riding stables, library, incidental/ancillary residential use.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Building and structure ancillary to use permitted in open spaces and parks such as stands for vehicles on hire, taxis and scooters, commercial use of transit nature like cinemas, circus and other shows, public assembly halls, restaurants, parking areas, caravan parks, open air cinemas/ theatre, entertainment and recreational complexes, community hall, library, open air theater, theme parks, amphitheatres, residential club, guest house, camping sites, yoga and meditation centres, fire post, police station, post and telegraph office, commercial uses center, special education areas.

iii. Prohibited Uses/Activities:

Any building or structure, which is not required for open air recreation, dwelling unit except for watch and ward, and uses not specifically permitted therein, all uses not specifically permitted herein.

h. Transportation Use Zone:

In Transportation Use Zone 'T' (Roads, Railways, Airport and Bus Depots/Truck Terminal/ Freight) have been marked for general guidance.

i. Uses/Activities Permitted:

All types of roads, railway stations and yards, airport, bus stops and bus and truck terminals, taxi stands, auto stands, rickshaw stands, ferry ghats, parking areas, multi level car parking, filling stations, transport offices, booking offices, information kiosks, night shelter, boarding houses, banks, restaurants, workshops and garages, automobile spares and services, godowns, loading and unloading platforms (with/without cold storage facility), weigh bridges, ware houses, storage depots, utility networks (drainage, sewage, power, tele-communications).

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Way side shops and restaurants, authorised/Planned Vending areas, incidental/ancillary residential use, emergency health care centre, tourism related projects, all ancillary (complimentary) uses for above categories (subject to decision of the Authority).

iii. Prohibited Uses/Activities:

Use/activity not specifically related to transport and communication permitted herein, all uses not specifically permitted herein.

i. Agriculture and Forest Use Zone:

In Agriculture Use Zone 'A' (Agriculture and Horticulture, Forest, Brick kilns and Extractive Area) have been marked for general guidance.

i. Uses/Activities Permitted:

Agriculture and Horticulture, dairy and poultry farming, milk chilling center, storage, processing and sale of farm products, dwelling for the people engaged in the farm (rural settlement), farm houses and accessory buildings, public utility and facility buildings, forest use, afforestation.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Houses incidental to this use, parks and other recreational uses, wayside shops and restaurants, educational and research institutions, agro serving, agro processing, agro business, cottage industries, burial and cremation grounds, service industries accessory to obnoxious and hazardous industries, ice factory, cold storage, godowns and ware houses, soil testing lab, normal expansion of land uses only in the existing homestead land, special outdoor recreations, solid waste management sites, Sewage disposal works, electric sub-station, quarrying of gravel, sand, clay or stone, building construction over plots covered under town planning scheme and conforming uses, brick kilns and extractive areas, servicing and repair of farm machineries and the sale of agricultural supply, small scale fertilizer chemicals, alcohol and distillery industry, petrol and other fuel filling stations, hospital for infectious and contagious diseases, mental hospital after clearance from the Authority, eco-tourism, camping sites, eco-parks, eco lodges, special outdoor recreations.

iii. Prohibited Uses/Activities:

Residential use except those ancillary uses permitted in agricultural use zone, heavy, extensive, obnoxious, noxious and hazardous industries, any activity which is creating nuisance and is obnoxious in nature, for notified forest lands only afforestation is permitted and eco-tourism, camping sites, eco-parks, eco lodges, special outdoor recreations are permissible by the competent authority, all uses not specifically permitted herein.

j. Water Bodies Use Zone:

In Water bodies Use Zone 'W' (River/Canal/Streams/Water Spring, Ponds/Lakes/Wetland/Aqua culture pond and Water logged/Marshy area) have been marked for general guidance.

i. Uses/Activities Permitted:

Rivers, canals, streams, water spring, ponds, lakes, wetland, aqua culture pond, reservoir, water logged/marshy area.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Fisheries, boating, water theme parks, water sports, lagoons, water based resort with special by-laws, any other use/activity incidental to Water Bodies use is permitted.

iii. Prohibited Uses/Activities:

Use/activity not specifically related to Water bodies Use not permitted herein, all uses not specifically permitted herein.

k. Special Heritage Use Zone:

In Special Area Use Zone 'SH' (Old Built-up Core Area, Heritage and Conservation zones and Other Areas) have been marked for general guidance.

Any development should be in conformity with special byelaws and regulations prescribed in respective zonal plan and to be approved by the Heritage Committee.

No construction /development in ASI /State Archeology restricted area.

i. Uses/Activities Permitted:

Residential with special bye laws, public -semi public with special bye laws, commercial with special bye laws, recreational with special bye laws, theme Parks, archeological parks / gardens with special bye laws, amphitheatres with special bye laws, open air museums with special bye laws, restoration of protected and enlisted monuments and precincts by the concerned authority only (ASI / State Archeology).

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Heritage interpretation centre, art galleries & sculpture complex, educational and research Institutions, social and cultural institutions, commercial activities, craft based cottage industries, hotels, guest houses, lodges, resorts, group Housing , apartments, auditorium, boating, picnic huts, camping sites, special training camps, hospitals & health centers, multistoried parking.

iii. Prohibited Uses/ Activities:

Use/activity not specifically related to Special Heritage Use Zone not permitted herein, multistoried building, multiplex, shopping mall, dumping ground, sewerage treatment, all uses not specifically permitted herein.

I. Environmentally Sensitive Use Zone:

In Environmentally Sensitive Use Zone 'ES' (River front developments, Scenic Value Areas) have been marked for general guidance.

Special bye laws need to be formulated in consultation with the Water resources dept. & other concerned departments for special Environmentally Sensitive zone.

i. Uses/Activities Permitted:

River front developments, scenic value areas, river side green areas, existing village settlements.

ii. Uses/Activities Permissible on Application to Competent Authority (with conditions/ upto 30% area on special consideration):

Group housing, corporate type housing adopting modern technology with special by-laws, theme parks, yoga parks, sports centres and community recreational areas, International convention centre, incidental residences, seven or five star lake resorts, five star hotels, organized commerce with special by-laws, hospitals and health institutions, art academy, media centres, food courts, music pavilions, parking areas, visitor facilities, educational, technical, research institutes of higher order, boating, picnic huts, camping sites special training camps, existing residential or other uses with special by-laws, resorts, sculpture complex, lagoons & lagoon resort, water sports, tourist and pilgrim related commercial activities, hotels and lodges, non polluting, agro-based and processing industries, storage or godowns for food grains, water treatment plant, sewage treatment plant, solid waste treatment plant solid waste dumping grounds.

iii. Prohibited Uses/ Activities:

Plotted housing, small industries or small institutions, use/activity not specifically related to Environmentally Sensitive Use Zone not permitted herein, **no development of any kind is permitted between the River/Canal/Stream and the embankment**, all uses not specifically permitted herein.

Table 14.5 shows the (a) Uses/Activities Permitted (b) Uses/Activities permissible on application to the Competent Authority (with conditions / up to 30% area on special consideration) & (c) Activities Prohibited as it has been already stated according to the Model Zoning regulations.

Table 14.5: Land Uses Permitted, Permitted Under Special Consideration & Prohibited In Different Use Zones

Sl No	Use Zone	Uses/Activities Permitted	Uses/Activities Permitted on application to the Competent Authority	Uses/Activities Prohibited
		(A)	(B)	(C)
1.	Residential Use Zone (R)	1. Residence plotted (detached, semi-detached and row housing), group housing, work-cum-residential centre	1. Places of worship	1. Heavy, large and extensive industries, noxious, obnoxious and hazardous industries
		2. Hostels, boarding and lodging houses	2. Shopping centres	2. Warehousing, storage godowns of perishables, hazardous, inflammable goods, wholesale mandis, junk yards
		3. Night shelters, dharamshalas, guest houses	3. Municipal, state and central government offices	3. Workshops for buses
		4. Educational buildings (nursery, primary, high school)	4. Colleges and research institutions	4. Slaughter houses
		5. Neighborhood level social, cultural and recreational facilities with adequate parking provisions	5. Petrol filling stations	5. Hospitals treating contagious diseases
		6. Marriage and community halls	6. Places of entertainment, cinema halls, restaurants and hotels	6. Sewage treatment plants and disposal sites
		7. Convenience shopping, local (retail) shopping	7. Markets for retail goods	7. Water treatment plants, solid waste dumping grounds
		8. Community centers, clubs, auditoriums	8. IT and IT enabled services	8. Outdoor and indoor games stadiums, shooting range
		9. Exhibition and art galleries	9. Tourism related services	9. Zoological garden, botanical garden, bird sanctuary
		10. Libraries and gymnasiums	10. Motor vehicle repairing workshop, garages, storage of LPG cylinders	10. International conference centers
		11. Health clinics, yoga centers, dispensaries, nursing homes and health centers (20 beds), yoga Centres	11. Burial grounds	11. District battalion offices, forensic science laboratory
		12. Public utilities and buildings except service and storage yards, electrical distribution depots and water pumping stations	12. Printing presses employing not more than 10 persons	12. All uses not specifically permitted in column (a) and (b)
		13. Nursery and green houses	13. Godowns /warehousing of non perishables	
		14. Services for households (salon, parlours, bakeries, sweet shops, dry cleaning, internet kiosks etc.)	14. Bus depots without workshop	
		15. Banks and professional offices not exceeding one floor	15. Household industries if the area for such use does not exceed one floor and there shall be no public display of the goods	
		16. Bus stops, taxi stands, 3 wheeler/auto stands, rickshaw stands	16. Consulates	
		17. Police posts and post offices		
		18. Parks and tot-lots		
		19. Accessory uses clearly incidental to residential use (except service uses) which will not create nuisance or hazard		
		20. Customary home occupation if the area for such use does not exceed 25% of the total floor area of the dwelling and there shall be no public display of the goods		

Continued...

Sl No	Use Zone	Uses/Activities Permitted	Uses/Activities Permitted on application to the Competent Authority	Uses/Activities Prohibited
		(A)	(B)	(C)
2.	Retail Commercial Use Zone (C1)	1. Retail business, mercantile	1. Associated residential uses	1. Polluting industries
		2. Commercial centers	2. Wholesale storage yards, Junk yards	2. Heavy, extensive, noxious, obnoxious, hazardous and extractive industrial units
		3. Banks, financial services and stock exchanges	3. Service garages provided they do not directly abut the main road	3. Large scale storage of hazardous and other inflammable materials except in areas, specifically earmarked for the purpose
		4. Perishable goods markets	4. Printing presses employing not more than 10 persons	4. Poultry farms, dairy farms, slaughter houses
		5. Business and professional offices	5. 20 bedded hospitals not treating contagious diseases and mental patients	5. Sewage treatment plants and disposal sites, solid waste treatment plants and dumping grounds
		6. Private institutional offices and semi government offices	6. Weigh bridges	6. Agricultural uses, storage of perishable and inflammable commodities
		7. Shops and shopping malls	7. Colleges, polytechnics and higher technical institutes	7. Quarrying of gravel, sand, clay and stone
		8. Commercial services	8. Sports complex and stadiums	8. Zoological gardens, botanical gardens and bird sanctuary
		9. Restaurants and hotels	9. Transient visitor's homes	9. Sports training centers
		10. Hostels, boarding houses, social and welfare institutions, guest houses	10. Places of entertainment, recreational uses and museums	10. District battalion offices
		11. Convenience and neighborhood shopping centers, local shopping centers, weekly and formal markets, bakeries and confectionaries	11. Convention centers	11. Forensic science laboratory and all other related activities which may cause nuisance
		12. Cinema halls, theaters, banquet halls, auditoriums	12. Religious places	12. Hospitals, research laboratories treating contagious diseases
		13. Marriage and community halls, night shelters	13. Public utilities, telephone exchanges	13. Court
		14. Clinics and nursing homes	14. Police posts and post offices	14. All uses not specifically permitted in the column(a) and(b)
		15. Petrol pumps and service stations on roads of 12 meter or more ROW	15. Residential plot/group housing	
		16. IT and IT enabled services	16. Picnic Hut	
		17. Commercial institutes, research and training institutes	17. Parks, playgrounds, clubs	
		18. Service uses like hair salon, tailoring shops, beauty parlour, laundry and dry cleaning shops etc.		
		19. Bus stops, Taxi stands, 3 wheeler/auto stands, rickshaw stands and parking spaces		
3.	Wholesale Commercial Use Zone (C2)	1. Wholesale business	1. Freight terminal, railway yards and stations	1. Polluting Industries
		2. Commercial and business offices and work places	2. Warehousing, storage godowns of perishable, inflammable goods, coal, wood, timber yards	2. Large scale storage of hazardous and other inflammable materials except in areas, specifically earmarked for the purpose
		3. Wholesale and storage buildings	3. Non-polluting, non-obnoxious light industries	3. All uses not specifically permitted in columns (a) and(b)
		4. Godowns, covered storage and warehousing	4. Service centers, garages, workshops	
		5. Weigh bridges	5. Junk-yards	
		6. Bus stops, Taxi stands, 3-wheeler / auto stands, rickshaw stands	6. Gas installation and gas works	
		7. Truck terminal, bus depots and parking spaces	7. Government and Semi-government offices	
		8. Restaurants	8. Banks, financial services	
		9. Public utilities	9. Associated residential uses	
			10. Water treatment plants	

Continued...

Zoning Regulations

Sl No	Use Zone	Uses/Activities Permitted	Uses/Activities Permitted on application to the Competent Authority	Uses/Activities Prohibited
		(A)	(B)	(C)
4.	Industrial Use Zone, light manufacturing industry, service industry and medium industry (I)	1. All kind of non polluting industries	1. Heavy, extensive and other obnoxious, hazardous industries subject to the approval of the Orissa Pollution Control Board	1. Polluting industries
		2. IT & ITES	2. Industrial Research Institute	2. General business unless incidental to and on the same site with industry
		3. SEZs notified by government of India	3. Technical Educational Institutions	3. Schools and colleges
		4. Loading, unloading spaces	4. Junkyards, sports/ stadiums/ playgrounds	4. Hotels, motels and caravan parks
		5. Warehousing, storage and depots of non perishable and non-inflammable commodities	5. Sewage disposal works, electric power plants, service stations	5. Recreational spots or centers
		6. Cold storage and ice factory	6. Govt. semi-govt., private business offices	6. Other non-industrial related activities
		7. Gas godowns	8. Agro-based industries, dairy and farming	7. Religious buildings
		8. Banks, financial institutions and other commercial offices	9. Gas installations and gas works	8. Irrigated and sewage farms
		9. Wholesale business establishments	10. Workshops garages	9. Major oil depot and LPG refilling plants
		10. Petrol filling station with garages and service stations	11. Hotels and guest houses	10. Social buildings
		11. Bus terminals and bus depots and workshops	12. Museum	11. All uses not specifically permitted in columns (a) and (b)
		12. Parking, taxi stands, 3 wheeler/auto stands, rickshaw stands	13. Helipads	
		13. Residential buildings for essential staff and for watch and ward	14. Hospitals and medical centers	
		14. Public utilities	15. Quarrying of gravel, sand, clay and stone	
		15. Railway siding		
		16. Incidental and utility use incidental to the main use		
5.	Public Semi-Public Use Zone (PS)	1. Government offices, central , state, local and semi-government, public undertaking offices	1. Residential flats, residential plots for group housing and staff housing	1. Heavy, extensive and other obnoxious, hazardous industries
		2. Universities and specialized educational institutions, colleges, schools, research and development centers	2. IT services	2. Slaughterhouses
		3. Social and welfare centers	3. Defense quarters	3. Junkyard
		4. Libraries	4. Hostels, transit accommodation	4. Wholesale mandies
		5. Hospitals, health centers, dispensaries and clinics	5. Entertainment and recreational complexes	5. Dairy and poultry farms, farmhouses
		6. Social and cultural institutes	6. Nursery and kindergarten, welfare center	6. Workshops for servicing and repairs
		7. Religious buildings	7. Open air theater, playground	7. Processing and sale of farm products
		8. Conference halls	8. Residential club, guest house	8. All uses not specifically permitted in columns (a) and (b)
		9. Community halls, kalyan mandap,	9. Bus and Truck terminals, helipads	
		10. Museums, art galleries, exhibition halls, auditoriums	10. Parking areas, taxi stands, 3 wheeler/auto stands, rickshaw stands	
		11. Police stations, police lines, jails	11. Retail shops, shopping complexes	
		12. Local state and central govt. offices uses for defense purpose	12. Residential and other uses which is no way causing any nuisance and hazard incidental to main use	
		13. Educational and research institutions		
		14. Social and cultural and religious institutions		

Continued...

SI No	Use Zone	Uses/Activities Permitted	Uses/Activities Permitted on application to the Competent Authority	Uses/Activities Prohibited
		(A)	(B)	(C)
5.	Public Semi-Public Use Zone (PS)	15. Local municipal facilities		
		16. Hotels, dharamashala, guest houses		
		17. Monuments		
		18. Convention center		
		19. Banking and financial services		
		20. Commercial uses center, Shopping complex		
		21. Public utility buildings		
		22. Uses for defense purpose, defense quarters, educational and police headquarters		
		23. Radio transmitters and wireless stations. 16. Uses incidental to govt. offices and for their use		
		24. Incidental/ancillary residential use		
6.	Utilities and Services Use Zone (US)	1. Post offices, Telegraph offices, public – utilities and buildings	1. Service industry	1. Any building or structure which is not required for uses related to public utilities and activities is not permitted therein.
		2. Water Treatment Plant, Sewage Treatment Plant, Solid waste Treatment Plant solid waste dumping grounds	2. Warehouse/storage godowns	2. Heavy, extensive and other obnoxious, hazardous industries
		3. Radio transmitter and wireless stations, telecommunication centers, telephone exchange	3. Health center for public and staff or any other use incidental to public utilities and services	3. All uses not specifically permitted in column (a) and (b)
		4. Water supply installations	4. Information/Payment kiosk	
		5. Sewage disposal works	5. Incidental/ancillary residential use	
		6. Service stations	6. Truck terminals, helipads	
		7. Cremation grounds and cemeteries/burial ground	7. Commercial use center	
		8. Power plants/ electrical substation		
		9. Radio and television station		
		10. Fire stations		
		11. Observatory and weather office		
7.	Recreational Use Zone (P)	1. Specialized parks/ maidans for multipurpose use	1. Building and structure ancillary to use permitted in open spaces and parks such as stands for vehicles on hire, taxis and scooters	1. Any building or structure, which is not required for open air recreation, dwelling unit except for watch and ward, and uses not specifically permitted therein.
		2. Regional parks, district parks, playgrounds, children's parks	2. Commercial use of transit nature like cinemas, circus and other shows	2. All uses not specifically permitted in column (a) and (b)
		3. Clubs	3. Public assembly halls	
		4. Stadiums, picnic huts, holiday resorts	4. Restaurants	
		5. Shooting range, sports training center	5. Parking areas, Caravan parks	
		6. Swimming pools	6. Open air cinemas/ theatre	
		7. Botanical/ zoological garden, bird sanctuary	7. Entertainment and recreational complexes	
		8. Green belts	8. Community hall, library	
		9. Bus and railway passenger terminals	9. Open air theater, theme parks, amphitheatres	
		10. Public utilities and facilities such as police post, fire post, post and telegraph office, health center for players and staff	10. Residential club, guest house	
		11. Animal racing or riding stables	11. Camping sites	
		12. Library	12. Yoga and meditation centres	
		13. Incidental/ancillary residential use	13. Fire post, police station, post and telegraph office	
			14. Commercial uses center	
			15. Special education areas	

Continued...

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Sl No	Use Zone	Uses/Activities Permitted	Uses/Activities Permitted on application to the Competent Authority	Uses/Activities Prohibited
		(A)	(B)	(C)
8.	Transportation Use Zone (T)	1. All types of roads	1. Way side shops and restaurants	1. Use/activity not specifically related to transport and communication permitted herein.
		2. Railway stations and yards	2. Authorised/Planned Vending areas	2. All uses not specifically permitted in column (a) and (b)
		3. Airport	3. Incidental/ancillary residential use	
		4. Bus stops and Bus and Truck terminals	4. Emergency health care centre	
		5. Taxi stands, auto stands, rickshaw stands	5. Tourism related projects	
		6. Ferry ghats	6. All ancillary (complimentary) uses for above categories (subject to decision of the Authority)	
		7. Parking areas		
		8. Multi level car parking		
		9. Filling stations		
		10. Transport offices, booking offices		
		11. Information kiosks		
		12. Night shelter, boarding houses		
		13. Banks		
		14. Restaurants		
		15. Workshops and garages		
		16. Automobile spares and services, Godowns		
		17. Loading and unloading platforms (with/without cold storage facility), weigh bridges		
		18. Ware houses, Storage depots		
		19. Utility networks (drainage, sewage, power, tele-communications)		
9.	Agriculture and Forest Use Zone (A)	1. Agriculture and Horticulture	1. Houses incidental to this use	1. Residential use except those ancillary uses permitted in agricultural use zone
		2. Dairy and poultry farming, milk chilling center	2. Parks and other recreational uses	2. Heavy, extensive, obnoxious, noxious and hazardous industries
		3. Storage, processing and sale of farm products	3. Wayside shops and restaurants	3. Any activity which is creating nuisance and is obnoxious in nature
		4. Dwelling for the people engaged in the farm (rural settlement)	4. Educational and research institutions	4. All uses not specifically permitted in column (a) and (b)
		5. Farm houses and accessory buildings	5. Agro serving, agro processing, agro business	
		6. Public utility and facility buildings	6. Cottage industries	
			7. Burial and cremation grounds	
			8. Service industries accessory to obnoxious and hazardous industries	
			9. Ice factory, cold storage	
			10. Godowns and ware houses	
			11. Soil testing lab	
			12. Normal expansion of land uses only in the existing homestead land	
			13. Special outdoor recreations	

Continued...

Sl No	Use Zone	Uses/Activities Permitted	Uses/Activities Permitted on application to the Competent Authority	Uses/Activities Prohibited
		(A)	(B)	(C)
9.	Agriculture and Forest Use Zone (A)		14. Solid waste management sites, Sewage disposal works	
			15. Electric sub station	
			16. Quarrying of gravel, sand, clay or stone	
			17. Building construction over plots covered under town planning scheme and conforming uses	
			18. Brick kilns and extractive areas	
			19. Servicing and repair of farm machineries and the sale of agricultural supply	
			20. Small scale fertilizer chemicals, alcohol and distillery industry	
			21. Petrol and other fuel filling stations	
			22. Hospital for infectious and contagious diseases, mental hospital after clearance from the Authority	
			7. Forest use	23. Eco-tourism, camping sites, eco-parks, eco lodges
	8. Afforestation	24. Special outdoor recreations		
10.	Water Bodies Use Zone (W)	1. Rivers, canals	1. Fisheries	1. Use/activity not specifically related to Water bodies Use not permitted herein.
		2. Streams, water spring	2. Boating, water theme parks, water sports, lagoons	2. All uses not specifically permitted in column (a) and (b)
		3. Ponds, lakes	3. Water based resort with special by-laws	
		4. Wetland, aqua culture pond	4. Any other use/activity incidental to Water Bodies use is permitted.	
		5. Reservoir		
		6. Water logged/marshy area		
11.	Special Heritage Use Zone (Area shown in the map) (SH)	<i>Any development should be in conformity with special byelaws and regulations prescribed in respective zonal plan and to be approved by the Heritage Committee. No construction /development in ASI /State Archeology restricted area.</i>		
		1. Residential with special bye laws	1. Heritage interpretation centre, art galleries & sculpture complex	1. Use/activity not specifically related to Special Heritage Use Zone not permitted herein.
		2. Public -semi public with special bye laws	2. Educational and research Institutions	2. Multistoried building
		3. Commercial with special bye laws	3 Social and cultural institutions	3. Multiplex, Shopping Mall
		4 Recreational with special bye laws	4. Commercial activities	4. Dumping ground
		5. Theme Parks , Archeological Parks / Gardens with special bye laws	5. Craft based cottage industries	5. Sewerage Treatment
		6. Amphitheatres with special bye laws	6. Hotels, guest houses, lodges , resorts	6. All uses not specifically permitted in column (a) and (b)
		7. Open Air Museums with special bye laws	7. Group Housing , apartments	
		8. Restoration of protected and enlisted monuments and precincts by the concerned authority only (ASI / State Archeology)	8 Auditorium	
			9 boating, picnic huts, camping sites, special training camps	
			10. Hospitals & health centers	
	11. Multistoried Parking			

Continued...

Sl No	Use Zone	Uses/Activities Permitted	Uses/Activities Permitted on application to the Competent Authority	Uses/Activities Prohibited
		(A)	(B)	(C)
12.	Environment ally Sensitive Use Zone (ES)	<i>Special bye laws need to be formulated in consultation with the Water resources dept. & other concerned departments for special Environmentally Sensitive zone</i>		
		1. River front developments	1. Group housing, corporate type housing adopting modern technology with special by-laws	1. Plotted housing
		2. Scenic value areas	2. Theme parks, yoga parks, sports centres and community recreational areas, International convention centre	2. Small industries or small institutions
		3. River side green areas	3. Incidental residences	3. Use/activity not specifically related to Environmentally Sensitive Use Zone not permitted herein
		4. Existing village settlements	4. Seven or five star lake resorts, Five star hotels. organized commerce with special by-laws	4. No development of any kind is permitted between the River/Canal/Stream and the embankment
			5. Hospitals and health institutions	5. All uses not specifically permitted in column (a) and (b)
			6. Art academy, media centres, food courts, music pavilions	
			7. Parking areas, visitor facilities	
			8. Educational, technical, research institutes of higher order	
			9. Boating , Picnic huts, Camping sites Special Training camps	
			10. Existing residential or other uses with special by-laws	
			11. Resorts, sculpture complex, lagoons& lagoon resort, water sports.	
			12. Tourist and pilgrim related commercial activities, hotels and lodges	
			13. Non polluting, agro-based and processing industries, Storage or Godowns for food grains	
	14. Water Treatment Plant, Sewage Treatment Plant, Solid waste Treatment Plant solid waste dumping grounds			

14.5.2 Statutory Process for Zoning Regulations

The consultant shall present the draft Comprehensive Development Plan to the stakeholders. The draft CDP will be finalized through the following procedures.

- a) Feedback from the stakeholders
- b) Statutory obligation (i.e. publication and hearing of objection/suggestions)
 - 1. The draft CDP will be published by the development authority. A copy will be available for inspection and publish a notice in such form and manner as may be prescribed by rules made in this behalf inviting objection and suggestion from any person with respect to the draft CDP before such date as may be specified in

the notice, not being earlier than sixty days from the publication of the notice.

2. The authority will give reasonable opportunity to every local authority, within whose limit any land covered wholly or partly by the CDP is situated to make any representation with respect to the process.

Government will constitute a 'Board of Enquiry' to hear all the objections and suggestions. After considering all objections, suggested that may have been received by the authority and after giving reasonable opportunity of being heard, to any person including representatives of government department and authorities who have made requests of being so heard, the authority shall finally prepare the Comprehensive Development Plan and submit to the state government for approval.

The board of enquiry report will be submitted to the government for review and approval.

A notice under section (1) shall be conclusive evidence that development plan has been duly prepared and approved. The said plan shall come into operation from the date of publication of such notice in the Gazette.

14.6 Other Development Control Guidelines

The regulations governing minimum size of plot, maximum plot coverage, minimum set backs on four sides of the buildings, minimum road widths, maximum number of floors and maximum height of structures that could be permitted in various zones are set out in **Annexure-I** appended to these regulations (Regulation 28-132, with minor modifications) of the Cuttack Development Authority (Planning and Building Standards) Regulations-2001.

14.7 Zone wise Village Components

The CDPA is comprised of 156 villages. They are located both in the municipal/urban areas and the rural areas. The land use prescription has also to be integrated with the village boundaries and each village wise land use map has been prepared in 1:4000 scale, which will be an essential part of the statutory obligation of implementation of the CDP. Zone wise village list is described in **Annexure II**.

The village wise proposed maps will form part of the CDP and will be sequentially numbered zone wise.

15.1 Introduction

The different sectoral plans for Cuttack Development Plan Area (CDPA) that have been drawn up for achievement over the period up to 2030 have given a rough estimate of investment to be undertaken. Notwithstanding the fact that this is just an indicative investment plan, it would be imperative to find out sources of enhanced capital finances to be able to carry out the required investment. Again, it has been a common experience that many of the capital expenditure has not been sustained properly leading the delivery of services to suffer. Therefore, sustenance of capital expenditure in terms of operation and maintenance of assets created becomes all the more important and this calls for looking at the recurrent revenue options.

15.2 Sector-wise Investment Proposal

A summary of sector-wise investment plan for all the sectors covering traffic and transportation, housing, social infrastructure, tourism and heritage have been shown in **Table 15.1, 15.2, 15.7, 15.8 & 15.9** respectively. For physical infrastructure tentative cost has been estimated component wise in **Table 15.3, 15.4, 15.5 & 15.6**.

Table 15.1: Tentative Investment Plan of Traffic and Transportation

Sl.No.	Proposed actions	Cost in (Crores)
1	Road network capacity improvement i. Creation of new road links ii. Capacity augmentation of existing links iii. Up-gradation and improvement of existing link iv. Improvement of intersections v. Provision of pedestrian and cyclist facilities	1430
2	New bridges (1 no.s) i. On Kathajodi (1 no.s) ii. On Mahanadi (1 no.s) iii. On Birupa (2 no.s) iv. On Kuakhai (1 no.s)	1240
3	Creation of bus terminal facilities i. Bidanasi ii. Sikharpur iii. Choudwar iv. Nirgundi	110
4	Creation of freight terminal and transshipment facilities i. Logistic hub facilities in Nirgundi ii. Truck terminal and whole sale trading zone in Sikharpur	350
5	Provision of mass transit facilities (High Capacity Bus Transit System) for inter-urban movement in CDPA	720
6	Provision of elevated mass transit option for intra-urban movement in Cuttack	800
7	Construction of parking facilities (provision of grade separated off-street facilities along with improvement of on-street facilities)	40
Total		4690

* This costs are tentative and do not include land acquisition cost

Table 15.2: Cost of Housing Development

Planning Zone No.	Planning Zone	Type	2030 Housing Area (in acres)	Land Acquisition cost (lakhs/acre)	Land Development Costs (in lakhs/acre)	Total Development Cost (per acre)	2030 Total Development Cost in Crores
1	Nirgundi	Extensive	409	25	10	35	143.15
2	Charbatia	Restricted	582	18	10	28	162.96
3	Chhatisa	Sensitive					
4	Choudwar	Intensive	317	25	10	35	110.95
5	Nimapur	Extensive	386	30	10	40	154.40
6	Bidanasi	Extensive	729	200 (Inclusive of land Development cost)	-	200	1458.00
7	Old Cuttack	Restricted	237	215	10	225	533.25
8	Sikharpur	Extensive	510	135	10	145	739.50
9	Mundali	Sensitive	282	30	10	40	112.80
10	Barang	Extensive	361	30	10	40	144.40
11	Gopalpur	Extensive	663	115	10	125	828.75
Current backlog + Dilapidated stock			1084	25	10	35	379.40
Grand Total			5560		10	86	4767.56

Table 15.3: Tentative cost estimate (in crores) of proposed water supply distribution systems in 2030 for various zones of CDPA

Sl. No.	Areas	Total capital cost(Crores)
1	Nirgundi	19
2	Charbatia	18
3	Chhatisa	3
5	Choudwar	13
6	Nimapur	26
7	Bidanasi	56
8	Old Cuttack	78
9	Sikharpur	49
4	Mundali	9
10	Barang	25
11	Gopalpur	40
Cost of Industrial water demand		175
Total CDPA		541

*Add the cost towards the price escalation of materials @10% and the cost towards the price escalation of labour charges @10% in the above mentioned capital cost.

Table 15.4: Tentative cost estimate (in crores) of proposed sewerage systems in 2030 for CDPA

Sl. No.	Areas	Total capital cost(Crores)
1	Nirgundi	42
2	Charbatia	42
3	Chhatisa	33
5	Choudwar	
6	Nimapur	54
7	Bidanasi	353
8	Old Cuttack	
9	Sikharpur	
4	Mundali	23
10	Barang	54
11	Gopalpur	86
Total CDPA		687

Add the cost towards the price escalation of materials@10% and the cost towards the price escalation of labour charges@10% in the above mentioned capital cost.

Table 15.5: Expected cost estimate of the proposed drainage system in CDPA.

Sl.No.	Zones	Total capital costs for drainage in (Crores)
1	Nirgundi	37
2	Charbatia	37
3	Chhatisa	22
4	Choudwar	23
5	Nimapur	35
6	Bidanasi, Old Cuttack and Sikharpur	106
7	Mundali	42
8	Barang	47
9	Gopalpur	31
10	Total CDPA	380

Table 15.6: Tentative cost estimate (in crores) of proposed SWM and treatment systems in 2030 for CDPA

Item	Bidanasi, Old Cuttack and Sikharpur	Nirgundi	Nimapur	Choudwar	Gopalpur	Chhatisa	Charbatia	Mundali	Barang	CDPA Total Cost (Crores)
Total Capital Costs	45	8.0	11.0	5.5	17.5	1.5	8.0	4.0	11.0	111.5

Table 15.7: Tentative Cost Estimate (In Crores) of Proposed Social Infrastructural Facilities for CDPA

Type of Facility		Additional No. of Facilities required	CDPA Total Cost (Crores)
Educational	Primary School	47	47
	Secondary School+ Senior Secondary School	37	101
	College, University + Prof. Tech. Institute	-	-
		84	148
Health	Hospital + Health Care Centres	8	320
	Nursing home	4	10
		12	330
Others	Telecommunication	-	50
	Postal Service	11	6
	Fire Service	7	7
	Commercial/Cooperative Bank	49	148
	Recreational Hall (Cinema/Auditorium)	39	33
	Parks and Playground	1350 (Area in ha)	34
	Community hall and Library	17	10
	Music dance and Drama Center	3	4
	Power Infrastructure	64	1550
		208	1842
Total CDPA		304	2320

Table 15.8: Land Requirement and Cost of Development for Tourism

Zone No.	Location Description	Area required (in Hectares)	Cost (in Crores)
2	Charbatia (Choudwar (M), CDPA Rural)	10	8
3	Chhatisa (CDPA Rural)	15	10
4	Choudwar (Choudwar (M))	10	10
5	Nimapur (CMC)	30	15
6	Bidanasi (CMC)	25	20
7	Old Cuttack (CMC)	10	15
8	Sikharpur (CMC)	15	10
9	Mundali (CDPA Rural)	5	10
10	Barang (CDPA Rural)	25	30
11	Gopalpur (CMC)	25	10
Tourism Publicity Budget (for the CDPA Planning Area)			5
Tourism Training Infrastructure (for the CDPA Planning Area)			3
Services like Water supply, Sewerage, Solid waste management, Power and Telecommunication (for CDPA Planning Area)			30
Total			176

Table 15.9: Cost of Preservation and Promotion of Heritage

Zone No.	Location Description Broad Zone	Cost (In Crores)
2 & 4	Charbatia & Choudwar Fort	40
7	Barabati Fort, Old Cuttack	60
	Cantonment, Old Cuttack	35
	Judiciary Complex, Old Cuttack	15
	Other Areas, Old Cuttack	25
	River Front Development along Mahandi and Kathajodi	75
	Inventory of heritage resources (for the CDPA Planning Area)	250
	Preservation and restoration of heritage structures, precincts and water bodies (for the CDPA Planning Area) (Acquisition cost not included)	5
	Public awareness (for the CDPA Planning Area)	5
	Total	260

15.3 Total Investment Proposal

It is observed by adding the sectoral plans through gross estimate as shown in **Table 15.10**; the CDPA Comprehensive Development Plan will require a total public and private sector investment of around Rs.18,940 crores during next 25 years.

Table 15.10: Sectoral Investment Plan for CDPA

Sl. No.	Sectors	Approx. Cost (In Crores)
1	Traffic and Transportation	4690
2	Housing	4770
3	Physical Infrastructure	1720
4	Social Infrastructure	2320
5	Tourism	180
6	Heritage	260
7	Commercial Development	2,500
8	Misc.	2,500
	Total	18,940

However, of this total tentative capital investment amount for all sectors, an approximate amount of Rs.5,000 crores will be the public investment. This fund will be raised through specially created BCUC Infrastructure Fund. Balance requirement will be met from long term Loan, Public Private Partnership Projects, Capital finance through devolution of fund, User Charges, increased and reformed Tax base and improved Collection.

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Table 3.6 : Zone-wise Percentage Area of Land Use

Zone No.	Location Description		Residential	Commercial	Industrial	Transportation	Public/ Semi-Public/ Institution	Utility & Services	Recreational	Vacant Land	Agricultural Land	Vegetation/ Forest Land	Waste Land	Water bodies/ Wet Land	Others	Total
01	Nirgundi	Area (in ha)	151.14	72.79	6.31	59.02	3.96	3.11	2.14	104.58	1711.34	397.8	216.69	181.94	14.18	2925.00
		Area %	5.17	2.49	0.21	2.02	0.14	0.11	0.07	3.57	58.51	13.60	7.41	6.22	0.48	100.00
02	Charbatia	Area (in ha)	285.04	4.56	73.02	73.18	591.76	35.74	16.23	143.88	863.25	581.86	218.85	40.59	33.31	2961.27
		Area %	9.63	0.15	2.47	2.47	19.98	1.21	0.55	4.86	29.15	19.65	7.39	1.37	1.12	100.00
03	Chatissa	Area (in ha)	32.6	0.18	0.00	9.55	2.00	0.74	0.93	9.29	605.33	122.20	547.17	365.44	50.65	1746.08
		Area %	1.87	0.01	0.00	0.55	0.11	0.04	0.05	0.53	34.67	7.00	31.34	20.93	2.90	100.00
04	Choudwar	Area (in ha)	155.68	5.51	30.48	46.89	15.26	9.73	8.37	127.23	355.23	401.54	279.29	316.12	79.72	1831.05
		Area %	8.50	0.30	1.67	2.56	0.83	0.53	0.46	6.95	19.40	21.93	15.25	17.27	4.35	100.00
05	Nimapur	Area (in ha)	256.75	14.44	87.18	75.63	16.16	0.16	1.75	219.87	590.58	324.2	535.7	684.52	16.51	2823.45
		Area %	9.09	0.51	3.09	2.68	0.57	0.01	0.06	7.79	20.92	11.48	18.97	24.24	0.59	100.00
06	Bidanasi	Area (in ha)	399.02	3.18	0.00	106.14	42.06	25.37	31.48	360.66	27.04	588.64	1332.90	383.72	17.41	3317.62
		Area %	12.03	0.10	0.00	3.20	1.27	0.76	0.95	10.87	0.81	17.74	40.18	11.57	0.52	100.00
07	Old Cuttack	Area (in ha)	676.70	93.42	0.24	153.57	109.94	13.51	69.84	150.48	0.00	218.93	210.53	632.95	7.10	2337.21
		Area %	28.95	4.00	0.01	6.57	4.70	0.58	2.99	6.44	0.00	9.37	9.01	27.08	0.30	100.00
08	Sikharpur	Area (in ha)	441.45	33.55	18.14	120.13	63.49	34.90	16.90	279.06	192.05	514.41	380.62	524.35	79.97	2699.02
		Area %	16.36	1.24	0.67	4.45	2.35	1.29	0.63	10.34	7.12	19.06	14.10	19.43	2.96	100.00
09	Mundali	Area (in ha)	107.37	1.11	4.83	53.25	71.24	8.00	4.72	72.28	958.45	1224.45	538.53	180.28	85.36	3309.87
		Area %	3.25	0.03	0.15	1.61	2.15	0.24	0.14	2.18	28.96	36.99	16.27	5.45	2.58	100.00
10	Barang	Area (in ha)	223.71	4.75	10.52	63.71	13.99	3.34	4.18	240.27	881.91	587.39	915.83	505.42	333.27	3788.29
		Area %	5.90	0.13	0.28	1.68	0.37	0.09	0.11	6.34	23.28	15.51	24.17	13.34	8.80	100.00
11	Gopalpur	Area (in ha)	258.39	24.88	5.04	75.88	21.59	3.46	6.00	358.89	321.68	411.78	586.99	181.38	222.52	2478.48
		Area %	10.43	1.00	0.20	3.06	0.87	0.14	0.24	14.48	12.98	16.62	23.68	7.32	8.98	100.00
CDPA		Area (in ha)	2987.85	258.37	235.76	836.95	951.45	138.06	162.54	2066.49	6506.86	5373.20	5763.10	3996.71	940.00	30217.34
		Area %	9.89	0.85	0.78	2.77	3.15	0.46	0.54	6.84	21.53	17.78	19.07	13.23	3.11	100.00

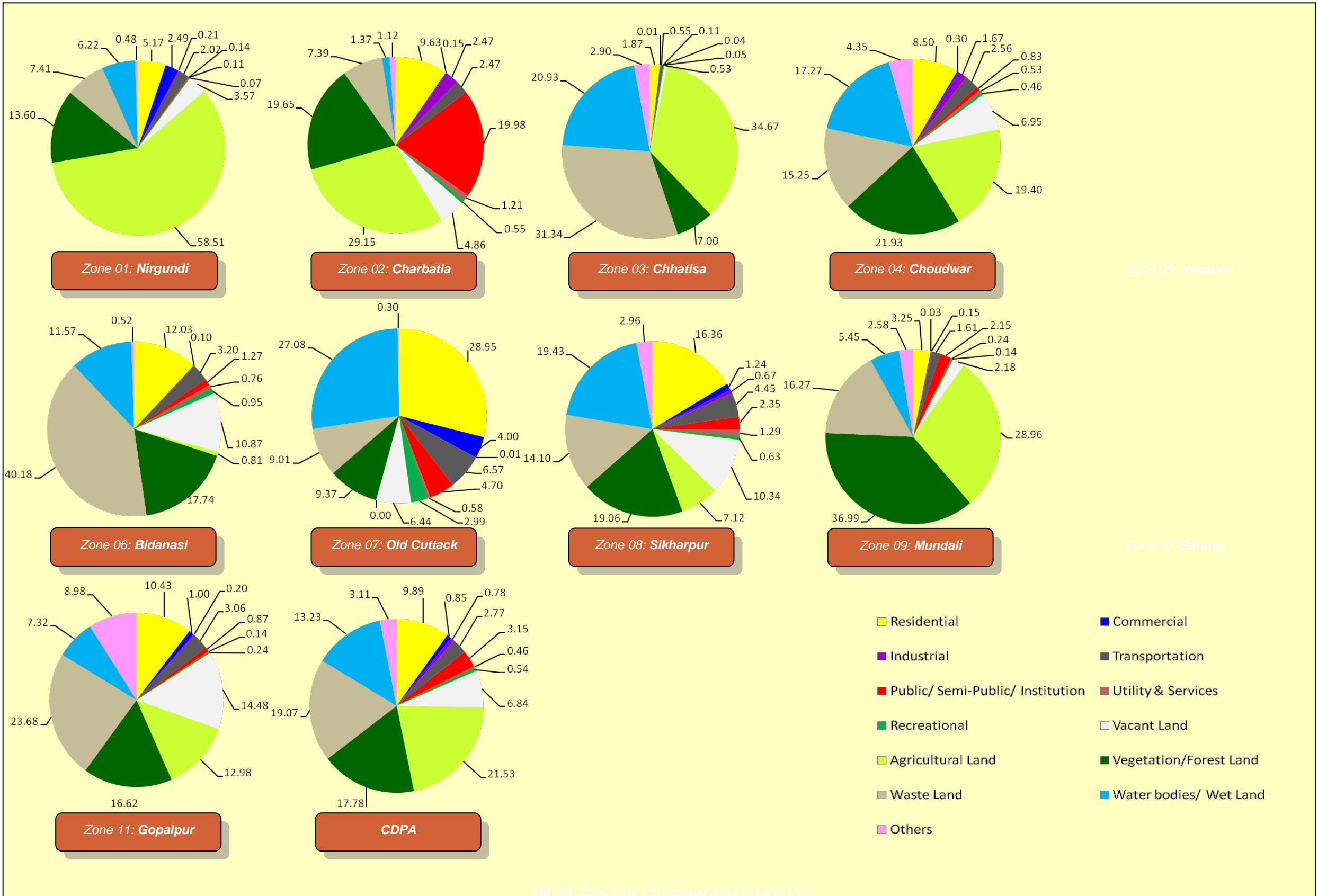


Fig 3.6: Zone-wise Percentage Area of Land Use

Table 3.7: Zone-wise Ownership Interpretation

Zone No.	Location Description		Villages within the Zone	Government	Government Reserved	Temple/ Trustee	Government Forest	Private	Ownership Not Available	Plot No. not available	Total
01	Nirgundi	Area (in ha)	Agarjodi, Alana, Alarpur, Athabatia, Banika, Barachancho, Barakesarpur, Bharandi, Bilteruan, Charbatia, Deulchua, Garudagan, Harianta, Hatsisua, Jajabhairabi, Kujibar, Manguli, Nakhara, Narapara, Nelia, Nimapara, Nirgundi, Padhania, Palasa, Saino, Sanachancho, Sanakesarpur, Sardola, Tarato.	356.61	200.72	117.15	0.00	1494.80	755.72	0.00	2925.00
		Area %		12.19	6.86	4.01	0.00	51.10	25.84	0.00	100.00
02	Charbatia	Area (in ha)	Agarpara, Agrahat, Bandala, Banipada (part), Bhabadeipur (part), Choudwar (part), Chhatisa, Chhatisa No. 2 (part), Gopalpur (part), Jajabhairabi, Kalyansinhpur (part), Kapaleswar (part), Kedareswar, Mangalpur, Mundamal, Nuagan (part), Soshapatana.	954.69	286.85	144.35	32.22	1431.69	110.54	0.93	2961.27
		Area %		32.24	9.69	4.87	1.09	48.35	3.73	0.03	100.00
03	Chhatisa	Area (in ha)	Bhabadeipur (part), Chhatisa No.1, Gopalpur, Indranipatana Aliash Gaukhana (part), Jhatia, Kayalapara, Mahanadi (part), Nuagan (part), Similihand, Udaynagar (part)	696.72	107.24	97.91	0.00	824.45	17.15	2.62	1746.08
		Area %		39.90	6.14	5.61	0.00	47.22	0.98	0.15	100.00
04	Choudwar	Area (in ha)	Banipada, Chashapara, Choudwar (part), Chatissa No.2 (part), Daulatabad, Gobindjiupatana, Godipatana, Gpoalpur (part), Haranathpur, Indranipatana Aliash Gaukhana (part), Jenipurnarasinpur, Kalyansinhpur (part), Kapaleswar (part), Mahanadi (Part), Sultanpur	634.88	77.53	81.93	2.87	997.30	19.38	17.16	1831.05
		Area %		34.67	4.23	4.47	0.16	54.47	1.06	0.94	100.00
05	Nimapur	Area (in ha)	Andeisahi, Gopinathpur, Gunjarpur, Imamnagar, Khaera, Nimapur, Tarol	865.81	166.06	30.86	0.00	745.48	1012.16	3.07	2823.45
		Area %		30.67	5.88	1.09	0.00	26.40	35.85	0.11	100.00
06	Bidanasi	Area (in ha)	Arilo (part), Baimundinagar, Bentakarpara (part), Bidansi, Bidyadharpur (part), Brajabiharipur, Chandinichouk, Deulasahi North, Deulasahi South, Krushnachandrapur (part), Mahanadi (part), Mundamuhan (part), Nayasarak, Ramagarh, Subarnapur (part), Tangarhuda (part), Tulasipur North, Tulasipur South, Udayanagar (part)	2453.22	277.46	51.33	0.00	518.91	0.00	16.70	3317.62
		Area %		73.95	8.36	1.55	0.00	15.64	0.00	0.50	100.00
07	Old Cuttack	Area (in ha)	Badambadi, Barabatikila, Bisinabar, Buxibazar, Cantonment, Choudhuribazar, College Square, Dolamunde, Jhanjirimangala, Jobra, Kathagarasahi, Machhuabazar, Madhupatana, Mahanadi, Mahanadi No.2, Mangalabag, Mirkamalpatna, Nayasarak, Oriabazar, Rajabagicha, Ranihat, Samant sahi, Sutahat	1457.54	49.28	78.23	0.00	733.98	13.01	5.17	2337.21
		Area %		62.36	2.11	3.35	0.00	31.40	0.56	0.22	100.00
08	Sikharpur	Area (in ha)	Andarpur, Arunadayanagar, Bagulapada, Banabidyadharpur, Bhadimul, Bidyadharpur, Chauliaganj, Dianrajahansa, Gandarpur, Gateirautpatana, Gunadol, Kanhaipur, Kantilo, Matagajapur, Nuapara, Paise, Poparada, Sartol, Shilpapuri, Sikharpur	1202.21	136.70	37.74	0.00	1148.31	168.40	5.65	2699.02
		Area %		44.54	5.06	1.40	0.00	42.55	6.24	0.21	100.00
09	Mundali	Area (in ha)	Chakradharpur, Chandiprasad, Govindpur, Mundali, Narajmarathapur, Nuagan, Ramdaspur, Ratagarhlenkasahi, Talagar	1437.42	546.51	46.42	0.00	1272.78	0.88	5.86	3309.87
		Area %		43.43	16.51	1.40	0.00	38.45	0.03	0.18	100.00
10	Barang	Area (in ha)	Arilo (part), Bachhapur, Belagachhia, Bentakarpara (part), Bidyadharpur (part), Brahmangan, Brajabiharipur (part), Dadhapatna, Krushnachandrapur, Kunheipara, Madhubana, Madhupur, Madhusudanpur, Mundamuhan (part), Naranpur, Padmalavanagar, Panchupal, Patapur, Phakirpara, Pratapnagari (part), Sribantapur, Subarnapur (part), Tangarhuda (part)	1803.42	175.28	64.54	10.10	1711.16	18.82	4.97	3788.29
		Area %		47.61	4.63	1.70	0.27	45.17	0.50	0.13	100.00
11	Gopalpur	Area (in ha)	Arakkud Aliash Telengapenth, Bandhachhara Aliash Kacharamal, Bhanpur, Gopalpur, Nuahat, Pratapnagari (part), Srikoruan, Subhadrapur, Uttampur	1248.88	88.76	37.28	0.00	1068.87	27.43	7.26	2478.48
		Area %		50.39	3.58	1.50	0.00	43.13	1.11	0.29	100.00
CDPA		Area (in ha)		13110.75	2112.53	787.70	45.20	11947.95	2143.81	69.39	30217.34
		Area %		43.39	6.99	2.61	0.15	39.54	7.09	0.23	100.00

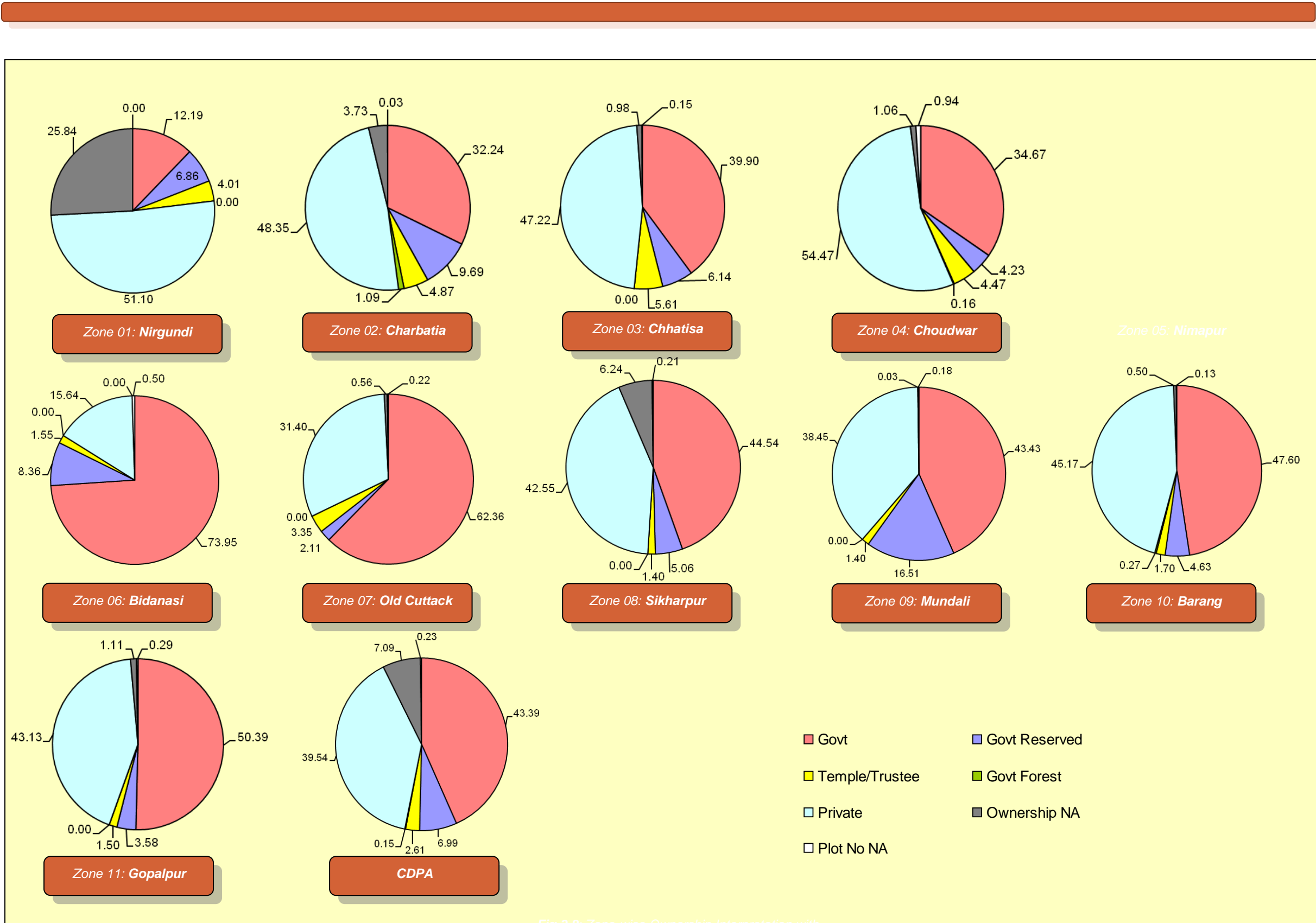


Table 10.1: Tourism Proposal of CDPA

Zone No.	Location Description	Broad Zone	Zone area in Sq.Kms	Existing Characteristics	Proposed Tourism functions/ Tourism potential
2	Charbatia (Choudwar (M), CDPA Rural)	Restricted Development	29.64	Cantonment and ASI protected area, Choudwar Fort, Asthasambhu temples	Ceremonial open spaces, brass and bell metal artefact display and sales centres around the Charbatia Fort for tourists' interest. Open Air Theatre near the fort for performing the traditional Ghoda Naach. Restoration and Conservation of major waterbodies along the religious complexes of the Ashthashambhu circuit.
3	Chhatisa (CDPA Rural)	Sensitive Development	17.46	Low lying agricultural lands	Amusement parks, with lagoons/ lakes after proper identification and delieneation of the drainage channels. Pisciculture/floriculture, herbal gardens. Pilgrims' rest shelter, toilets and eateries on the way to Dhableswar Temple
4	Choudwar (Choudwar (M))	Intensive Development	18.28	Old factories, Industries, Developable land	Folk art and Horse-dance training and performance areas, Religious and Cultural Fair Grounds. A Textile-and-Handicraft Hub and Building Industries along with Mason Training Centres. Ashthashambhu circuit with pilgrim shelters, eateries, shops, toilets, etc.
5	Nimapur (CMC)	Extensive Development	28.14	Proximity to NH 5, Periurban area, Mahanadi River front, Agricultural fields	Special recreational activities with parks and gardens, water sports, movie theatres, food streets, etc. Extensive development is preferred for Sports Complex, Fitness Centres, etc.
6	Bidanasi (CMC)	Extensive Development	33.39	Developable open space, Residential colonies, Institutions, River fronts	Along the Mahanadi river banks, picnic spots, martyrs' memorial, landscaped parks (Shantiban, Delhi style) for Oriya historic personalities can be made for tourist attraction (Utkal Ratna Bhumi). Open spaces with beautiful landscape can be earmarked for fair grounds, religious discourses, etc along with Deer Park, birds' sanctuary, etc.
7	Old Cuttack (CMC)	Restricted Development	23.36	Wholesale and retail markets, Colonial heritage structures, Barabati Fort, Stadiums	Tourist complex around historical Barabati Fort can be developed with archaeological museum, light and sound shows, tourist-care activities, etc. Surrounding moat or water course can be revived for paddle boating, musical fountains, landscaped gardens, etc. Formal spaces can be introduced for performing traditional 'yatra' with the peripheral audience seating near the landscape gardens. Historical parks depicting chronological development of Cuttack city. Barabati Haat, an Oriya Cultural Ensemble in the line of 'Delhi Haat' where the tourist can see the glimpses of Orissa's rich traditional art and culture, cuisine, handicrafts, textile and lifestyle in one place only. Only temporary kiosks will be allowed at the Barabati Haat instead of permanent buildings. Netaji's birth place can be conserved through urban conservation program with appropriate landscaping, environmental lighting, Homage offer site, etc. Youth Development Centre for inspiring power among the youth, generating patriotic awareness and community service – may bear the scope of new allied development for this 'Veer Sthal'. Suitable River Strand Drive Program should be introduced along the entire stretch of Mahanadi from Naraj point to Jobra barrage.
8	Sikharpur (CMC)	Extensive Development	26.99	Mixed residential area, Agricultural lands, River fronts	Along Taladanda Canal, Urban Parkway System may be introduced with intermittent approach ghats for navigational and other socio-cultural activities. Boating for tourists may be planned in the line of Backwater Cruise in Kerala.
9	Mundali (CDPA Rural)	Sensitive Development	33.10	Forest, Hills, Agricultural fields, Mahanadi and Kathajodi River front and village settlements	Golf Club, Club Town, riverside resorts. Afforestation and recreational parks such as Energy Park, resort housing along the foothills thereby forming ideal locations for picnic spots. Interesting spot for activities such as trekking, bird watching, etc.
10	Barang (CDPA Rural)	Extensive Development	37.68	Villages having vast vacant developable lands, River front	High-end activity zone with high-end commercial activities along the riverfront. Open spaces for religious discourses, Yoga Clubs, naturopathy centers, etc. have been proposed along the riverfront near Sri Sri Ravi Shankar University. Also a Science and Technology Entrepreneur's Park has been proposed in this zone along the riverfront.
11	Gopalpur (CMC)	Extensive Development	24.79	Proximity to NH 5, Vacant agricultural land and speculated holdings	Near Jain Museum Complex and near the meeting points of Kuakhai river and Puri Canal, integrated recreational development with small cottages, boat cruises, picnic spots etc.

Table 10.2: Land Requirement and Cost of Development

Zone No.	Location Description	Broad Zone	Zone area in Sq.Kms	Proposed Tourism functions/ Tourism potential	Area required (in Hectares)	Cost (in Crores)
2	Charbatia (Choudwar (M), CDPA Rural)	Restricted Development	29.64	Ceremonial open spaces, brass and bell metal artefact display and sales centres around the Charbatia Fort for tourists' interest. Open Air Theatre near the fort for performing the traditional Ghoda Naach. Restoration and Conservation of major waterbodies along the religious complexes of the Ashthashambhu circuit.	10	8
3	Chhatisa (CDPA Rural)	Sensitive Development	17.46	Amusement parks, with lagoons/ lakes after proper identification and delieneation of the drainage channels. Pisciculture/floriculture, herbal gardens. Pilgrims' rest shelter, toilets and eateries on the way to Dhableswar Temple	15	10
4	Choudwar (Choudwar (M))	Intensive Development	18.28	Folk art and Horse-dance training and performance areas, Religious and Cultural Fair Grounds. A Textile-and-Handicraft Hub and Building Industries along with Mason Training Centres. Ashthashambhu circuit with pilgrim shelters, eateries, shops, toilets, etc.	10	10
5	Nimapur (CMC)	Extensive Development	28.14	Special recreational activities with parks and gardens, water sports, movie theatres, food streets, etc. Extensive development is preferred for Sports Complex, Fitness Centres, etc.	30	15
6	Bidanasi (CMC)	Extensive Development	33.39	Along the Mahanadi river banks, picnic spots, martyrs' memorial, landscaped parks (Shantiban, Delhi style) for Oriya historic personalities can be made for tourist attraction (Utkal Ratna Bhumi). Open spaces with beautiful landscape can be earmarked for fair grounds, religious discourses, etc along with Deer Park, birds' sanctuary, etc.	25	20
7	Old Cuttack (CMC)	Restricted Development	23.36	Tourist complex around historical Barabati Fort can be developed with archaeological museum, light and sound shows, tourist-care activities, etc. Surrounding moat or water course can be revived for paddle boating, musical fountains, landscaped gardens, etc. Formal spaces can be introduced for performing traditional 'yatra' with the peripheral audience seating near the landscape gardens. Historical parks depicting chronological development of Cuttack city. Barabati Haat, an Oriya Cultural Ensemble in the line of 'Delhi Haat' where the tourist can see the glimpses of Orissa's rich traditional art and culture, cuisine, handicrafts, textile and lifestyle in one place only. Only temporary kiosks will be allowed at the Barabati Haat instead of permanent buildings. Netaji's birth place can be conserved through urban conservation program with appropriate landscaping, environmental lighting, Homage offer site, etc. Youth Development Centre for inspiring power among the youth, generating patriotic awareness and community service – may bear the scope of new allied development for this 'Veer Sthal'. Suitable River Strand Drive Program should be introduced along the entire stretch of Mahanadi from Naraj point to Jobra barrage.	10	15
8	Sikharpur (CMC)	Extensive Development	26.99	Along Taladanda Canal, Urban Parkway System may be introduced with intermittent approach ghats for navigational and other socio-cultural activities. Boating for tourists may be planned in the line of Backwater Cruise in Kerala.	15	10
9	Mundali (CDPA Rural)	Sensitive Development	33.10	Golf Club, Club Town, riverside resorts. Afforestation and recreational parks such as Energy Park, resort housing along the foothills thereby forming ideal locations for picnic spots. Interesting spot for activities such as trekking, bird watching, etc.	5	10
10	Barang (CDPA Rural)	Extensive Development	37.68	High-end activity zone with high-end commercial activities along the riverfront. Open spaces for religious discourses, Yoga Clubs, naturopathy centers, etc. have been proposed along the riverfront near Sri Sri Ravi Shankar University. Also a Science and Technology Entrepreneur's Park has been proposed in this zone along the riverfront.	25	30
11	Gopalpur (CMC)	Extensive Development	24.79	Near Jain Museum Complex and near the meeting points of Kuakhai river and Puri Canal, integrated recreational development with small cottages, boat cruises, picnic spots etc.	25	10
<i>Tourism Publicity Budget (for tre CDPA Planning Area)</i>						5
<i>Tourism Training Infrastructure (for the CDPA Planning Area)</i>						3
<i>Services like Water supply, Sewerage, Solid waste management, Power and Telecommunication (for CDPA Planning Area)</i>						30
Total						176

Table 11.1: Signifiant Heritage Areas

Zone name	Area name	Main Elements	Quality	Recommended measures	Typical Features
Charbatia Zone No: 02 & Choudwar Zone No: 04	Choudwar Fort & Astha shambhu Temples	Archeological, Historical Natural, Socio- cultural (Astha Sambhu Temples, Ghora naach)	High	Preservation & development	
A. Special Areas					
Old Cuttack Zone No: 07	1. Barabati Fort	Archeological, Historical Natural , Architectural	Very High	Careful Preservation	
	2. Cantonment Area	Historical, Institutional , Townscape , Architectural	High	Preservation of townscape and institutional activity, harmonious infill development	
	3. Judiciary Complex	Historical, Architectural, Townscape	Very High	Preservation of urban precinct and harmonious infill development	
	4. River Front	Natural, Historical, Townscape	Excellent	Redevelopemnt and revitalisation	
B. Other Area		Townscape, Architectural, Historical , Cultural (Filigree work)	High	.Promotion of Filigree works and preservation of listed structures and precincts	

Table 11.2: Proposed activities and land use classification of various Heritage Zones in CDPA

Zone No.	Name	Significance	Land Use Category		Recommendations	Uses Permitted	Levels of Control
			Level I	Level II			
2 & 4	Charbatia and Choudwar Fort	Archeological reserve, pilgrimage circuit, indigenous performing art form and artist community, water bodies	I 10	S2	Initiating afforestation with mandatory approval from ASI	Archeological Park and protected archeological reserve with landscaping, planned heritage trails and pilgrimage circuit, development of basic minimum facilities for visitors.	Restricted Development, No construction activity and mining operation permitted.
				S4	Rehabilitation and revitalization of the existing settlements	Training and workshops, museums, research and documentation centre, folk art and craft museum, open air theatre and tourists spots at Charbatia, training centre for folk art (Ghora Naach)	Regulated Development
6	Bidanasi	Natural heritage - river front			Craft Village: Promotion through training and workshops, organised marketing, incentives and modernisation, regulated river front development.	Craft Village, as well as, a Centre for promotion of filigree works at an international level.	Regulated Development
7	Barabati Fort	Historical site and archeological reserve, festival ground, natural heritage(moat and river front)	I 10	S2	Initiating afforestation with mandatory approval from ASI	Son-et-luminiere show, Historical Theme Park, Interpretation centre and museum; fair ground, cultural complex, landscaping, temporary training camps and workshops, revival of the surrounding moat.	Special Area, Protected Area, No constructional activity and mining operation permitted.
				S5	Core area preservation, Urban design controls	Amphitheatre, fair ground, heritage interpretation centre, water front development.	Prohibited and regulated area. Height and FAR Restriction
	Cantonment	Diverse architectural, built and institutional heritage, river front (natural heritage)	I 10	S1	Preservation of townscape value. Regulation of urban design guidelines. Proposed activities– Institutional and Govt. residential.	Restoration and rehabilitation of unused or derelict heritage structures to accommodate new activities like guest houses, club houses, schools, institutes etc. to be allowed. New harmonious construction/developments may be allowed for totally derelict and unlisted structures.	Prohibited and regulated area. Height and FAR Restriction, set-back regulations, urban design control.
	Judiciary Complex	Architectural, built and institutional heritage	I 10	S1	Preservation of townscape value and development of pedestrian precinct. Regulation of urban design guidelines.	Preservation	Restricted Development, Generally no construction activity. In special cases, harmonious new constructions may be permitted with approval from Heritage Committee.

Table 11.3: Cost of Preservation and Promotion of Heritage

Zone No.	Location Description	Broad Zone	Proposed Heritage and Cultural functions	Cost (In Crores)
2 & 4	Charbatia & Choudwar Fort	Intensive Development includes 3 temples of the Astha Shambhu Complex; Rest of the areas is included within the Restricted Development	Archeological Park and protected archeological reserve with proper maintenance and landscaping, planned heritage trails and basic minimum facilities, folk art centre and sympathetic development of necessary facilities and amenities, Fort is well protected but needs promotion and interpretation, further excavation, Preservation of Astha Shambhu Temples, Revitalizing local folk art (Ghora Naach) through training and workshops, festivals, museums, research and documentation centre, folk art and craft museum, open air theatre and tourists spots at Charbatia, Historical Theme Park; Son-et-luminiere show, Enlisting, grading and suitable recommendations for all historical structures and tanks within Zone 2.	40
7	Barabati Fort, Old Cuttack	Restricted Development	Protected area of highest significance, Son-et-luminiere show, Historical Theme Park, Interpretation centre and museum within the Fort; fair ground, cultural complex in the vicinity, Large scale natural green area required for protecting structures from pollution, Effectively dealing with the issue of encroachment, Temporary training camps and workshops, Revival of surrounding moat to be used for boating as a recreational facility, Activities that are permitted beyond the protected area but within 200 m are amphitheatre, fair ground, heritage interpretation centre, water front development.	60
	Cantonment, Old Cuttack	Restricted Development	Preservation of townscape value and heritage structures, Regulation and urban design guidelines for new construction, Proposed activities for Institutional and Govt. residential, Preservation of Colonial Township, Enlisting, grading and suitable recommendations for all historical structures, precincts, landmarks within cantonment, Development Controls specified for any new construction, Urban design guidelines prescribed specially for some of the streets. e.g. Cantonment Road and Street adjoining the areas, Restoration and rehabilitation of unused or derelict heritage structures for new activities like guest houses, club houses, schools, institutes etc., well organized guided tours to colonial landmarks supported by well planned tourist facilities.	35
	Judiciary Complex, Old Cuttack	Restricted Development	Public activities with high value built heritage and socio cultural institutes, Preservation and augmentation of Townscape value, Prescription of Urban design guidelines, Restriction on unsympathetic new construction. Intrinsic morphology of the area must not be disrupted, Identified precincts to be pedestrianised, Improvement and augmentation of facilities and amenities for the users.	15
	Other Areas, Old Cuttack	Restricted Development	Conservation and Preservation of significant heritage areas of Cuttack like the prestigious institution- Ravenshaw University; memorials like the Netaji Birth Place Museum; built forms depicting colonial architectural character such as Jobra Workshop, Chinese Restaurant, the Kanika Raja Palace and the Darpani Rani Palace, etc. Conservation of existing work-cum-living centres of the filigree workers and proposal for a new institute.	25
River Front Development along Mahandi and Kathajodi			City level open spaces, parks, fair ground, recreational areas, cultural complex, commercial development, institutional areas, resorts, hotels and residential complex. Specific urban design guidelines need to be formulated to develop the river banks into attractive zones. Recreational and Cultural Hub at Gopalpur: Drama Academy, Fair Ground, Open Air Theatre, and Parks. Special bye-laws and regulations to be formulated Priority for open space based water front related recreational activities. Encouragement of related commercial activities, specific institutional areas and housing, Urban design guidelines to be prescribed, Enlisting, grading and suitable recommendations for all historical structures, tanks, precincts, significant secular structures, Improvement and augmentation of facilities and amenities, Dealing issue of encroachment and polluting activities.	75
Total cost for preservation and restoration of heritage structures, precincts and water bodies (for the CDPA Planning Area) (Acquisition cost not included)				250
Inventory of heritage resources (for the CDPA Planning Area)				5
Public awareness (for the CDPA Planning Area)				5
Total				260

Table 14.3 : Percentage Area of Proposed Zone-wise Land Use

Zone No.	Location Description		Residential	Retail Commercial and Business	Wholesale Commerce	Industrial	Public and Semi-Public	Utility & Services	Recreational	Transportation	Agriculture and Forest	Water Bodies	Special Heritage	Environmentally Sensitive	Total
01	Nirgundi	Area (in ha)	759.46	281.80	202.49	287.42	196.12	34.22	28.47	756.84	126.35	201.96	15.80	34.06	2925.00
		Area %	25.96	9.63	6.92	9.83	6.71	1.17	0.97	25.87	4.32	6.90	0.54	1.16	100.00
02	Charbatia	Area (in ha)	434.10	15.32	0.00	280.23	768.52	42.46	428.04	235.87	351.22	53.58	351.93	0.00	2961.27
		Area %	14.66	0.52	0.00	9.46	25.95	1.43	14.45	7.97	11.86	1.81	11.88	0.00	100.00
03	Chatissa	Area (in ha)	380.06	30.17	0.00	278.52	154.13	0.00	143.27	135.62	48.69	573.03	0.00	2.59	1746.08
		Area %	21.77	1.73	0.00	15.95	8.83	0.00	8.21	7.77	2.79	32.82	0.00	0.15	100.00
04	Choudwar	Area (in ha)	383.18	49.23	21.72	443.61	12.39	10.29	152.20	186.82	0.00	437.26	118.02	16.32	1831.05
		Area %	20.93	2.69	1.19	24.23	0.68	0.56	8.31	10.20	0.00	23.88	6.45	0.89	100.00
05	Nimapur	Area (in ha)	785.09	53.67	11.35	259.75	95.70	14.13	19.10	298.52	0.00	1211.20	0.00	74.95	2823.45
		Area %	27.81	1.90	0.40	9.20	3.39	0.50	0.68	10.57	0.00	42.90	0.00	2.65	100.00
06	Bidanasi	Area (in ha)	645.47	46.42	0.00	0.00	192.95	21.84	27.52	257.73	27.45	1765.85	16.04	316.35	3317.62
		Area %	19.46	1.40	0.00	0.00	5.82	0.66	0.83	7.77	0.83	53.23	0.48	9.54	100.00
07	Old Cuttack	Area (in ha)	658.27	116.88	2.75	0.00	140.75	17.14	199.22	230.63	0.00	825.05	140.75	5.77	2337.21
		Area %	28.16	5.00	0.12	0.00	6.02	0.73	8.52	9.87	0.00	35.30	6.02	0.25	100.00
08	Sikharpur	Area (in ha)	944.79	34.25	67.17	25.11	268.02	52.74	9.46	358.51	0.00	872.03	0.00	66.93	2699.02
		Area %	35.00	1.27	2.49	0.93	9.93	1.95	0.35	13.28	0.00	32.31	0.00	2.48	100.00
09	Mundali	Area (in ha)	713.69	0.00	0.00	0.00	676.57	107.70	391.95	282.40	508.31	616.88	0.00	12.37	3309.87
		Area %	21.56	0.00	0.00	0.00	20.44	3.25	11.84	8.53	15.36	18.64	0.00	0.37	100.00
10	Barang	Area (in ha)	986.47	153.17	0.00	77.66	584.46	7.52	43.72	415.64	34.16	1222.43	0.00	263.06	3788.29
		Area %	26.04	4.04	0.00	2.05	15.43	0.20	1.15	10.97	0.90	32.27	0.00	6.94	100.00
11	Gopalpur	Area (in ha)	844.59	234.07	0.00	0.00	121.02	19.87	0.00	344.12	0.00	612.16	0.00	302.65	2478.48
		Area %	34.08	9.44	0.00	0.00	4.88	0.80	0.00	13.88	0.00	24.70	0.00	12.21	100.00
CDPA			7535.18	1014.98	305.48	1652.31	3210.63	327.89	1442.95	3502.71	1096.19	8391.43	642.53	1095.06	30217.34
			24.94	3.36	1.01	5.47	10.63	1.09	4.78	11.59	3.63	27.77	2.13	3.62	100.00



Fig 14.1: Proposed Zone-wise percentage area of

1. Census of India, District Census handbooks, 2001, 1991, 1981, 1971
2. Economic Survey Report 2003-04, Dir. Of Economics and statistics, Govt. of Orissa
3. Economic Survey 2005-06, Govt. of Orissa
4. Orissa Reference Annual- 2004
5. Cuttack Development Authority (Planning and Building Standards) Regulation, 2001
6. Bhubaneswar Development Authority (Planning and Building Standards) Regulation, 2008
7. Urban Development Plans Formation and Implementation (UDPFI) Guidelines, Ministry of Urban Affairs & Employment, Govt. of India, 1996
8. An Economic-Cum-Purpose classification of the Orissa Govt. Budget
9. District Statistical Handbook 2001 for Cuttack
10. Interim Development Plan for Bidanasi Cuttack. (Dir. Town Planning, 1983)
11. Draft Master Plan for Choudwar. (1980)
12. Master plan for Greater Cuttack Improvement Trust (1980)
13. Income and Expenditure of Choudwar Municipality for the year 2006-07, 2005-06, 2004-05, 2003-04, 2002-03, 2001-02
14. Income and Expenditure of Cuttack Municipal Corporation for the year 2005-06, 2004-05
15. DPR of Integrated Sewerage and Solid Waste Management for Abatement of Pollution of Rivers Kuakhai and Daya at Bhubaneswar (Orissa Water Supply and Sewerage Board Bhubaneswar) prepared by Alternate Hydro Energy Centre, IIT Roorkee
16. Orissa Development Authorities Manual
17. The Constitution on India
18. Panchayat Laws in Orissa
19. Orissa Municipal Corporation Manual, Ashoka Kumar Mohapatra
20. Orissa Municipal Manual, Orissa law Review
21. Draft report of Environmental Management Plan, Orissa State Pollution Control Board
22. Earthquake hazard map of Orissa

23. Technical annual report of Institute of Engineers (Geology and Urban Development of Bhubaneswar, Cuttack and Paradeep)
24. Geomorphology By. N.K.Mahalik, Professor Geology, Utkal University, Bhubaneswar
25. The Pyromex waste to energy and desalination technologies with feasibility study
26. Integrated waste management comprising of compost, land fill and energy recovery of 6 Mw prepared by Ekdanta Power Pvt. Ltd
27. Development of twin cities of Cuttack and Bhubaneswar, Transport network RITES 1996
28. Mass Transit System for Cuttack & Bhubaneswar, RITES Ltd, January 2008
29. JBIC special assistance for project formation(SAPROF) for Orissa Integrated Sanitation Improvement Project in the Republic of India, INTERIM REPORT
30. Action plan Industrial Development of Cuttack District- 2005-06
31. Five years projected Action Plan for Industrial Development of Cuttack District
32. Statistical Bulletin 2005, Dept. of Tourism and Culture, Govt. of Orissa
33. The Forgotten Monuments of Orissa, (vol-1,2), Edited by B. K. Rath
34. Charter for the Conservation of Unprotected Architectural Heritage and Sites in India (Adopted at the INTACH National Convention, November 2004, INTACH, New Delhi
35. Heritage Regulation for Greater Bombay, 1995, Government of Maharashtra, Urban Development Department of Bombay
36. www.bhulekh.ori.nic.in
37. Perspective Plan for Bhubaneswar-Cuttack Urban Complex, A&RP, IIT, 2007
38. Socio-Economic Survey Report, IIT, SPARC, 2007

APPENDIX-I

The Appendix refers to the Regulations prescribed in the **CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010** and adopted for application in enforcing the Comprehensive Development Plan (CDP) for Cuttack Development Plan Area (CDPA).

However, some modifications have been made by incorporating some of the provisions of Bhubaneswar Development Authority (Planning and Building Standard) Regulation, 2008.

General Building Requirements

This refers to the Regulations No. 1163 of Part IV of the **CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010**

26. Restriction on Permission:

Without prejudice to any other stipulation in these Regulations, no permission to construct a building on a site shall be granted:

- a. in areas of natural waterways or drains, as detailed in the Development Plan, and drainage plan as modified from time to time;
- b. if the orientation of such building is not in harmony with the surroundings, as may be decided by the Art Commission;
- c. if the use to which the site is proposed to be put does not conform to the use earmarked in the Development Plan;
- d. if the building is to be constructed over or under a municipal drain, sewerage line, electrical line, water main, any other government or public land, or public utility services;
- e. if the foundation of the external wall along a street is located at a distance less than 0.5 meters from the edge of the street or road margin including the drain;
- f. if the construction of proposed building thereon is for public worship, which is the opinion of the Authority will adversely affect the religious feelings of any other class or persons in the vicinity;
- g. if all structure plans are not prepared taking into account the structural safety from seismic zone point of view;
- h. if the site is not drained properly or incapable of being well drained.
- i. if the plot having kizam as agriculture/jalasaya in ROR;
- j. if the building is to be constructed over a land where construction is prohibited by the Authority with approval of Government.

27. Distance from Electric lines:

As provided in clause-6.4 of National Building Code-2005, no verandah, balcony or the like shall be allowed to be erected or re-erected or any additions or alterations made to a building within the distances quoted below in accordance with the *Indian Electricity Rules* between the building and any overhead electric supply line.

Where a high or extra-high voltage overhead line passes above or adjacent to any building or part of a building it shall have on the basis of maximum sag a vertical clearance above the highest part of the building immediately under such line, of not less than as shown in **table-1**.

The horizontal clearance between the nearest conductor and any part of such building shall, on the basis of maximum deflection due to wind pressure, be not less than as shown in **table-1**.

Table 1: Minimum Distance from the Electric line

	<i>Vertical distance in meters</i>	<i>Horizontal distance in meters</i>
<i>Low and medium voltage lines and service lines</i>	2.5	1.2
<i>High voltage lines up to and including 11,000 Volt</i>	3.7	1.2
<i>High voltage lines above 11,000 volt and up to and including 33,000 Volt</i>	3.7	2.0
<i>Extra high voltage line beyond 33,000 Volt</i>	3.7 <i>(Plus 0.3 meters for every additional 33,000 volts or part thereof)</i>	2.0 <i>(Plus 0.3 meters for every additional 33,000 volts or part thereof)</i>

28. Plantation:

- a. While granting permission for any development, the authority may, where so required make adequate provision for the preservation or planting of trees.
- b. In every building area, at least 10% of the land shall be utilised by plantation, but in case of multi-storied buildings/ Group Housing/ Apartment building/ Industrial/ Assembly/ Educational/ Institutional buildings, at least 20% of the land shall be covered by plantation.

29. Means of access:

- 1) Every building/ plot shall abut on a public/ private means of access like streets /roads of duly formed of width as specified in clause 4, Part-3 of NBC-2005.
- 2) Every person who erects a building shall not at any time erect or cause or permit to erect any building which in any way

encroaches upon or diminishes the area set apart as means of access required in these regulations. No buildings shall be erected so as to deprive any other buildings of the means of access.

- 3) In no case, development of plots shall be permitted unless it is accessible by a public/private street of width not less than 6 meters and in case of a cul-de-sac having a length less than 150 metres, it shall be 4.5 metres.
- 4) In the existing built-up areas in the case of plots facing street/ means of access less than 6.0 metres in width, the plot boundary shall be shifted by 3.0 metres from the central line of the street/ means of access to facilitate formation of a new street/ means of access of 6.0 metres width up to a length of 120 metres after which it should be connected to a wider road.
- 5) Any private road which access to only one plot shall not be less than 3.3 metres in width and more than 25 metres in length. Such means of access shall be kept free from any obstruction and shall be fully open to the sky.
- 6) In case of institutional, administrative, assembly, industrial and other non-residential and non-commercial activities, the minimum road width shall be 9 meter.
- 7) In case of a private road, which gives access to one or more buildings, the owner of the said private road shall develop the road and storm water drain as required by the Local Authority, and transfer the same by way of gift to the Local Authority or handed over to the Registered Residents' Welfare Association for maintenance.

30. Minimum size of plots:

The minimum size of plots for different categories of building is given below:

- a. No construction of a building for residential purpose in areas other than basti area and development scheme area shall be permitted on a plot which has an area of less than 54 square metres, or a width less than 6.0 metres or an average depth of less than 9.0 metres.
- b. In the case of group housing/ plotted development schemes, the Authority may relax the requirements of the plot size as specified in sub-regulation (1) above to such extent as it may deem necessary, but in no case it shall be less than the minimum prescribed under Indian Standard Number 8888 of 1993 as mentioned in Schedule-II.

- c. For industries other than service industries and industrial estates, the minimum size of the plot shall be 400 square metres.
- d. In the case of service industries and industrial estates the minimum size of the plot shall be 200 square metres.
- e. In commercial areas, the minimum plot size of the shop shall be 18.0 sq.mt. with a minimum width of 3.0 metres provided that kiosks shall be considered as shops.
- f. In case of plots for assembly occupancy other than cinema (in existing built-up areas), the minimum size of the area shall be not less than 500 square metres and the minimum width of the plot shall be 16 metres and it shall front on a street having width of not less than 12 metres.
- g. The minimum size of the plot of cinema/theatre buildings shall be 0.6 acre for seating capacity of 500 persons and 0.75 to 1.00 acre for larger capacity with essential facilities. It shall front on a street having width of not less than 9 metres.
- h. In case of plots for institutional/ religious occupancy, the minimum area of the plot shall be 350 square metres with a minimum width of 12 metres.

Table 2: Category wise Size of Plots

Category	Min. road width (m)	Min. size of plot in Sq. m.
Kalyan Mandaps	12	1000
Cinema, game centres, multiplex, convention centres	12	2000
Social clubs and amenities	9	1000
Multi storey car parking	9	1000
Office buildings	9	300
Primary/Upper primary school	9	2000
High school, Residential school	9	6000
+2 College/Junior college	9	4000
Degree college	12	6000
Technical educational institution	12	10000
Petrol pumps/Filling stations	12	500
Restaurant	9	500
LPG storage	9	500
Places of congregation	9	500
Public libraries	9	300
Conference hall	12	1000
Community hall	9	500
Nursing homes/polyclinics	9	300
Hotel	9	2000
R&D lab	12	1500

Note: In exceptional cases the Authority may consider revising the minimum size of plot and the minimum road width on the recommendations of the Development Plan & Building Permission (DP&BP) Committee.

31. Minimum setbacks and Height for non-high rise buildings:

- 1) The minimum setbacks and height of buildings permissible in a given size/plot for residential and commercial building in non-high rising category shall be as follows;

Table 3: Plot Size wise permissible Setbacks and Height of Buildings

Plot size (in Sq.Mts.)	Maximum height of building permissible (in Mts.)	Maximum Coverage	Minimum Front setbacks (in Mts.) Abutting road width					Minimum setbacks other sides (in Mts.)	
			Less than 9 Mts.	9 Mts. And less than 12 Mts.	12 Mts. And less than 18 Mts.	18 Mts. And less than 30 Mts.	Above 30 Mts.	Rear side	Other side
1	2	3	4(a)	4(b)	4(c)	4(d)	4(e)	5	6
Less than 100	7	65%	1.5	2.0	3.0	3.0	4.5	1.0	-
100 & up to 200	10	60%						1.5	1.5
Above 200 & up to 300	10	60%						2.0	1.5
Above 300 & up to 400	12	55%	1.5	2.0	3.0	3.0	4.5	2.5	1.5
Above 400 & up to 500	12	55%						3	2
Above 500 & up to 750	15	50%	1.5	2.0	3.0	3.0	4.5	3	3
Above 750	15	50%						4	4

- 2) The conditions of minimum setback and maximum coverage shall not be applicable for slum housing, rehabilitation of service population or for other housing schedule for economically weaker sections approved by Government, Housing Board, Authority and other government agencies.
- 3) The rear open space shall be with reference to the depth of the site/ plot.
- 4) In case of group housing/apartment buildings, the minimum distance between two buildings will not be less than 1/3rd of the height of the taller building. However the minimum width of the internal road shall be 6 meter.
- 5) The setbacks/open spaces for other occupancies shall be as below:
 - A. Institutional (Educational) buildings-In case of nursery schools, the open spaces around the building shall not be less than 3 meter and for all other educational buildings the open spaces around the building shall not be less than 6 meter.
 - B. Institutional buildings- the open spaces around the building shall not be less than 6 meter.

- C. Assembly buildings- the open space in front shall not be less than 12 meter and the other open spaces around the building shall not be less than 6 meter.
 - D. Commercial & Storage buildings- in case of plots with more than 500 sq.mt. area, the open spaces around the building shall not be less than 4.5 meter.
 - E. Industrial buildings- the open spaces around the building shall not be less than 4.5 meter for height up to 15 meter, with an increase of 0.25 meter for every increase of 1 meter or fraction thereof in height.
 - F. Hazardous occupancies- the open spaces around the building shall not be less than 6 meter.
 - G. IT, ITES and other Corporate Buildings- in case of plots up to 750 sq.mt. the minimum set backs around the building shall not be less than 3 meter. In case of plots above 750 sq.mt. the minimum set backs around the building shall not be less than 4.5 meter.
- 6) The maximum plot coverage, maximum height of residential building and front setback with respect to the width of the street (approach road) shall be as given in **Table 3**.

Note:

- i. Where the maximum coverage of a plot works out to less than maximum permissible for the next below lower sized plot, the maximum coverage of the plot may be increased to that permissible for the said next below category plot.
- ii. While reckoning the height of residential building, stair cover, lift-room, water tank, parapet etc. may be excluded.
- iii. Where sites do not face or abut a road of the required width specified in **Table-3**, the front setback and the coverage of the building shall be regulated according to the size of the plot but the floor area ratio will be regulated according to the width of road along which the concerned site is located.
- iv. The standard requirements for row-housing and semi-detached buildings shall be as specified in Regulation 54.
- v. For height of buildings with 15 metres and above other parameters of the building shall be governed by provisions relating to multi-storied building specified in these Regulations.

32. Minimum setbacks for high-rise/multi-storied buildings:

For high-rise/multi-storied buildings, the open spaces around the building shall be as given in the table below;

Table 4: Provision of Exterior Open Spaces around the Buildings

Sl. No.	Height of the Building (in meters)	Exterior open spaces to be left out on all sides in meter (front rear and sides in each plot)
1	15 and above & up to 18	5
2	More than 18 & up to 21	6
3	More than 21 & up to 24	7
4	More than 24 & up to 27	8
5	More than 27 & up to 30	9
6	More than 30 & up to 35	10
7	More than 35 & up to 40	11
8	More than 40 & up to 45	12
9	More than 45 & up to 50	13
10	More than 50 & up to 55	14
11	More than 55	16

Note-

- (i) On sides where no habitable rooms face, a minimum space of 9.0 m. shall be left for heights above 27.0 m.
- (ii) In case of multi storied buildings the exterior open space around a building shall be of hard surface capable of taking load of fire engine weighting up to 45 tonnes.

33. Floor Area Ratio

- 1) The Floor Area Ratio (FAR) for residential, commercial, corporate, IT/ITES buildings shall be decided on the basis of the road width on which the plot/site abuts.

Table 5: FAR as per road width

Road width (in meters)	FAR for Commercial /Residential buildings	FAR for /IT /ITES/Corporate buildings
Up to 6	1.00	-
Above 6 & less than 9	1.50	-
9 or more & less than 12	1.75	-
12 or more & less than 15	2.00	2.00
15 or more & less than 18	2.25	2.25
18 or more & less than 30	2.50	2.5
30 & above	2.75	2.75

- 2) In case of group housing, the maximum permissible FAR shall be 2.50 and maximum ground coverage shall be 40%. However additional FAR of up to 0.25 shall be allowed for dwelling units meant exclusively for LIG/EWS. The FAR shall be calculated on the total area.

- 3) In case of Institutional and Assembly building the maximum permissible FAR shall be 1.50 for plots up to 1000 sq.mt. and 1.75 for plots above 1000 sq.mt.
- 4) In case of transport related activities such as; railway yards, railway station, bus stands, bus shelters, transport depot, airport, special ware housing, cargo terminals, etc. the maximum permissible FAR shall be 1.00.
- 5) In case of Industrial building the maximum FAR shall be 1.00.
- 6) In case a part of the plot is acquired / donated for public purpose like road, drain, etc., the Authority may allow additional FAR up to 0.25 in the form of TDR (Transferable Development Right) as per the modality approved by the Authority.
- 7) The Authority may allow premium FAR up to 0.25 on IT/ITES buildings on payment of fees to be decided by the Authority from time to time, on roads of width 30 height and above. The Authority may refund the fee proportionate to 0.10 premiums FAR in case of platinum/ gold certified green buildings.
- (8) The benefit of unutilized FAR in respect of Apartment Buildings/ Group Housing shall be made available to the society and not to the Builder/Developer.
- (9) Exclusive multi-storey parking blocks can be provided within the required setback area without reducing the driveway for the fire tender to the extent of minimum 6 meters. This will not be included in the calculation of coverage and FAR.
- (10) FAR shall not include: -
 - A. basements or cellars and space under a building constructed on stilts and used-as a parking space and air-conditioning plant room used as accessory to the principal use;
 - B. electric cabin or substation, watchman booth of maximum size of 3 Sq.Mt. with minimum width or diameter of 1.732 m., pump house, garbage shaft, space required for location of fire hydrants, electric fittings and water tank, society room of maximum 12 Sq.Mt.;
 - C. projections and accessories buildings as specifically exempted from the open space/setback requirement;
 - D. staircase room and lift rooms above the topmost storey, architectural features, and chimneys and elevated tanks of dimensions as permissible under the NBC; the area of the lift shaft shall be taken only on one floor.

34. Height of a building

- (1) The height of the building shall be governed by the limitations of Floor Area Ratio, open space (setbacks), and the width of the street facing the plot described as detailed below:
- A. the maximum height of a building shall in no case exceed 1.5 times [the width of the road on which the plot abuts + minimum required front setback]. However, higher height on account of premium FAR may be permitted with the approval of the Government;
 - B. if a building abuts on two or more streets of different widths, the building shall be deemed to face upon the street that has the greater width and the height of the building shall be regulated by the width of the street.
- 2) No building exceeding 12 metres in height shall be permitted in the areas with old infrastructure as may be decided by the Authority from time to time.
- 3) Notwithstanding anything contained in sub-regulation (1) the height restrictions with respect to approach Funnels and Transitional area of Airport as detailed in **Table 6 & 7** shall be adhered to.

Table 6: Height restriction with respect to approach funnels

<i>Distance from nearest runway end (in meters)</i>	<i>Maximum Permissible height above the elevation of the nearest runway end (in meters)</i>
<i>Up to 360</i>	<i>0</i>
<i>Above 360 to 510</i>	<i>6</i>
<i>Above 510 to 660</i>	<i>9</i>
<i>Above 660 to 810</i>	<i>12</i>
<i>Above 810 to 960</i>	<i>15</i>
<i>Above 960 to 1110</i>	<i>18</i>
<i>Above 1110 to 1260</i>	<i>21</i>
<i>Above 1260 to 1410</i>	<i>24</i>
<i>Above 1410 to 1560</i>	<i>27</i>
<i>More than 1560</i>	<i>30</i>

Table 7: Height restriction with respect to transitional area

<i>Distance of the Inner Boundary of the Transitional Area (Outer Boundary of the Air Port) [Meters]</i>	<i>Maximum Permissible height above the elevation of the airport reference point [meters]</i>
<i>Upto21</i>	<i>0</i>
<i>Above 21 to 42</i>	<i>3</i>
<i>Above 42 to 63</i>	<i>6</i>
<i>Above 63 to 84</i>	<i>9</i>
<i>Above 84 to 105</i>	<i>12</i>
<i>Above 105 to 126</i>	<i>15</i>
<i>Above 126 to 147</i>	<i>18</i>
<i>Above 147 to 168</i>	<i>21</i>
<i>Above 168 to 189</i>	<i>24</i>
<i>Above 189 to 210</i>	<i>27</i>
<i>More than 210</i>	<i>30</i>

- (3) Notwithstanding anything contained in the Tables under sub-regulation (1), no Radio Aerial, T.V. Antenna, Cell phone tower or such similar type of installations exceeding 52 meters in height shall be erected without prior permission of the concerned Civil Aviation Authority.
- (4) No building structure or installation exceeding the height indicated in the said Tables shall be permitted unless the applicant produces a 'No Objection Certificate' from the Airport Authority.

35. Off Street Parking Space

- 1) Each off-street parking space for one four wheeled vehicle shall not be less than 15 square metres. For scooters and cycles it shall not be less than 1.5 and 1.0 square metres respectively.
- 2) One parking unit shall have parking space of at least 40 square metre.
- 3) In all buildings including Apartment buildings/Group Housing, Hotels, Restaurants and Lodges, business buildings, commercial buildings, Institutional buildings like hospitals, Educational buildings like schools and colleges, multi-storied buildings/complexes, etc. and all other non-residential activities provision shall be made for parking spaces as per the following requirements.

Table 8: Minimum off street parking space for different categories of occupancies

Sl. No.	Category of building/ activity	Minimum parking area to be provided as percentage of total built up area
1	2	3
1	Shopping malls, Shopping malls with Multiplexes/Cine pi exes, Cinemas, Retail shopping centre, IT/ITES complexes and hotels.	50
2	Restaurants, Lodges, other commercial buildings, Assembly buildings, Offices and High-rise buildings/complexes	40
3	Residential Apartment Buildings, Group Housing, Clinics, Nursing Homes, Hospitals, Institutional and Industrial buildings.	25

N.B. –

- (i) Parking to be provided as percentage of total built up area may be in basement/stilt floor and setback/open spaces at ground level,
 - (ii) Basement(s) used exclusively for parking and services shall not be counted towards FAR.
- (4) The parking spaces may be provided in (for all schemes)

- A. basements or cellars,
 - B. on stilt floor,
 - C. open parking area,
 - D. exclusive multi level parking, or
 - E. roof top parking in case of commercial/IT/ITES and Corporate building,
 - F. a combination of any or all of the above.
- (5) For parking purposes, single basement shall be allowed in case of plot size of 500 square meter or more, and multiple basements shall be allowed in case of plot size of 1000 square meter or more. The roof top parking with car lift shall be allowed only in case of plinth area/roof area of 2000 square meter or more.
- (6) Off-street parking spaces shall be provided with adequate vehicular access to a street and the area of drives, aisles and such other provisions required for adequate maneuvering of vehicles.
- (7) If the total off-street parking space required under these regulations is provided by a group of property owners at a place for their mutual benefit, such parking spaces may be construed as meeting the off-street parking requirement, however, subject to the approval of the Authority. The Authority may also decide to develop such parking spaces and charge property owners to bear proportionate cost.
- (8) Garage with locking facilities shall be included in the calculation of floor space for determining the requirement of parking space, unless this is provided in the basement of a building or under a building constructed on stilts with no external walls.
- (9) The parking spaces to be provided shall be in addition to the open spaces (setback) required around a building under these regulations. However, parking may be provided in the front open space and other side open spaces without reducing the clear vehicular access way to less than 6.0 meters.
- (10) Misuse of the area specified for parking of vehicles for any other use shall be summarily removed /demolished by the Authority.
- (11) For parking spaces in basements and upper storey of parking floors, at least two ramps of minimum 3.6 m. width or one ramp of minimum 5.4m. width and in maximum 1:10 slope shall be provided. Such ramps may be permitted in the side and rear setbacks after leaving 6 meter space for movement of fire-fighting vehicles. Access to these may also be accomplished through provisions of mechanical lifts.

- (12) Up to 10% of cellar may be utilized for utilities and non-habitation purpose like A/C plant room, Generator room, Electrical installations, laundry, etc.
- (13) At least 20% of the parking in-group housing, apartment buildings shall be earmarked for visitors. The visitors parking facility shall be open to all visitors.
- (14) Every building except a residential building having less than four dwelling units will have parking space earmarked for ambulance, fire tender and physically challenged persons.
- (15) In respect of Apartment Complexes/Building/Block, in sites up to 750 Sq.mt. the parking requirement shall be deemed to be met if the entire stilt floor is left for parking. A WC/Toilet facility shall be provided for watch and ward in the stilt floor.
- (16) Apart from use of Basement for Services/Parking/ Storage, it may be used for other activities like Library, Study Room, Games Room and Laundry only in case of Residential and Institutional Buildings.
- (17) Violation of any of the conditions relating to parking space under this regulation shall not be compounded or relaxed by the Authority.

36. Interior Open Space

- (1) At least one side of all the rooms intended for human habitation, if such room does not abut on the front or the rear or the side setbacks, shall abut on an interior open space whose minimum dimension shall be 3 meters X 3 meters in cases of buildings up to a height of 12 meters. In cases where the height of the building is more than 12 meters, the width of the interior open space shall be increased at the rate of one meter for every additional 3 (three) meters height. This provision shall be applicable to all categories of buildings, namely, residential, group housing, apartment, commercial, institutional, administrative, assembly.
- (2) In case any interior open space is intended to be used for the benefit of more than one building belonging to the same owner, the width of such open space shall be the one specified for the tallest building abutting on such open space provided that such open space shall not be less than three metres.
- (3) In case of group housing, if the interior open space is used for providing access to the building blocks the same shall not be less than six metres in width.
- (4) For ventilating the spaces for water closets and bathrooms ventilation shafts shall be provided with size as provided under clause 8.2.5, part-3 of NBC, 2005.

37. Height Exemption of the building

- (1) The following appurtenant structures shall not be included in the height of the building: -
- A. roof tanks and their supports (with support height not exceeding 1m.);
 - B. ventilating, air conditioning, lift rooms and similar service equipments;
 - C. stair cover (mumty) not exceeding 3.0m. in height; and
 - D. chimneys, parapet walls and architectural features not exceeding 1.2 m. in height;
 - E. height of the ceiling of the upper basement roof not exceeding 1.5 m. from the average surrounding ground level.

38. Exemption in open space

- (1) Every open space provided either in the interior or exterior in respect of any building shall be kept free from any erection thereon and shall be open to the sky and no cornice, roof, or weather shade of more than 0.75 m. in width shall overhang or project over such open space.
- (2) A portico of up to 2.5 m. width and 4.6 m. length with a minimum height of 2.1 m. from the plinth level may be permitted within the side setback. A garage is permissible at the rear end of side open space provided no openings are located on the side and rear boundary. Access to the top of the portico/garage should not affect the privacy of the neighbouring plot.
- (3) The portico provided as above should not rest on the boundary wall and should be open to provide through access to the rear. In case the Portico is not a cantilevered one and supported by pillars the area shall be included in the FAR.

39. Building Line

The following building lines shall be maintained for construction of building abutting arterial roads:

Table 9: Distance of Building Lines from Arterial Roads

Category of arterial roads	Minimum distance of the building line from R/W of the road
18.0 metres (60 feet)	3.0 metres (10 feet)
24.0 metres (80 feet)	4.0 metres (13 feet)
Above 24.0 metres (above 80 feet)	4.5 metres (15 feet)

40. Basement/Cellar

- (1) Basements/cellars shall not be permitted in low-lying area and areas without adequate drainage facilities to ensure drainage from the basement.
- (2) Construction of basements/cellars may be allowed by the Authority in accordance with the provisions contained in the development plan applicable to the concerned area.
- (3) The basements/cellars shall only be put to the following uses: -
 - A. storage of household or other non-combustible materials;
 - B. strong room, bank cellars; etc.
 - C. installation of air-conditioning equipments and other machines used for service and utilities of building;
 - D. parking places.
- (4) However basements/cellars may be permitted to be constructed leaving the prescribed setback/open space applicable to the building. Further, in case of apartment/group housing/commercial/corporate & IT/ITES buildings, the basements may be allowed to be constructed under the entire plot area leaving 3 meter space from the boundary of the premises subject to the following:
 - (i) In all such cases the owners have to indemnify the Authority against any damage caused by her/him/them to the adjacent property in the format given in Form-XI.
 - (ii) The portion of the basement projecting out of the building line shall flush with the ground.
- (5) The basements shall be used exclusively for parking/services/storage.
- (6) The basement shall fulfill the following requirements: -
 - A. every basement shall be in every part at least 2.5 m. in height from the floor to the soffit of the roof slab or ceiling;
 - B. adequate ventilation shall be provided for the basement. The standard of ventilation shall be the same as required by the particular occupancy according to regulations. Any deficiency may be met by providing adequate mechanical ventilation in the form of blowers, exhaust fans (one exhaust fan for 50 Sq.mt. of basement area), air-conditioning system, etc.
 - C. the minimum height of the ceiling of upper basement shall be 1.20 m. and the maximum 1.5 m. above the average surrounding ground level;

- D. adequate arrangement shall be made, so that surface drainage does not enter the basement;
- E. the walls and floors of the basement shall be water-tight and be so designed that the effect of the surrounding soil and moisture, if any, are taken into account in design and adequate damp proofing treatment is given;
- F. the access to the basement shall be separate from the main and alternative staircase providing access and exit from higher floors shall be provided. Where the staircase is continuous in the case of buildings served by more than one staircase, the same shall be of enclosed type serving as a fire separation from the basement floor and higher floor. Open ramps shall be permitted if they are constructed within the building line subject to provision of (D) above;
- G. in case of basement of office and commercial occupancies, sufficient number of exit ways and access ways shall be provided with a travel distance not more than 15 metres.
- H. the basement shall not be partitioned. In case the partitions in the basements are allowed by the Authority, no compartment shall be less than 45 square metres in area and each compartment shall have ventilation standards as laid down in sub-clause (ii) separately and independently. The partitions shall, however, conform to the norms laid down by the State Fire Prevention Authorities, Orissa.
- I. the ramp providing access to basement to be used for parking shall have a gradient not steeper than 1:10 and this shall not obstruct the clear vehicular and pedestrian movement around the building including movement of fire tender (6 meter).

41. Provision of Lift

- (1) Lift shall be provided for buildings above 10 m. height in case of apartments, group housing, commercial, institutional and office buildings.
- (2) The number and type of lifts, their planning, design and installation shall be in accordance with the provisions of Part-VIII (Building Services) Section 5 (Installation of Lifts and Escalators) of National Building Code of India, 2005.
- (3) Lift shall be provided at the rate of one lift for twenty dwelling units, or part thereof for residential buildings and at the rate of one lift per one thousand Sq.mt. or part thereof of built-up area per floor for non-

residential buildings. Built-up area on ground floor and two upper floors shall be excluded in computing the above requirement.

- (4) Notwithstanding anything contained in these regulations in case of building with 21 m. or more in height, at least two lifts shall be provided.

42. Mezzanine

- (1) Mezzanine floor may be permitted above any floor in all types of buildings up to an extent of one-third of the actual covered area of that floor. All Mezzanine floors shall be counted toward FAR calculation, except the mezzanine floor over the ground floor.
- (2) The height of the mezzanine floor shall not be less than 2.20 metres and not more than 2.70 metres.
- (3) The mezzanine floor shall:
 - i. have direct light and ventilation to the extent of 10% of the floor area;
 - ii. be so constructed as not to interfere under any circumstances with the ventilation of the space over and under it;
 - iii. in no case be closed so as to make it laible to be converted into unventilated compartments.

43. Drainage and sewerage

- 1) It shall be the responsibility of the builder or the owner of the building to ensure that the plinth is high enough to prevent rain/ drainage/ sewerage water entering into the lowest floor.
- 2) No permission shall be granted for construction over the natural drains identified and approved by the Authority/ Local Body/ Govt. or incorporated in the Development Plan.
- 3) Where any construction is taken up over any drain, or waterway, the Vice Chairman can, apart from taking action for removal of the constructions, take action for recovery of the cost of restoration of adequate drainage.

44. Heritage Zone

- (i) The Authority may notify the Heritage Zones in consultation with the Archaeological Survey of India, State Department of Archaeology, and Cuttack Municipal Corporation.

- (ii) The Authority may modify the Heritage Zone in consultation with the Archaeological Survey of India, State Department of Archaeology, Cuttack Municipal Corporation and the Art Commission.
- (iii) **Conservation of Heritage Buildings, Heritage Precincts and Natural features:-** Conservation of buildings, artifacts, structures, areas and precincts of historic and/or aesthetic and/or architectural and/or cultural significance (Heritage buildings and heritage precincts) and/or natural features of environmental significance shall be taken up by the Cuttack Municipal Corporation in accordance with the relevant provisions in-force and those framed from time to time.

45. Barrier free access for the physically challenged person

Adequate provision for facilitating easy access of disabled persons shall be made in all public buildings in accordance with the provisions of National Building Code of India, including the minimum facility to reach the staircase/lift without any barrier.

Barrier free environment is one, which enables people with disabilities to move about safely and freely and to use all facilities within the built environment. The goal of barrier free design is to provide an environment that supports the independent functioning of individuals so that they can get into and participate in all activities without assistance.

The main purpose is to integrate disabled and elderly persons fully into the society. In view of the above, the Government of India has enacted the Disabilities Act, 1955. Section 44, 45 and 46 of the Act stipulates that the appropriate Governments, local authorities to ensure provisions of barrier free facilities in all new Government buildings and public utilities roads and transport. Also, in 1996 Government of India enacted other persons with Disabilities (Equal Opportunity, Protection of Rights and Full Participation) Act for the Barrier Free Environment for differently abled persons.

This regulation is applicable to all Buildings, recreational areas and facilities used by public.

(1) Site Planning:

- 1.1 Level of the roads, access paths and parking areas shall be described in the plan along with specification of the materials.
- 1.2 Every Building should have one access two main entrance/exit for persons with disabilities which shall be indicated by proper signage.
- 1.3 The approach to the entrance should be level if possible. Where entrances or exits are not leveled, both stage and ramps should be

provided as some disable persons cannot use the ramps upon which wheel chair users depend.

- 1.4 The ramp should have a landing after every 9 meters run and in front of the lower way. Minimum size of the land shall be 1200 mm. X 2000 mm.
- 1.5 The approach should be adequately illuminated after dark.

(2) Access Path/ Walkway:

- 2.1 Access path from plot entry and surface parking to building entrance shall be minimum of 1800 mm. wide having even surface without any steps.
- 2.2 Slope, if any, shall not have gradient greater than 5%.
- 2.3 Curbs wherever provided should have curb ramps. Curbs should be dropped, to be flush with walkway at a gradient no greater than 1:10 on both sides of necessary and convenient crossing points. Width should not be less than 1200 mm. If width is less than 1200 mm. then slopes of the flared side shall not exceed 1:12. Warning strips to be provided on the Curb side edge of the slope so that a person with vision impairment does not accidentally walk on to the road.
- 2.4 Street furniture, trees, lighting and dustbins should be located on one side of pathways.
- 2.5 The surface texture may be changed to indicate the approach to those items.

(3) Accessible Parking:

- 3.1 Parking should be within 30 meters of the main entrance of the building.
- 3.2 2 accessible parking lots with minimum width of 3600 mm. x 5000 mm. should be provided.
- 3.3 It should have the international signage painted on the ground and also on a signpost/ board put near it.
- 3.4 The symbol should be large enough to be easily visible by person looking for the accessible parking, recommended size being 1000 mm. x 1000 mm. but not larger than 1500 mm. x 1500 mm. With the preferred colours being white and blue, the sign painted on the floor should contrast in colour and luminosity with the floor colour.
- 3.5 There should be directional signs guiding people to the accessible parking.

(4) Ground and Floor Surfaces

- 4.1 Ground and floor surfaces (along accessible routes and in accessible rooms and spaces, including floors, walks, ramps, stairs and curb ramps) should be stable, firm and slip-resistant.
- 4.2 Vertical level changes up to 6 mm. may not need edge treatment. Changes in level between 6 mm. and 12 mm. should be leveled off with a slope no greater than 1:2.
- 4.3 If gratings are placed in pathways, they should have spaces no bigger than a wheelchair's wheel (e.g. 12 mm.).
- 4.4 Edges of paths can be clearly defined by using different colours and textures.

(5) Entrance Doors

Whatever the type of entrance door, it must be wide enough to accommodate pedestrian traffic comfortably.

- 5.1 The recommended minimum clear opening width of an internal door is 900 mm. minimum.
- 5.2 Where doors comprise two leaves (i.e. double doors), each leaf should be 900 mm. min. wide, so that persons carrying large items and wheelchair users do not have to open both leaves.
- 5.3 Manual doors should incorporate kick plates 300 mm. high to withstand impact of wheelchair footrest (this is especially important where doors are glazed).
- 5.4 Also be fitted with vision panels at least between 900mm and 1500 mm. from floor level be color contrasted with the surrounding wall and should not be heavier than 22N to open Door hardware should be positioned between 900-1200 mm. above floor. Lever handles and push type mechanisms are recommended. When a sliding door is fully open, handles should be usable from both sides. Where revolving doors or turnstiles are used, an alternative wheelchair accessible entrance must also be provided.
- 5.5 A distance of 400 mm. should be provided beyond the leading edge of door to enable a wheelchair user to maneuver and to reach the handle.
- 5.6 Thresholds of doorways should not exceed 12 mm. Raised threshold and floor level changes at doorways should be leveled off (beveled) with a slope on each side of a threshold.
- 5.7 To ensure maximum clarity for persons with vision impairments, the entrance should be easily distinguishable from its surroundings by the effective use of landscaping, signage, color (preferably yellow/orange), tonal contrast and tactile surfacing.

- 5.8 Revolving doors are particularly difficult to negotiate and their use should be avoided. If fitted, they must be accompanied by adjacent automatic sliding doors or swing to allow easy they must be accompanied by adjacent automatic sliding doors or swing door to allow easy access.
- 5.9 Glass doors must have a bright, colored motif at eye level.
- 5.10 Glazed doors and fixed glazed areas should be made visible by use of a clear, colour and tone contrasted warning or decorative feature that is effective from both inside and outside and under any lighting conditions, e.g. a logo of minimum dimensions 150 mm. by 150 mm. (though not necessarily square), set at eye level.
- 5.11 Fixed glazed areas should have a supplementary contrasting kick plate (skirting) across the bottom of the glass panel, preferably 300 mm. - 400 mm. in height, to withstand the impact of wheelchair footrests.

(6) Lobby:

- 6.1 Where both doors open in the same direction, and are manual, lobby dimensions should measure 1500 mm. (w) x 2000 mm. (l).
- 6.2 Where both sets of doors could open into a lobby (i.e. doors are mounted on two-way hinges) lobby dimensions should be increased to 1500 mm. (w) x 2400. mm. (l).

(7) Steps & Stairs:

- 7.1 Steps should be uniform with the tread not less than 300 mm. and the risers 150 mm.
- 7.2 The risers should not be open.
- 7.3 The steps should have an unobstructed width of at least 1200 mm.
- 7.4 Have continuous handrails on both sides including the wail (if any) at two levels: upper at 850 mm. - 900 mm. and lower at 700 mm.
- 7.5 Warning blocks to be placed 300mm at the beginning and at the end of all stairs.
- 7.6 Nosing to be avoided.
- 7.7 The staircase should be adequately and uniformly illuminated during day and night (when in use).
- 7.8 The level of illumination should preferably fall between 150-200 lux.
- 7.9 Lighting systems in stairwells should be designed to create a slight contrast between treads and risers, while providing a uniform overall level of illumination.
- 7.10 Where the stair direction must change, a series of landings is recommended.

- 7.11 Landing should be 1200 mm. deep, clear of any door swing.
- 7.12 The rise of a flight between landings must be no more than 1200mm.
- 7.13 All steps should be fitted with a permanent colour and tone contrasting at the step edge, extending the full width of the step, reaching a minimum depth of 50 mm. on both tread and riser.
- 7.14 If the edges are painted on as a temporary measure, it should be regularly repainted.
- 7.15 The stair covering and nosing should be slip- resistant, non-reflective, firmly-fixed and easy to maintain.
- 7.16 Soffit (underside/open area under the stairs) of the stairs should be enclosed or protected.

(8) Handrails:

- 8.1 Handrails should be circular in section with a diameter of 40-45 mm.
- 8.2 At least 45mm clear of the surface to which they are attached.
- 8.3 Extended by at least 300 mm beyond the head and foot of the flight in the line of travel and grouted in the ground.
- 8.4 Handrails/grab bars should be in a color that contrasts sharply with the surrounding area.
- 8.5 The handrail should be positioned at two levels - 700 mm. and 850 - 900 mm. above the pitch-line of a flight of stairs and must extend horizontally a minimum of 300 mm. beyond the top and bottom steps, returning to the wall or floor or rounded off, with a positive end that does not project into the route of travel.
- 8.6 The handrail should be circular in Section, of diameter 40 mm. and formed from materials which provide good grip such as timber, nylon or powder coating, matt finish metal finishes.
- 8.7 The handrail should contrast in color (preferably yellow/orange) with surrounding surfaces and should be supported on brackets which do not obstruct continuous hand contact with the handrail.

(9) Ramps:

- 9.1 Ramps should be accompanied by steps for ambulant disabled persons.
- 9.2 The gradient should ideally be 1 in 20 and no greater than 1 in 12.
- 9.3 The steeper the gradient, the shorter the length of ramp between landings.
- 9.4 On long ramps, a horizontal resting space should be provided every 6 meters.

- 9.5 The required minimum clear unobstructed width of a ramp (i.e. between handrails) is 1200 mm. for ramps up to 3.6 meters long. For ramps longer than 3.6 meters and up to 9 meters the minimum width should be 1500 mm. For ramps more than 9 meters long the ramp should be minimally 1800 mm wide.
- 9.6 Surface materials should be slip-resistant, non-reflective, firmly-fixed and easily maintained.
- 9.7 The edge of the ramp should have an edge protection with a minimum height of 100 mm.
- 9.8 Landings every 750 mm of vertical rise.
- 9.9 A tapping or lower rail should be positioned so that its bottom edge is no higher than 200 mm above ground level.
- 9.10 Handrails on the ramps should be on both sides at two levels: upper at 850 mm. - 900 mm. and lower at 700 mm.; both end to be rounded and grouted; extend 300 mm. beyond top and bottom of ramp.

(10) Lifts:

A carefully designed lift makes a huge contribution to the accessibility of a multi-storey building for persons with reduced mobility and disabilities.

- 10.1 Lift locations should be clearly signposted from the main pedestrian route and recognizable through design and location.
- 10.2 The colour and tone of the lift doors should contrast with the surrounding wall finish to assist in their location. Lift doors with metallic finishes such as steel grey and silver should be avoided as they are difficult to identify by persons with low vision.
- 10.3 The lift lobby shall be of an inside measurement of 1800 mm. x 2000 mm. or more.
- 10.4 A clear landing area in front of the lift doors of minimum dimensions 1 1500 mm x 1500 mm should be provided.
- 10.5 By making the landing area distinguishable by floor surface and contrast, it will aid location and recognition of core areas. This could comprise a change in floor finish from thin carpet to vinyl/PVC, or cement/mosaic floor to carpet.
- 10.6 Changes in floor finish must be flush.
- 10.7 The floor level/location should be indicated on the wall adjacent to or just above the call buttons and opposite the lift doors where possible.

(11) Lift Dimension:

11.1 Provisions of at least one lift shall be made for the wheel chair user with the following car dimensions of lift recommended for passenger lift for 13 persons capacity by Bureau of Indian Standard.

- * Clear internal depth - 1100 mm.
- * Clear internal width - 2000 mm.
- * Entrance door width-900 mm.

11.2 Minimum internal dimensions for passenger lifts of 1500 mm x 1500 mm. size should be provided. These dimensions will allow access for one person using a wheelchair allowing them to turn a full circle, or two persons with push chairs.

11.3 The clear opening width of the doors should be a minimum of 900 mm., but 950 mm. or wider is preferable.

(12) Corridors/Passages:

12.1 Corridors should be 1800 mm minimum wide to allow two persons to pass.

12.2 The floor should be slip-resistant.

12.3 Corridors should be left unobstructed and features such as fire extinguishers and AC recessed.

12.4 If necessary, changes of direction should be at 90 degrees, avoiding curved corridors or oblique angles where possible.

12.5 In long corridors, consideration should be given to the provision of resting places or support rails.

12.6 Seating should be slightly recessed off the main circulation route.

12.7 Directional signage should be repeated in long corridors to prevent disorientation.

(13) Windows:

13.1 Windows should be designed to avoid the glare which is a particular problem for people with impaired sight.

13.2 Large glass areas close to circulation spaces should be marked a little below eye-level with a coloured band or frame.

13.3 A window should have an unobstructed viewing zone for wheelchair users 600 mm. - 1450 mm.

13.4 Transoms positioned between 900 mm. and 1200 mm. should not be incorporated into the design to allow a clear view through a

window from a seated position. Windows should be easy to open and close.

13.5 Their controls should be placed in the zone 850 to 1200 mm. from the floor. Lever handles should be used in preference to knobs.

13.6 Windows should contrast visually with their background for the benefit of persons with visual impairments.

(14) Washrooms and Toilets:

14.1 Accessible public toilets should have the access symbol displayed outside for wheelchair access.

(15) WC Compartment Dimensions:

15.1 The dimensions of a unisex toilet are critical in ensuring access. The compartment should be at least 1750 mm. wide and 2000 mm. long.

(16) Water Closet (WC) Fittings:

16.1 A standard WC unit with pan should be fitted 460 mm. - 480 mm. above finished floor level.

16.2 An unobstructed space 900 mm wide should be provided to one side of the WC for transfer, together with a clear space 1200 mm deep in front of the W/C.

16.3 WC should be centred 500 mm away from the side wall, with the front edge of the pan 750 mm away from the back wall.

16.4 Have a back support.

16.5 L-shape grab bar at the adjacent wall and on the transfer side swing up grab bars shall be provided.

16.6 The cistern should have a lever flush mechanism, located on the most accessible side of the cistern, i.e. on the transfer side and not on the wall side.

16.7 The WC should not incorporate a lid, since this can hinder transfer.

16.8 The seat should be sturdy, but highly contoured seats are not recommended.

(17) Accessible Urinal:

At least one of the urinals should have grab bars to support ambulant persons with disabilities (for example, crutch users).

17.1 A stall-type urinal is recommended.

17.2 Urinals shall be stall-type or wall - hung, with an elongated rim at a maximum of 430 mm above the finish floor.

- 17.3 Urinal shields (that do not extend beyond the front edge of the urinal rim) may be provided with 735 mm clearance between them.
- 17.4 Grab bars to be installed on each side, and in the front, of the urinal.
- 17.5 The front bar is to provide chest support; the sidebars are for the user to hold on to while standing.

(18) Emergency Egress:

- 18.1 An accessible environment is one which persons can not only enter and use independently, but also one which they can leave safely in the event of an emergency.

(19) Emergency Evacuation Strategy:

- 19.1 The basic principle of an emergency egress strategy is to move persons horizontally to a safe area where, if necessary, they can await assistance or rescue, before traveling vertically to reach the final exist level.
- 19.2 The egress routes will therefore comprise horizontal escape routes, refuges, stairwells and lifts.
- 19.3 As well as safe escape routes, a fire evacuation strategy must be in place.
- 19.4 The management procedures identified in the fire evacuation strategy will be influenced by the design of the building, its occupancy and its use.
- 19.5 There should be procedures to ensure the safe egress of persons who work in the building who may experience difficulties in the event of an emergency. This could include persons with visual or hearing impairments, persons with learning difficulties and persons with mobility difficulties.
- 19.6 Clear, well illuminated signage indicating escape routes is essential.

(20) Building requirements:

The specified facilities for the buildings for handicapped persons shall be as follows:

- Approach at plinth level
- Corridor connecting the entrance/exit
- Stairways
- Lift
- Toilet
- Drinking water

- A. **Approach at plinth level**-Every building must have at least one entrance accessible to the handicapped and shall be indicated by proper signage. This entrance shall be approached through a ramp together with stepped entry.
- B. **Ramp Approach**-Ramp shall be finished with non-slip material. Minimum width of ramp shall be 1800 mm. with maximum gradient 1:12, length of ramp shall not exceed 9 meter having 800 mm. high handrails on both sides extending 300mm beyond top and bottom of the ramp. Minimum gap from the adjacent wall to the handrail shall be 50mm.
- C. **Stepped Approach**-For stepped approach width of tread shall not be less than 300 mm. and maximum riser shall be 150 mm. Provision of 800 mm. high hand rail on both sides of the stepped approach similar to the ramp approach shall be made.
- D. **Exit/Entrance Door**-Minimum clear opening of the entrance door shall be 900mm. and it shall not be provided with a step that obstructs the passage of a wheel chair user. Threshold shall not be raised more than 12 mm.
- E. **Entrance Landing**-Entrance landing shall be provided adjacent to ramp with the minimum dimension 1800 mm. x 2000 mm. The entrance landing that adjoins the top end of a slope shall be provided with floor materials to attract the attention of visually impaired persons (limited to coloured floor material whose colour and brightness is conspicuously different from that of the surrounding floor material or the material that emits different sound to guide visually impaired persons hereinafter referred to as guiding floor material). Finishes shall have a non-slip surface with a texture traversable by a wheel chair. Curbs wherever provided must blend to a common level.
- F. **Corridor connecting the entrance/exit for the handicapped**: The corridor connecting the entrance/exit for handicapped leading directly outdoors to a place where information concerning the overall use of the specified building can be provided to visually impaired persons either by a person or by signs, shall be provided as follows:
- i. Guiding floor materials shall be provided or devices that emit sound to guide visually impaired persons.
 - ii. The minimum width shall be 1250 mm.
 - iii. In case there is a difference of level, slope ways shall be provided with a slope of 1:12
 - iv. Handrails shall be provided for ramps/slope ways at a height of 800 mm.

- G. **Stair ways**-One of the stairways near the entrance/exit for the handicapped shall have the following provisions:
- A. The minimum width shall be 1350 mm.
 - B. Height of the riser shall not be more than 150mm and width of the tread 300 mm. The steps shall not have abrupt (square) nosing.
 - C. Maximum number of risers on a flight shall be limited to 12.
 - D. Hand rails shall be provided on both sides and shall extend 30 mm. on the top and bottom of each flight of steps.
- H. **Lifts**-Wherever lift is required as per bye-laws, provision of at least one lift shall be made for the wheel chair user with the following cage dimensions of lift recommended for passenger lift of 13 persons capacity by Bureau of Indian Standards.
- Clear internal depth: 1100 mm.
- Clear internal width: 2000 mm.
- Entrance door width: 900 mm.
- A. A handrail not less than 600 mm. long at 1000 mm. above floor level shall be fixed adjacent to the control panel.
 - B. The lift lobby shall be of an inside measurement of 1800 mm. x 1800 mm. or more.
 - C. The time of an automatically closing door shall be minimum 5 seconds and the closing speed should not exceed 0.25 meter/sec.
 - D. The interior of the cage shall be provided with a device that audibly indicates the floor the cage has reached and indicates that the door of the cage for entrance/exit is either open or closed.
 - E. The control panel shall have marking in Braille to help visually impaired.
- I. **Toilets**-One special Water Closet, in a set of toilets shall be provided for the use of handicapped with essential provision of washbasin near the entrance for the handicapped.
- A. The minimum size shall be 1500 x 1750 mm.
 - B. Minimum clear opening of the door shall be 900 mm. and the door shall swing out.
 - C. Suitable arrangement of vertical/horizontal handrails with 50 mm. clearance from wall shall be made in the toilet.
 - D. The Water Closet seat shall be 50 mm. from the floor.
- J. **Drinking Water**-Suitable provision of drinking water shall be made for handicapped near the special toilet provided for them.

K. **Designing for Children**-In a building meant for the predominant use of the children, it is necessary to suitably alter the height of the handrail and other fittings and fixtures.

46. Rainwater harvesting system

(1) Provision of rainwater harvesting is mandatory for all plots, which are more than 300 Sq.mt. in area. The dimension of recharging pits/trenches shall be at least 6 cubic meters for every 100 Sq. m. of roof area. Percolation Pits shall be filled with small pebbles or brick jelly or river sand and covered with perforated concrete slabs. Apart from this, the following requirements are optional and may be provided depending on site conditions.

A. **Terrace Water Collection**-The terrace shall be connected to a sump or the well through a filtering tank by PVC pipe. A valve system shall be incorporated to enable the first part of the rainwater collected to be discharged out or to the soil if it is dirty. A filtering tank measuring 0.36 Sq.mt. can be constructed near the sump. A perforated slab can divide the tank and one part should be filled by small pebbles and other by brick jelly. The bottom portion of the tank should have a slope to avoid stagnation of water.

B. **Open Ground**-Where there is open ground, a portion of topsoil shall be removed and replaced with river sand to allow slow percolation of rainwater. Any other method proved to be effective in conservation and harvesting of rainwater may be adopted in each and every construction taken up.

47. Signs and outdoor display structures

- (1) Signs and outdoor display structures shall be governed by the relevant provisions of the Orissa Municipal Corporation Act/Orissa Municipal Act.
- (2) Within the Cuttack Development Plan Area where no specific guideline for the above structures is framed, the Authority shall prescribe the guidelines with approval of Government.

48. Reference to the standards

The standards relating to water and sanitation requirements for various occupancies and uses, fire protection and fire safety requirements and guidelines for installation of solar water heating system shall be referred

to as given at Annexure-IV in Cuttack Development Authority (Planning & Building Standards) Regulations – 2010.

This refers to the Regulations No. 1163 of Part V of the CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010

49. Apartment

- (1) No apartment building shall be permitted on plots less than 500 Sq.mt. in size.
- (2) In apartment building with joint ownership of land the owner/ developer shall provide floor space for house owner's society Office/ assembly at the rate of 1 Sq.mt. per flat provided that the minimum area shall not be less than 12 Sq.mt.
- (3) One staircase for every 6 dwelling units or fraction thereof in a floor shall be provided.
- (4) The minimum width of approach road to the plot shall be 9 meters for non high- rise and 18 meters for high-rise buildings.
- (5) In addition to other requirements, the apartments on plot area of 4000 Sq.mt. or more shall be accompanied by-
 - (i) A. Services and Utilities plan as per standards for water supply system, drainage and storm water disposal system, sewerage system, rain water harvesting structures, and for other utilities.
 - B. Landscape plan including rainwater harvesting/ water recycling details.
 - C. Parking & internal circulation plan along with Common pool parking area plan, if any. The above shall be drawn on suitable scale with relevant details.
 - (ii) A black topped unhindered public access road of at least 7.5 meter width is to be developed on any one side of the periphery as per suitability and feasibility for the convenience of accessibility of other sites and lands located in the interior.
 - (iii) In case of blocks up to 12 m. heights, access through pathways of 6 m. width would be allowed. All internal roads and pathways shall be developed as per standards.
 - (iv) A minimum of 15% of site area shall be earmarked for organized open space and be utilized as greenery, tot lot or soft landscaping, etc. This space may be in one or more pockets.
- (6) Common facilities like shopping centre, community hall or centre/club etc. are required to be provided in up to 5% of the built

up area and shall be planned and developed in cases where the units are above 50 in number and not to be part of the residential blocks.

- (7) For apartment buildings, at least 20% of the units will be earmarked for construction of housing units for EWS/LIG category. The cost and method of allotment of such houses will be decided by the Authority.

The developer has the option of developing the EWS/LIG units at the same site or within a distance of five (05) kilometers from the main project:

Provided that in case of Apartment projects taken over an area of up to five (5) acres, the Developer will have the option of contributing an amount equal to Rupees one hundred (100) per square meter of the total built up area to a fund named as "Shelter Fund" to be maintained by the CDA in lieu of constructing the EWS/LIG houses. The proceeds of this fund will be utilized by the Authority for construction of EWS/LIG houses.

However additional FAR up to 0.25 shall be allowed for dwelling units meant exclusively for LIG/EWS.

50. Group Housing

- (1) The minimum size of site for group housing shall be 4000 Sq.mt.
- (2) In addition to other requirements the group housing schemes shall be accompanied by-
 - A. a services and Utilities plan as per standards for water supply system, drainage and storm water disposal system, sewerage system, rain water harvesting structures, and for other utilities;
 - B. a landscape plan including rainwater harvesting/ water recycling details;
 - C. parking & internal circulation plan along with Common Pool Parking Area plan, if any. The above shall be drawn on suitable scale with relevant details.
- (3) The minimum width of approach road to the plot shall be 9 meters for non high- rise and 18 meters for high-rise buildings.
- (4) Common facilities like shopping centre, community hall or centre/club etc. are required to be provided in up to 5% of the built up area and shall be planned and developed in cases where the units are above 50 in number and not to be part of the residential blocks.
- (5) A black topped unhindered public access road of at least 7.5 meter width is to be developed on any one side of the periphery as per

suitability and feasibility for the convenience of accessibility of other sites and lands located in the interior.

- (6) In case of blocks up to 12 m. heights, access through pathways of 6 m. width would be allowed. All internal roads and pathways shall be developed as per standards.
- (7) Minimum of 15% of site area shall be earmarked for organized open space and be utilized as greenery, tot lot or soft landscaping, etc. This space may be in one or more pockets.
- (8) In group housing with apartment/joint ownership of land, the owner/developer shall provide floor space for house owners/society Office/assembly at the rate of 1 sq.mt. per household/flat provided that the minimum area shall not be less than 12 sq.mt.
- (9) The area for community facility shall be provided as per **Table 10** below:

<i>Ultimate Population</i>	<i>Percentage of total area required for community facility</i>
1000	5
3000	8
10000	10

Note:

Provided that where the ultimate population is less than 1000, the above percentage of space shall not be insisted upon. The ultimate population will be arrived at by considering upper storey development within permissible. F.A.R. and the total number of dwelling units accommodated in the Scheme. The household size occupying a dwelling unit is to be taken as five.

51. Outhouse

An outhouse with zero rear and one side set back may be permitted on a plot having an area not less than 150 Sq.mt.:

Provided that: -

- (1) the coverage of the outhouse shall not exceed 30 sq.mt. and the height shall not exceed 3 mt.;
- (2) the coverage of the outhouse and that of the main building together shall not exceed the permissible coverage for the concerned plot;

- (3) the built up area of the outhouse and that of the main building together shall not exceed the permissible FAR for the concerned plot;
- (4) the outhouse shall not cover more than one third of the width and more than one fourth of depth of the plot and shall not abut any public road;
- (5) a minimum 1.5 mt. strip of land shall be kept open to the sky between the main building and the outhouse;
- (6) no opening either in the form of windows or doors or ventilators shall be provided to the adjoining properties;
- (7) outhouses with sloping roof would only be permitted. In no case permission for outhouses would be granted with reinforced concrete cement flat roof.

52. Addition/alteration of existing Building

- (1) Construction proposed over all existing buildings which have been divided into parts by partition/sale or otherwise may be permitted (without insisting on front, rear or side setbacks) subject to fulfillment of following provisions:
 - a) Proposed coverage of the upper floor shall not exceed 75% of the plinth area of existing floor for organising an open terrace to facilitate light and ventilation to habitable rooms & toilets.
 - b) Separate arrangement shall be made for drainage of the storm water.
 - c) Ventilators may be permitted above lintel height on production of no objection certificate from the owners of the adjacent plot to which the ventilators abuts. But no window overlooking others property shall be permitted without obtaining written consent of the owner of the plot to which the window overlooks.
- (2) For constructions on first and subsequent floors on existing floors in a basti area, constructions with zero setbacks on sides may be permitted.
- (3) Provided that the construction does not lead to closing down of windows/ ventilators/ skylights of the neighbouring plot which already exist lawfully.
- (4) While according permissions without providing required setbacks, no-objection certificate from the side neighbour where setback is not provided may be obtained and reasons for the same may be recorded in writing.

53. Requirement for Basti

- (1) (a) The Basti areas are to be delineated and notified by the Authority.
 - (b) Side setback for plots having area up to 100 square meter with width less than 5.0 meters may be relaxed provided a no-objection certificate is obtained from the immediate side neighbours.
 - (c) In plots having narrow width (above 5.0 mt. but less than 7.5 mt.) constructions at zero setback may be allowed on one side with a passage of 1 meter on the other side.
 - (d) The front and rear setbacks shall not be less than the prescribed setback provided in these regulations.
 - (e) In such small size plots an internal courtyard of not less than 6 square meters in area and 1.5 meters in width shall be provided in such a way that at least the wall of each living room shall abut such courtyard or verandah opening to such a courtyard.
 - (f) A minimum of 25 percent of the plot shall be left open without adversely affecting light and ventilation for habitable space and toilet.
- (2) Requirements of small plots in basti area:
- (a) **Minimum plot size & frontage:-**The minimum size and frontage of residential plots shall not be less than 30 square meter and 3.5 meter respectively.
 - (b) **Open space:-** In such plots it shall not be mandatory to leave setback on any side. However front setback may not be less than 1.00 meter.
 - (c) **Internal Courtyard:-** In such plots having zero setback on both sides an internal courtyard of area not less than 6 sq.mt. in area and not less than 1.5 meter in width shall be provided in such a way that at least one wall of each living room/ toilet shall abut such a courtyard or a verandah opening to the courtyard.
 - (d) For plots with narrow width (7.5 meters) zero setbacks may be allowed on one side with a passage of one meter on the other side.
 - (e) The rear setback and front setback shall not be less than 1 m. respectively.
 - (f) **Foundation of building with zero set back in basti area:-**
 - a. Where constructions of building have been permitted with zero setback in no case footing of the foundation shall be allowed to spread into the plot of the neighbours.

- b. Sufficient precaution shall be taken while digging foundation to ensure that the structural safety of the neighbouring building is not adversely affected.

54. Semi-detached and row housing

- (1) Owners of adjacent similar dimension plot abutting a road may be permitted to construct row or semi-detached buildings.
- (2) The orientation of the row or semi-detached building shall preferably be such that the prevailing south-west summer breeze can be availed by each dwelling unit.
- (3) For semi-detached buildings over two adjacent plots, the setbacks, the height and the FAR shall be regulated by treating both the plots as one.
- (4) In case of row housing, the length of a row shall not exceed 30 mt. along the road on which such houses abut. In case, the dwelling units in a row are scattered the maximum length of the road shall be 100 mt.
- (5) For row houses the ground coverage shall not be allowed to exceed 60% and the FAR more than 1.50.
- (6) The minimum size of the plot on which a unit of a row housing may be allowed shall be 30 sq.mt.

55. Shop cum residence

Where plots are allotted in a row for shop-cum-residential purpose the Authority may allow construction of shop-cum-residential building without any side set backs up to a depth of 10 meters from the front exterior wall. Provided that no part of the building up to said depth is used for residential purpose on the ground floor. No building exceeding 11 meters in height shall be allowed to be constructed as a shop-cum-residential plot, unless so permitted under the Zonal Development Plan, provided that the shop-cum-residence shall have 2/3rd of the total floor area used for shops. The FAR and other parameters shall conform to that specified for commercial buildings.

56. Institutional buildings

All Institutional, Assembly, Commercial and Industrial Buildings shall contain at least two doors for entry and exit and shall provide adequate toilet facility separately for men, women and handicapped persons in each floor which shall be linked to main sewerage/ drainage systems of

the town wherever possible and shall be maintained cleanly and properly by the builders/ tenants/ occupants of the building as the case may be.

57. Cinema, Multiplex and Theatre building

- (1) The relevant provisions of the Orissa Cinemas (Regulations) Rules, 1954 shall apply for planning, designing and construction of Cinema and Theatre buildings and plan and design shall be made as per **Table 11** below:

Table 11 Open Space Requirement for Cinema/ Theatre Buildings

Area of the plot (in square metres)	Maximum Coverage	Minimum road width (in meter)	FAR	Minimum Open Spaces Requirement (in metres)		
				Front	Sides	Rear
2000	35%	12.0	1.0	9	6	5
3000	35%	12.0	1.5	12	6	

- (2) No permission for construction of a building to be used as a cinema hall, theatre or auditoria for cultural show shall be granted unless the construction of such buildings, conforms to the provisions of the Orissa Cinema (Regulations Act, 1954) and the Orissa Cinematograph Rules, 1939 or any other law in the subject for the time being in force in the State.
- (3) No permission to construct a cinema hall on a site shall be given unless the Authority has approved such site for the purpose.
- (4) The open spaces (setbacks) to be left around a cinema building number of floors, coverage, FAR in respect of cinema hall, theatres or auditoria for cultural show shall be as per the **Table 11** given in Claus 57(1).
- (5) Buildings referred to in Sub-Claus (3) shall be permitted only on plots which abuts a street with a minimum right way of 24 metres and where the width of the right of way is less than 24 metres if permissible under a Zonal Plan or a Development scheme or a town planning scheme.
- (4) Excepting provision for restaurant and incidental facilities no other use shall be permitted in a cinema building.
- (5) All cinema, theatre or auditoria buildings shall conform to IS: 4898-1968 and acoustics design of such buildings shall adhere to the requirements of IS: 2526-1963.

- (6) Exits and fire safety requirements shall be in accordance with Part IV (Fire and life safety) of National Building Code of India, 2005.

58. Liquefied petroleum gas Cylinder Godown

- (1) Vacant space shall be maintained at all times, with the following distances for storage shed used for the storage of liquefied petroleum gas cylinder between any building, public space, public road or any adjoining property which may be built upon and the said storage shed.

Table 12: Minimum distances required for storage shed of liquefied petroleum gas cylinders

Quantity of Compressed Gas in Cylinders (Kg.)	Minimum Clear Distance to be kept (meters.)
0-100	1
Above 100-1000	3
Above 1000 to 4000	5
Above 4000 to 8000	7
Above 8000 to 12000	9
Above 12000 to 30000	12
Above 30000	15

- (2) Notwithstanding anything contained in the conditions specified above, cylinders containing liquefied petroleum gas exceeding 100 Kilograms but not exceeding 300 Kilograms may be kept in a storage shed forming part of, or attached to building, if it is separated there from by a substantial partition and the only means of access to it is from outside. Such a storage shed shall not be situated under any staircase or near other entrances to or exits from the rest of the building or other buildings. A suitable fence to prevent unauthorised persons from having access to the shed shall surround a shed used for storage of liquefied petroleum gas cylinders.

59. Petrol Pump

- (1) Minimum distance from the road intersections shall be:
- For minor roads having less than 30 mt. width - 50 m.
 - For major roads having width 30 mt. or more - 100 m.
- (2) The minimum distance of the property line of petrol pump from the centre line of the road shall not be less than 15 meters on roads having less than 30 mt. width. In case of roads having 30 mt. or more width, the width of the road shall be protected.
- (3) Plot size:
- Only for filling stations - 30 m. X 17 m.
 - Filling-cum-service station -36 m. X 30 m.

- C. Frontage of the plot shall not be less than 30 m.
- (4) New petrol pump shall not be located on roads having less than 30 mt. width.
- (5) **(A) Other controls:**
- i. Ground coverage - 20%
 - ii. FAR - 0.20
 - iii. Maximum height - 7 m.
 - iv. Canopy equivalent to permissible ground coverage within setback line.
 - v. Front set back - minimum 6 m.
- (B) Other regulations:**
- i. NOC from Explosives/Fire Department
 - ii. License from the District Magistrate
 - iii. Ground coverage will exclude canopy area
- (C) Compressed Natural Gas (CNG) mother station**
- i. Plot size (Max) - 36 m. X 30 m.
 - ii. Maximum ground coverage - 20%
 - iii. Maximum height - 7 m. (single storey)
 - iv. Building component - control room/ office/ dispensary, store, pantry and W.C.

60. Farm House

For construction of Farm House Building in Agriculture and forest Use Zone:

- (1) **Minimum size of plot-** Minimum size of a plot for farmhouse shall not be less than 1.00 hectare.
- (2) **Maximum coverage** and FAR shall be as given in the table below-

Table 13: Maximum coverage and FAR

a. Maximum permissible ground coverage for all types of activity	15 percent
b. Maximum permissible FAR	0.25
c. Residential accommodation of watch and ward/maintenance staff	100 sq.mt.
d. Maximum height	7 m.
e. Setbacks	Front/side abutting road 15.0m. and all other sides 9.0 m.

- (3) **Other Provisions**-Minimum 50 percent of the total area of the farmhouse shall be under plantation/cultivation. At least 100 trees per hectare shall be planted out of which at least 50 per cent shall be evergreen trees.
- (4) **Water-supply, Sewerage and Drainage:**
- A. In case of a plot for a farmhouse having dwelling units, the owner thereof shall be responsible to make lawful arrangements for potable water.
- B. The owner shall be responsible to provide drains in the farmhouse to be used for rain water and in case of dairy farm open or closed sanitary drains to clean sheds, as may be required by the Authority.
- C. The owner shall be responsible to provide septic tank with necessary disposal trenches for disposal of human and animal waste in the farmhouse within his own premises.
- (5) **Electrification**-The owner of a farmhouse shall obtain electric connection directly from the appropriate authority authorized for distribution on such terms and conditions at his own cost as decided by the appropriate Authority from time to time.

Integrated Township

This refers to the Regulations No. 1163 of Part VI of the CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010

61. Large Projects

- (1) Integrated Townships with minimum 10 Ha. of land having access from minimum 30 m. R/W road shall be allowed. The road shall have adequate provision for cycle track, footpath, covered drain, plantation, street light and underground utilities.
- (2) The integrated Township shall be permitted in Residential / Public and Semi-public use Zone.
- (3) Permissible land use within the township (%)
- | | |
|-------------------------------|-------|
| A. Residential | 45-50 |
| B. Industrial (Non-Polluting) | 8-10 |
| C. Commercial | 2-3 |
| D. Institutional | 6-8 |
| E. Recreational | 12-14 |
- (4) Other regulations for approval of Integrated Township:

- A. At least 10% of the total area shall be reserved for parks and open space. It shall be developed and maintained by the developer.
- B. At least 5% of the site area shall be reserved for public and semi-public use and shall be handed over to the Authority free of cost and the Authority for development either to the developer or others on lease basis shall allot the same.
- C. The FAR shall be calculated on the total area.
- D. Road shown in Comprehensive Development Plan shall be incorporated within the plan and shall be handed over to the Local Authority free of cost after development.
- E. The FAR and coverage shall be 2,50 and 40% respectively.
- F. At least 20% of the housing units developed will be earmarked for housing for the EWS/LIG category. The cost and method of allotment of such houses will be decided by the Authority.
- G. At least one of the major interconnecting roads shall be 18 Mt. R/W and shall be open ended.

Multi-Storeyed Buildings and Group Housing Schemes/Apartments: Additional Requirements

This refers to the Regulations No. 1163 of Part VII of the CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010

62. Restriction on construction of multi-storied building

- (1) The Authority may restrict construction of multi-storied buildings in any area on the basis of objective assessment of the available infrastructure and planning needs after obtaining due approval of the Government.
- (2) Before commencement of these regulations, where permission has been granted conditionally, and such cases shall be dealt with under corresponding provisions of these Regulations without any major change, or removal of construction, subject to the condition where violation of Heritage Zone conditions has occurred, this relaxation shall not apply.
- (3) No multi-storied building shall be allowed to be constructed:
 - a. with approach road less than 12 m. width;
 - b. on plot size less than 2000 sq. m.

- c. Within 100 (One hundred) metres from the centre of a National Highway on either side;
- d. Within 300 (three hundred) metres of the boundary line of any old temple or historical monuments or site of archaeological importance recognised by the Archaeological Survey of India, State protected monuments outside the Heritage Zone of the Comprehensive Development Plan;
- e. Within 100 (hundred) metres from boundary of the Railway track of the Indian Railway;
- f. Within the heritage zone;
- g. Within one kilometer from the reference point of an Airport without clearance from the Airport Authority.
- h. In low-lying areas as notified by the Authority.

63. Application for approval of site

- a. Before making an application for construction a multi-storied building, the owner of the concerned plots/site shall first obtain from the Authority a clearance with regard to suitability of the site. An application for such clearance shall be in the form to be specified by the Authority and shall be accompanied by a site plan with detail information with regard to its location and dimension and a service charge as decided by the Authority.
- b. The Authority after due inspection of the site may issue or refuse clearance for construction of the multi-storied building. Such clearance shall be valid for 18 months from the date of its issue.

64. Application for construction of multi-storied building

- a. Every application for approval of the site and building plan and permission to construct or reconstruct or alter or add to, a multi-storied building shall, in addition to the prescribed scrutiny fee under the rules and other fees as prescribed by the Authority from time to time and the applicable particulars required, be accompanied with the following further particulars, namely :
 - i. A key plan showing :
 - the means of access from the street or streets to all the buildings existing and proposed at the site, to the parking space and facilities provided at the site for scavengers and fire protection;

- the spaces to be left around the building for access, parking, circulation of air, light and other amenity;
 - the disposal system of storm and domestic refuse water; and
 - a rain water harvesting structure;
- ii. Building plans showing :
- floor plan of all floors and covered area indicating clearly size and spacing of all framing members and sizes and arrangement of rooms and the position of stair-case, ramps, lift, wells and circulation spaces etc.;
 - longitudinal cross-section of the building including size of footings, basement and super structure framing members and details of building and room heights and of staircase etc.;
 - plans and sectional details of water supply, drainage and sewerage system of the building;
 - internal electrical design;
 - the general lay-out of the columns and load bearing walls; and;
 - a landscape plan showing the area to be developed as lawn, garden, plantation etc.
 - location and provision of Fire Prevention related equipments like hydrants, hose seals, fire extinguishers, vehicular access and refuse area.
- iii. No Objection Certificate :
- In case of buildings having more than four floors or 15 [fifteen] metres and above height, from the Chief Fire Officer having jurisdiction to the effect that the applicant has agreed to provide the fire fighting measures for the building as prescribed in the National Building Code and to the effect that the plan referred above provides access for easy movement of fire service vehicles in case of a fire hazard in future; and
 - In all multi-storied buildings, the Chief Officer of the Archaeological Survey of India in case of any portion of the plot or site of the building or its boundary exist within 300 (three hundred) metres of the boundary line of any old temple of historical monuments or site of archaeological importance, or heritage site.
 - Public Health Engineer Department with regard to adequacy of water supply and sewerage.

- CESCO with regard to supply of electricity. .
 - Respective Municipal Corporation/Urban Local Body/Panchayat Samiti with regard to approach road and adequacy of drainage.
- iv. The clearance certificate in original issued by the Authority as referred to in Regulation 63 (2).
- v. Statement and calculation sheets with regard to the plot area, floor wise details of spaces under various categories like apartment or office spaces, lobby circulation, staircase, lift, mezzanine space, balconies and details of such area which are to be exempted from calculation of floor area ratio, and;
- vi. A certificate from a Registered /Empanelled Civil/ Structural Engineer with regard to details of structural plan and structural design including soil test certificate of the proposed multi-storied building. Provided further that while preparing the structural plan /design following aspects should be taken into account:
- The loads and forces including seismic forces and wind loads which are to be taken into account for structural design of building shall be in accordance with the Section- I (Loads) of Part-VI (structural design) of the National Building Code of India, 2005.
 - The structural design of foundations and elements in Sub-structure and super structure of wood, masonry, reinforced and pre-stressed concrete and steel shall be in accordance with Section-2(foundation), Section-3(wood), Section-4 (masonry), Section-5 (concrete) and Section-6 (steel) of Part-VI (structural design) of the National Building Code of India, 2005.
- b. All plans, drawings, statements, design details shall bear the signature of the applicant and shall be duly countersigned by a registered Architect. All documents and plans related to structural designs shall bear the full name and full signature of a Structural Engineer. Plans and documents related to sanitary arrangements shall bear the full name and full signature of a Public Health Engineer.
- Note:**
- i. The registered Architect who has prepared the plan shall put the registration number and seal on all plans and documents signed by him and shall also furnish a certificate to the effect that he shall supervise the construction of the building and shall be responsible for any deviation from the approved plan.

- ii. The Structural Engineer, who has prepared the structural design, shall put his seal, and address on all the documents signed by him and shall also furnish a certificate to the effect that he shall supervise the structural part of the construction and shall be responsible for any structural failure except caused by unprecedented natural calamities in Form-X.
- iii. All aspects related to structural design, building surface, plumbing, electrical installation, sanitary arrangements, fire protection shall adhere to the specification, standards and code of practice recommended in the National Building Code of India, 1983 and any breach thereof shall be deemed to be a breach of the requirements under these Regulations.

65. Permission for construction of multi-storied building

Permission for construction of multi-storied building shall be accorded along with direction to the builder/developer to develop the onsite and offsite infrastructure like connectivity of sewerage, drainage, water supply, road etc. as per the specification of the concerned public authorities.

The builder/developer shall produce no objection certificate from the applying for occupancy certificate.

After receipt of the NOC from the above authorities, occupancy certificate shall be given by CDA.

66. Commencement of Work

- (1) Every applicant or builder or owner shall submit a notice regarding his intention to commence the foundation work of the proposed multi-storied building to the Authority through authorised technical persons. The said notice shall be accompanied by the approved plan and shall be in Form-V of Cuttack Development Authority (Planning & Building Standards) Regulations – 2010.
- (2) Soon after the receipt of the notice referred to in sub- clause (1) above, the Authority shall send a team of officers to the proposed building site and the layout for foundation of the proposed multi-storied building shall be made in presence of those officers. The team shall also submit a report to the Authority to the effect that the layout has been made as per the approved plan.
- (3) During or soon after the construction of the foundation work of the multi-storied building, the Vice-Chairman of the Authority or his representatives or independent Engineer/ Architect appointed by Authority shall inspect the construction to ensure that the setbacks,

coverage, basement if any, and foundation standards are done according to the approved plan.

- (4) The applicant/builder shall submit periodic progress report after casting of each floor slab in Form-VIII of Cuttack Development Authority (Planning & Building Standards) Regulations – 2010.

67. Liability of defective construction

- (1) For defective constructions, the Authority shall sue the owner's builders, architects, and the engineers for both civil and criminal liabilities, besides taking action under these regulations.
- (2) Without prejudice to the provisions of the Act, the actions to be taken by the Authority shall include stop construction notices, cancellation of permission, and removal of unauthorized constructions, which shall be notified.

68. Maintenance

- (1) The main entrance to the premises shall not be less than 5 (five) meter in width in order to allow easy access to fire engine. The gate shall fold back against the compound wall of the premises, thus leaving the exterior access way, within the plot, free for the movement of fire service vehicles. If archway is provided over the main entrances, the height of the archway shall not be less than 5 (five) meter.
- (2) For multi-storied group housing scheme on one plot, the access way within the premises shall not be less than 7.5 (seven and half) meter in width and between individual building blocks, there shall be an open un-built space of 6 (six) meter.
- (3) The space set apart for providing access within the premises shall, in no case, be included in the calculation of requirements pertaining to parking spaces and other amenities required to be provided for the building.
- (4) Every access way shall be properly drained and lit to the satisfaction of the Authority. Manhole covers or any other fittings laid within the right of way of the access way shall be flushed with the finished surface level of it so as not to obstruct safe movement of men and vehicles.
- (5) Reconstruction or addition or alteration to any multi-storied building shall not be taken in a manner which shall reduce the width of the access way to a level below the minimum prescribed limit under these regulations.

69. Exit

- (1) Every multi-storey building meant for human occupation or assembly shall be provided with exit sufficient to permit safe escape of the occupants in case of fire or other emergencies.
- (2) An exit may be a doorway, corridor, and passageway to an internal or external staircase or to a verandah or roof or terrace having access to a street.
- (3) Exits shall be so arranged as to provide continuous means of access to the exterior of a building or exterior open space leading to a street without passing through any occupied unit.
- (4) Exits shall be so located that the travel distance on the floor shall not exceed twenty meters in case of residential, educational, institutional and hazardous occupancies and thirty meters in the case of assembly, business, mercantile, industrial and storage occupancies. Wherever more than one exit is required for a floor of a building, exits shall be placed at a reasonable distance from each other as possible. All the exits shall be accessible from the entire floor area at all floor levels.
- (5) There shall be at least two exits serving every floor and at least one of them shall lead to a staircase.
- (6) The width of every exit shall not be less than one meter and shall be provided as per the following table: -

Table 14: Number of occupants as per type of occupancy

Sl. No.	Type of occupancy	Number of occupants per unit exit	
		Stair Case	Terrace
1	2	3	4
1	Residential	25	75
2	Mixed and other uses	50	75

Explanation:

- A. Lifts and escalators shall not be considered as an exit.
- B. 'Travel distance' means the distance from any point in the floor area to any exit measured along the path or egress except that when the floor areas are sub-divided into rooms, used singly or of rooms and served by suite corridors and passage, the travel distance may be measured from the corridor entrance of such rooms or suites to the nearest staircase or verandah having access to the street.

70. Mandatory Provision

- a. Every multi-storied building shall provide one or more rain water harvesting structures. The total dimension of recharging/percolating pits/ trenches should be at least at the rate of 6 [six] cubic metres dimension for every 100 [one hundred] square metres of roof area.
- b. Every multi-storied building shall provide red lights on the roof facing the sky of a minimum wattage of 500. This can be of one or more units; but the minimum wattage of one unit shall be 100 watts.

71. Lifts

Lifts shall be provided in all multi-storied buildings irrespective of the use. The lifts provided shall not be considered as means of escape in case of emergencies. An extra staircase shall be provided as a means of escape during emergency.

72. Floor Area Ratio and Set-back

In case of multi-storied buildings, the maximum Floor Area Ratio shall be 2.00, and the maximum ground coverage shall be 50%. Out of the balance area, at least 20% shall be covered by plantation.

- a. The minimum side and rear set-back for the multi-storied building shall be $1/3^{\text{rd}}$ (one third) of the height of the building.
- b. The minimum front setback for the multi-storied building shall be $1/3^{\text{rd}}$ (one third) of the height of the building + 1 (one) meter.
- c. The area covered under following services and structures shall not be included in the calculation of floor area ratio namely :
 - i. a basement or cellar or covered space under a building constructed on stilt (not exceeding 2.56 metres in height), provided that it is used for parking, installation of air conditioning equipments and other machines used for services and utilities of the building (lift room, pump house, fire fighting).
 - ii. Electric cabin of sub-station, watchman booth, pump house and garbage shaft, staircase room and lift rooms above the top most storey, architectural feature, chimneys and elevated tanks; and
 - iii. Spaces occupied by staircase rooms, lift and lobbies attached to them and circulation or movement corridors and fire refuse areas.

73. Building height

- a. Notwithstanding anything contained in these Regulations, no building exceeding 27 (twenty seven) metres in height shall be permitted within the Cuttack Development Area, except with the Approval of the full Authority, as stated in sub-regulation [2] below.
- b. The Authority shall not issue permission on case to case basis. The Authority, in a full meeting, shall specify the mouzas and units where buildings above 27 (twenty seven) metres height may be taken up. Before taking a decision on this, the concurrence of the Art Commission and the Airport Authority of India shall be obtained. A draft notification shall be published by the Authority, inviting suggestions and objections, giving thirty days time. After receipt of the objections and suggestions, if any, will be considered by the full Authority, and a decision will be taken. The areas in which buildings above 27 [twenty seven] meters height will be permissible, will be notified by the Vice Chairman of the Authority. No request for approval of plan shall be entertained before expiry of one month from the date of publication of the final notification in this regard. No approval will be given before the expiry of two months from the date of publication of this notification.

74. Departure of approved plan

If during the construction of a building any substantial departure from the approved plan is intended to be made by way of internal alterations or modifications, which will increase the potential occupancy, prior sanction of the Authority shall be obtained. The revised plan showing the deviation shall be submitted and the procedure laid down in these Regulations shall apply to such revised plan.

75. Inspection

- a. The Vice-chairman of the Authority or his authorised representative shall inspect the building from time to time during construction.
- b. If at any stage of construction it is noticed that there is possibility of threat to the structural stability of a multi-storied building on account of addition of extra loads, both horizontally and vertically, addition of extra floors or poor construction practices by using low quality materials etc., the Authority shall get the building inspected by its own technical personnel or by engaging experts from reputed institutes or firms. The expenditure incurred in this connection shall be realised from the builder or owner of the building.
- c. The authorised technical person or the expert engaged for the above purpose shall inspect the building and carry out such tests if required,

as per the provision of NBC and submit a report mentioning the details of findings to the Authority.

- d. If the Authority, after carefully examining the report as referred to in Clause-3 above, feels that actually there is threat to the structural stability of the building, the Authority shall declare the building unsafe for human habitation and cause disconnection of water supply and electricity to the building and initiate action for demolition of the building. The decision of the Authority in this regard shall be published.
- e. An appeal against an order made under sub-clause (4) above shall lie under section 103 of the Act.

76. ICT landing points

Every multi-storied building complex shall have provision for Information and Communication Technology (ICT) landing point in the form of a room near the main entrance gate of dimension not less than 3 m x 4 m. and having 3 m. clear height. The room shall have two fire proof doors of 1.2 m. width opening outwards along with adequate ventilation in the form of windows/ ventilators. Such room shall not be counted in coverage and FAR calculations.

77. Penal Action against Builders/ Technical personnel

- (1) Notwithstanding anything contained in these regulations, the Authority reserves the right to debar/ black list the builder/ technical person who has deviated from the professional conduct or has made any fraudulent statement or has misrepresented/suppressed any material facts in his application/ plan or is involved in construction of the building deviating from the approved plan/norms of these regulations.
- (2) Before taking any action under clause (1) specified above, the Authority shall issue a notice specifying the reasons thereof asking for a show-cause within 15 days as to why such builder/technical person shall not be debarred/black listed. After receipt of the show cause, if any, the same shall be placed before the Authority for a decision on debarring/black listing the technical person/builder. The decision of the Authority in this regard shall be published in the Notice Board of the Authority and the Govt. website.
- (3) An appeal against an order under sub-clause (2) above shall lie under Section 18 of the Act.

78. Occupancy of the building

In addition to the general provisions contained in regulation-16 and partial modification thereof the following provisions shall be followed in case of multi-storied buildings, apartments and group housing schemes;

- (1) No person shall occupy or allow any other person to occupy any part of the multi-storied building for any purpose until such building or any part of it, as the case may be, is granted occupancy certificate by the Authority.
- (2) On receipt of completion certificate in Form-VI (Part-I & Part-II) the Planning Member with the approval of Vice-Chairman shall issue a provisional occupancy certificate in Form-X to enable the builder/land owner to obtain service connections.
- (3) The authorities entrusted with the job of providing services like electricity, water supply and sewerage shall not provide such services without provisional occupancy certificate by the Authority. However, temporary service connection may be provided for construction purpose.
- (4) The builder shall cause to register an Association of apartment owners as required under the Orissa Apartment Ownership Act, 1982, before occupancy certificate for 50% or more of the floor area is given.
- (5) The builder shall submit a copy of the agreement it has entered into with the apartment owners' society. This agreement shall contain the terms of maintenance of public utilities.
- (6) On satisfactory compliance of above & provision of the services the final occupancy certificate shall be issued by the Planning Member with approval of the Vice-Chairman.

79. Completion of construction

Every applicant/ owner shall submit a notice in Form-VI (Part-I and Part-II) regarding completion of the construction of multi-storied building, to the Authority through the registered Architect/Structural Engineer, who has supervised the construction. The said notice shall be accompanied with the following documents:

- A. Three copies of plan of the completed building.
- B. A fee of Rs.5000.
- C. Record of Rights (ROR) relating to ownership.
- D. Evidence to the effect of all public utility services, and in particular, sewerage, drainage, water supply and electricity has been linked to the main public utility system.

- E. The Authority may accept or reject completion certificate. In case it is rejected the reasons for the same shall be indicated.
- F. Completion of the work shall be done within the period of validity of permission. The concerned agencies shall submit report of completion of the utility services.
- G. No Objection Certificate from Fire Prevention Officer.

80. Issue of occupancy certificate

- (1) The Authority on receipt of the notice of completion, along with all the required documents, shall take a decision to either issue or refuse occupancy certificate in Form-X within 60 days from the date of receipt of such notice which shall be published in the Notice Board of the Authority and in the Govt. website.
- (2) If the occupancy certificate is not issued by the Authority within sixty days from the receipt of notice, the owner shall draw the attention of the Vice-Chairman of the Authority in this regard in the Form-XIII. If within the further period of two months the authority does not communicate its decision either granting or refusing occupancy certificate, such issue of occupancy certificate shall be deemed to have been granted to the owner on the date following the date of expiry of said two months.
- (3) Where occupancy certificate is refused by the Authority, reasons recorded thereof shall be communicated to the applicant and the same shall be published. An appeal against such a decision will lie under Section 18 of the Act. The Appellate Authority shall be competent to seek the views of, and implead as parties, authorities in charge of public utility services, as provided under the Act, under the Orissa Apartment Ownership Act, 1982, and apartment owners. Where non-provision of public utilities is likely to affect other residents, such residents may also be impleaded as parties.

81. Structural Safety Design and other services requirements

- (1) **Structural Design:** The structural design of foundation, masonry, timber, plain concrete, reinforced concrete, pre-stressed concrete and structural steel shall be carried out in accordance with Part-VI structural design, Section-1 loads, Section-2 foundation, Section-3 wood, Section-4 masonry, Section-5 concrete and Section-6 steel of National Building Code of India taking into consideration all relevant Indian Standards prescribed by Bureau of Indian Standards including the Indian Standard given in IS-Code 1893-1984, 13920-

1993, 4326-1993, 13828-1993, 13827-1993 and 13935-1993 for structural safety.

- (2) **Quality of Materials and Workmanship:** All material and workmanship shall be of good quality conforming generally to the accepted standards of Public Works Department and Indian standard specification and codes as included in Part-V Building Materials and Part-VII Construction practices and safety of National Building Code of India.

(3) **Construction practices and safety**

The safety measure to be adopted during various constructions, operations, including storage of material in construction side and corporation land shall be in accordance with part VII, constructional practices and safety of the National Building Code of India, 2005.

- (3) **Alternative Materials, Methods of Design and Construction and Tests:** The provisions of these regulations are not intended to prevent the use of any material or method of design or construction not specifically prescribed by these regulations provided any such alternative has been approved.

The Authority may approve any such alternative if it is found that the proposed alternative is satisfactory and conform to the provision of relevant parts of this regulation regarding material, design and construction and that material method of work offered is, for the purpose intended, at least equivalent to that prescribed in these regulations with regard to effectiveness fire and water resistance, durability and safety requirements.

The building materials approved by B.I.S. or any statutory body will form part of the approved building material and technology as part of the regulations.

(4) **Building Services:**

A. the Planning design and installation of electrical installations, air conditioning installation of lifts and escalators can be carried out in accordance with Part-VIII Building Services, Section-2 electrical installation, Section-3 air conditioning and heating, Section-5 installation of lifts and escalators of National Building Code of India, 2005.

B. The requirements of electric sub-station and the provision of electric sub-station shall also require approval from the concerned Authority.

(5) **Plumbing Services:**

The planning, design, construction and installation of water supply, drainage and sanitation and gas supply system shall be in accordance

with Part-IX, Plumbing Services, Section-1 water supply; Section-2 drainage and sanitation and Section-3 gas supply of National Building Code of India 2005.

82. Fire safety requirements

Buildings shall be planned, designed and constructed to ensure adequate fire safety to the property and inhabitants and this shall be carried out in accordance with Part- IV (Fire and Life Safety) of the National Building Code of India, 2005 for buildings above 5 storeys of 15 metres in height. The fire fighting requirements, arrangements and installations required in buildings shall also conform to the provisions of Part IV (Fire and Life Safety) of the National Building Code of India, 2005.

83. Test

Whenever there is insufficient evidence of compliance with the provisions of these regulations or evidence that any material or method of design or construction does conform to the requirements of these regulations or in order to substantiate claims for alternative materials design or methods of constructions, the Authority may require tests sufficiently in advance as proof of compliance. Those tests shall be made by an approved agency at the expenses of the owner.

Test methods shall be specified by these regulations for the materials or design or construction in question. If there are no appropriate test methods specified in these regulations the Authority shall determine the test procedure. For method of tests for building materials reference may be made to relevant Indian Standards as given in the National Building Code of India, 1983 published by the Indian Standards Instruction.

Copy of the results of all such tests shall be retained by the Authority for a period of not less than two years after the acceptance of the alternative materials.

Development and Sub-Division of Land Regulations

This refers to the Regulations No. 1163 of Part VIII of the CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010

84. Application

- (1) Applications for subdivision of land for utilizing selling, leasing out or otherwise disposing it off as referred to in clause(a) of sub-section(1) of Section 16 of the Act shall be made to the Authority in Form-1.

- (2) The applications for Subdivision shall be in addition to the requirements specified in regulation-5(2) (iii) accompanied by-
- i. a copy of the title deed of the land in question;
 - ii. an affidavit with regard to the right, title and interest of land and such other particulars as the Authority may require;
 - iii. an authenticated copy of the certificate with regard to the payment of development charges, if any, under, Chapter-IX of the Act, provided that submission of such certificate shall not be necessary if the provisions of Chapter-IX of the Act has not been brought into force in the area in which the concerned land is located;
 - iv. an authenticated copy of the receipt towards payment of the scrutiny fee to the Authority as prescribed under rule-18;
 - v. a no-objection certificate, from the lessor in case the land is not lease-hold unless the lease deed permits undertaking Sub-division as applied for;
 - vi. a site plan traced out of revenue village settlement map in operation indicating therein in red colour the lands to which the application relates and surrounding plots;
 - vii. an index plan of the site showing adjoining areas within a radius of 150 m. round from the proposed site marking clearly therein the boundaries of the proposed layout in red colour, existing road, structures, burial ground and high tension or low-tension power line passing through the site of the layout plan and the level of the site;
 - viii.a detailed plan to a scale not less than 1:100 showing the proposed layout (Subdivision) indicating size of plot width of the proposed road, open space and amenities provided;
 - ix. land use analysis indicating the survey plot number, the bye-plot number, the detailed dimensions of all the plots, the area of each-plot and the use to which they are proposed to be put;
 - x. in case of land originally belonging to any religious endowments, a no-objection certificate from the endowment commissioner or wakf board as the case may be; and
- (3) Where permission for Subdivision of land is granted, such permission shall be communicated to the applicant in Form II within 60 days from the receipt of the application.
- (4) Where permission for Subdivision of land is refused such refusal shall be communicated to the applicant in Form IX.

85. Use in relation to development plan

- (1) Sub-division of land shall normally be permitted for the purpose for which the concerned land is earmarked in the development plan. Such Sub-division may be for residential, commercial, industrial, institutional or combination of one or more of this purpose or such other purpose as may be considered conforming to the provisions in the development plan: provided that in every Sub-division plan spaces for roads, community facilities and public utilities as specified in this part or such other facilities as the Authority may determine shall be incorporated.
- (2) After a Sub-division plan has been approved the Authority shall not permit construction of a building on any of the plot under Section-16 unless the owners have laid down and made street or streets and provided amenities as approved or transferred the land covered by roads, open spaces or other public purposes to the concerned local body.
- (3) Sub-division of land for residential purpose in green-belt use zone shall not be permitted unless such Sub-division in the opinion of the Authority forms a part of the normal expansion of existing human habitation.
- (4) Sub-division of land should cater to all income groups with different plot sizes and grouping as far as practicable.
- (5) The Sub-division shall conform to the proposals of the CDP and other development plans.

86. Roads to be provide in residential sub-division plan:

- a. Depending upon the total area to be sub-divided roads is to be provided in a hierarchical manner as per the following **Table 15** provided that roads of 6 metres width can only serve as access to plots and the collector streets should have a minimum width of 9 metres.

Table 15: Hierarchical manner of providing the roads

<i>Class of roads</i>	<i>Width of road (in metres)</i>	<i>Maximum permissible length (in metres)</i>
1	6.0	150
2	9.0	300
3	12.0	500
4	18.0	1000
5	24.0	Above 1000

- b. The corner of the plots facing road junction shall be chamfered to 45 degree up to a distance of 2.0 metres from the corner.

87. Open spaces & Community Facilities

The open spaces and community facilities in a residential sub-division plan shall be provided as mentioned below:

- a. **Open Space:** A minimum of 7% of the total area in residential sub-division plan shall be left for open space requirement to be used for tot-lot park, playground, plantation and such other purposes.

Provided that where a person owns one acre of land or less without owning contiguous land, the percentage of open space may be reduced to 10%. In case, the width of road provide is 9 metres or more this provision of open space may be exempted.

- b. **Community Facility:** Over and above the open space stated above, area shall be left for community facilities such as education, health, recreation and other utilities. This will be in proportionate to the size of the population to be accommodated ultimately and be provided as per the rate prescribed in **Table 16**.

Table 16: Community facilities for Plotted Development and Group Housing

Sl. No.	Facilities Required		Scale of Provision	Area required and Remarks
	Main type	Sub-type		
1.	Education Facilities	Nursery School (+3 to 5 age group)	4 for 15,000 population	0.5 acre for density up to 100 population/acre 0.35 acre for density up to 101 to 200 population/acre 0.25 acre for density of 201 population/acre and above
		Primary School (+5 to 12 age group)	4 for 15,000 population	2.25 acre for density up to 100 population/acre 2.0 acre for density up to 101 to 200 population/acre 1.75 acre for density of 201 population/acre and above
		High School (+12 to 16 age group)	1 for 15,000 population	6.0 acre for density up to 100 population/acre 5.0 acre for density up to 101 to 200 population/acre 4.0 acre for density of 201 population/acre and above
		Degree College	1 for 75,000 to 1,00,000	10 to 15 acres
2.	Health Facilities	Health Centre	1 for 15,000 population	1.5 acres
			1 for 75,000 population	10.0 acres for 200 beds with ancillaries and staff quarters
3.	Commercial Facilities including shopping facilities	Shops	1 for every 250 to 500	20 square meter per 250
			1 for every and subsequent 500 up to 3,500	40 square meter per 500
		Convenient Shopping Centre	Up to 10 shops for 5,000	0.2 to 0.5 acres
		Local Shopping Centre	Up to 20 shops for 15,000	1.75 acres
		Zonal Shopping Centre	Up to 80 to 100 shops for 50,000	11 acres

Continued...

Sl. No.	Facilities Required		Scale of Provision	Area required and Remarks
	Main type	Sub-type		
4.	Communi- cation facilities and essential service	Sub Post Office	1 for every 10,000	10 square metres
		Post and Telegraph Office cum Delivery and Booking including Telephone Exchange of 10,000 lines	1 for every 10,000	2.5 acres
		Electric Sub-station	1 in all shopping centre	12 meter X 12 meter
		Police station with Staff Quarters	1 for every 50,000	2.0 acres
		Police Post with Staff Quarters	1 for every 20,000	1.0 acre
		Fire Station	1 for every 5 kilometers radial distance	2.0 acres
5.	Social and Cultural facilities	Religious building	1 for every 15,000	2 acres location at intersection of road and 60 meters away from 6 junctions
		Community hall and Library	1 for every 15,000	0.75 acre
		Cinemas	1 for every 25,000	0.8 acre with parking location in zonal shopping centres, business and commercial area not in residential zone.

88. Size of the plot and road width

- (1) No sub divided plot will be less than 50sq.m. However the Authority reserves the right to relax in special cases such as EWS housing. The size of the plot shall be according to the relevant Subdivision of plot size in the zones.

Table 17: Minimum road widths for Residential sub-division

Sl. No.	Length of road in (m)	Min. width of road
1	Up to 250	9.0
2	Above 250 up to 500	12.0
3	Above 500 up to 1000	15.0
4	Above 1000	18.0

N.B. -For EWS housing scheme, the minimum road width may be relaxed.

- (2) At least 20% of the plots will be earmarked for of EWS/LIG category. The cost and method of allotment of such plots will be decided by the Authority.
- (3) The developer has the option of developing the EWS/LIG plots at the same site or within a distance of two kilometers from the main project.

89. Area for development

Apart from the provision for amenities, open spaces, the area for residential development shall be up to maximum of 50% of the total land area.

90. Parks and open spaces

Parks and open spaces shall not be less than 10% of the total land area. This shall be relinquished to the Authority and if required, the Authority may handover area over for maintenance to the residents' welfare association or owner or developer. If the site is not utilized for which it is leased out within a prescribed period, it will be resumed back to the Authority.

91. Civic amenities

Civic amenities space shall not be less than 5% of the total area. The site shall be relinquished to Authority and leased to the residents' welfare association or the developer on payment of necessary nominal fees as prescribed by the Authority from time to time. If the site is not utilized for which it is leased out within a prescribed period, it will be resumed back to the Authority.

92. Exemptions

- (1) In case of developable area for residential development is less than 50% by providing for Master Plan roads or any other road or due to statutory reasons, prescribed by the Authority in a layout, the applicant may be exempted from complying with Civic amenities reservation.
- (2) For layout over 10.0 ha, commercial land uses such as Business offices, shopping complexes and Retail up to 2-3% may be permitted, subject to provision of separate access.
- (3) For residential development up to 0.30 hectare of land, the requirement of open space may not be insisted on.

93. Security deposit for Subdivision plan

- (1) The applicant shall deposit a refundable non-earning security deposit at the rate of Rs.100/- per Sq. m. of plot area for development of land for a plotted development scheme.
- (2) The security deposits shall be refunded within 60 days from the date on which completion certificate is produced. If the development is

not as per approved plan, this deposit shall be forfeited and the amount will be transferred to the local authority for development of the site.

- (3) The security deposit will be refunded with 2% interest if the development is carried out as per the approved plan / lay out.
- (4) The applicant may deposit the security fee in the form of Bank Guarantee.

Compounding

This refers to the Regulations No. 1163 of Part IX of the CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010

94. Restriction on Compounding

- (1) Any deviation pertaining to unauthorized development shall not be compounded, -
 - A. where construction has been undertaken on Government land or land belonging to local body or land not owned by the person undertaking such development;
 - B. where development has been undertaken unauthorized within the prohibited limits of any ancient or archaeological monuments;
 - C. where development has been undertaken unauthorized over the area earmarked /approved for parking; reducing the minimum area of parking requirement;
 - D. where road or drain whether public or private, whether constructed or natural has been encroached.
- (2) Subject to the provisions contained in sub regulation (1), the Authority shall have the power to determine such other circumstances under which compounding may be prohibited.
- (3) The Authority may, either before or after the institution of the proceedings under the provisions of the Act compound any offence-
 - A. where development has been undertaken without permission, but within the framework of use restrictions and the provisions of these regulations applicable to the concerned plot;
 - B. where development has been undertaken in deviation of the approved plan, but within the framework of the use restriction and the provisions, norms, and stipulations of these regulations;
 - C. the Authority may however compound deviations up to 25% (twenty five per cent) beyond the permissible norms of these regulations in respect of front, rear and side setbacks and

coverage. The maximum deviation allowed to be compounded in FAR will be ten per cent on the permissible FAR, provided it does not exceed 3.00.

95. Power of Govt. to exempt

- a. Notwithstanding contained in this Regulation, the government may however relax any of the provisions of these regulation with an objective to deal with the constructions under taken prior to enforcement of these Regulation and not in conformity with the provisions of these regulations.
- b. For the purpose of making any such relaxation under clause (1) above the Government may formulate a scheme specifying a maximum time period of four months and publish the same in the Gazette and as referred to in Regulation-14.

Note: The above two clauses shall cease to have its effect after six months from the date of publication of this Regulation.

96. Compounding Rates

Compounding Rates for various categories shall be as follows:

Table 18: Category wise Compounding Rates

Sl. No	Situations	Compounding fee for Sq.Mt. (in Rs.)	
		Residential/Institutional	Others
1	Where development has been undertaken without permission, but within the frame work of use restrictions and the provisions of the Regulations applicable to concerned plot.	250	400
2	Where development has been undertaken in deviation to the approved plan, but within the framework of use, restrictions and the provisions of norms and stipulations of these regulations.	100	250
3	Construction up to 10% beyond the permissible norms of these Regulations with respect to front, side and rear setback and/or the deviation in FAR are within five percent.	500	1000
4	Construction up to 20% beyond the permissible norms of these Regulations with respect to front, side and rear setback and/or the deviation in FAR is more than five per cent or but within ten percent, provided it does not exceed 3.00.	1000	2000

Note: the above rate shall be revised by the Authority from time to time with the prior approval of the Government.

97. Compounding amount

At least 50% of the compounding fee collected shall be utilized for slum rehabilitation and development, development of public utility services and protection of heritage sites and structures.

98. Temporary retention

The Authority may allow retention of any unauthorized structure for temporary period on deposit of retention fee. The Authority shall decide the type of structure to be retained, the period of retention and the fees to be deposited from time to time.

Savings / Repeals and Interpretation

This refers to the Regulations No. 1163 of Part X of the CUTTACK DEVELOPMENT AUTHORITY (PLANNING & BUILDING STANDARDS) DRAFT REGULATIONS – 2010

99. Repeal and Savings

(1) The Cuttack Development Authority (Planning and Building Standards) Regulations 2001 are hereby repealed.

(2) Notwithstanding such repeal, anything done or any action taken under the regulations so repealed shall be deemed to have been done or taken under these regulations.

100. Educating the people

- a. The Authority shall take a pro-active role in educating the land owners within their jurisdiction so that (a) there will be a planned growth within development area and (b) expensive demolition will be avoided.
- b. A copy of these Regulations shall be printed by the Authority and sold to public in the sales counter of the Authority.

101. Interim Development Plans

(1) The Authority may prepare Interim Development Plans (IDP) for newly included development areas including stitiban/ryoti land within a reasonable time frame so that development may not be held up in the name of pendency of Interim Development Plan. Where such IDP has not been prepared, the general provisions of this Regulation shall apply without any zonal restrictions.

(2) The Authority shall ensure that resources for land acquisition and cost of land are mobilized or are likely to be mobilized within the time

frame projected for implementation of such Interim Development Plans.

102. Provision of development plan to prevail

In case any of the provisions of these regulations are at variance with those contained in any Development Plan or Town Planning Scheme, the provisions of such plan or scheme shall prevail.

103. Applicability of National Building Code

Where no express provision has been made in respect of any matter connected with planning and building standards by the Act, the Rules, the Development plan, the Town Planning Schemes, or these Regulations or by any resolution of the Authority, the provisions of the National Building Code of India, 2005 shall *mutatis mutandis* be applicable.

104. Schedules and annexure

- (1) As regards qualification, experience and competence of technical personnel and Builders the references of which are given in annexure-I of Cuttack Development Authority (Planning & Building Standards) Draft Regulations – 2010, may be followed.
- (2) The extract of ODA Act 1982, ODA rules 1983 and relevant provisions of National Building Code, which are provided in annexure-II of Cuttack Development Authority (Planning & Building Standards) Draft Regulations – 2010, may be referred to.
- (3) The application for permission under sub Section-1 of Section 16, order granting permission under sub-section (3) of Section 16, drawing attention of the Vice-Chairman under sub-section (7) of Section 16, maintenance of registers under sub-section (4) of Section 16 and (12) of the Act, notice for commencement of work, completion certificate, certificate for execution of work, certificate for structural stability, periodical progress report, of the Act, occupancy certificate Indemnity bond for basement, intimation regarding approval of residential building plan are provided in form I to XII of these regulations.

105. Constitution of B.P Committee

- a. The Authority may constitute a Committee under section-6 of ODA Act to be called Building Permission Committee with members from different Government organizations and departments.

- b. The Authority may by notification delegate such of its powers relating to approval of schemes, projects and building plans to the Committee constituted under Sub-Regulation (1) as it may deem appropriate.
- c. Matters and cases relating to permission under section 16 of the ODA Act and such others which are deemed fit may be referred to the Committee from time to time for advice & recommendations.
- d. In order to facilitate clearance from different bodies / departments of State Government with the concept of single window clearance approach and thereby final approval by the Authority within stipulated time frame, the Authority shall constitute a Building Approval Committee consisting of representatives of the organizations / bodies from whom clearance for development / building permit clearance is required for approval of plans coming up in Special Economic Zones, Group Housing, Multistoried buildings & other Special Buildings.

106. Validity of permission and re-validation

- a. As per Section 20 of the act, every permission granted shall remain valid up to three years. If within the validity period the work is not completed and completion certificate as prescribed under Section 20 of the Act, is not received, the owner shall have to apply for revalidation of the permission in Form-XIV along with copies of the previously approved plan and approval letter and the details of the construction already undertaken and such other information as may be required and pay all the fees and charges as prescribed in the Act.
- b. Every revalidation permission granted in Form XV shall be valid for a period of three years from the date of revalidation.

107. Decision of the Government to be Final

In case of any dispute in interpretation of these regulations, the decision of the State Government shall be final.

108. Relaxation by the Government

The Authority may recommend to the Government for relaxation/ modification of any of the clauses of these Regulations in the general interest of the public pertaining to projects/schemes developed by the Government agencies and the decision of the Government in this regard shall be final.

APPENDIX-II

Zone No.	Location	Villages within the Zone
01	Nirgundi	Agarjodi, Alana, Alarpur, Athabatia, Banika, Barachancho, Barakesarpur, Bharandi, Bilteruan, Charbatia, Deulchua, Garudagan, Harianta, Hatsisua, Jajabhairabi, Kujibar, Manguli, Nakhara, Narapara, Nelia, Nimapara, Nirgundi, Padhania, Palasa, Saino, Sanachancho, Sanakesarpur, Sardola, Tarato.
02	Charbatia	Agarpara, Agrahat, Bandala, Banipada (part), Bhabadeipur (part), Choudwar (part), Chhatisa, Chatissa No. 2 (part), Gopalpur (part), Jajabhairabi, Kalyansinhpur (part), Kapaleswar (part), Kedareswar, Mangalpur, Mundamal, Nuagan (part), Soshapatana.
03	Chatissa	Bhabadeipur (part), Chatissa No.1, Gopalpur, Indranipatana Aliash Gaukhana (part), Jhatia, Kayalapara, Mahanadi (part), Nuagan (part), Similihand, Udaynagar (part)
04	Choudwar	Banipada, Chashapara, Choudwar (part), Chatissa No.2 (part), Daulatabad, Gobindjiupatana, Godipatana, Gpoalpur (part), Haranathpur, Indranipatana Aliash Gaukhana (part), Jenipurnarasinpur, Kalyansinhpur (part), Kapaleswar (part), Mahanadi (Part), Sultanpur
05	Nimapur	Andeisahi, Gopinathpur, Gunjarpur, Imamnagar, Khaera, Nimapur, Tarol
06	Bidanasi	Arilo (part), Baimundinagar, Bentakarpara (part), Bidansi, Bidyadharpur (part), Brajabiharipur, Chandinichouk, Deulasahi North, Deulasahi South, Krushnachandrapur (part), Mahanadi (part), Mundamuhan (part), Nayasarak, Ramagarh, Subarnapur (part), Tangarhuda (part), Tulasipur North, Tulasipur South, Udayanagar (part)
07	Old Cuttack	Badambadi, Barabatikila, Bisinabar, Buxibazar, Cantonment, Choudhuribazar, College Square, Dolamunde, Jhanjirimangala, Jobra, Kathagarasahi, Machhuabazar, Madhupatana, Mahanadi, Mahanadi No.2, Mangalabag, Mirkamalpatna, Nayasarak, Oriabazar, Rajabagicha, Ranihat, Samant sahi, Sutahat
08	Shikharpur	Andarpur, Arunadayanagar, Bagulapada, Banabidyadharpur, Bhadimul, Bidyadharpur, Chauliaganj, Dianrajahansa, Gandarpur, Gateirautpatana, Gunadol, Kanhaipur, Kantilo, Matagajapur, Nuapara, Paise, Poparada, Sartol, Shilpapuri, Shikharpur
09	Mundali	Chakradharpur, Chandiprasad, Govindpur, Mundali, Narajmarathapur, Nuagan, Ramdaspur, Ratagarhlenkasahi, Talagar
10	Barang	Arilo (part), Bachhapur, Belagachhia, Bentakarpara (part), Bidyadharpur (part), Brahmangan, Brajabiharipur (part), Dadhapatna, Krushnachandrapur, Kunheipara, Madhubana, Madhupur, Madhusudanpur, Mundamuhan (part), Naranpur, Padmalavanagar, Panchupal, Patapur, Phakirpara, Pratapnagari (part), Sribantapur, Subarnapur (part), Tangarhuda (part)
11	Gopalpur	Arakhkud Aliash Telengapenth, Bandhachhara Aliash Kacharamal, Bhanpur, Gopalpur, Nuahat, Pratapnagari (part), Srikoruan, Subhadrapur, Uttampur

Inventory of Heritage Resources

Sl. No.	Name of the Heritage structure/precinct	ID	Category	Location	Ownership	Status	Year of construction	Grade	State of Preservation	Significance	Image
<i>Zone 2 & 4: Charbatia and Choudwar</i>											
1.	Choudwar Fort	ASI-02	Civic	Kedareswar	ASI	Protected Monument	-	I	Good	Historical	
2.	Budhalinga/ Kedareswar Temple	OSA-02	Religious	Kedareswar	Orissa State Archeology	Protected Monument	-	I	Good	Historical and Architectural , one of the Astha Sambhu temples	
3.	Uttareswar Temple	OSA-03	Religious	Agrahat	Orissa Government	Protected Monument	-	I	Good	Historical and Architectural , one of the Astha Sambhu temples	
4.	Maninageswar Temple	UL-01	Religious	Agrahat	Local People	Living Temple	1300	II	Fair , undergone modification	Cultural, one of the Astha Sambhu temples	
5.	Baideswar Temple	UL-02	Religious	Agarjodi	Local People	Living Temple	1200	II	Good	Cultural, one of the Astha Sambhu temples	
6.	Choudwar Jail	UL-03	Civic	Kedareswar	Orissa Government	Central Jail	-	-	-	Social	-
7.	Town Hall, Choudwar	UL-04	Civic	Gandhi Chhak	Choudwar Municipality	Town Hall	-	II	Good	Social, Architectural	-

8.	Jhoteswar Temple	UL-05	Religious	Mundamal	Local People	-	-	-	-	Cultural , one of the Astha Sambhu temples	
9.	Kapaleswar Temple	UL-06	Religious	Kapaleswar	Private	Living Temple	1200	II	Good, undergone modification	Cultural , one of the Astha Shambhu temples	
10.	Chatteswar Temple	UL-07	Religious	Choudwar	Local People	Living Temple	1300	II	Good, un-sympathetic extension	Cultural , one of the Astha Shambhu temples	
11.	Gupteswar Temple	UL-08	Religious	Kapaleswar	Private	Living Temple	1600	II	Fair, undergone modification	Cultural , one of the Astha Shambhu temples	
12.	Yagneswari Temple	UL-09	Religious	Banipada	Village Committee	Living Temple		II	Good	Cultural	
13.	Dhabaleswar Temple	UL-10	Religious	Brajabiharipur	-	Living Temple	-	II	Good	Cultural	
Zone 7: Barabati Fort, Old Cuttack											
14.	Barabati Fort	ASI-01	Civic	Barabati Quila	ASI	-	1200	I	Excellent	Historical , Cultural and Architectural	

15.	Quilasahi Mosque	OSA-01	Religious	Barabati Fort Complex	Waqf Board	Living Mosque	1800	II	Fair	Historical and Cultural	
16.	Gada Chandi Temple	UL-11	Religious	Barabati Fort Complex	-	Living Temple	-	I	Fair	Historical, Cultural	
17.	Bungalow	UL-12	Civic	Barabati Fort Complex	Orissa Government (earlier residence of Chief Justice)	Residential	1905	II	Good	Historical, recommended for Adaptive Reuse	
18.	Gadagadia Temple	UL-13	Religious	Barabati Quila	-	Living Temple	-	II	Fair	Cultural	
19.	Cemetery	UL-14	Civic	Gora Kabar (River Mahanadi)	Orissa Government	Burial Ground for Christian Community	1900	II	Good	Historical and Social	
20.	Moat (Gada Khai)	UL-15	Street-scape	Barabati Fort Complex	Orissa Government	Public Visiting Place	1600	I	In serious condition	Historical and Natural	
Zone 7: Cantonment, Old Cuttack											
21.	Office of the Superintendent Engineer, Irrigation	UL-16	Civic	Cantonment	Orissa Government	Official	1900	III	Fair	Historical	

22.	Colonial Bungalow	UL-18	Civic	Cantonment	Orissa Governmen (official residence of BM Mahapatra)	Residential	-	II	Fair	Architecture & Townscape	
23.	Colonial Bungalow (Kindergarden School)	UL-19	Civic	Cantonment	Orissa Government	Institutional	-	II	Good	Architecture & Townscape	
24.	Colonial Bungalow (CB-16)	UL-20	Civic	Cantonment	Orissa Government	Residential	-	II	Good	Architecture & Townscape	
25.	Ratha Kothi (Smith Bungalow)	UL-21	Civic	Near Barabati Fort	-	Residential	1800	II	Fair, undergone internal modification	Historical & Architectural	
26.	Colonial Bungalow (Collector's Quarter)	UL-22	Civic	Near Barabati Fort	-	Residential	1900	II	Good	Historical, Architectural & Townscape	
27.	St. Joseph's Girls High School	UL-23	Civic	Barabati Quila	-	Institutional	-	III	Fair (largely new construction, only a small original portion retained)	Historical Precinct, Socio-cultural	

28.	Holy Rosary Cathedral	UL-24	Religious	Barabati Quila	Institutional/Trustee	Living Church	-	III	Old structure demolished, new construction	Historical Precinct, Socio-cultural	
29.	Cambridge School	UL-25	Civic	Cantonment	Institutional/Trustee	Institutional	-	III	Old structure demolished, new construction	Historical Precinct, Socio-cultural	
30.	Mount House Church of God	UL-26	Religious	Barabati Quila	Institutional/Trustee	Living Church	-	II	Good	Historical, Socio-cultural, Architectural	
31.	Kanika Raja Palace	UL-27	Civic	Tulasipur South	Private	Residential	1900	II	Poor	Architecture & Townscape	
32.	Cuttack Chandi Temple	UL-28	Religious	Chandinichouk	-	-	-	I	Fair	Cultural	
33.	Building of Late Madhusudan Das	UL-29	Civic	Near Chandi Mandir	Government of Orissa	Sailabala Women's College	1915	II	Good	Historical, Architectural	

34.	<i>The Cedars</i>	<i>UL-30</i>	<i>Religious</i>	<i>Sutahat</i>	-	-	-	-	-	-	-
35.	<i>Chirst Collegiate School</i>	<i>UL-31</i>	<i>Civic</i>	<i>Sutahat</i>	<i>Government of Orissa</i>	<i>Institution</i>	<i>1900</i>	<i>II</i>	<i>Good</i>	<i>Socio-cultural, Architectural, Townscape</i>	
36.	<i>Diocesan Guest House</i>	<i>UL-32</i>	<i>Civic</i>	<i>Sutahat</i>	<i>Institutional/Trustee</i>	<i>Meeting Place & Guest House</i>	-	<i>III</i>	<i>Fair</i>	<i>Socio-cultural, Townscape</i>	
37.	<i>Buckley House</i>	<i>UL-33</i>	<i>Residential</i>	<i>Sutahat</i>	<i>Private</i>	<i>Residential</i>	<i>1902</i>	<i>III</i>	<i>Good</i>	<i>Social</i>	
38.	<i>Diocess of Cuttack, Church of North India</i>	<i>UL-34</i>	<i>Religious</i>	<i>Oriya Bazaar</i>	<i>Institutional/Trustee</i>	<i>Institutional</i>	-	<i>III</i>	<i>Fair</i>	<i>Socio-cultural</i>	
39.	<i>Baptist Church</i>	<i>UL-35</i>	<i>Religious</i>	<i>Oriya Bazaar</i>	<i>Institutional/Trustee</i>	<i>Religious</i>	-	<i>II</i>	<i>Good</i>	<i>Socio-cultural, Architectural</i>	
40.	<i>United Theological School</i>	<i>UL-36</i>	<i>Civic</i>	<i>Cantonment</i>	<i>Institutional/Trustee</i>	<i>Institutional</i>	-	<i>III</i>	<i>Fair</i>	<i>Socio-cultural</i>	

41.	Utkal Prantiya Rastra Bhasa Prachara Sava	UL-37	Civic	Cantonment	Government of Orissa	Institutional	-	II	Good	Socio-cultural, Architectural	
42.	Palace of Madhupur King	UL-38	Civic	Near Stewart College	Government of Orissa	Old Office of AIR	-	III	Deteriorating	Historical	
43.	Samaj Office	UL-39	Civic	Cantonment	Institutional/Trustee	Newspapaer Office & Archieve	-	II	Good	Socio-cultural, Historical Association	
44.	Amareswar Temple	UL-40	Religious	Buxi Bazaar	Government of Orissa	Living Temple	1900	III	Good	Socio-cultural	
45.	Old Secretariat	UL-17	Civic	Cantonment	Government of Orissa	Recruitment Office	-	III	Deteriorating	Historical	
Zone 7: Other Areas, Old Cuttack											
46.	Jobra Workshop	OSA-04	Civic	Jobra	Government of Orissa- Irrigation Department	Workshop of Irrigation and Power Department; Proposed Maritime Museum	1866	II	Work in progress for adaptive reuse as maritime museum	Historical, Architectural	
47.	Netaji Seva Sadan	OSA-05	Civic	Oriya Bazaar	Government of Orissa	-	-	-	-	-	-
48.	Mahadeva Temple	OSA-06	Religious	Nayasarak	Private	Living Temple	1800	III	Good	Cultural	-

49.	Swaraj Office	OSA-07	Civic	Choudhary Bazaar	Private	Social Project Office & Residence	-	III	Good	Historical, Townscape	
50.	Regimental Mosque	UL-41	Religious	Cantonment	Government of Orissa- Waqf board	Living Mosque	-	III	Good	Social	-
51.	Chinese Restaurant	UL-42	Civic	Buxi Bazaar	Private	Restaurant	1905	III	Deteriorating	Socio-cultural, Architectural	
52.	Raj Lodge	UL-43	Civic	Oriya Bazaar	Private	Guest House	1900	III	Deteriorating	Architectural	
53.	Pyarimohan Academy	UL-44	Civic	Oriya Bazaar	Government of Orissa- Education Department	School building	1875	III	Good	Historical, Architectural	-
54.	Gangeswar Temple	UL-45	Religious	Oriya Bazaar	Private	Living Temple	1400	II	Good	Social	-
55.	Ravenshaw Girl's High School	UL-46	Civic	Gourishankar Park	Government of Orissa- Education Department	School building	1873	III	Good	Social	-
56.	Kadam Rasul Mosque	UL-48	Religious	Jail Road	Government of Orissa- Waqf board	Living Mosque	1756	II	Good	Social	-
57.	Sultania Mosque	UL-49	Religious	Kathagada Sahi	Government of Orissa- Waqf board	Living Mosque	1857	III	Good	Social	-
58.	Richaram Dharamsala	UL-50	Civic	Kathagada Sahi	Private	Rest House for Pilgrims and Tourists	1930	III	Good	Social	-
59.	Gopalji Temple	UL-51	Religious	Choudhary Bazaar	Private	Living Temple	1900	III	Good	Social	-
60.	Digambara Jain Temple	UL-55	Religious	Choudhary Bazaar	Private	Living Temple	1800	III	Good	Social	-

61.	Shaheed Bhawan	UL-56	Civic	Choudhary Bazaar	Government of Orissa	For Public meetings and functions	-	III	Good	Socio-cultural, Architectural	
62.	Ujjelekhan Mosque	UL-57	Religious	Chandinichouk	Government of Orissa- Waqf board	Living Mosque	1707	II	Good	Social	-
63.	Darpani Rani Palace	UL-58	Street-scape	Chandinichouk	Private	Residential	1800	II	Fair	Architectural	
64.	Landa Deula	UL-67	Religious	Nayasarak	Government of Orissa- Endowment Commission	Living Temple	1800	II	Good		-
65.	Swaraj Ashram	UL-68	Civic	Nayasarak				II	Fair	Historical Association	-
66.	Radhanath Training Hostel	UL-69	Civic	Nayasarak	Government of Orissa- Education Department	Hostel	.	II	Good	Socio-cultural, Townscape	
67.	Jagannath Temple	UL-59	Religious	Choudhary Bazaar	Government of Orissa- Endowment Commission	Living Temple	1900	III	Good	Social	
68.	Old Circuit House	UL-70	Civic	Howrah Motor Chhak	Government of Orissa	Guest House	1903	II	Good	Historical, Architectural	

69.	Cancer Research Centre	UL-71	Civic	Infront of SCB Hospital	Government of Orissa- Health Department	Research Centre	1900	II	Fair	Historical, Architectural	
70.	BOSE Engineering School	UL-72	Civic	Jobra	Government of Orissa	Engineering School	1932	II	Good	Socio-cultural, Historical	
71.	Ravenshaw College	UL-75	Civic	College Square	Government of Orissa	University	1888	I	Good	Socio-cultural, Historical, Architectural	
72.	Padhihari Pathagara	UL-47	Civic	Gourishankar Park	Government of Orissa- Information & Public Relations Department	Library	1958	II	Good	Socio-cultural, Historical, Architectural	
73.	CMC Office	UL-52	Civic	Choudhary Bazaar	Government of Orissa	Public	-	II	Fair	Historical, Architectural	-
74.	Old Building Residence (D Hansraj)	UL-73	Civic	College Square	Private	Residence cum office	1920	III	Good	Architectural, Townscape	
75.	Cuttack Town Hall	UL-54	Civic	Choudhary Bazaar	Government of Orissa	Public	-	II	Fair	Historical, Architectural, Townscape	-
76.	Shatabdi Bhawan	UL-53	Civic	Choudhary Bazaar	Government of Orissa	Public	-	II	Fair	Historical, Architectural, Townscape	-
77.	Bombay Hotel	UL-74	Civic	College Square	Private	Hotel	-	III	Fair	Socio-cultural, Historical, Townscape	-

Zone 7: Judiciary Complex , Old Cuttack											
78.	Old Building (Residence of RP Shastri)	UL-60	Civic	Chandinichouk	Private	Residence	-	III	Fair	Historical, Architectural	
79.	Sishu Bhawan	UL-61	Civic	Chandinichouk	Government of Orissa- Health Department	Infant Hospital	-	II	Fair	Historical	
80.	Orissa High Court	UL-62	Civic	Chandinichouk	Government of Orissa	High Court	1900	I	Excellent	Historical, Architectural	
81.	Judge Court	UL-63	Civic	Near High Court	Government of Orissa	Court	-	II	Good	Historical, Architectural	-
82.	Board of Revenue Office of the Government of Orissa	UL-64	Civic	Near High Court	Government of Orissa	Official	1900	III	Good	Socio-cultural, Historical	
83.	Collectorate Office	UL-65	Civic	Chandinichouk	Government of Orissa	Official	-	I	Good	Historical, Architectural	
84.	Ravenshaw Collegiate School	UL-66	Civic	Near High Court	Government of Orissa- Education Department	School	1900	II	Good	Historical, Architectural, Socio- Cultural	